

# GDCM

## 3.0.24

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# Chapter 1

## GDCM Documentation

This is the developers documentation.

A PDF version of this doxygen documentation can be found here:

<http://gdcm.sourceforge.net/3.0/gdcm-3.0.24.pdf>

A tarball version of this HTML doxygen documentation can be found here:

<http://gdcm.sourceforge.net/3.0/gdcm-3.0.24-doc.tar.gz>

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## Chapter 2

# Todo List

### Class [gdcm::CSAHeader](#)

MrEvaProtocol in 29,1020 contains ^M that would be nice to get rid of on UNIX system...

### Class [gdcm::network::ApplicationContext](#)

Looks like Application Context can only be 64 bytes at max (see Figure 9-1 / PS 3.8 - 2009 )

### Class [gdcm::Overlay](#)

Is there actually any way to recognize an overlay ? On images with multiple overlay I do not see any way to differentiate them (other than the group tag).

### Class [gdcm::SequenceOfFragments](#)

I do not enforce that Sequence of Fragments ends with a SQ end del

### Class [gdcm::TransferSyntax](#)

: The implementation is completely retarded -> see [gdcm::UIDs](#) for a replacement We need: IsSupported We need preprocess of raw/xml file We need GetFullName()

### Member [gdcm::UIDGenerator::IsValid](#) (const char \*uid)

: Move that in DataStructureAndEncoding (see FileMetaInformation::CheckFileMetaInformation)



## Chapter 3

# Deprecated List

Member `gdcm::CompositeNetworkFunctions::ConstructQuery` (`ERootType` inRootType, `EQueryLevel` inQueryLevel, const `KeyValuePairArrayType` &keys, `EQueryType` queryType=eFind)

Member `gdcm::FileSet::AddFile` (`File` const &)

. Does nothing

Member `gdcm::TransferSyntax::GetSwapCode` () const

Return the `SwapCode` associated with the Transfer Syntax. Be careful with the special GE private syntax the `DataSet` is written in little endian but the Pixel Data is in Big Endian.





## Chapter 4

# Bug List

### Class `gdcm::DICOMDIRGenerator`

: There is a current limitation of not handling Referenced SOP Class UID / Referenced SOP Instance UID simply because the `Scanner` does not allow us See PS 3.11 / [Table D.3-2 STD-GEN Additional DICOMDIR Keys](#)

**Member `gdcm::FileStreamer::StartGroupDataElement`** (`const PrivateTag &pt`, `size_t maxsize=0`, `uint8_t startoffset=0`)

`maxsize` should be a value lower than the actual total size of the buffer to be copied

### Class `gdcm::IPPSorter`

There are currently a couple of bugs in this implementation:



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# Directory Hierarchy

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## Chapter 6

# Namespace Index

### 6.1 Namespace List

Here is a list of all namespaces with brief descriptions:

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## Chapter 7

# Hierarchical Index

### 7.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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<a href="#">gdc SmartPointer.h</a>	1600
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gdcmCSAHeaderDictEntry.h	1635
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gdcmDataElement.h	1703
gdcmDataSet.h	1707
gdcmDataSetEvent.h	1711
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gdcmExplicitImplicitDataElement.h	1727
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gdcmFileMetaInformation.h	1730
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<a href="#">gdcmEncapsulatedDocument.h</a>	1897
<a href="#">gdcmEquipmentManufacturer.h</a>	1898
<a href="#">gdcmFiducials.h</a>	1900
<a href="#">gdcmFileAnonymizer.h</a>	1901
<a href="#">gdcmFileChangeTransferSyntax.h</a>	1902
<a href="#">gdcmFileDecompressLookupTable.h</a>	1904
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<a href="#">gdcmImageChangePhotometricInterpretation.h</a>	1920
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<a href="#">gdcmImageHelper.h</a>	1932
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<a href="#">gdcmImageRegionReader.h</a>	1936
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<a href="#">gdcmImageWriter.h</a>	1939
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<a href="#">gdcmJPEG8Codec.h</a>	1948
<a href="#">gdcmJPEGCodec.h</a>	1949
<a href="#">gdcmJPEGLSCodec.h</a>	1952
<a href="#">gdcmJSON.h</a>	1953
<a href="#">gdcmKAKADUCodec.h</a>	1955
<a href="#">gdcmLookupTable.h</a>	1956
<a href="#">gdcmMEC_MR3.h</a>	1959
<a href="#">gdcmMeshPrimitive.h</a>	1960
<a href="#">gdcmOrientation.h</a>	1963
<a href="#">gdcmOverlay.h</a>	1964
<a href="#">gdcmPDFCodec.h</a>	1967
<a href="#">gdcmPersonName.h</a>	1968
<a href="#">gdcmPGXCodec.h</a>	1970
<a href="#">gdcmPhotometricInterpretation.h</a>	1971
<a href="#">gdcmPixelFormat.h</a>	1973
<a href="#">gdcmPixmap.h</a>	1977
<a href="#">gdcmPixmapReader.h</a>	1980
<a href="#">gdcmPixmapToPixmapFilter.h</a>	1982
<a href="#">gdcmPixmapWriter.h</a>	1983
<a href="#">gdcmPNMCodec.h</a>	1985
<a href="#">gdcmPrinter.h</a>	1986

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gdcmRAWCodec.h	1991
gdcmRescaler.h	1992
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gdcmScanner2.h	1998
gdcmSegment.h	2001
gdcmSegmentedPaletteColorLookupTable.h	2005
gdcmSegmentHelper.h	2006
gdcmSegmentReader.h	2008
gdcmSegmentWriter.h	2010
gdcmSerieHelper.h	2012
gdcmSimpleSubjectWatcher.h	2015
gdcmSorter.h	2017
gdcmSpacing.h	2020
gdcmSpectroscopy.h	2021
gdcmSplitMosaicFilter.h	2022
gdcmStreamImageReader.h	2025
gdcmStreamImageWriter.h	2026
gdcmStrictScanner.h	2028
gdcmStrictScanner2.h	2031
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<a href="#">vtkGDCMPolyDataReader.h</a>	2206
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<a href="#">vtkGDCMThreadedImageReader2.h</a>	2213
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<a href="#">vtkImageMapToColors16.h</a>	2219
<a href="#">vtkImageMapToWindowLevelColors2.h</a>	2221
<a href="#">vtkImagePlanarComponentsToComponents.h</a>	2223
<a href="#">vtkImageRGBToYBR.h</a>	2224
<a href="#">vtkImageYBRToRGB.h</a>	2226
<a href="#">vtkLookupTable16.h</a>	2227
<a href="#">vtkRTStructSetProperties.h</a>	2229
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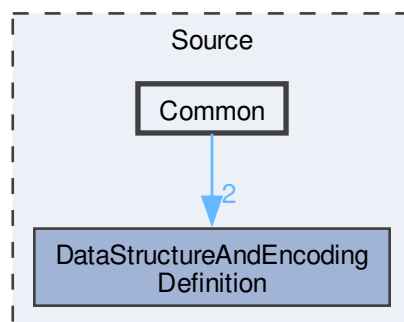


## Chapter 10

# Directory Documentation

### 10.1 Common Directory Reference

Directory dependency graph for Common:



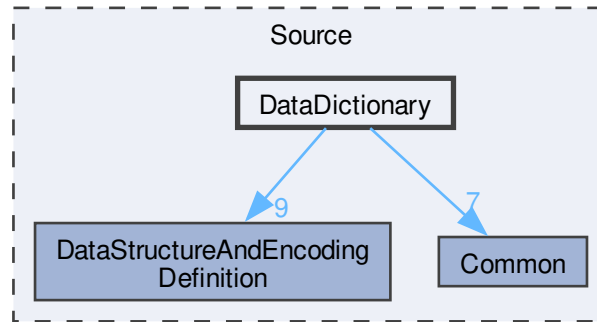
#### Files

- file [gdcmASN1.h](#)
- file [gdcmBase64.h](#)
- file [gdcmBoxRegion.h](#)
- file [gdcmByteSwap.h](#)
- file [gdcmCAPICryptoFactory.h](#)
- file [gdcmCAPICryptographicMessageSyntax.h](#)
- file [gdcmCommand.h](#)
- file [gdcmCryptoFactory.h](#)

- file [gdcmCryptographicMessageSyntax.h](#)
- file [gdcmDataEvent.h](#)
- file [gdcmDeflateStream.h](#)
- file [gdcmDirectory.h](#)
- file [gdcmDummyValueGenerator.h](#)
- file [gdcmEvent.h](#)
- file [gdcmException.h](#)
- file [gdcmFilename.h](#)
- file [gdcmFileNameEvent.h](#)
- file [gdcmFilenameGenerator.h](#)
- file [gdcmLegacyMacro.h](#)
- file [gdcmMD5.h](#)
- file [gdcmObject.h](#)
- file [gdcmOpenSSLCryptoFactory.h](#)
- file [gdcmOpenSSLCryptographicMessageSyntax.h](#)
- file [gdcmOpenSSLP7CryptoFactory.h](#)
- file [gdcmOpenSSLP7CryptographicMessageSyntax.h](#)
- file [gdcmProgressEvent.h](#)
- file [gdcmRegion.h](#)
- file [gdcmSHA1.h](#)
- file [gdcmSmartPointer.h](#)
- file [gdcmStaticAssert.h](#)
- file [gdcmString.h](#)
- file [gdcmSubject.h](#)
- file [gdcmSwapCode.h](#)
- file [gdcmSwapper.h](#)
- file [gdcmSystem.h](#)
- file [gdcmTerminal.h](#)
- file [gdcmTestDriver.h](#)
- file [gdcmTesting.h](#)
- file [gdcmTrace.h](#)
- file [gdcmTypes.h](#)
- file [gdcmUnpacker12Bits.h](#)
- file [gdcmVersion.h](#)
- file [gdcmWin32.h](#)

## 10.2 DataDictionary Directory Reference

Directory dependency graph for DataDictionary:

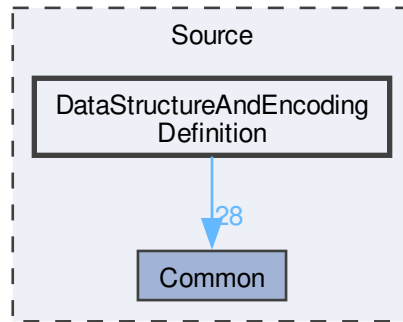


### Files

- file [gdcmCSAHeaderDict.h](#)
- file [gdcmCSAHeaderDictEntry.h](#)
- file [gdcmDict.h](#)
- file [gdcmDictConverter.h](#)
- file [gdcmDictEntry.h](#)
- file [gdcmDicts.h](#)
- file [gdcmGlobal.h](#)
- file [gdcmGroupDict.h](#)
- file [gdcmSOPClassUIDToIOD.h](#)
- file [gdcmUIDs.h](#)

## 10.3 DataStructureAndEncodingDefinition Directory Reference

Directory dependency graph for DataStructureAndEncodingDefinition:



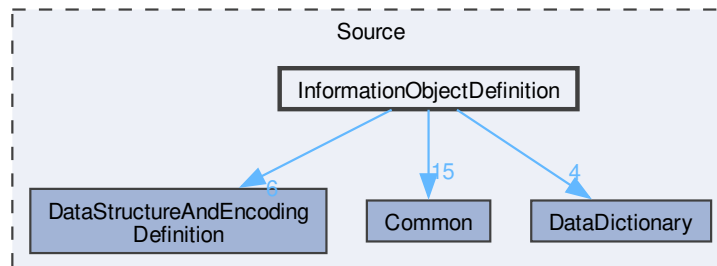
### Files

- file [gdcmAttribute.h](#)
- file [gdcmBasicOffsetTable.h](#)
- file [gdcmByteBuffer.h](#)
- file [gdcmByteSwapFilter.h](#)
- file [gdcmByteValue.h](#)
- file [gdcmCodeString.h](#)
- file [gdcmCP246ExplicitDataElement.h](#)
- file [gdcmCSAElement.h](#)
- file [gdcmCSAHeader.h](#)
- file [gdcmDataElement.h](#)
- file [gdcmDataSet.h](#)
- file [gdcmDataSetEvent.h](#)
- file [gdcmElement.h](#)
- file [gdcmExplicitDataElement.h](#)
- file [gdcmExplicitImplicitDataElement.h](#)
- file [gdcmFile.h](#)
- file [gdcmFileMetaInformation.h](#)
- file [gdcmFileSet.h](#)
- file [gdcmFragment.h](#)
- file [gdcmImplicitDataElement.h](#)
- file [gdcmItem.h](#)
- file [gdcmLO.h](#)
- file [gdcmMediaStorage.h](#)
- file [gdcmMrProtocol.h](#)

- file [gdcmParseException.h](#)
- file [gdcmParser.h](#)
- file [gdcmPDBelement.h](#)
- file [gdcmPDBHeader.h](#)
- file [gdcmPreamble.h](#)
- file [gdcmPrivateTag.h](#)
- file [gdcmReader.h](#)
- file [gdcmSequenceOfFragments.h](#)
- file [gdcmSequenceOfItems.h](#)
- file [gdcmTag.h](#)
- file [gdcmTagToVR.h](#)
- file [gdcmTransferSyntax.h](#)
- file [gdcmUNExplicitDataElement.h](#)
- file [gdcmUNExplicitImplicitDataElement.h](#)
- file [gdcmValue.h](#)
- file [gdcmValueIO.h](#)
- file [gdcmVL.h](#)
- file [gdcmVM.h](#)
- file [gdcmVR.h](#)
- file [gdcmVR16ExplicitDataElement.h](#)
- file [gdcmWriter.h](#)

## 10.4 InformationObjectDefinition Directory Reference

Directory dependency graph for InformationObjectDefinition:



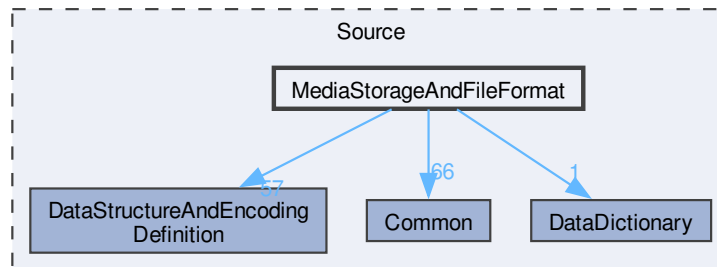
### Files

- file [gdcmDefinedTerms.h](#)
- file [gdcmDefs.h](#)
- file [gdcmEnumeratedValues.h](#)
- file [gdcmIOD.h](#)

- file [gdcmIODEntry.h](#)
- file [gdcmIODs.h](#)
- file [gdcmMacro.h](#)
- file [gdcmMacroEntry.h](#)
- file [gdcmMacros.h](#)
- file [gdcmModule.h](#)
- file [gdcmModuleEntry.h](#)
- file [gdcmModules.h](#)
- file [gdcmNestedModuleEntries.h](#)
- file [gdcmPatient.h](#)
- file [gdcmSeries.h](#)
- file [gdcmStudy.h](#)
- file [gdcmTable.h](#)
- file [gdcmTableEntry.h](#)
- file [gdcmTableReader.h](#)
- file [gdcmType.h](#)
- file [gdcmUsage.h](#)
- file [gdcmXMLDictReader.h](#)
- file [gdcmXMLPrivateDictReader.h](#)

## 10.5 MediaStorageAndFileFormat Directory Reference

Directory dependency graph for MediaStorageAndFileFormat:



### Files

- file [gdcmAnonymizeEvent.h](#)
- file [gdcmAnonymizer.h](#)
- file [gdcmApplicationEntity.h](#)
- file [gdcmAudioCodec.h](#)
- file [gdcmBitmap.h](#)
- file [gdcmBitmapToBitmapFilter.h](#)

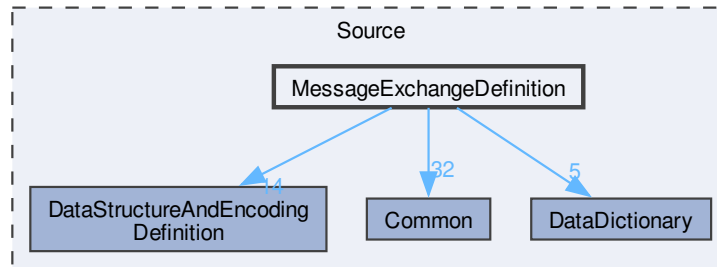


- file [gdcmCleaner.h](#)
- file [gdcmCodec.h](#)
- file [gdcmCoder.h](#)
- file [gdcmConstCharWrapper.h](#)
- file [gdcmCurve.h](#)
- file [gdcmDataSetHelper.h](#)
- file [gdcmDecoder.h](#)
- file [gdcmDeltaEncodingCodec.h](#)
- file [gdcmDICOMDIR.h](#)
- file [gdcmDICOMDIRGenerator.h](#)
- file [gdcmDictPrinter.h](#)
- file [gdcmDirectionCosines.h](#)
- file [gdcmDirectoryHelper.h](#)
- file [gdcmDPath.h](#)
- file [gdcmDumper.h](#)
- file [gdcmEmptyMaskGenerator.h](#)
- file [gdcmEncapsulatedDocument.h](#)
- file [gdcmEquipmentManufacturer.h](#)
- file [gdcmFiducials.h](#)
- file [gdcmFileAnonymizer.h](#)
- file [gdcmFileChangeTransferSyntax.h](#)
- file [gdcmFileDecompressLookupTable.h](#)
- file [gdcmFileDerivation.h](#)
- file [gdcmFileExplicitFilter.h](#)
- file [gdcmFileStreamer.h](#)
- file [gdcmIconImage.h](#)
- file [gdcmIconImageFilter.h](#)
- file [gdcmIconImageGenerator.h](#)
- file [gdcmImage.h](#)
- file [gdcmImageApplyLookupTable.h](#)
- file [gdcmImageChangePhotometricInterpretation.h](#)
- file [gdcmImageChangePlanarConfiguration.h](#)
- file [gdcmImageChangeTransferSyntax.h](#)
- file [gdcmImageCodec.h](#)
- file [gdcmImageConverter.h](#)
- file [gdcmImageFragmentSplitter.h](#)
- file [gdcmImageHelper.h](#)
- file [gdcmImageReader.h](#)
- file [gdcmImageRegionReader.h](#)
- file [gdcmImageToImageFilter.h](#)
- file [gdcmImageWriter.h](#)
- file [gdcmIPPSorter.h](#)
- file [gdcmJPEG12Codec.h](#)
- file [gdcmJPEG16Codec.h](#)
- file [gdcmJPEG2000Codec.h](#)
- file [gdcmJPEG8Codec.h](#)
- file [gdcmJPEGCodec.h](#)
- file [gdcmJPEGLSCodec.h](#)
- file [gdcmJSON.h](#)
- file [gdcmKAKADUCodec.h](#)
- file [gdcmLookupTable.h](#)

- file [gdcmMEC\\_MR3.h](#)
- file [gdcmMeshPrimitive.h](#)
- file [gdcmOrientation.h](#)
- file [gdcmOverlay.h](#)
- file [gdcmPDFCodec.h](#)
- file [gdcmPersonName.h](#)
- file [gdcmPGXCodec.h](#)
- file [gdcmPhotometricInterpretation.h](#)
- file [gdcmPixelFormat.h](#)
- file [gdcmPixmap.h](#)
- file [gdcmPixmapReader.h](#)
- file [gdcmPixmapToPixmapFilter.h](#)
- file [gdcmPixmapWriter.h](#)
- file [gdcmPNMCodec.h](#)
- file [gdcmPrinter.h](#)
- file [gdcmPVRGCodec.h](#)
- file [gdcmRAWCodec.h](#)
- file [gdcmRescaler.h](#)
- file [gdcmRLECodec.h](#)
- file [gdcmScanner.h](#)
- file [gdcmScanner2.h](#)
- file [gdcmSegment.h](#)
- file [gdcmSegmentedPaletteColorLookupTable.h](#)
- file [gdcmSegmentHelper.h](#)
- file [gdcmSegmentReader.h](#)
- file [gdcmSegmentWriter.h](#)
- file [gdcmSerieHelper.h](#)
- file [gdcmSimpleSubjectWatcher.h](#)
- file [gdcmSorter.h](#)
- file [gdcmSpacing.h](#)
- file [gdcmSpectroscopy.h](#)
- file [gdcmSplitMosaicFilter.h](#)
- file [gdcmStreamImageReader.h](#)
- file [gdcmStreamImageWriter.h](#)
- file [gdcmStrictScanner.h](#)
- file [gdcmStrictScanner2.h](#)
- file [gdcmStringFilter.h](#)
- file [gdcmSurface.h](#)
- file [gdcmSurfaceHelper.h](#)
- file [gdcmSurfaceReader.h](#)
- file [gdcmSurfaceWriter.h](#)
- file [gdcmTagPath.h](#)
- file [gdcmUIDGenerator.h](#)
- file [gdcmUUIDGenerator.h](#)
- file [gdcmValidate.h](#)
- file [gdcmWaveform.h](#)
- file [gdcmXMLPrinter.h](#)

## 10.6 MessageExchangeDefinition Directory Reference

Directory dependency graph for MessageExchangeDefinition:



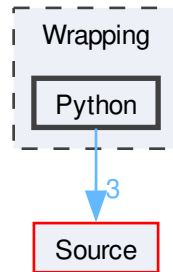
### Files

- file [gdcmAAAbortPDU.h](#)
- file [gdcmAAssociateACPDU.h](#)
- file [gdcmAAssociateRJPDU.h](#)
- file [gdcmAAssociateRQPDU.h](#)
- file [gdcmAbstractSyntax.h](#)
- file [gdcmApplicationContext.h](#)
- file [gdcmAReleaseRPPDU.h](#)
- file [gdcmAReleaseRQPDU.h](#)
- file [gdcmARTIMTimer.h](#)
- file [gdcmAsynchronousOperationsWindowSub.h](#)
- file [gdcmBaseCompositeMessage.h](#)
- file [gdcmBaseNormalizedMessage.h](#)
- file [gdcmBasePDU.h](#)
- file [gdcmBaseQuery.h](#)
- file [gdcmBaseRootQuery.h](#)
- file [gdcmCEchoMessages.h](#)
- file [gdcmCFindMessages.h](#)
- file [gdcmCMoveMessages.h](#)
- file [gdcmCommandDataSet.h](#)
- file [gdcmCompositeMessageFactory.h](#)
- file [gdcmCompositeNetworkFunctions.h](#)
- file [gdcmCStoreMessages.h](#)
- file [gdcmDIMSE.h](#)
- file [gdcmFindPatientRootQuery.h](#)
- file [gdcmFindStudyRootQuery.h](#)
- file [gdcmImplementationClassUIDSub.h](#)
- file [gdcmImplementationUIDSub.h](#)

- file [gdcmImplementationVersionNameSub.h](#)
- file [gdcmMaximumLengthSub.h](#)
- file [gdcmModalityPerformedProcedureStepCreateQuery.h](#)
- file [gdcmModalityPerformedProcedureStepSetQuery.h](#)
- file [gdcmMovePatientRootQuery.h](#)
- file [gdcmMoveStudyRootQuery.h](#)
- file [gdcmNActionMessages.h](#)
- file [gdcmNCreateMessages.h](#)
- file [gdcmNDeleteMessages.h](#)
- file [gdcmNetworkEvents.h](#)
- file [gdcmNetworkStateID.h](#)
- file [gdcmNEventReportMessages.h](#)
- file [gdcmNGetMessages.h](#)
- file [gdcmNormalizedMessageFactory.h](#)
- file [gdcmNormalizedNetworkFunctions.h](#)
- file [gdcmNSetMessages.h](#)
- file [gdcmPDataTFPDU.h](#)
- file [gdcmPDUFactory.h](#)
- file [gdcmPresentationContext.h](#)
- file [gdcmPresentationContextAC.h](#)
- file [gdcmPresentationContextGenerator.h](#)
- file [gdcmPresentationContextRQ.h](#)
- file [gdcmPresentationDataValue.h](#)
- file [gdcmQueryBase.h](#)
- file [gdcmQueryFactory.h](#)
- file [gdcmQueryImage.h](#)
- file [gdcmQueryPatient.h](#)
- file [gdcmQuerySeries.h](#)
- file [gdcmQueryStudy.h](#)
- file [gdcmRoleSelectionSub.h](#)
- file [gdcmServiceClassApplicationInformation.h](#)
- file [gdcmServiceClassUser.h](#)
- file [gdcmSOPClassExtendedNegociationSub.h](#)
- file [gdcmTransferSyntaxSub.h](#)
- file [gdcmULAction.h](#)
- file [gdcmULActionAA.h](#)
- file [gdcmULActionAE.h](#)
- file [gdcmULActionAR.h](#)
- file [gdcmULActionDT.h](#)
- file [gdcmULBasicCallback.h](#)
- file [gdcmULConnection.h](#)
- file [gdcmULConnectionCallback.h](#)
- file [gdcmULConnectionInfo.h](#)
- file [gdcmULConnectionManager.h](#)
- file [gdcmULEvent.h](#)
- file [gdcmULTransitionTable.h](#)
- file [gdcmULWritingCallback.h](#)
- file [gdcmUserInformation.h](#)
- file [gdcmWLMFindQuery.h](#)

## 10.7 Python Directory Reference

Directory dependency graph for Python:

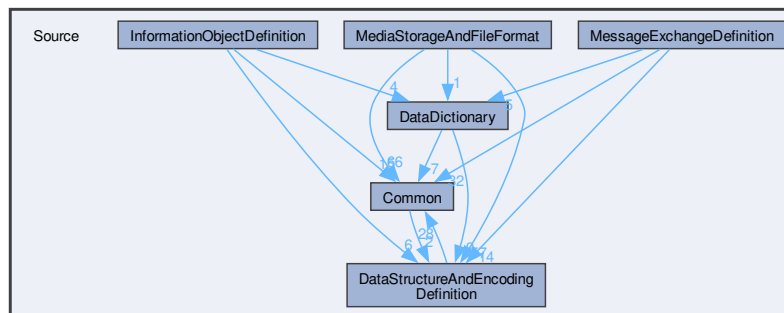


### Files

- file [gdcmPythonFilter.h](#)

## 10.8 Source Directory Reference

Directory dependency graph for Source:



## Directories

- directory [Common](#)
- directory [DataDictionary](#)
- directory [DataStructureAndEncodingDefinition](#)
- directory [InformationObjectDefinition](#)
- directory [MediaStorageAndFileFormat](#)
- directory [MessageExchangeDefinition](#)

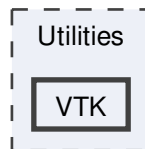
## 10.9 Utilities Directory Reference

### Directories

- directory [VTK](#)

## 10.10 VTK Directory Reference

Directory dependency graph for VTK:

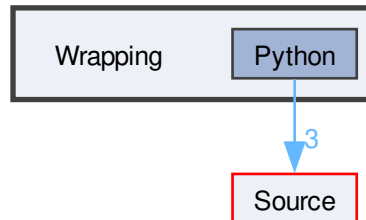


### Files

- file [vtkGDCMImageReader.h](#)
- file [vtkGDCMImageReader2.h](#)
- file [vtkGDCMImageWriter.h](#)
- file [vtkGDCMMedicalImageProperties.h](#)
- file [vtkGDCMPolyDataReader.h](#)
- file [vtkGDCMPolyDataWriter.h](#)
- file [vtkGDCMTesting.h](#)
- file [vtkGDCMThreadedImageReader.h](#)
- file [vtkGDCMThreadedImageReader2.h](#)
- file [vtkImageColorViewer.h](#)
- file [vtkImageMapToColors16.h](#)
- file [vtkImageMapToWindowLevelColors2.h](#)
- file [vtkImagePlanarComponentsToComponents.h](#)
- file [vtkImageRGBToYBR.h](#)
- file [vtkImageYBRToRGB.h](#)
- file [vtkLookupTable16.h](#)
- file [vtkRTStructSetProperties.h](#)

## 10.11 Wrapping Directory Reference

Directory dependency graph for Wrapping:



### Directories

- directory [Python](#)





# Chapter 11

## Namespace Documentation

### 11.1 gdcM Namespace Reference

#### Namespaces

- namespace [network](#)
- namespace [SegmentHelper](#)
- namespace [terminal](#)

*Class for Terminal.*

#### Classes

- class [AbortEvent](#)
- class [AnonymizeEvent](#)  
*AnonymizeEvent.*
- class [Anonymizer](#)  
*Anonymizer.*
- class [AnyEvent](#)
- class [ApplicationEntity](#)  
*ApplicationEntity.*
- class [ASN1](#)  
*Class for ASN1.*
- class [Attribute](#)  
*Attribute class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.*
- class [Attribute< Group, Element, TVR, VM::VM1 >](#)
- class [Attribute< Group, Element, TVR, VM::VM1\\_3 >](#)
- class [Attribute< Group, Element, TVR, VM::VM1\\_8 >](#)
- class [Attribute< Group, Element, TVR, VM::VM1\\_n >](#)
- class [Attribute< Group, Element, TVR, VM::VM2\\_2n >](#)
- class [Attribute< Group, Element, TVR, VM::VM2\\_n >](#)
- class [Attribute< Group, Element, TVR, VM::VM3\\_3n >](#)
- class [Attribute< Group, Element, TVR, VM::VM3\\_n >](#)

- class [AudioCodec](#)  
*AudioCodec.*
- class [Base64](#)  
*Class for Base64.*
- class [BaseQuery](#)  
*BaseQuery.*
- class [BaseRootQuery](#)  
*BaseRootQuery.*
- class [BasicOffsetTable](#)  
*Class to represent a BasicOffsetTable.*
- class [Bitmap](#)  
*Bitmap class.*
- class [BitmapToBitmapFilter](#)  
*BitmapToBitmapFilter class.*
- class [BoxRegion](#)  
*Class for manipulation box region.*
- class [ByteBuffer](#)  
*ByteBuffer.*
- class [ByteSwap](#)  
*ByteSwap.*
- class [ByteSwapFilter](#)  
*ByteSwapFilter.*
- class [ByteValue](#)  
*Class to represent binary value (array of bytes).*
- class [CAPICryptoFactory](#)
- class [CAPICryptographicMessageSyntax](#)
- class [Cleaner](#)  
*Cleaner.*
- class [Codec](#)  
*Codec class.*
- class [Coder](#)  
*Coder.*
- class [CodeString](#)  
*CodeString.*
- class [Command](#)  
*Command superclass for callback/observer methods.*
- class [CommandDataSet](#)  
*Class to represent a Command DataSet.*
- class [CompositeNetworkFunctions](#)  
*Composite Network Functions.*
- class [ConstCharWrapper](#)  
*Do not use me.*
- class [CP246ExplicitDataElement](#)  
*Class to read/write a DataElement as CP246Explicit Data Element.*
- class [CryptoFactory](#)  
*Class to do handle the crypto factory.*
- class [CryptographicMessageSyntax](#)

- class [CSAElement](#)  
*Class to represent a CSA [Element](#).*
- class [CSAHeader](#)  
*Class for [CSAHeader](#).*
- class [CSAHeaderDict](#)  
*Class to represent a map of [CSAHeaderDictEntry](#).*
- class [CSAHeaderDictEntry](#)  
*Class to represent an Entry in the [Dict](#).*
- class [CSAHeaderDictException](#)
- class [Curve](#)  
*[Curve](#) class to handle element 50xx,3000 [Curve](#) Data.*
- class [DataElement](#)  
*Class to represent a Data [Element](#) either Implicit or Explicit.*
- class [DataElementException](#)
- class [DataEvent](#)  
*[DataEvent](#).*
- class [DataSet](#)  
*Class to represent a Data Set (which contains Data Elements).*
- class [DataSetEvent](#)  
*[DataSetEvent](#).*
- class [DataSetHelper](#)  
*[DataSetHelper](#) (internal class, not intended for user level).*
- class [Decoder](#)  
*[Decoder](#).*
- class [DefinedTerms](#)  
*Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data [Element](#) with Defined Terms that does not contain a [Value](#) equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation [Type](#) ID (4008,0210) is an example of a Data [Element](#) having Defined Terms. It is defined to have a [Value](#) that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data [Element](#) has Defined Terms other Interpretation [Type](#) IDs may be defined by the implementor.*
- class [Defs](#)  
*FIXME I do not like the name 'Defs'.*
- class [DeltaEncodingCodec](#)  
*[DeltaEncodingCodec](#) compression used by some private vendor.*
- class [DICOMDIR](#)  
*[DICOMDIR](#) class.*
- class [DICOMDIRGenerator](#)  
*[DICOMDIRGenerator](#) class.*
- class [Dict](#)  
*Class to represent a map of [DictEntry](#).*
- class [DictConverter](#)  
*Class to convert a .dic file into something else:*
- class [DictEntry](#)  
*Class to represent an Entry in the [Dict](#).*
- class [DictPrinter](#)  
*[DictPrinter](#) class.*

- class [Dicts](#)  
*Class to manipulate the sum of knowledge (all the dict user load).*
- class [DirectionCosines](#)  
*class to handle [DirectionCosines](#)*
- class [Directory](#)  
*Class for manipulation directories.*
- class [DirectoryHelper](#)  
*[DirectoryHelper](#).*
- class [DPath](#)  
*class to handle a DICOM path While supp 118 did introduced a notion of XPath for XML Native model this convention is too XML-centric. Instead prefer DCMTK style notation <https://groups.google.com/g/comp.protocols>.↔  
[dicom/c/IyIH0IOBMPA](#)*
- class [DummyValueGenerator](#)  
*Class for generating dummy value.*
- class [Dumper](#)  
*[Codec](#) class.*
- class [Element](#)  
*[Element](#) class.*
- class [Element< TVR, VM::VM1\\_2 >](#)
- class [Element< TVR, VM::VM1\\_n >](#)
- class [Element< TVR, VM::VM2\\_2n >](#)
- class [Element< TVR, VM::VM2\\_n >](#)
- class [Element< TVR, VM::VM3\\_3n >](#)
- class [Element< TVR, VM::VM3\\_4 >](#)
- class [Element< TVR, VM::VM3\\_n >](#)
- class [Element< VR::AS, VM::VM5 >](#)
- class [Element< VR::OB, VM::VM1 >](#)
- class [Element< VR::OW, VM::VM1 >](#)
- class [ElementDisableCombinations](#)  
*A class which is used to produce compile errors for an invalid combination of template parameters.*
- class [ElementDisableCombinations< VR::OB, VM::VM1\\_n >](#)
- class [ElementDisableCombinations< VR::OW, VM::VM1\\_n >](#)
- class [EmptyMaskGenerator](#)  
*[EmptyMaskGenerator](#) Main class to generate a Empty Mask [Series](#) from an input [Series](#). This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM [Series](#) within the same input directory.*
- class [EncapsulatedDocument](#)  
*[EncapsulatedDocument](#).*
- class [EncodingImplementation](#)  
*[EncodingImplementation](#).*
- class [EncodingImplementation< VR::VRASCII >](#)
- class [EncodingImplementation< VR::VRBINARY >](#)
- class [EndEvent](#)
- class [EnumeratedValues](#)  
*[Element](#). A Data [Element](#) with Enumerated Values that does not have a [Value](#) equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:*
- class [EquipmentManufacturer](#)
- class [Event](#)  
*superclass for callback/observer methods*

- class [Exception](#)  
*Exception.*
- class [ExitEvent](#)
- class [ExplicitDataElement](#)  
*Class to read/write a [DataElement](#) as Explicit Data [Element](#).*
- class [ExplicitImplicitDataElement](#)  
*Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).*
- class [Fiducials](#)  
*Fiducials.*
- class [File](#)  
*a DICOM File*
- class [FileAnonymizer](#)  
*FileAnonymizer.*
- class [FileChangeTransferSyntax](#)  
*FileChangeTransferSyntax.*
- class [FileDecompressLookupTable](#)  
*FileDecompressLookupTable class.*
- class [FileDerivation](#)  
*FileDerivation class.*
- class [FileExplicitFilter](#)  
*FileExplicitFilter class.*
- class [FileMetaInformation](#)  
*Class to represent a [File](#) Meta Information.*
- class [Filename](#)  
*Class to manipulate file name's.*
- class [FileNameEvent](#)  
*FileNameEvent.*
- class [FilenameGenerator](#)  
*FilenameGenerator.*
- class [FileSet](#)
- class [FileStreamer](#)  
*FileStreamer.*
- class [FileWithName](#)  
*FileWithName.*
- class [FindPatientRootQuery](#)  
*PatientRootQuery.*
- class [FindStudyRootQuery](#)  
*FindStudyRootQuery.*
- class [Fragment](#)  
*Class to represent a [Fragment](#).*
- class [Global](#)  
*Global.*
- class [GroupDict](#)  
*Class to represent the mapping from group number to its abbreviation and name.*
- class [IconImageFilter](#)  
*IconImageFilter.*
- class [IconImageGenerator](#)

- [\*IconImageGenerator.\*](#)
- struct [ignore\\_char](#)
- class [Image](#)
  - [\*Image.\*](#)
- class [ImageApplyLookupTable](#)
  - [\*ImageApplyLookupTable\* class.](#)
- class [ImageChangePhotometricInterpretation](#)
  - [\*ImageChangePhotometricInterpretation\* class.](#)
- class [ImageChangePlanarConfiguration](#)
  - [\*ImageChangePlanarConfiguration\* class.](#)
- class [ImageChangeTransferSyntax](#)
  - [\*ImageChangeTransferSyntax\* class.](#)
- class [ImageCodec](#)
  - [\*ImageCodec.\*](#)
- class [ImageConverter](#)
  - [\*Image\* Converter.](#)
- class [ImageFragmentSplitter](#)
  - [\*ImageFragmentSplitter\* class.](#)
- class [ImageHelper](#)
  - [\*ImageHelper\* \(internal class, not intended for user level\).](#)
- class [ImageReader](#)
  - [\*ImageReader.\*](#)
- class [ImageRegionReader](#)
  - [\*ImageRegionReader.\*](#)
- class [ImageToImageFilter](#)
  - [\*ImageToImageFilter\* class.](#)
- class [ImageWriter](#)
  - [\*ImageWriter.\*](#)
- class [ImplicitDataElement](#)
  - [\*Class to represent an Implicit VR Data Element.\*](#)
- class [InitializeEvent](#)
- class [IOD](#)
  - [\*Class for representing a IOD.\*](#)
- class [IODEntry](#)
  - [\*Class for representing a IODEntry.\*](#)
- class [IODs](#)
  - [\*Class for representing a IODs.\*](#)
- class [IPPSorter](#)
  - [\*IPPSorter.\*](#)
- class [Item](#)
  - [\*Class to represent an Item.\*](#)
- class [IterationEvent](#)
- class [JPEG12Codec](#)
  - [\*Class to do JPEG 12bits \(lossy & lossless\).\*](#)
- class [JPEG16Codec](#)
  - [\*Class to do JPEG 16bits \(lossless\).\*](#)
- class [JPEG2000Codec](#)

- Class to do JPEG 2000.*
- class [JPEG8Codec](#)
  - Class to do JPEG 8bits (lossy & lossless).*
- class [JPEGCodec](#)
  - JPEG codec.*
- class [JPEGLSCCodec](#)
  - JPEG-LS.*
- class [JSON](#)
- class [KAKADUCodec](#)
  - KAKADUCodec.*
- class [LO](#)
  - LO.*
- class [LookupTable](#)
  - LookupTable class.*
- class [Macro](#)
  - Class for representing a [Macro](#).*
- class [Macros](#)
  - Class for representing a [Modules](#).*
- class [MD5](#)
  - Class for [MD5](#).*
- class [MEC\\_MR3](#)
  - Class for [MEC\\_MR3](#).*
- class [MediaStorage](#)
  - MediaStorage.*
- class [MemberCommand](#)
  - Command subclass that calls a pointer to a member function.*
- class [MeshPrimitive](#)
  - This class defines surface mesh primitives.*
- class [ModalityPerformedProcedureStepCreateQuery](#)
  - ModalityPerformedProcedureStepCreateQuery.*
- class [ModalityPerformedProcedureStepSetQuery](#)
  - ModalityPerformedProcedureStepSetQuery.*
- class [ModifiedEvent](#)
- class [Module](#)
  - Class for representing a [Module](#).*
- class [ModuleEntry](#)
  - Class for representing a [ModuleEntry](#).*
- class [Modules](#)
  - Class for representing a [Modules](#).*
- class [MovePatientRootQuery](#)
  - MovePatientRootQuery.*
- class [MoveStudyRootQuery](#)
  - MoveStudyRootQuery.*
- class [MrProtocol](#)
  - Class for [MrProtocol](#).*
- class [NestedModuleEntries](#)
  - Class for representing a [NestedModuleEntries](#).*

- class [NoEvent](#)
- class [NormalizedNetworkFunctions](#)  
*Normalized Network Functions.*
- class [Object](#)  
*Object.*
- class [OpenSSLCryptoFactory](#)
- class [OpenSSLCryptographicMessageSyntax](#)
- class [OpenSSLP7CryptoFactory](#)
- class [OpenSSLP7CryptographicMessageSyntax](#)
- class [Orientation](#)  
*class to handle [Orientation](#)*
- class [Overlay](#)  
*Overlay class.*
- class [ParseException](#)  
*[ParseException](#) Standard exception handling object.*
- class [Parser](#)  
*[Parser](#) ala XML\_Parser from expat (SAX).*
- class [Patient](#)  
*See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.*
- class [PDBElement](#)  
*Class to represent a PDB [Element](#).*
- class [PDBHeader](#)  
*Class for [PDBHeader](#).*
- class [PDFCodec](#)  
*[PDFCodec](#) class.*
- class [PersonName](#)  
*[PersonName](#) class.*
- class [PGXCodec](#)  
*Class to do PGX.*
- class [PhotometricInterpretation](#)  
*Class to represent an [PhotometricInterpretation](#).*
- class [PixelFormat](#)  
*[PixelFormat](#).*
- class [Pixmap](#)  
*[Pixmap](#) class.*
- class [PixmapReader](#)  
*[PixmapReader](#).*
- class [PixmapToPixmapFilter](#)  
*[PixmapToPixmapFilter](#) class.*
- class [PixmapWriter](#)  
*[PixmapWriter](#).*
- class [PNMCodec](#)  
*Class to do PNM.*
- class [Preamble](#)  
*DICOM [Preamble](#) (Part 10).*
- class [PresentationContext](#)  
*[PresentationContext](#).*



- class [PresentationContextGenerator](#)  
*PresentationContextGenerator.*
- class [Printer](#)  
*Printer class.*
- class [PrivateDict](#)  
*Private Dict.*
- class [PrivateTag](#)  
*Class to represent a Private DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#), Owner).*
- class [ProgressEvent](#)  
*ProgressEvent.*
- class [PVRGCodec](#)  
*PVRGCodec.*
- class [PythonFilter](#)  
*PythonFilter [PythonFilter](#) is the class that make gdcM2.x looks more like gdcM1 and transform the binary blob contained in a [DataElement](#) into a string, typically this is a nice feature to have for wrapped language.*
- class [QueryBase](#)  
*QueryBase.*
- class [QueryFactory](#)  
*QueryFactory.h.*
- class [QueryImage](#)  
*QueryImage.*
- class [QueryPatient](#)  
*QueryPatient.*
- class [QuerySeries](#)  
*QuerySeries.*
- class [QueryStudy](#)  
*QueryStudy.h.*
- class [RAWCodec](#)  
*RAWCodec class.*
- class [Reader](#)  
*Reader ala DOM (Document [Object](#) Model).*
- struct [RealWorldValueMappingContent](#)
- class [Region](#)  
*Class for manipulation region.*
- class [Rescaler](#)  
*Rescale class.*
- class [RLECodec](#)  
*Class to do RLE.*
- class [Scanner](#)  
*Scanner.*
- class [Scanner2](#)  
*Scanner2.*
- class [Segment](#)  
*This class defines a segment.*
- class [SegmentedPaletteColorLookupTable](#)  
*SegmentedPaletteColorLookupTable class.*
- class [SegmentReader](#)

*This class defines a segment reader.*

- class [SegmentWriter](#)

*This class defines a segment writer.*

- class [SequenceOfFragments](#)

*Class to represent a Sequence Of Fragments.*

- class [SequenceOfItems](#)

*Class to represent a Sequence Of Items.*

- class [SerieHelper](#)

*[SerieHelper](#) DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.*

- class [Series](#)

*Series.*

- class [ServiceClassUser](#)

*ServiceClassUser.*

- class [SHA1](#)

*Class for [SHA1](#).*

- class [SimpleMemberCommand](#)

*Command subclass that calls a pointer to a member function.*

- class [SimpleSubjectWatcher](#)

*SimpleSubjectWatcher.*

- class [SmartPointer](#)

*Class for Smart Pointer.*

- class [SOPClassUIDToIOD](#)

*Class convert a class SOP Class UID into [IOD](#).*

- class [Sorter](#)

*Sorter.*

- class [Spacing](#)

*Class for [Spacing](#).*

- class [Spectroscopy](#)

*Spectroscopy class.*

- class [SplitMosaicFilter](#)

*SplitMosaicFilter class.*

- class [StartEvent](#)

- struct [static\\_assert\\_test](#)

- struct [STATIC\\_ASSERTION\\_FAILURE](#)

- struct [STATIC\\_ASSERTION\\_FAILURE< true >](#)

- class [StreamImageReader](#)

*StreamImageReader.*

- class [StreamImageWriter](#)

*StreamImageReader.*

- class [StrictScanner](#)

*StrictScanner.*

- class [StrictScanner2](#)

*StrictScanner2.*

- class [String](#)

*String.*

- class [StringFilter](#)

- StringFilter.*
- class [Study](#)
  - Study.*
- class [Subject](#)
  - Subject.*
- class [Surface](#)
  - This class defines a SURFACE IE.*
- class [SurfaceHelper](#)
  - SurfaceHelper.*
- class [SurfaceReader](#)
  - This class defines a SURFACE IE reader.*
- class [SurfaceWriter](#)
  - This class defines a SURFACE IE writer.*
- class [SwapCode](#)
  - SwapCode representation.*
- class [SwapperDoOp](#)
- class [SwapperNoOp](#)
- class [System](#)
  - Class to do system operation.*
- class [Table](#)
  - Table.*
- class [TableEntry](#)
  - TableEntry.*
- class [TableReader](#)
  - Class for representing a [TableReader](#).*
- class [Tag](#)
  - Class to represent a DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#)).*
- class [TagPath](#)
  - class to handle a path of tag.*
- class [Testing](#)
  - class for testing*
- class [Trace](#)
  - Trace.*
- class [TransferSyntax](#)
  - Class to manipulate Transfer Syntax.*
- class [Type](#)
  - Type.*
- struct [UI](#)
- class [UIDGenerator](#)
  - Class for generating unique UID.*
- class [UIDs](#)
  - all known uids*
- class [UNExplicitDataElement](#)
  - Class to read/write a [DataElement](#) as UNExplicit Data [Element](#).*
- class [UNExplicitImplicitDataElement](#)
  - Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).*
- class [Unpacker12Bits](#)

- Pack/Unpack 12 bits pixel into 16bits.*
- class [Usage](#)
  - Usage.*
- class [UserEvent](#)
- class [UUIDGenerator](#)
  - Class for generating unique UUID.*
- class [Validate](#)
  - Validate class.*
- class [Value](#)
  - Class to represent the value of a Data [Element](#).*
- class [ValueIO](#)
  - Class to dispatch template calls.*
- class [Version](#)
  - major/minor and build version*
- class [VL](#)
  - Value Length.*
- class [VM](#)
  - Value Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.*
- struct [VMToLength](#)
- class [VR](#)
  - VR class.*
- class [VR16ExplicitDataElement](#)
  - Class to read/write a [DataElement](#) as Explicit Data [Element](#).*
- struct [VRToEncoding](#)
- struct [VRToType](#)
- class [VRVLSize](#)
- class [VRVLSize< 0 >](#)
- class [VRVLSize< 1 >](#)
- class [Waveform](#)
  - Waveform class.*
- class [WLMFindQuery](#)
  - PatientRootQuery.*
- class [Writer](#)
  - Writer ala DOM (Document [Object Model](#)).*
- class [XMLDictReader](#)
  - Class for representing a [XMLDictReader](#).*
- class [XMLPrinter](#)
- class [XMLPrivateDictReader](#)
  - Class for representing a [XMLPrivateDictReader](#).*

## Typedefs

- typedef [String](#)<"\", 16 > [AECComp](#)
- typedef [String](#)<"\", 64 > [ASComp](#)
- typedef bool(\* [BOOL\\_FUNCTION\\_PFILE\\_PFILE\\_POINTER](#)) ([File](#) \*, [File](#) \*)
- typedef [String](#)<"\", 16 > [CSCComp](#)
- typedef [String](#)<"\", 64 > [DACComp](#)

- typedef [String](#)<"\", 64 > [DTComp](#)
- typedef std::vector< [SmartPointer](#)< [FileWithName](#) > > [FileList](#)
- typedef [Bitmap](#) [IconImage](#)
- typedef [String](#)<"\", 64 > [LOComp](#)
- typedef [String](#)<"\", 64 > [LTComp](#)
- typedef [ModuleEntry](#) [MacroEntry](#)
- typedef [NestedModuleEntries](#) [NestedMacroEntries](#)
- typedef [String](#)<"\", 64 > [PNComp](#)
- typedef [String](#)<"\", 64 > [SHComp](#)
- typedef [String](#)<"\", 64 > [STComp](#)
- typedef [String](#)<"\", 16 > [TMComp](#)
- typedef [String](#)<"\", 4294967294 > [UCComp](#)
- typedef [String](#)<"\", 64, 0 > [UIComp](#)
- typedef [String](#)<"\", 4294967294 > [URComp](#)
- typedef [String](#)<"\", 64 > [UTComp](#)

## Enumerations

- enum [CompOperators](#) {  
[GDCM\\_EQUAL](#) = 0 ,  
[GDCM\\_DIFFERENT](#) ,  
[GDCM\\_GREATER](#) ,  
[GDCM\\_GREATEROREQUAL](#) ,  
[GDCM\\_LESS](#) ,  
[GDCM\\_LESSEOREQUAL](#) }
- enum [ECharSet](#) {  
[eLatin1](#) = 0 ,  
[eLatin2](#) ,  
[eLatin3](#) ,  
[eLatin4](#) ,  
[eCyrillic](#) ,  
[eArabic](#) ,  
[eGreek](#) ,  
[eHebrew](#) ,  
[eLatin5](#) ,  
[eJapanese](#) ,  
[eThai](#) ,  
[eJapaneseKanjiMultibyte](#) ,  
[eJapaneseSupplementaryKanjiMultibyte](#) ,  
[eKoreanHangulHanjaMultibyte](#) ,  
[eUTF8](#) ,  
[eGB18030](#) }
- enum [ENQueryType](#) {  
[eCreateMMPS](#) = 0 ,  
[eSetMMPS](#) }
- enum [EQueryLevel](#) {  
[ePatient](#) = 0 ,  
[eStudy](#) = 1 ,  
[eSeries](#) = 2 ,  
[eImage](#) = 3 }

- enum [EQueryType](#) {  
    [eFind](#) = 0 ,  
    [eMove](#) ,  
    [eWLMFind](#) }
- enum [ERootType](#) {  
    [ePatientRootType](#) ,  
    [eStudyRootType](#) }
- enum [LodModeType](#) {  
    [LD\\_ALL](#) = 0x00000000 ,  
    [LD\\_NOSEQ](#) = 0x00000001 ,  
    [LD\\_NOSHADOW](#) = 0x00000002 ,  
    [LD\\_NOSHADOWSEQ](#) = 0x00000004 }

## Functions

- static int [add1](#) (char \*buf, int n)
- [ignore\\_char](#) const [backslash](#) ("\\")
- template<typename T>  
    static T [Clamp](#) (int v)
- static void [clean](#) (char \*mant)
- static int [doround](#) (char \*buf, unsigned int n)
- [VR::VRType](#) [GetVRFromTag](#) ([Tag](#) const &tag)
- bool [operator!=](#) (const [CodeString](#) &ref, const [CodeString](#) &cs)
- bool [operator!=](#) (const [DataElement](#) &lhs, const [DataElement](#) &rhs)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [GroupDict](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [IOD](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [IODEntry](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [IODs](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Macro](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Macros](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [MediaStorage](#) &ms)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Module](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [ModuleEntry](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Modules](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [NestedModuleEntries](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Tag](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [TransferSyntax](#) &ts)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Type](#) &val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [UI](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [UIDs](#) &uid)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Usage](#) &val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [VM](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [VR](#) &val)
- std::ostream & [operator<<](#) (std::ostream &os, const [BasicOffsetTable](#) &val)
- std::ostream & [operator<<](#) (std::ostream &os, const [CodeString](#) &str)
- std::ostream & [operator<<](#) (std::ostream &os, const [CommandDataSet](#) &val)
- std::ostream & [operator<<](#) (std::ostream &os, const [CSAElement](#) &val)
- std::ostream & [operator<<](#) (std::ostream &os, const [CSAHeader](#) &d)
- std::ostream & [operator<<](#) (std::ostream &os, const [CSAHeaderDict](#) &val)
- std::ostream & [operator<<](#) (std::ostream &os, const [CSAHeaderDictEntry](#) &val)

- `std::ostream & operator<< (std::ostream &os, const DataElement &val)`
- `std::ostream & operator<< (std::ostream &os, const DataSet &val)`
- `std::ostream & operator<< (std::ostream &os, const Dict &val)`
- `std::ostream & operator<< (std::ostream &os, const DictEntry &val)`
- `std::ostream & operator<< (std::ostream &os, const Dicts &d)`
- `std::ostream & operator<< (std::ostream &os, const Directory &d)`
- `std::ostream & operator<< (std::ostream &os, const DPath &val)`
- `std::ostream & operator<< (std::ostream &os, const Event &e)`

*Generic inserter operator for [Event](#) and its subclasses.*

- `std::ostream & operator<< (std::ostream &os, const File &val)`
- `std::ostream & operator<< (std::ostream &os, const FileMetalInformation &val)`
- `std::ostream & operator<< (std::ostream &os, const FileSet &f)`
- `std::ostream & operator<< (std::ostream &os, const Fragment &val)`
- `std::ostream & operator<< (std::ostream &os, const Global &g)`
- `std::ostream & operator<< (std::ostream &os, const Item &val)`
- `std::ostream & operator<< (std::ostream &os, const MrProtocol &d)`
- `std::ostream & operator<< (std::ostream &os, const Object &obj)`
- `std::ostream & operator<< (std::ostream &os, const Orientation &o)`
- `std::ostream & operator<< (std::ostream &os, const PDElement &val)`
- `std::ostream & operator<< (std::ostream &os, const PDBHeader &d)`
- `std::ostream & operator<< (std::ostream &os, const PhotometricInterpretation &val)`
- `std::ostream & operator<< (std::ostream &os, const PixelFormat &pf)`
- `std::ostream & operator<< (std::ostream &os, const Preamble &val)`
- `std::ostream & operator<< (std::ostream &os, const PrivateDict &val)`
- `std::ostream & operator<< (std::ostream &os, const PrivateTag &val)`
- `std::ostream & operator<< (std::ostream &os, const Region &r)`
- `std::ostream & operator<< (std::ostream &os, const Scanner &s)`
- `std::ostream & operator<< (std::ostream &os, const Scanner2 &s)`
- `std::ostream & operator<< (std::ostream &os, const Sorter &s)`
- `std::ostream & operator<< (std::ostream &os, const StrictScanner &s)`
- `std::ostream & operator<< (std::ostream &os, const StrictScanner2 &s)`
- `std::ostream & operator<< (std::ostream &os, const SwapCode &sc)`
- `std::ostream & operator<< (std::ostream &os, const Version &v)`
- `std::ostream & operator<< (std::ostream &os, const VL &val)`
- `bool operator== (const CodeString &ref, const CodeString &cs)`
- `std::istream & operator>> (std::istream &_is, Tag &_val)`
- `std::istream & operator>> (std::istream &in, ignore\_char const &ic)`
- `template<char TDelimiter, unsigned int TMaxLength, char TPadChar>  
std::istream & operator>> (std::istream &is, String< TDelimiter, TMaxLength, TPadChar > &ms)`
- `template<typename T>  
static int Round (T x)`
- `static int roundat (char *buf, size_t bufLen, unsigned int i, int iexp)`
- `template<typename Float>  
static void x16printf (char *buf, int size, Float f)`

## Variables

- static [Global](#) [GlobalInstance](#)

### 11.1.1 Detailed Description

This header defines the classes for the AA Actions, Association Abort Related Actions ([Table 9-9](#) of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

This header defines the classes for the AE Actions, Association Establishment Related Actions ([Table 9-6](#) of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

This header defines the classes for the AR Actions, Association Release Related Actions ([Table 9-8](#) of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

This header defines the classes for the DT Actions, Data Transfer Related Actions ([Table 9-8](#) of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

### 11.1.2 Typedef Documentation

#### 11.1.2.1 AECComp

```
typedef String<'\\',16> gdcM::AECComp
```

#### 11.1.2.2 ASComp

```
typedef String<'\\',64> gdcM::ASComp
```

#### 11.1.2.3 BOOL\_FUNCTION\_PFILE\_PFILE\_POINTER

```
typedef bool(* gdcM::BOOL\_FUNCTION\_PFILE\_PFILE\_POINTER) (File *, File *)
```

#### 11.1.2.4 CSCComp

```
typedef String<'\\',16> gdcM::CSCComp
```



### 11.1.2.5 DComp

```
typedef String<'\\', 64> gdcm::DComp
```

#### Examples

[TemplateEmptyImage.cxx](#).

### 11.1.2.6 DComp

```
typedef String<'\\', 64> gdcm::DTComp
```

### 11.1.2.7 FileList

```
typedef std::vector< SmartPointer<FileWithName> > gdcm::FileList
```

### 11.1.2.8 IconImage

```
typedef Bitmap gdcm::IconImage
```

#### Examples

[ExtractIconFromFile.cxx](#).

### 11.1.2.9 LOComp

```
typedef String<'\\', 64> gdcm::LOComp
```

### 11.1.2.10 LTComp

```
typedef String<'\\', 64> gdcm::LTComp
```

### 11.1.2.11 MacroEntry

```
typedef ModuleEntry gdcm::MacroEntry
```

### 11.1.2.12 NestedMacroEntries

```
typedef NestedModuleEntries gdcm::NestedMacroEntries
```

#### 11.1.2.13 PNComp

```
typedef String<'\\', 64> gdcm::PNComp
```

#### 11.1.2.14 SHComp

```
typedef String<'\\', 64> gdcm::SHComp
```

#### 11.1.2.15 STComp

```
typedef String<'\\', 64> gdcm::STComp
```

#### 11.1.2.16 TMComp

```
typedef String<'\\', 16> gdcm::TMComp
```

#### Examples

[TemplateEmptyImage.cxx](#).

#### 11.1.2.17 UCComp

```
typedef String<'\\', 4294967294> gdcm::UCComp
```

#### 11.1.2.18 UIComp

```
typedef String<'\\', 64, 0> gdcm::UIComp
```

#### 11.1.2.19 URComp

```
typedef String<'\\', 4294967294> gdcm::URComp
```

#### 11.1.2.20 UTComp

```
typedef String<'\\', 64> gdcm::UTComp
```

### 11.1.3 Enumeration Type Documentation

#### 11.1.3.1 CompOperators

enum [gdcmm::CompOperators](#)

##### Enumerator

GDCM_EQUAL	
GDCM_DIFFERENT	
GDCM_GREATER	
GDCM_GREATEROREQUAL	
GDCM_LESS	
GDCM_LESOREQUAL	

#### 11.1.3.2 ECharSet

enum [gdcmm::ECharSet](#)

The character sets enumerated in PS 3.3 2009 Annex C, section C.12.1.1.2 The resulting character set is stored in 0008,0005 The conversion to the data element is performed by the [QueryFactory](#) itself

##### Enumerator

eLatin1	
eLatin2	
eLatin3	
eLatin4	
eCyrillic	
eArabic	
eGreek	
eHebrew	
eLatin5	
eJapanese	
eThai	
eJapaneseKanjiMultibyte	
eJapaneseSupplementaryKanjiMultibyte	
eKoreanHangulHanjaMultibyte	
eUTF8	
eGB18030	

### 11.1.3.3 ENQueryType

enum `gdcm::ENQueryType`

#### Enumerator

eCreateMMPS	
eSetMMPS	

### 11.1.3.4 EQueryLevel

enum `gdcm::EQueryLevel`

#### Enumerator

ePatient	
eStudy	
eSeries	
eImage	

### 11.1.3.5 EQueryType

enum `gdcm::EQueryType`

#### Enumerator

eFind	
eMove	
eWLMFind	

### 11.1.3.6 ERootType

enum `gdcm::ERootType`

#### Enumerator

ePatientRootType	
eStudyRootType	

### 11.1.3.7 LodModeType

enum [gdcm::LodModeType](#)

#### Enumerator

LD_ALL	
LD_NOSEQ	
LD_NOSHADOW	
LD_NOSHADOWSEQ	

## 11.1.4 Function Documentation

### 11.1.4.1 add1()

```
int gdcm::add1 (
    char * buf,
    int n) [static]
```

References [add1\(\)](#).

Referenced by [add1\(\)](#), and [doround\(\)](#).

### 11.1.4.2 backslash()

```
ignore_char const gdcm::backslash (
    '\\ ' )
```

References [backslash\(\)](#).

Referenced by [backslash\(\)](#), and [gdcm::EncodingImplementation< VR::VRASCII >::ReadComputeLength\(\)](#).

### 11.1.4.3 Clamp()

```
template<typename T>
T gdcm::Clamp (
    int v) [inline], [static]
```

Referenced by [gdcm::ImageChangePhotometricInterpretation::RGB2YBR\(\)](#), and [gdcm::ImageChangePhotometricInterpretation::YBR2RGB\(\)](#).

### 11.1.4.4 clean()

```
void gdcm::clean (
    char * mant) [inline], [static]
```

References [clean\(\)](#).

Referenced by [clean\(\)](#), and [x16printf\(\)](#).

#### 11.1.4.5 doround()

```
int gdcm::doround (
    char * buf,
    unsigned int n) [static]
```

References [add1\(\)](#), and [doround\(\)](#).

Referenced by [doround\(\)](#), and [roundat\(\)](#).

#### 11.1.4.6 GetVRFromTag()

```
VR::VRType gdcm::GetVRFromTag (
    Tag const & tag)
```

#### 11.1.4.7 operator"!=( ) [1/2]

```
bool gdcm::operator!= (
    const CodeString & ref,
    const CodeString & cs) [inline]
```

Referenced by [operator!=\(\)](#).

#### 11.1.4.8 operator"!=( ) [2/2]

```
bool gdcm::operator!= (
    const DataElement & lhs,
    const DataElement & rhs) [inline]
```

References [operator!=\(\)](#).

#### 11.1.4.9 operator<<() [1/59]

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const GroupDict & _val) [inline]
```

#### 11.1.4.10 operator<<() [2/59]

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const IOD & _val) [inline]
```

**11.1.4.11 operator<<() [3/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & _os,  
    const IODEntry & _val) [inline]
```

**11.1.4.12 operator<<() [4/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & _os,  
    const IODs & _val) [inline]
```

**11.1.4.13 operator<<() [5/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & _os,  
    const Macro & _val) [inline]
```

**11.1.4.14 operator<<() [6/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & _os,  
    const Macros & _val) [inline]
```

**11.1.4.15 operator<<() [7/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & _os,  
    const MediaStorage & ms) [inline]
```

**11.1.4.16 operator<<() [8/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & _os,  
    const Module & _val) [inline]
```

**11.1.4.17 operator<<() [9/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & _os,  
    const ModuleEntry & _val) [inline]
```

**11.1.4.18 operator<<() [10/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const Modules & _val) [inline]
```

**11.1.4.19 operator<<() [11/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const NestedModuleEntries & _val) [inline]
```

**11.1.4.20 operator<<() [12/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const Tag & _val) [inline]
```

**11.1.4.21 operator<<() [13/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const TransferSyntax & ts) [inline]
```

**11.1.4.22 operator<<() [14/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const Type & val) [inline]
```

**11.1.4.23 operator<<() [15/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const UI & _val) [inline]
```

**11.1.4.24 operator<<() [16/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const UIDs & uid) [inline]
```

References [gdcmm::UIDs::GetName\(\)](#), and [gdcmm::UIDs::GetString\(\)](#).



**11.1.4.25 operator<<() [17/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const Usage & val) [inline]
```

**11.1.4.26 operator<<() [18/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const VM & _val) [inline]
```

**11.1.4.27 operator<<() [19/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const VR & val) [inline]
```

**11.1.4.28 operator<<() [20/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const BasicOffsetTable & val) [inline]
```

**11.1.4.29 operator<<() [21/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const CodeString & str) [inline]
```

**11.1.4.30 operator<<() [22/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const CommandDataSet & val) [inline]
```

**11.1.4.31 operator<<() [23/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const CSAElement & val) [inline]
```

**11.1.4.32 operator<<() [24/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const CSAHeader & d) [inline]
```

**11.1.4.33 operator<<() [25/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const CSAHeaderDict & val) [inline]
```

**11.1.4.34 operator<<() [26/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const CSAHeaderDictEntry & val) [inline]
```

**11.1.4.35 operator<<() [27/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const DataElement & val) [inline]
```

**11.1.4.36 operator<<() [28/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const DataSet & val) [inline]
```

**11.1.4.37 operator<<() [29/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const Dict & val) [inline]
```

**11.1.4.38 operator<<() [30/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const DictEntry & val) [inline]
```

**11.1.4.39 operator<<() [31/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const Dicts & d) [inline]
```

**11.1.4.40 operator<<() [32/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const Directory & d) [inline]
```

**11.1.4.41 operator<<() [33/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const DPath & val) [inline]
```

**11.1.4.42 operator<<() [34/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const Event & e) [inline]
```

Generic inserter operator for [Event](#) and its subclasses.

References [gdcm::Event::Print\(\)](#).

**11.1.4.43 operator<<() [35/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const File & val) [inline]
```

**11.1.4.44 operator<<() [36/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const FileMetaInformation & val) [inline]
```

**11.1.4.45 operator<<() [37/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const FileSet & f) [inline]
```

**11.1.4.46 operator<<() [38/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const Fragment & val) [inline]
```

**11.1.4.47 operator<<() [39/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const Global & g) [inline]
```

**11.1.4.48 operator<<() [40/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const Item & val) [inline]
```

**11.1.4.49 operator<<() [41/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const MrProtocol & d) [inline]
```

**11.1.4.50 operator<<() [42/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const Object & obj) [inline]
```

**11.1.4.51 operator<<() [43/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const Orientation & o) [inline]
```

**11.1.4.52 operator<<() [44/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const PDBelement & val) [inline]
```

**11.1.4.53 operator<<() [45/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & os,  
    const PDBHeader & d) [inline]
```

**11.1.4.54 operator<<() [46/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & os,  
    const PhotometricInterpretation & val) [inline]
```

**11.1.4.55 operator<<() [47/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & os,  
    const PixelFormat & pf) [inline]
```

**11.1.4.56 operator<<() [48/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & os,  
    const Preamble & val) [inline]
```

**11.1.4.57 operator<<() [49/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & os,  
    const PrivateDict & val) [inline]
```

**11.1.4.58 operator<<() [50/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & os,  
    const PrivateTag & val) [inline]
```

**11.1.4.59 operator<<() [51/59]**

```
std::ostream & gdcm::operator<< (  
    std::ostream & os,  
    const Region & r) [inline]
```

References [gdcm::Region::Print\(\)](#).

**11.1.4.60 operator<<() [52/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const Scanner & s) [inline]
```

**11.1.4.61 operator<<() [53/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const Scanner2 & s) [inline]
```

**11.1.4.62 operator<<() [54/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const Sorter & s) [inline]
```

**11.1.4.63 operator<<() [55/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const StrictScanner & s) [inline]
```

**11.1.4.64 operator<<() [56/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const StrictScanner2 & s) [inline]
```

**11.1.4.65 operator<<() [57/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const SwapCode & sc) [inline]
```

**11.1.4.66 operator<<() [58/59]**

```
std::ostream & gdcmm::operator<< (  
    std::ostream & os,  
    const Version & v) [inline]
```

**11.1.4.67 operator<<()** [59/59]

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const VL & val) [inline]
```

**11.1.4.68 operator==(())**

```
bool gdcm::operator==(
    const CodeString & ref,
    const CodeString & cs) [inline]
```

**11.1.4.69 operator>>()** [1/3]

```
std::istream & gdcm::operator>> (
    std::istream & _is,
    Tag & _val) [inline]
```

**11.1.4.70 operator>>()** [2/3]

```
std::istream & gdcm::operator>> (
    std::istream & in,
    ignore_char const & ic) [inline]
```

References [gdcm::ignore\\_char::m\\_char](#).

**11.1.4.71 operator>>()** [3/3]

```
template<char TDelimiter, unsigned int TMaxLength, char TPadChar>
std::istream & gdcm::operator>> (
    std::istream & is,
    String< TDelimiter, TMaxLength, TPadChar > & ms) [inline]
```

**11.1.4.72 Round()**

```
template<typename T>
int gdcm::Round (
    T x) [inline], [static]
```

Referenced by [gdcm::ImageChangePhotometricInterpretation::RGB2YBR\(\)](#), and [gdcm::ImageChangePhotometricInterpretation::YBR2RGB\(\)](#).

#### 11.1.4.73 roundat()

```
int gdcmm::roundat (
    char * buf,
    size_t bufLen,
    unsigned int i,
    int iexp) [static]
```

References [doround\(\)](#), and [roundat\(\)](#).

Referenced by [roundat\(\)](#), and [x16printf\(\)](#).

#### 11.1.4.74 x16printf()

```
template<typename Float>
void gdcmm::x16printf (
    char * buf,
    int size,
    Float f) [static]
```

References [clean\(\)](#), [roundat\(\)](#), and [x16printf\(\)](#).

Referenced by [gdcmm::EncodingImplementation< VR::VRASCII >::Write\(\)](#), and [x16printf\(\)](#).

### 11.1.5 Variable Documentation

#### 11.1.5.1 GlobalInstance

```
Global gdcmm::GlobalInstance [static]
```

## 11.2 gdcmm::network Namespace Reference

### Classes

- class [AAbortPDU](#)  
[AAbortPDU](#).
- class [AAssociateACPDU](#)  
[AAssociateACPDU](#).
- class [AAssociateRJPDU](#)  
[AAssociateRJPDU](#).
- class [AAssociateRQPDU](#)  
[AAssociateRQPDU](#).
- class [AbstractSyntax](#)  
[AbstractSyntax](#).
- class [ApplicationContext](#)



- ApplicationContext.*
- class [AReleaseRPPDU](#)  
*AReleaseRPPDU.*
- class [AReleaseRQPDU](#)  
*AReleaseRQPDU.*
- class [ARTIMTimer](#)  
*ARTIMTimer.*
- class [AsynchronousOperationsWindowSub](#)  
*AsynchronousOperationsWindowSub.*
- class [BaseCompositeMessage](#)  
*BaseCompositeMessage.*
- class [BaseNormalizedMessage](#)  
*BaseNormalizedMessage.*
- class [BasePDU](#)  
*BasePDU.*
- class [CEchoRQ](#)  
*CEchoRQ.*
- class [CEchoRSP](#)  
*CEchoRSP* this file defines the messages for the cecho action.
- class [CFind](#)
- class [CFindCancelRQ](#)  
*CFindCancelRQ* this file defines the messages for the cfind action.
- class [CFindRQ](#)  
*CFindRQ.*
- class [CFindRSP](#)  
*CFindRSP* this file defines the messages for the cfind action.
- class [CMoveCancelRq](#)
- class [CMoveRQ](#)  
*CMoveRQ.*
- class [CMoveRSP](#)  
*CMoveRSP* this file defines the messages for the cmove action.
- class [CompositeMessageFactory](#)  
*CompositeMessageFactory.*
- class [CStoreRQ](#)  
*CStoreRQ.*
- class [CStoreRSP](#)  
*CStoreRSP* this file defines the messages for the cecho action.
- class [DIMSE](#)  
*DIMSE.*
- class [ImplementationClassUIDSub](#)  
*ImplementationClassUIDSub.*
- class [ImplementationUIDSub](#)  
*ImplementationUIDSub.*
- class [ImplementationVersionNameSub](#)  
*ImplementationVersionNameSub.*
- class [MaximumLengthSub](#)  
*MaximumLengthSub.*

- class [NActionRQ](#)  
[NActionRQ](#).
- class [NActionRSP](#)  
[NActionRSP](#) this file defines the messages for the NAction action.
- class [NCreateRQ](#)  
[NCreateRQ](#).
- class [NCreateRSP](#)  
[NCreateRSP](#) this file defines the messages for the ncreate action.
- class [NDeleteRQ](#)  
[NDeleteRQ](#).
- class [NDeleteRSP](#)  
[NDeleteRSP](#) this file defines the messages for the ndelete action.
- class [NEventReportRQ](#)  
[NEventReportRQ](#).
- class [NEventReportRSP](#)  
[NEventReportRSP](#) this file defines the messages for the neventreport action.
- class [NGetRQ](#)  
[NGetRQ](#).
- class [NGetRSP](#)  
[NGetRSP](#) this file defines the messages for the nget action.
- class [NormalizedMessageFactory](#)
- class [NSetRQ](#)  
[NSetRQ](#).
- class [NSetRSP](#)  
[NSetRSP](#) this file defines the messages for the nset action.
- class [PDataTFPDU](#)  
[PDataTFPDU](#).
- class [PDUFactory](#)  
[PDUFactory](#) basically, given an initial byte, construct the.
- class [PresentationContextAC](#)  
[PresentationContextAC](#).
- class [PresentationContextRQ](#)  
[PresentationContextRQ](#).
- class [PresentationDataValue](#)  
[PresentationDataValue](#).
- class [RoleSelectionSub](#)  
[RoleSelectionSub](#).
- class [ServiceClassApplicationInformation](#)
- class [SOPClassExtendedNegociationSub](#)  
[SOPClassExtendedNegociationSub](#).
- class [TableRow](#)
- class [TransferSyntaxSub](#)  
[TransferSyntaxSub](#).
- struct [Transition](#)
- class [ULAction](#)  
[ULAction](#).
- class [ULActionAA1](#)

- class [ULActionAA2](#)
- class [ULActionAA3](#)
- class [ULActionAA4](#)
- class [ULActionAA5](#)
- class [ULActionAA6](#)
- class [ULActionAA7](#)
- class [ULActionAA8](#)
- class [ULActionAE1](#)
- class [ULActionAE2](#)
- class [ULActionAE3](#)
- class [ULActionAE4](#)
- class [ULActionAE5](#)
- class [ULActionAE6](#)
- class [ULActionAE7](#)
- class [ULActionAE8](#)
- class [ULActionAR1](#)
- class [ULActionAR10](#)
- class [ULActionAR2](#)
- class [ULActionAR3](#)
- class [ULActionAR4](#)
- class [ULActionAR5](#)
- class [ULActionAR6](#)
- class [ULActionAR7](#)
- class [ULActionAR8](#)
- class [ULActionAR9](#)
- class [ULActionDT1](#)
- class [ULActionDT2](#)
- class [ULBasicCallback](#)  
*ULBasicCallback.*
- class [ULConnection](#)  
*ULConnection.*
- class [ULConnectionCallback](#)
- class [ULConnectionInfo](#)  
*ULConnectionInfo.*
- class [ULConnectionManager](#)  
*ULConnectionManager.*
- class [ULEvent](#)  
*ULEvent.*
- class [ULTransitionTable](#)  
*ULTransitionTable* The transition table of all the *ULEvents*, new *ULActions*, and *ULStates*.
- class [ULWritingCallback](#)
- class [UserInformation](#)  
*UserInformation.*

## Enumerations

- enum [EEventID](#) {
  - [eAASSOCIATERequestLocalUser](#) = 0 ,
  - [eTransportConnConfirmLocal](#) ,
  - [eASSOCIATE\\_ACPDUreceived](#) ,
  - [eASSOCIATE\\_RJPDUreceived](#) ,
  - [eTransportConnIndicLocal](#) ,
  - [eAASSOCIATE\\_RQPDUreceived](#) ,
  - [eAASSOCIATEResponseAccept](#) ,
  - [eAASSOCIATEResponseReject](#) ,
  - [ePDATArequest](#) ,
  - [ePDATATFPDU](#) ,
  - [eARELEASERequest](#) ,
  - [eARELEASE\\_RQPDUReceivedOpen](#) ,
  - [eARELEASE\\_RPPDUReceived](#) ,
  - [eARELEASEResponse](#) ,
  - [eAABORTRequest](#) ,
  - [eAABORTPDUReceivedOpen](#) ,
  - [eTransportConnectionClosed](#) ,
  - [eARTIMTimerExpired](#) ,
  - [eUnrecognizedPDUReceived](#) ,
  - [eEventDoesNotExist](#) }
- enum [EStateID](#) {
  - [eStaDoesNotExist](#) = 0 ,
  - [eSta1Idle](#) = 1 ,
  - [eSta2Open](#) = 2 ,
  - [eSta3WaitLocalAssoc](#) = 4 ,
  - [eSta4LocalAssocDone](#) = 8 ,
  - [eSta5WaitRemoteAssoc](#) = 16 ,
  - [eSta6TransferReady](#) = 32 ,
  - [eSta7WaitRelease](#) = 64 ,
  - [eSta8WaitLocalRelease](#) = 128 ,
  - [eSta9ReleaseCollisionRqLocal](#) = 256 ,
  - [eSta10ReleaseCollisionAc](#) = 512 ,
  - [eSta11ReleaseCollisionRq](#) = 1024 ,
  - [eSta12ReleaseCollisionAcLocal](#) = 2048 ,
  - [eSta13AwaitingClose](#) = 4096 }

## Functions

- int [GetStateIndex](#) ([EStateID](#) inState)

## Variables

- const int [cMaxEventID](#) = [eEventDoesNotExist](#)
- const int [cMaxStateID](#) = 13

## 11.2.1 Enumeration Type Documentation

### 11.2.1.1 EEventID

enum `gdcmm::network::EEventID`

#### Enumerator

eAASSOCIATERequestLocalUser	
eTransportConnConfirmLocal	
eASSOCIATE_ACPDUreceived	
eASSOCIATE_RJPDUreceived	
eTransportConnIndicLocal	
eAASSOCIATE_RQPDUreceived	
eAASSOCIATEResponseAccept	
eAASSOCIATEResponseReject	
ePDATArequest	
ePDATATFPDU	
eARELEASERequest	
eARELEASE_RQPDUReceivedOpen	
eARELEASE_RPPDUReceived	
eARELEASEResponse	
eAABORTRequest	
eAABORTPDUReceivedOpen	
eTransportConnectionClosed	
eARTIMTimerExpired	
eUnrecognizedPDUReceived	
eEventDoesNotExist	

### 11.2.1.2 EStateID

enum `gdcmm::network::EStateID`

Each network connection will be in a particular state at any given time. Those states have IDs as described in the standard ps3.8-2009, roughly 1-13. This enumeration lists those states. The actual ULState class will contain more information about transitions to other states.

name and date: 16 sept 2010 mmr

#### Enumerator

eStaDoesNotExist	
------------------	--

eSta1Idle	
eSta2Open	
eSta3WaitLocalAssoc	
eSta4LocalAssocDone	
eSta5WaitRemoteAssoc	
eSta6TransferReady	
eSta7WaitRelease	
eSta8WaitLocalRelease	
eSta9ReleaseCollisionRqLocal	
eSta10ReleaseCollisionAc	
eSta11ReleaseCollisionRq	
eSta12ReleaseCollisionAcLocal	
eSta13AwaitingClose	

## 11.2.2 Function Documentation

### 11.2.2.1 GetStateIndex()

```
int gdcn::network::GetStateIndex (
    EStateID inState) [inline]
```

References [eSta10ReleaseCollisionAc](#), [eSta11ReleaseCollisionRq](#), [eSta12ReleaseCollisionAcLocal](#), [eSta13AwaitingClose](#), [eSta1Idle](#), [eSta2Open](#), [eSta3WaitLocalAssoc](#), [eSta4LocalAssocDone](#), [eSta5WaitRemoteAssoc](#), [eSta6TransferReady](#), [eSta7WaitRelease](#), [eSta8WaitLocalRelease](#), [eSta9ReleaseCollisionRqLocal](#), and [eStaDoesNotExist](#).

## 11.2.3 Variable Documentation

### 11.2.3.1 cMaxEventID

```
const int gdcn::network::cMaxEventID = eEventDoesNotExist
```

### 11.2.3.2 cMaxStateID

```
const int gdcn::network::cMaxStateID = 13
```

Referenced by [gdcn::network::TableRow::TableRow\(\)](#), and [gdcn::network::TableRow::~~TableRow\(\)](#).

## 11.3 gdcmm::SegmentHelper Namespace Reference

### Classes

- struct [BasicCodedEntry](#)

*This structure defines a basic coded entry with all of its attributes.*

## 11.4 gdcmm::terminal Namespace Reference

Class for Terminal.

### Enumerations

- enum [Attribute](#) {  
    [reset](#) = 0 ,  
    [bright](#) = 1 ,  
    [dim](#) = 2 ,  
    [underline](#) = 3 ,  
    [blink](#) = 5 ,  
    [reverse](#) = 7 ,  
    [hidden](#) = 8 }
- enum [Color](#) {  
    [black](#) = 0 ,  
    [red](#) ,  
    [green](#) ,  
    [yellow](#) ,  
    [blue](#) ,  
    [magenta](#) ,  
    [cyan](#) ,  
    [white](#) }
- enum [Mode](#) {  
    [CONSOLE](#) = 0 ,  
    [VT100](#) }

### Functions

- [GDCM\\_EXPORT](#) std::string [setattribute](#) ([Attribute](#) att)
- [GDCM\\_EXPORT](#) std::string [setbgcolor](#) ([Color](#) c)
- [GDCM\\_EXPORT](#) std::string [setfgcolor](#) ([Color](#) c)
- [GDCM\\_EXPORT](#) void [setmode](#) ([Mode](#) m)

### 11.4.1 Detailed Description

Class for Terminal.

Allow one to print in color in a shell

- support VT100 compatible shell
- win32 console

## 11.4.2 Enumeration Type Documentation

### 11.4.2.1 Attribute

enum `gdcmm::terminal::Attribute`

#### Enumerator

reset	
bright	
dim	
underline	
blink	
reverse	
hidden	

### 11.4.2.2 Color

enum `gdcmm::terminal::Color`

#### Enumerator

black	
red	
green	
yellow	
blue	
magenta	
cyan	
white	

### 11.4.2.3 Mode

enum `gdcmm::terminal::Mode`

#### Enumerator

CONSOLE	
VT100	



### 11.4.3 Function Documentation

#### 11.4.3.1 setattribute()

```
GDCM_EXPORT std::string gdcm::terminal::setattribute (  
    Attribute att)
```

References [GDCM\\_EXPORT](#).

#### 11.4.3.2 setbgcolor()

```
GDCM_EXPORT std::string gdcm::terminal::setbgcolor (  
    Color c)
```

References [GDCM\\_EXPORT](#).

#### 11.4.3.3 setfgcolor()

```
GDCM_EXPORT std::string gdcm::terminal::setfgcolor (  
    Color c)
```

References [GDCM\\_EXPORT](#).

#### 11.4.3.4 setmode()

```
GDCM_EXPORT void gdcm::terminal::setmode (  
    Mode m)
```

References [GDCM\\_EXPORT](#).



## Chapter 12

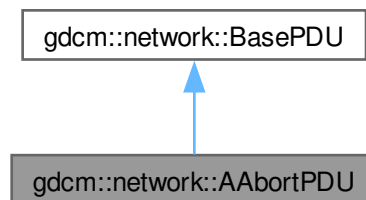
# Class Documentation

### 12.1 gdcm::network::AAabortPDU Class Reference

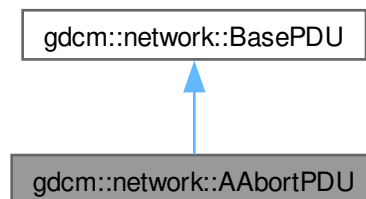
[AAabortPDU](#).

```
#include <gdcmAAabortPDU.h>
```

Inheritance diagram for gdcm::network::AAabortPDU:



Collaboration diagram for gdcm::network::AAabortPDU:



## Public Member Functions

- [AAbortPDU](#) ()
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- void [SetReason](#) (const uint8\_t r)
- void [SetSource](#) (const uint8\_t s)
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

## Public Member Functions inherited from [gdcm::network::BasePDU](#)

- virtual [~BasePDU](#) ()=default

### 12.1.1 Detailed Description

[AAbortPDU](#).

[Table 9-26](#) A-ABORT PDU FIELDS

### 12.1.2 Constructor & Destructor Documentation

#### 12.1.2.1 AAbortPDU()

```
gdcm::network::AAbortPDU::AAbortPDU ()
```

### 12.1.3 Member Function Documentation

#### 12.1.3.1 IsLastFragment()

```
bool gdcm::network::AAbortPDU::IsLastFragment () const [inline], [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

#### 12.1.3.2 Print()

```
void gdcm::network::AAbortPDU::Print (
    std::ostream & os) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

### 12.1.3.3 Read()

```
std::istream & gdcm::network::AAabortPDU::Read (  
    std::istream & is) [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

### 12.1.3.4 SetReason()

```
void gdcm::network::AAabortPDU::SetReason (  
    const uint8_t r)
```

### 12.1.3.5 SetSource()

```
void gdcm::network::AAabortPDU::SetSource (  
    const uint8_t s)
```

### 12.1.3.6 Size()

```
size_t gdcm::network::AAabortPDU::Size () const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

### 12.1.3.7 Write()

```
const std::ostream & gdcm::network::AAabortPDU::Write (  
    std::ostream & os) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

The documentation for this class was generated from the following file:

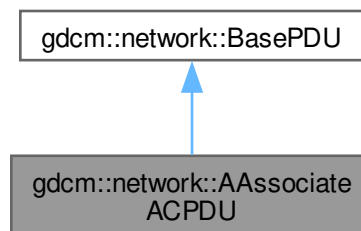
- [gdcmAAabortPDU.h](#)

## 12.2 gdcmm::network::AAssociateACPDU Class Reference

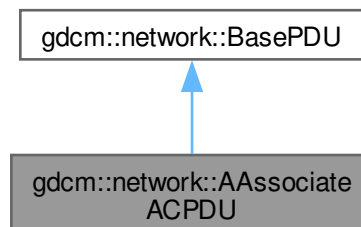
[AAssociateACPDU](#).

```
#include <gdcmAAssociateACPDU.h>
```

Inheritance diagram for gdcmm::network::AAssociateACPDU:



Collaboration diagram for gdcmm::network::AAssociateACPDU:



### Public Types

- typedef std::vector< [PresentationContextAC](#) >::size\_type [SizeType](#)

### Public Member Functions

- [AAssociateACPDU](#) ()
- void [AddPresentationContextAC](#) ([PresentationContextAC](#) const &pcac)
- [SizeType](#) [GetNumberOfPresentationContextAC](#) () const
- const [PresentationContextAC](#) & [GetPresentationContextAC](#) ([SizeType](#) i)
- const [UserInfo](#) & [GetUserInfo](#) () const
- void [InitFromRQ](#) ([AAssociateRQPDU](#) const &rqpdu)
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- [SizeType](#) [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

### Public Member Functions inherited from [gdcm::network::BasePDU](#)

- virtual [~BasePDU](#) ()=default

### Protected Member Functions

- void [SetCalledAETitle](#) (const char calledaetitle[16])
- void [SetCallingAETitle](#) (const char callingaetitle[16])

### Friends

- class [AAssociateRQPDU](#)

## 12.2.1 Detailed Description

[AAssociateACPDU](#).

[Table 9-17](#) ASSOCIATE-AC PDU fields

## 12.2.2 Member Typedef Documentation

### 12.2.2.1 SizeType

```
typedef std::vector<PresentationContextAC>::size_type gdcm::network::AAssociateACPDU::SizeType
```

## 12.2.3 Constructor & Destructor Documentation

### 12.2.3.1 AAssociateACPDU()

```
gdcm::network::AAssociateACPDU::AAssociateACPDU ()
```

## 12.2.4 Member Function Documentation

### 12.2.4.1 AddPresentationContextAC()

```
void gdcn::network::AAssociateACPDU::AddPresentationContextAC (  
    PresentationContextAC const & pcac)
```

### 12.2.4.2 GetNumberOfPresentationContextAC()

```
SizeType gdcn::network::AAssociateACPDU::GetNumberOfPresentationContextAC () const [inline]
```

### 12.2.4.3 GetPresentationContextAC()

```
const PresentationContextAC & gdcn::network::AAssociateACPDU::GetPresentationContextAC (  
    SizeType i) [inline]
```

### 12.2.4.4 GetUserInfoInformation()

```
const UserInfoInformation & gdcn::network::AAssociateACPDU::GetUserInfoInformation () const [inline]
```

### 12.2.4.5 InitFromRQ()

```
void gdcn::network::AAssociateACPDU::InitFromRQ (  
    AAssociateRQPDU const & rqpdu)
```

References [AAssociateRQPDU](#).

### 12.2.4.6 IsLastFragment()

```
bool gdcn::network::AAssociateACPDU::IsLastFragment () const [inline], [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).

### 12.2.4.7 Print()

```
void gdcn::network::AAssociateACPDU::Print (  
    std::ostream & os) const [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).



#### 12.2.4.8 Read()

```
std::istream & gdcm::network::AAssociateACPDU::Read (  
    std::istream & is) [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

#### 12.2.4.9 SetCalledAETitle()

```
void gdcm::network::AAssociateACPDU::SetCalledAETitle (  
    const char calledaetitle[16]) [protected]
```

#### 12.2.4.10 SetCallingAETitle()

```
void gdcm::network::AAssociateACPDU::SetCallingAETitle (  
    const char callingaetitle[16]) [protected]
```

References [AAssociateRQPDU](#).

#### 12.2.4.11 Size()

```
SizeType gdcm::network::AAssociateACPDU::Size () const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

#### 12.2.4.12 Write()

```
const std::ostream & gdcm::network::AAssociateACPDU::Write (  
    std::ostream & os) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

### 12.2.5 Friends And Related Symbol Documentation

#### 12.2.5.1 AAssociateRQPDU

```
friend class AAssociateRQPDU [friend]
```

References [AAssociateRQPDU](#).

Referenced by [AAssociateRQPDU](#), [InitFromRQ\(\)](#), and [SetCallingAETitle\(\)](#).

The documentation for this class was generated from the following file:

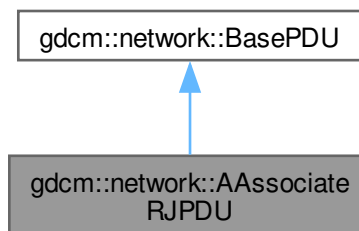
- [gdcmAAssociateACPDU.h](#)

## 12.3 gdcn::network::AAssociateRJPDU Class Reference

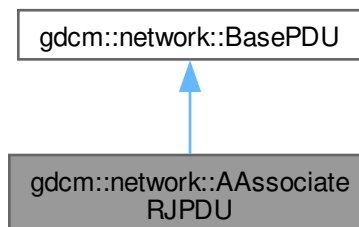
[AAssociateRJPDU](#).

```
#include <gdcnAAssociateRJPDU.h>
```

Inheritance diagram for gdcn::network::AAssociateRJPDU:



Collaboration diagram for gdcn::network::AAssociateRJPDU:



### Public Member Functions

- [AAssociateRJPDU](#) ()
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

## Public Member Functions inherited from [gdcmm::network::BasePDU](#)

- virtual [~BasePDU](#) ()=default

### 12.3.1 Detailed Description

[AAssociateRJPDU](#).

Table 9-21 ASSOCIATE-RJ PDU FIELDS

### 12.3.2 Constructor & Destructor Documentation

#### 12.3.2.1 AAssociateRJPDU()

```
gdcmm::network::AAssociateRJPDU::AAssociateRJPDU ()
```

### 12.3.3 Member Function Documentation

#### 12.3.3.1 IsLastFragment()

```
bool gdcmm::network::AAssociateRJPDU::IsLastFragment () const [inline], [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

#### 12.3.3.2 Print()

```
void gdcmm::network::AAssociateRJPDU::Print (
    std::ostream & os) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

#### 12.3.3.3 Read()

```
std::istream & gdcmm::network::AAssociateRJPDU::Read (
    std::istream & is) [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

#### 12.3.3.4 Size()

```
size_t gdcmm::network::AAssociateRJPDU::Size () const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 12.3.3.5 Write()

```
const std::ostream & gdcm::network::AAssociateRJPDU::Write (  
    std::ostream & os) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

The documentation for this class was generated from the following file:

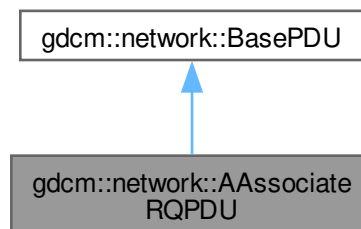
- [gdcmAAssociateRJPDU.h](#)

## 12.4 gdcm::network::AAssociateRQPDU Class Reference

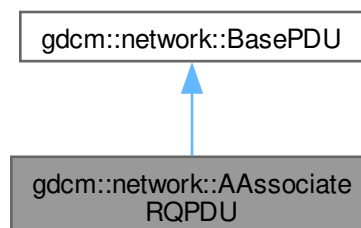
[AAssociateRQPDU](#).

```
#include <gdcmAAssociateRQPDU.h>
```

Inheritance diagram for gdcm::network::AAssociateRQPDU:



Collaboration diagram for gdcm::network::AAssociateRQPDU:



## Public Types

- typedef std::vector< [PresentationContextRQ](#) > [PresentationContextArrayType](#)
- typedef std::vector< [PresentationContextRQ](#) >::size\_type [SizeType](#)

## Public Member Functions

- [AAssociateRQPDU](#) ()
- [AAssociateRQPDU](#) (const [AAssociateRQPDU](#) &pdu)
- void [AddPresentationContext](#) ([PresentationContextRQ](#) const &pc)
- std::string [GetCalledAETitle](#) () const
- std::string [GetCallingAETitle](#) () const
- [SizeType](#) [GetNumberOfPresentationContext](#) () const
- [PresentationContextRQ](#) const & [GetPresentationContext](#) ([SizeType](#) i) const
- const [PresentationContextRQ](#) \* [GetPresentationContextByAbstractSyntax](#) ([AbstractSyntax](#) const &absyn) const
- const [PresentationContextRQ](#) \* [GetPresentationContextByID](#) (uint8\_t i) const
- [PresentationContextArrayType](#) const & [GetPresentationContexts](#) ()
- const [UserInformation](#) & [GetUserInformation](#) () const
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- void [SetCalledAETitle](#) (const char calledaetitle[16])  
*Set the Called AE Title.*
- void [SetCallingAETitle](#) (const char callingaetitle[16])  
*Set the Calling AE Title.*
- void [SetUserInformation](#) ([UserInformation](#) const &ui)
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

## Public Member Functions inherited from [gdcm::network::BasePDU](#)

- virtual [~BasePDU](#) ()=default

## Static Public Member Functions

- static bool [IsAETitleValid](#) (const char title[16])  
*Check whether or not the.*

## Protected Member Functions

- std::string [GetReserved43\\_74](#) () const

## Friends

- class [AAssociateACPDU](#)

### 12.4.1 Detailed Description

[AAssociateRQPDU](#).

[Table 9-11](#) ASSOCIATE-RQ PDU fields

### 12.4.2 Member Typedef Documentation

#### 12.4.2.1 PresentationContextArrayType

```
typedef std::vector<PresentationContextRQ> gdcn::network::AAssociateRQPDU::PresentationContextArrayType
```

#### 12.4.2.2 SizeType

```
typedef std::vector<PresentationContextRQ>::size_type gdcn::network::AAssociateRQPDU::SizeType
```

### 12.4.3 Constructor & Destructor Documentation

#### 12.4.3.1 AAssociateRQPDU() [1/2]

```
gdcn::network::AAssociateRQPDU::AAssociateRQPDU ()
```

Referenced by [AAssociateRQPDU\(\)](#).

#### 12.4.3.2 AAssociateRQPDU() [2/2]

```
gdcn::network::AAssociateRQPDU::AAssociateRQPDU (
    const AAssociateRQPDU & pdu) [inline]
```

References [AAssociateRQPDU\(\)](#).

### 12.4.4 Member Function Documentation

#### 12.4.4.1 AddPresentationContext()

```
void gdcn::network::AAssociateRQPDU::AddPresentationContext (
    PresentationContextRQ const & pc)
```

#### 12.4.4.2 GetCalledAETitle()

```
std::string gdcn::network::AAssociateRQPDU::GetCalledAETitle () const [inline]
```

#### 12.4.4.3 GetCallingAETitle()

```
std::string gdcmm::network::AAAssociateRQPDU::GetCallingAETitle () const [inline]
```

#### 12.4.4.4 GetNumberOfPresentationContext()

```
SizeType gdcmm::network::AAAssociateRQPDU::GetNumberOfPresentationContext () const [inline]
```

#### 12.4.4.5 GetPresentationContext()

```
PresentationContextRQ const & gdcmm::network::AAAssociateRQPDU::GetPresentationContext (
    SizeType i) const [inline]
```

#### 12.4.4.6 GetPresentationContextByAbstractSyntax()

```
const PresentationContextRQ * gdcmm::network::AAAssociateRQPDU::GetPresentationContextByAbstract←
Syntax (
    AbstractSyntax const & absyn) const
```

#### 12.4.4.7 GetPresentationContextByID()

```
const PresentationContextRQ * gdcmm::network::AAAssociateRQPDU::GetPresentationContextByID (
    uint8_t i) const
```

#### 12.4.4.8 GetPresentationContexts()

```
PresentationContextArrayType const & gdcmm::network::AAAssociateRQPDU::GetPresentationContexts ()
[inline]
```

#### 12.4.4.9 GetReserved43\_74()

```
std::string gdcmm::network::AAAssociateRQPDU::GetReserved43_74 () const [protected]
```

#### 12.4.4.10 GetUserInfo()

```
const UserInformation & gdcmm::network::AAAssociateRQPDU::GetUserInfo () const [inline]
```

#### 12.4.4.11 IsAETitleValid()

```
bool gdcmm::network::AAssociateRQPDU::IsAETitleValid (
    const char title[16]) [static]
```

Check whether or not the.

##### Parameters

<i>title</i>	is a valid AE title
--------------	---------------------

#### 12.4.4.12 IsLastFragment()

```
bool gdcmm::network::AAssociateRQPDU::IsLastFragment () const [inline], [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

#### 12.4.4.13 Print()

```
void gdcmm::network::AAssociateRQPDU::Print (
    std::ostream & os) const [override], [virtual]
```

This function will initialize an [AAssociateACPDU](#) from the fields in the [AAssociateRQPDU](#) structure

Implements [gdcmm::network::BasePDU](#).

#### 12.4.4.14 Read()

```
std::istream & gdcmm::network::AAssociateRQPDU::Read (
    std::istream & is) [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

#### 12.4.4.15 SetCalledAETitle()

```
void gdcmm::network::AAssociateRQPDU::SetCalledAETitle (
    const char calledaetitle[16])
```

Set the Called AE Title.

#### 12.4.4.16 SetCallingAETitle()

```
void gdcmm::network::AAssociateRQPDU::SetCallingAETitle (
    const char callingaetitle[16])
```

Set the Calling AE Title.



#### 12.4.4.17 SetUserInfoInformation()

```
void gdcmm::network::AAssociateRQPDU::SetUserInfoInformation (
    UserInfoInformation const & ui)
```

#### 12.4.4.18 Size()

```
size_t gdcmm::network::AAssociateRQPDU::Size () const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

#### 12.4.4.19 Write()

```
const std::ostream & gdcmm::network::AAssociateRQPDU::Write (
    std::ostream & os) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 12.4.5 Friends And Related Symbol Documentation

#### 12.4.5.1 AAssociateACPDU

```
friend class AAssociateACPDU [friend]
```

References [AAssociateACPDU](#).

Referenced by [AAssociateACPDU](#).

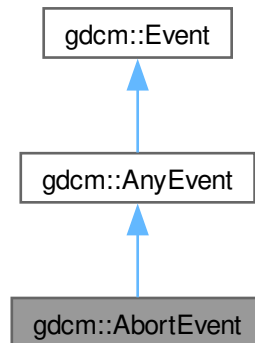
The documentation for this class was generated from the following file:

- [gdcmmAAssociateRQPDU.h](#)

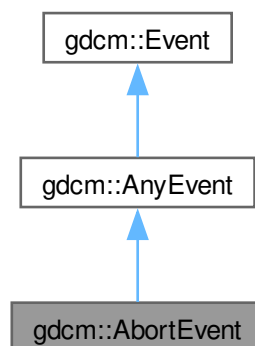
## 12.5 gdcm::AbortEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::AbortEvent:



Collaboration diagram for gdcm::AbortEvent:



### Additional Inherited Members

### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()

- [Event](#) (const Event &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 12.6 gdcm::network::AbstractSyntax Class Reference

[AbstractSyntax](#).

```
#include <gdcmAbstractSyntax.h>
```

### Public Member Functions

- [AbstractSyntax](#) ()
- [DataElement](#) [GetAsDataElement](#) () const
- const char \* [GetName](#) () const
- bool [operator==](#) (const [AbstractSyntax](#) &as) const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetName](#) (const char \*name)
- void [SetNameFromUID](#) ([UIDs::TSName](#) tsname)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.6.1 Detailed Description

[AbstractSyntax](#).

[Table](#) 9-14 ABSTRACT SYNTAX SUB-ITEM FIELDS

### 12.6.2 Constructor & Destructor Documentation

#### 12.6.2.1 AbstractSyntax()

```
gdcm::network::AbstractSyntax::AbstractSyntax ()
```

Referenced by [operator==\(\)](#).

### 12.6.3 Member Function Documentation

#### 12.6.3.1 GetAsDataElement()

```
DataElement gdcn::network::AbstractSyntax::GetAsDataElement () const
```

#### 12.6.3.2 GetName()

```
const char * gdcn::network::AbstractSyntax::GetName () const [inline]
```

#### 12.6.3.3 operator==()

```
bool gdcn::network::AbstractSyntax::operator== (
    const AbstractSyntax & as) const [inline]
```

References [AbstractSyntax\(\)](#).

#### 12.6.3.4 Print()

```
void gdcn::network::AbstractSyntax::Print (
    std::ostream & os) const
```

#### 12.6.3.5 Read()

```
std::istream & gdcn::network::AbstractSyntax::Read (
    std::istream & is)
```

#### 12.6.3.6 SetName()

```
void gdcn::network::AbstractSyntax::SetName (
    const char * name) [inline]
```

#### 12.6.3.7 SetNameFromUID()

```
void gdcn::network::AbstractSyntax::SetNameFromUID (
    UIDs::TSName tname)
```

#### 12.6.3.8 Size()

```
size_t gdcn::network::AbstractSyntax::Size () const
```

### 12.6.3.9 Write()

```
const std::ostream & gdcm::network::AbstractSyntax::Write (  
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

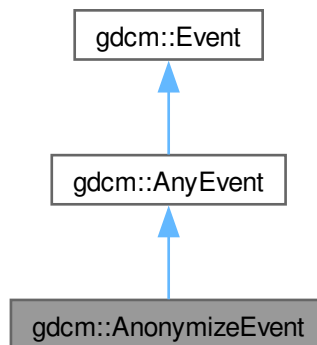
- [gdcmAbstractSyntax.h](#)

## 12.7 gdcm::AnonymizeEvent Class Reference

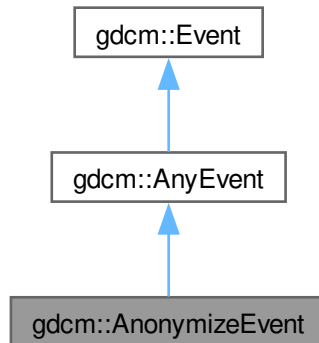
[AnonymizeEvent.](#)

```
#include <gdcmAnonymizeEvent.h>
```

Inheritance diagram for gdcm::AnonymizeEvent:



Collaboration diagram for `gdcm::AnonymizeEvent`:



## Public Types

- typedef [AnonymizeEvent](#) `Self`
- typedef [AnyEvent](#) `Superclass`

## Public Member Functions

- [AnonymizeEvent](#) (`const Self &s`)
- [AnonymizeEvent](#) (`Tag const &tag=0`)
- [~AnonymizeEvent](#) () `override=default`
- `bool` [CheckEvent](#) (`const ::gdcm::Event *e`) `const override`
- `const char *` [GetEventName](#) () `const override`
- `Tag const &` [GetTag](#) () `const`
- `::gdcm::Event *` [MakeObject](#) () `const override`
- `void` [operator=](#) (`const Self &`) `=delete`
- `void` [SetTag](#) (`const Tag &t`)

## Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()
- [Event](#) (`const Event &`)
- `virtual` [~Event](#) ()
- `virtual bool` [CheckEvent](#) (`const Event *`) `const =0`
- `void` [operator=](#) (`const Event &`) `=delete`
- `virtual void` [Print](#) (`std::ostream &os`) `const`

## 12.7.1 Detailed Description

[AnonymizeEvent](#).

Special type of event triggered during the Anonymization process

See also

[Anonymizer](#)

Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

## 12.7.2 Member Typedef Documentation

### 12.7.2.1 Self

```
typedef AnonymizeEvent gdcm::AnonymizeEvent::Self
```

### 12.7.2.2 Superclass

```
typedef AnyEvent gdcm::AnonymizeEvent::Superclass
```

## 12.7.3 Constructor & Destructor Documentation

### 12.7.3.1 AnonymizeEvent() [1/2]

```
gdcm::AnonymizeEvent::AnonymizeEvent (
    Tag const & tag = 0) [inline]
```

### 12.7.3.2 ~AnonymizeEvent()

```
gdcm::AnonymizeEvent::~~AnonymizeEvent () [override], [default]
```

### 12.7.3.3 AnonymizeEvent() [2/2]

```
gdcm::AnonymizeEvent::AnonymizeEvent (
    const Self & s) [inline]
```

## 12.7.4 Member Function Documentation

### 12.7.4.1 CheckEvent()

```
bool gdcm::AnonymizeEvent::CheckEvent (
    const ::gdcm::Event * e) const [inline], [override]
```

### 12.7.4.2 GetEventName()

```
const char * gdcm::AnonymizeEvent::GetEventName () const [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements [gdcm::Event](#).

### 12.7.4.3 GetTag()

```
Tag const & gdcm::AnonymizeEvent::GetTag () const [inline]
```

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 12.7.4.4 MakeObject()

```
::gdcm::Event * gdcm::AnonymizeEvent::MakeObject () const [inline], [override], [virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implements [gdcm::Event](#).

### 12.7.4.5 operator=()

```
void gdcm::AnonymizeEvent::operator= (
    const Self & ) [delete]
```

### 12.7.4.6 SetTag()

```
void gdcm::AnonymizeEvent::SetTag (
    const Tag & t) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmAnonymizeEvent.h](#)

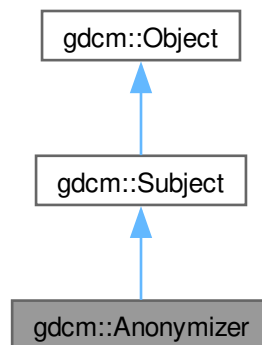


## 12.8 gdcm::Anonymizer Class Reference

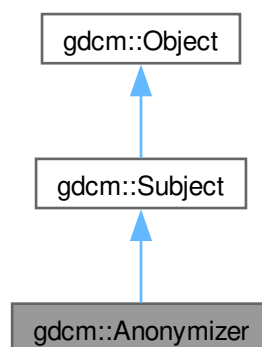
[Anonymizer.](#)

```
#include <gdcmAnonymizer.h>
```

Inheritance diagram for gdcm::Anonymizer:



Collaboration diagram for gdcm::Anonymizer:



## Public Member Functions

- [Anonymizer](#) ()
- [~Anonymizer](#) () override
- bool [BasicApplicationLevelConfidentialityProfile](#) (bool deidentify=true)
- bool [Clear](#) ([PrivateTag](#) const &pt)
- bool [Clear](#) ([Tag](#) const &t)
  - Identical to 'Empty' except no action is done when tag is not present.*
- bool [Empty](#) ([PrivateTag](#) const &pt)
- bool [Empty](#) ([Tag](#) const &t)
  - Make [Tag](#) t empty (if not found tag will be created).*
- const [CryptographicMessageSyntax](#) \* [GetCryptographicMessageSyntax](#) () const
- [File](#) & [GetFile](#) ()
- bool [Remove](#) ([PrivateTag](#) const &pt)
- bool [Remove](#) ([Tag](#) const &t)
  - remove a tag (even a SQ can be removed)*
- bool [RemoveGroupLength](#) ()
  - Main function that loop over all elements and remove group length.*
- bool [RemovePrivateTags](#) ()
  - Main function that loop over all elements and remove private tags.*
- bool [RemoveRetired](#) ()
  - Main function that loop over all elements and remove retired element.*
- bool [Replace](#) ([PrivateTag](#) const &t, const char \*value)
- bool [Replace](#) ([PrivateTag](#) const &t, const char \*value, [VL](#) const &vl)
- bool [Replace](#) ([Tag](#) const &t, const char \*value)
- bool [Replace](#) ([Tag](#) const &t, const char \*value, [VL](#) const &vl)
- void [SetCryptographicMessageSyntax](#) ([CryptographicMessageSyntax](#) \*cms)
  - Set/Get CMS key that will be used to encrypt the dataset within BasicApplicationLevelConfidentialityProfile.*
- void [SetFile](#) (const [File](#) &f)
  - Set/Get [File](#).*

## Public Member Functions inherited from [gdcm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)
- *Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Static Public Member Functions

- static void [ClearInternalUIDs](#) ()
- static std::vector< [Tag](#) > [GetBasicApplicationLevelConfidentialityProfileAttributes](#) ()
- *Return the list of [Tag](#) that will be considered when anonymizing a DICOM file.*
- static [SmartPointer](#)< [Anonymizer](#) > [New](#) ()
- *for wrapped language: instantiate a reference counted object*

## Protected Member Functions

- bool [BALCPPProtect](#) ([DataSet](#) &ds, [Tag](#) const &tag, const [IOD](#) &iod)
- bool [CanEmptyTag](#) ([Tag](#) const &tag, const [IOD](#) &iod) const
- void [RecurseDataSet](#) ([DataSet](#) &ds)

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### 12.8.1 Detailed Description

[Anonymizer](#).

This class is a multi purpose anonymizer. It can work in 2 mode:

- Full (irreversible) anonymizer (aka dumb mode)
- reversible de-identifier/re-identifier (aka smart mode). This implements the Basic Application Level Confidentiality Profile, DICOM PS 3.15-2009

1. dumb mode This is a dumb anonymizer implementation. All it allows user is simple operation such as:

[Tag](#) based functions:

- complete removal of DICOM attribute (Remove)

- make a tag empty, ie make it's length 0 (Empty)
- replace with another string-based value (Replace)

[DataSet](#) based functions:

- Remove all group length attribute from a DICOM dataset (Group Length element are deprecated, DICOM 2008)
- Remove all private attributes
- Remove all retired attributes

All function calls actually execute the user specified request. Previous implementation were calling a general Anonymize function but traversing a `std::set` is  $O(n)$  operation, while a simple user specified request is  $O(\log(n))$  operation. So 'm' user interaction is  $O(m \cdot \log(n))$  which is  $< O(n)$  complexity.

1. smart mode this mode implements the Basic Application Level Confidentiality Profile (DICOM PS 3.15-2008) In this case, it is extremely important to use the same [Anonymizer](#) class when anonymizing a [FileSet](#). Once the [Anonymizer](#) is destroyed its memory of known (already processed) [UIDs](#) will be lost. which will make the anonymizer behaves incorrectly for attributes such as [Series](#) UID [Study](#) UID where user want some consistency. When attribute is [Type 1](#) / [Type 1C](#), a dummy generator will take in the existing value and produce a dummy value (a sha1 representation). sha1 algorithm is considered to be cryptographically strong (compared to md5sum) so that we meet the following two conditions:

- Produce the same dummy value for the same input value
- do not provide an easy way to retrieve the original value from the sha1 generated value

This class implement the Subject/Observer pattern trigger the following event:

- [AnonymizeEvent](#)
- [IterationEvent](#)
- [StartEvent](#)
- [EndEvent](#)

See also

[CryptographicMessageSyntax](#)

Examples

[ClinicalTrialAnnotate.cxx](#), [CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [ManipulateFile.cs](#), and [MpegVideoInfo.cs](#).

## 12.8.2 Constructor & Destructor Documentation

### 12.8.2.1 Anonymizer()

```
gdcm::Anonymizer::Anonymizer () [inline]
```

Referenced by [New\(\)](#).

### 12.8.2.2 ~Anonymizer()

```
gdcm::Anonymizer::~~Anonymizer () [override]
```

## 12.8.3 Member Function Documentation

### 12.8.3.1 BALCPPProtect()

```
bool gdcm::Anonymizer::BALCPPProtect (
    DataSet & ds,
    Tag const & tag,
    const IOD & iod) [protected]
```

### 12.8.3.2 BasicApplicationLevelConfidentialityProfile()

```
bool gdcm::Anonymizer::BasicApplicationLevelConfidentialityProfile (
    bool deidentify = true)
```

PS 3.15 / E.1.1 De-Identifier An Application may claim conformance to the Basic Application Level Confidentiality Profile as a deidentifier if it protects all Attributes that might be used by unauthorized entities to identify the patient. NOT THREAD SAFE

#### Examples

[BasicAnonymizer.cs](#).

### 12.8.3.3 CanEmptyTag()

```
bool gdcm::Anonymizer::CanEmptyTag (
    Tag const & tag,
    const IOD & iod) const [protected]
```

### 12.8.3.4 Clear() [1/2]

```
bool gdcm::Anonymizer::Clear (
    PrivateTag const & pt)
```

### 12.8.3.5 Clear() [2/2]

```
bool gdcm::Anonymizer::Clear (
    Tag const & t)
```

Identical to 'Empty' except no action is done when tag is not present.

### 12.8.3.6 ClearInternalUIDs()

```
void gdcM::Anonymizer::ClearInternalUIDs () [static]
```

Clear the internal mapping of real [UIDs](#) to generated [UIDs](#)

#### Warning

the mapping is definitely lost

### 12.8.3.7 Empty() [1/2]

```
bool gdcM::Anonymizer::Empty (
    PrivateTag const & pt)
```

Make [PrivateTag](#) pt empty (if not found tag will be created) Pay special attention that this code must be done before any call to Empty/Remove of the associated Private Creator, but before any call to Replace.

### 12.8.3.8 Empty() [2/2]

```
bool gdcM::Anonymizer::Empty (
    Tag const & t)
```

Make [Tag](#) t empty (if not found tag will be created).

#### Examples

[CreateJPIPDataSet.cxx](#).

### 12.8.3.9 GetBasicApplicationLevelConfidentialityProfileAttributes()

```
std::vector< Tag > gdcM::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes ()
[static]
```

Return the list of [Tag](#) that will be considered when anonymizing a DICOM file.

#### Examples

[GenFakeIdentifyFile.cxx](#), and [TraverseModules.cxx](#).

### 12.8.3.10 GetCryptographicMessageSyntax()

```
const CryptographicMessageSyntax * gdcM::Anonymizer::GetCryptographicMessageSyntax () const
```

### 12.8.3.11 GetFile()

```
File & gdcm::Anonymizer::GetFile () [inline]
```

#### Examples

[BasicAnonymizer.cs](#), and [ManipulateFile.cs](#).

### 12.8.3.12 New()

```
SmartPointer< Anonymizer > gdcm::Anonymizer::New () [inline], [static]
```

for wrapped language: instantiate a reference counted object

References [Anonymizer\(\)](#).

### 12.8.3.13 RecurseDataSet()

```
void gdcm::Anonymizer::RecurseDataSet (  
    DataSet & ds) [protected]
```

### 12.8.3.14 Remove() [1/2]

```
bool gdcm::Anonymizer::Remove (  
    PrivateTag const & pt)
```

remove a private tag (even a SQ can be removed) Pay special attention that this code must be done before any call to Empty/Remove of the associated Private Creator, but before any call to Replace. When the private reservation becomes empty, no check is done to automatically remove the private creator

### 12.8.3.15 Remove() [2/2]

```
bool gdcm::Anonymizer::Remove (  
    Tag const & t)
```

remove a tag (even a SQ can be removed)

### 12.8.3.16 RemoveGroupLength()

```
bool gdcm::Anonymizer::RemoveGroupLength ()
```

Main function that loop over all elements and remove group length.

#### Examples

[ClinicalTrialAnnotate.cxx](#), and [ManipulateFile.cs](#).

### 12.8.3.17 RemovePrivateTags()

```
bool gdcm::Anonymizer::RemovePrivateTags ()
```

Main function that loop over all elements and remove private tags.

#### Examples

[ClinicalTrialAnnotate.cxx](#), and [ManipulateFile.cs](#).

### 12.8.3.18 RemoveRetired()

```
bool gdcm::Anonymizer::RemoveRetired ()
```

Main function that loop over all elements and remove retired element.

### 12.8.3.19 Replace() [1/4]

```
bool gdcm::Anonymizer::Replace (  
    PrivateTag const & t,  
    const char * value)
```

### 12.8.3.20 Replace() [2/4]

```
bool gdcm::Anonymizer::Replace (  
    PrivateTag const & t,  
    const char * value,  
    VL const & vl)
```

### 12.8.3.21 Replace() [3/4]

```
bool gdcm::Anonymizer::Replace (  
    Tag const & t,  
    const char * value)
```

Replace tag with another value, if tag is not found it will be created: WARNING: this function can only execute if tag is a VRASCI

#### Examples

[ClinicalTrialAnnotate.cxx](#), [CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [ManipulateFile.cs](#), and [MpegVideoInfo.cs](#).



### 12.8.3.22 Replace() [4/4]

```
bool gdcm::Anonymizer::Replace (
    Tag const & t,
    const char * value,
    VL const & vl)
```

when the value contains \0, it is a good idea to specify the length. This function is required when dealing with VRBINARY tag

### 12.8.3.23 SetCryptographicMessageSyntax()

```
void gdcm::Anonymizer::SetCryptographicMessageSyntax (
    CryptographicMessageSyntax * cms)
```

Set/Get CMS key that will be used to encrypt the dataset within BasicApplicationLevelConfidentialityProfile.

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 12.8.3.24 SetFile()

```
void gdcm::Anonymizer::SetFile (
    const File & f) [inline]
```

Set/Get [File](#).

#### Examples

[BasicAnonymizer.cs](#), [ClinicalTrialAnnotate.cxx](#), [CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [ManipulateFile.cs](#), and [MpegVideoInfo.cs](#).

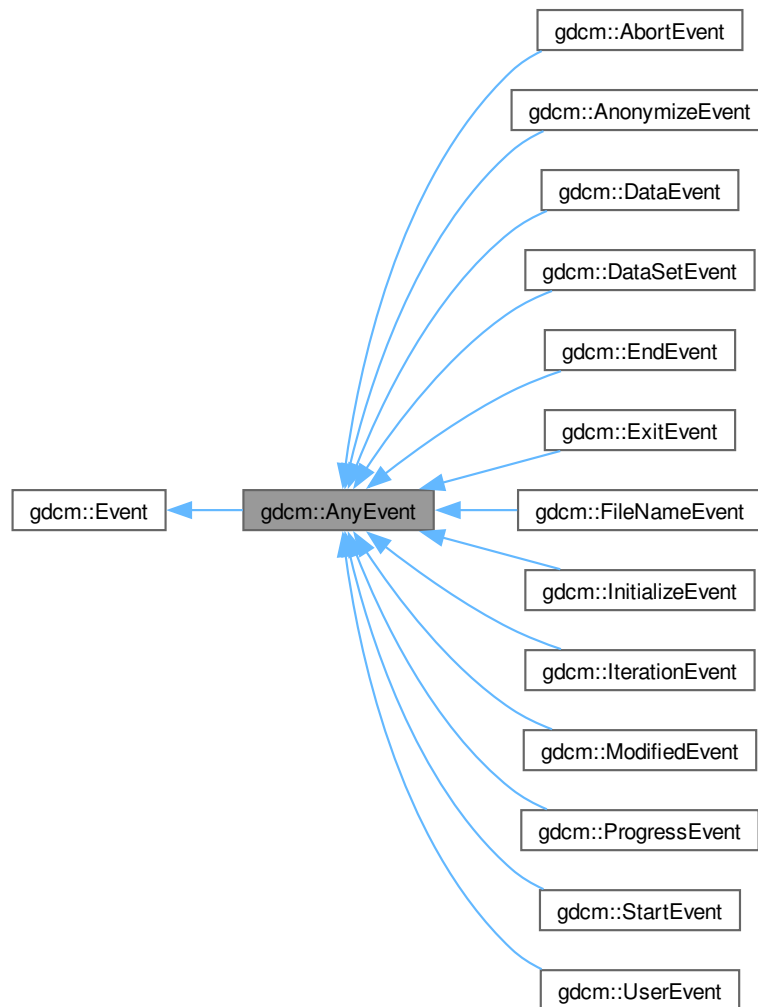
The documentation for this class was generated from the following file:

- [gdcmAnonymizer.h](#)

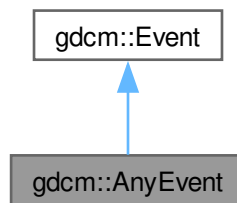
## 12.9 gdcM::AnyEvent Class Reference

```
#include <gdcMEvent.h>
```

Inheritance diagram for gdcM::AnyEvent:



Collaboration diagram for gdcm::AnyEvent:



### Additional Inherited Members

### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()
- [Event](#) (const Event &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 12.10 gdcm::network::ApplicationContext Class Reference

[ApplicationContext](#).

```
#include <gdcmApplicationContext.h>
```

### Public Member Functions

- [ApplicationContext](#) ()
- const char \* [GetName](#) () const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetName](#) (const char \*name)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.10.1 Detailed Description

[ApplicationContext](#).

[Table](#) 9-12 APPLICATION CONTEXT ITEM FIELDS

**Todo** Looks like Application Context can only be 64 bytes at max (see Figure 9-1 / PS 3.8 - 2009 )

### 12.10.2 Constructor & Destructor Documentation

#### 12.10.2.1 ApplicationContext()

```
gdcm::network::ApplicationContext::ApplicationContext ()
```

### 12.10.3 Member Function Documentation

#### 12.10.3.1 GetName()

```
const char * gdcm::network::ApplicationContext::GetName () const [inline]
```

#### 12.10.3.2 Print()

```
void gdcm::network::ApplicationContext::Print (  
    std::ostream & os) const
```

#### 12.10.3.3 Read()

```
std::istream & gdcm::network::ApplicationContext::Read (  
    std::istream & is)
```

#### 12.10.3.4 SetName()

```
void gdcm::network::ApplicationContext::SetName (  
    const char * name) [inline]
```

#### 12.10.3.5 Size()

```
size_t gdcm::network::ApplicationContext::Size () const
```

### 12.10.3.6 Write()

```
const std::ostream & gdcm::network::ApplicationContext::Write (  
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

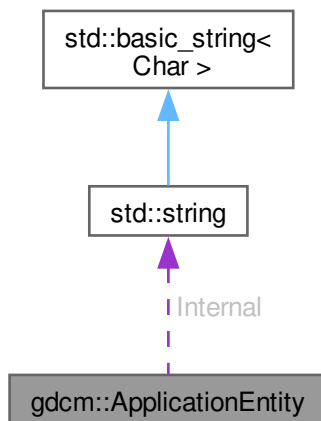
- [gdcmApplicationContext.h](#)

## 12.11 gdcm::ApplicationEntity Class Reference

[ApplicationEntity](#).

```
#include <gdcmApplicationEntity.h>
```

Collaboration diagram for gdcm::ApplicationEntity:



### Public Member Functions

- bool [IsValid](#) () const
- void [Print](#) (std::ostream &os) const
- void [SetBlob](#) (const std::vector< char > &v)
- void [Squeeze](#) ()

### Public Attributes

- std::string [Internal](#)

## Static Public Attributes

- static const unsigned int [MaxLength](#) = 16
- static const unsigned int [MaxNumberOfComponents](#) = 1
- static const char [Padding](#) = ''
- static const char [Separator](#) = ''

### 12.11.1 Detailed Description

[ApplicationEntity](#).

- AE Application Entity
- A string of characters that identifies an Application Entity with leading and trailing spaces (20H) being non-significant. A value consisting solely of spaces shall not be used.
- Default Character Repertoire excluding character code 5CH (the BACKSLASH \ in ISO-IR 6), and control characters LF, FF, CR and ESC.
- 16 bytes maximum

### 12.11.2 Member Function Documentation

#### 12.11.2.1 IsValid()

```
bool gdcmm::ApplicationEntity::IsValid () const [inline]
```

#### 12.11.2.2 Print()

```
void gdcmm::ApplicationEntity::Print (  
    std::ostream & os) const [inline]
```

#### 12.11.2.3 SetBlob()

```
void gdcmm::ApplicationEntity::SetBlob (  
    const std::vector< char > & v) [inline]
```

#### 12.11.2.4 Squeeze()

```
void gdcmm::ApplicationEntity::Squeeze () [inline]
```

## 12.11.3 Member Data Documentation

### 12.11.3.1 Internal

```
std::string gdcmm::ApplicationEntity::Internal
```

### 12.11.3.2 MaxLength

```
const unsigned int gdcmm::ApplicationEntity::MaxLength = 16 [static]
```

### 12.11.3.3 MaxNumberOfComponents

```
const unsigned int gdcmm::ApplicationEntity::MaxNumberOfComponents = 1 [static]
```

### 12.11.3.4 Padding

```
const char gdcmm::ApplicationEntity::Padding = ' ' [static]
```

### 12.11.3.5 Separator

```
const char gdcmm::ApplicationEntity::Separator = ' ' [static]
```

The documentation for this class was generated from the following file:

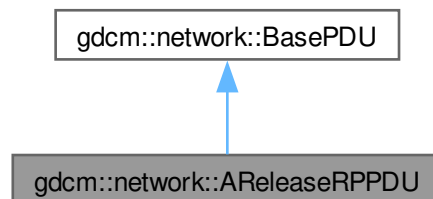
- [gdcmmApplicationEntity.h](#)

## 12.12 gdcmm::network::AReleaseRPPDU Class Reference

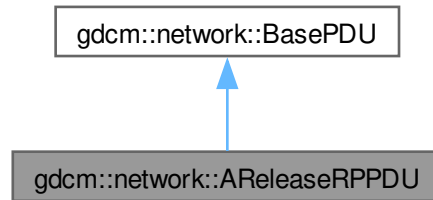
[AReleaseRPPDU](#).

```
#include <gdcmmAReleaseRPPDU.h>
```

Inheritance diagram for gdcmm::network::AReleaseRPPDU:



Collaboration diagram for `gdcm::network::AReleaseRPPDU`:



### Public Member Functions

- [AReleaseRPPDU](#) ()
- `bool` [IsLastFragment](#) () const override
- `void` [Print](#) (std::ostream &os) const override
- `std::istream &` [Read](#) (std::istream &is) override
- `size_t` [Size](#) () const override
- `const std::ostream &` [Write](#) (std::ostream &os) const override

### Public Member Functions inherited from [gdcm::network::BasePDU](#)

- `virtual` [~BasePDU](#) ()=default

## 12.12.1 Detailed Description

[AReleaseRPPDU](#).

[Table 9-25](#) A-RELEASE-RP PDU fields

## 12.12.2 Constructor & Destructor Documentation

### 12.12.2.1 AReleaseRPPDU()

```
gdcm::network::AReleaseRPPDU::AReleaseRPPDU ()
```

## 12.12.3 Member Function Documentation

### 12.12.3.1 IsLastFragment()

```
bool gdcm::network::AReleaseRPPDU::IsLastFragment () const [inline], [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).



### 12.12.3.2 Print()

```
void gdcmm::network::AReleaseRPPDU::Print (  
    std::ostream & os) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 12.12.3.3 Read()

```
std::istream & gdcmm::network::AReleaseRPPDU::Read (  
    std::istream & is) [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 12.12.3.4 Size()

```
size_t gdcmm::network::AReleaseRPPDU::Size () const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 12.12.3.5 Write()

```
const std::ostream & gdcmm::network::AReleaseRPPDU::Write (  
    std::ostream & os) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

The documentation for this class was generated from the following file:

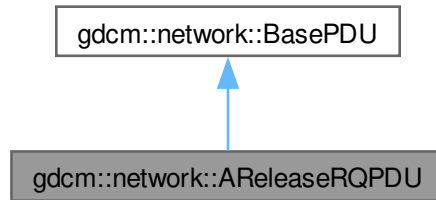
- [gdcmAReleaseRPPDU.h](#)

## 12.13 gdcmm::network::AReleaseRQPDU Class Reference

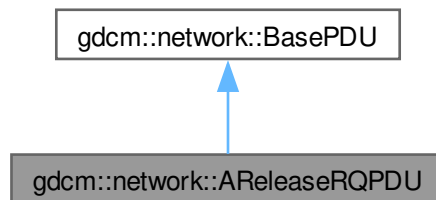
[AReleaseRQPDU](#).

```
#include <gdcmAReleaseRQPDU.h>
```

Inheritance diagram for `gdcm::network::AReleaseRQPDU`:



Collaboration diagram for `gdcm::network::AReleaseRQPDU`:



### Public Member Functions

- [AReleaseRQPDU](#) ()
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

### Public Member Functions inherited from [gdcm::network::BasePDU](#)

- virtual [~BasePDU](#) ()=default

## 12.13.1 Detailed Description

[AReleaseRQPDU](#).

[Table 9-24 A-RELEASE-RQ PDU FIELDS](#)

## 12.13.2 Constructor & Destructor Documentation

### 12.13.2.1 AReleaseRQPDU()

```
gdcmm::network::AReleaseRQPDU::AReleaseRQPDU ()
```

## 12.13.3 Member Function Documentation

### 12.13.3.1 IsLastFragment()

```
bool gdcmm::network::AReleaseRQPDU::IsLastFragment () const [inline], [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 12.13.3.2 Print()

```
void gdcmm::network::AReleaseRQPDU::Print (  
    std::ostream & os) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 12.13.3.3 Read()

```
std::istream & gdcmm::network::AReleaseRQPDU::Read (  
    std::istream & is) [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 12.13.3.4 Size()

```
size_t gdcmm::network::AReleaseRQPDU::Size () const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 12.13.3.5 Write()

```
const std::ostream & gdcmm::network::AReleaseRQPDU::Write (  
    std::ostream & os) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

The documentation for this class was generated from the following file:

- [gdcmmAReleaseRQPDU.h](#)

## 12.14 gdcm::network::ARTIMTimer Class Reference

[ARTIMTimer](#).

```
#include <gdcmARTIMTimer.h>
```

### Public Member Functions

- [ARTIMTimer](#) ()
- double [GetElapsedTime](#) () const
- bool [GetHasExpired](#) () const
- double [GetTimeout](#) () const
- void [SetTimeout](#) (double inTimeout)
- void [Start](#) ()
- void [Stop](#) ()

### 12.14.1 Detailed Description

[ARTIMTimer](#).

This file contains the code for the ARTIM timer.

Basically, the ARTIM timer will just get the wall time when it's started, and then can be queried for the current time, and then can be stopped (ie, the start time reset).

Because we're trying to do this without threading, we should be able to 'start' the ARTIM timer by this mechanism, and then when waiting for a particular response, tight loop that with sleep calls and determinations of when the ARTIM timer has reached its peak. As such, this isn't a strict 'timer' in the traditional sense of the word, but more of a time keeper.

There can be only one ARTIM timer per connection.

### 12.14.2 Constructor & Destructor Documentation

#### 12.14.2.1 ARTIMTimer()

```
gdcm::network::ARTIMTimer::ARTIMTimer ()
```

### 12.14.3 Member Function Documentation

#### 12.14.3.1 GetElapsedTime()

```
double gdcm::network::ARTIMTimer::GetElapsedTime () const
```

### 12.14.3.2 GetHasExpired()

```
bool gdcm::network::ARTIMTimer::GetHasExpired () const
```

### 12.14.3.3 GetTimeout()

```
double gdcm::network::ARTIMTimer::GetTimeout () const
```

### 12.14.3.4 SetTimeout()

```
void gdcm::network::ARTIMTimer::SetTimeout (
    double inTimeout)
```

### 12.14.3.5 Start()

```
void gdcm::network::ARTIMTimer::Start ()
```

### 12.14.3.6 Stop()

```
void gdcm::network::ARTIMTimer::Stop ()
```

The documentation for this class was generated from the following file:

- [gdcmARTIMTimer.h](#)

## 12.15 gdcm::ASN1 Class Reference

Class for [ASN1](#).

```
#include <gdcmASN1.h>
```

### Public Member Functions

- [ASN1](#) ()
- [ASN1](#) (const [ASN1](#) &)=delete
- [~ASN1](#) ()
- void [operator=](#) (const [ASN1](#) &)=delete

### Static Public Member Functions

- static bool [ParseDump](#) (const char \*array, size\_t length)
- static bool [ParseDumpFile](#) (const char \*filename)

## Protected Member Functions

- int [TestPBKDF2](#) ()

### 12.15.1 Detailed Description

Class for [ASN1](#).

### 12.15.2 Constructor & Destructor Documentation

#### 12.15.2.1 [ASN1\(\)](#) [1/2]

```
gdcmm::ASN1::ASN1 ()
```

Referenced by [ASN1\(\)](#), and [operator=\(\)](#).

#### 12.15.2.2 [~ASN1\(\)](#)

```
gdcmm::ASN1::~~ASN1 ()
```

#### 12.15.2.3 [ASN1\(\)](#) [2/2]

```
gdcmm::ASN1::ASN1 (  
    const ASN1 & ) [delete]
```

References [ASN1\(\)](#).

### 12.15.3 Member Function Documentation

#### 12.15.3.1 [operator=\(\)](#)

```
void gdcmm::ASN1::operator= (  
    const ASN1 & ) [delete]
```

References [ASN1\(\)](#).

#### 12.15.3.2 [ParseDump\(\)](#)

```
bool gdcmm::ASN1::ParseDump (  
    const char * array,  
    size_t length) [static]
```

### 12.15.3.3 ParseDumpFile()

```
bool gdcm::ASN1::ParseDumpFile (
    const char * filename) [static]
```

### 12.15.3.4 TestPBKDF2()

```
int gdcm::ASN1::TestPBKDF2 () [protected]
```

The documentation for this class was generated from the following file:

- [gdcmASN1.h](#)

## 12.16 gdcm::network::AsynchronousOperationsWindowSub Class Reference

[AsynchronousOperationsWindowSub.](#)

```
#include <gdcmAsynchronousOperationsWindowSub.h>
```

### Public Member Functions

- [AsynchronousOperationsWindowSub](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.16.1 Detailed Description

[AsynchronousOperationsWindowSub.](#)

PS 3.7 [Table](#) D.3-7 ASYNCHRONOUS OPERATIONS WINDOW SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

### 12.16.2 Constructor & Destructor Documentation

#### 12.16.2.1 AsynchronousOperationsWindowSub()

```
gdcm::network::AsynchronousOperationsWindowSub::AsynchronousOperationsWindowSub ()
```

## 12.16.3 Member Function Documentation

### 12.16.3.1 Print()

```
void gdcmm::network::AsynchronousOperationsWindowSub::Print (
    std::ostream & os) const
```

### 12.16.3.2 Read()

```
std::istream & gdcmm::network::AsynchronousOperationsWindowSub::Read (
    std::istream & is)
```

### 12.16.3.3 Size()

```
size_t gdcmm::network::AsynchronousOperationsWindowSub::Size () const
```

### 12.16.3.4 Write()

```
const std::ostream & gdcmm::network::AsynchronousOperationsWindowSub::Write (
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

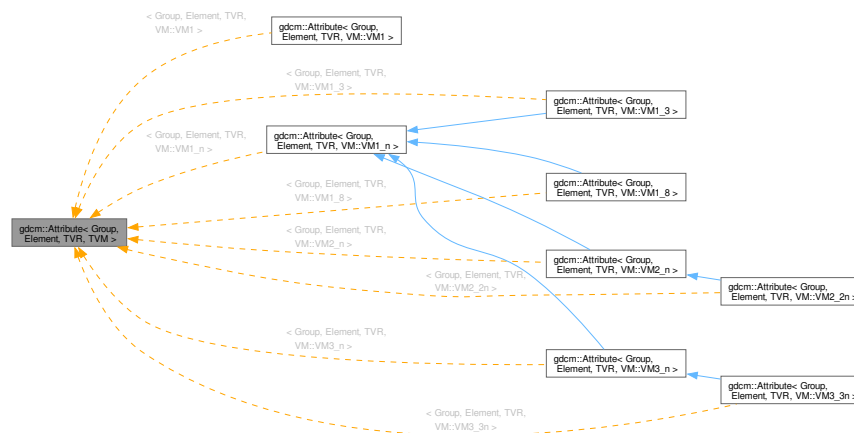
- [gdcmmAsynchronousOperationsWindowSub.h](#)

## 12.17 gdcmm::Attribute< Group, Element, TVR, TVM > Class Template Reference

[Attribute](#) class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.

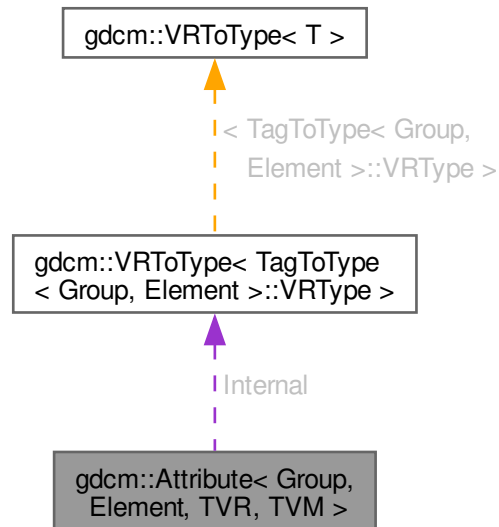
```
#include <gdcmmAttribute.h>
```

Inheritance diagram for gdcmm::Attribute< Group, Element, TVR, TVM >:





Collaboration diagram for gdcm::Attribute< Group, Element, TVR, TVM >:



### Public Types

- enum { `VMType` = `VMToLength<TVM>::Length` }
- typedef `VRTToType< TVR >::Type` `ArrayType`

### Public Member Functions

- `GDCM_STATIC_ASSERT` (((((VR::VRTType) TVR & VR::VR\_VM1) && ((VM::VMType) TVM == VM::VM1)) || !((VR::VRTType) TVR & VR::VR\_VM1)))
- `GDCM_STATIC_ASSERT` (((VM::VMType) TVM & (VM::VMType)(TagToType< Group, Element >::VMType)))
- `GDCM_STATIC_ASSERT` (((VR::VRTType) TVR & (VR::VRTType)(TagToType< Group, Element >::VRTType)))
- `DataElement` `GetAsDataElement` () const
- unsigned int `GetNumberOfValues` () const
- `ArrayType` & `GetValue` (unsigned int idx=0)
- `ArrayType` const & `GetValue` (unsigned int idx=0) const
- const `ArrayType` \* `GetValues` () const
- bool `operator!=` (const `Attribute` &att) const
- bool `operator<` (const `Attribute` &att) const
- bool `operator==` (const `Attribute` &att) const
- `ArrayType` & `operator[]` (unsigned int idx)
- `ArrayType` const & `operator[]` (unsigned int idx) const
- void `Print` (std::ostream &os) const
- void `Set` (`DataSet` const &ds)
- void `SetFromDataElement` (`DataElement` const &de)
- void `SetFromDataSet` (`DataSet` const &ds)
- void `SetValue` (`ArrayType` v, unsigned int idx=0)
- void `SetValues` (const `ArrayType` \*array, unsigned int numel=`VMType`)

### Static Public Member Functions

- static [VM GetDictVM](#) ()
- static [VR GetDictVR](#) ()
- static [Tag GetTag](#) ()
- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

### Public Attributes

- [ArrayType Internal](#) [[VMToLength](#)< TVM >::Length]

### Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## 12.17.1 Detailed Description

**template<uint16\_t Group, uint16\_t Element, long long TVR = TagToType<Group, Element>::VRType, int TVM = TagToType<Group, Element>::VMType>**  
**class gdcmm::Attribute< Group, Element, TVR, TVM >**

[Attribute](#) class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.

Typical example that compile is: [Attribute<0x0008,0x9007>](#) a = {"ORIGINAL","PRIMARY","T1","NONE"};

Examples that will NOT compile are:

[Attribute<0x0018,0x1182, VR::IS, VM::VM1>](#) fd1 = {}; // not enough parameters [Attribute<0x0018,0x1182, VR::IS, VM::VM2>](#)  
 fd2 = {0,1,2}; // too many initializers [Attribute<0x0018,0x1182, VR::IS, VM::VM3>](#) fd3 = {0,1,2}; // VM3 is not valid  
[Attribute<0x0018,0x1182, VR::UL, VM::VM2>](#) fd3 = {0,1}; // UL is not valid [VR](#)

#### Examples

[CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DeriveSeries.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_In](#)  
[FixOrientation.cxx](#), [GenFakeIdentifyFile.cxx](#), [GetSequenceUltrasound.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#),  
[PatchFile.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [SortImage.cxx](#), [StreamImageReaderTest.cxx](#),  
[VolumeSorter.cxx](#), [gdcmmrtionplan.cxx](#), [gdcmmrtplan.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

## 12.17.2 Member Typedef Documentation

### 12.17.2.1 ArrayType

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
typedef VRToType<TVR>::Type gdcmm::Attribute< Group, Element, TVR, TVM >::ArrayType
```

#### Examples

[ReadAndPrintAttributes.cxx](#).

## 12.17.3 Member Enumeration Documentation

### 12.17.3.1 anonymous enum

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
anonymous enum
```

#### Enumerator

VMType	
--------	--

## 12.17.4 Member Function Documentation

### 12.17.4.1 GDCM\_STATIC\_ASSERT() [1/3]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
gdcm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    (((VR::VRType) TVR &VR::VR_VM1) && ((VM::VMType) TVM==VM::VM1)) || !((VR::VRType) TVR
&VR::VR_VM1)) )
```

References [gdcm::VM::VM1](#), and [gdcm::VR::VR\\_VM1](#).

### 12.17.4.2 GDCM\_STATIC\_ASSERT() [2/3]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
gdcm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    ((VM::VMType) TVM &(VM::VMType) (TagToType< Group, Element >::VMType)) )
```

### 12.17.4.3 GDCM\_STATIC\_ASSERT() [3/3]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
gdcm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR &(VR::VRType) (TagToType< Group, Element >::VRType)) )
```

#### 12.17.4.4 GetAsDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
DataElement gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement () const [inline]
```

##### Examples

[CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixOrientation.cxx](#), [GenFakeIdentifyFile.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [PatchFile.cxx](#), and [StreamImageReaderTest.cxx](#).

References [GetNumberOfValues\(\)](#), [GetTag\(\)](#), [GetVR\(\)](#), [gdcm::DataElement::GetVR\(\)](#), [Internal](#), [gdcm::DataElement::SetByteValue\(\)](#), [gdcm::DataElement::SetVR\(\)](#), [gdcm::VR::SQ](#), [gdcm::VR::UI](#), and [gdcm::VR::VRASCII](#).

#### 12.17.4.5 GetDictVM()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
VM gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVM () [inline], [static]
```

#### 12.17.4.6 GetDictVR()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
VR gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVR () [inline], [static]
```

#### 12.17.4.7 GetNumberOfValues()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
unsigned int gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues () const [inline]
```

##### Examples

[LargeVRDSExplicit.cxx](#).

Referenced by [GetAsDataElement\(\)](#), [GetValue\(\)](#), [GetValue\(\)](#), [operator!=\(\)](#), [operator<\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1](#), [operator==\(\)](#), [Print\(\)](#), [SetByteValue\(\)](#), [SetByteValueNoSwap\(\)](#), [SetValue\(\)](#), and [SetValues\(\)](#).

#### 12.17.4.8 GetTag()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
Tag gdcm::Attribute< Group, Element, TVR, TVM >::GetTag () [inline], [static]
```

##### Examples

[PatchFile.cxx](#), [ReadAndPrintAttributes.cxx](#), [gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

Referenced by [GetAsDataElement\(\)](#), and [Print\(\)](#).

#### 12.17.4.9 GetValue() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType & gdcm::Attribute< Group, Element, TVR, TVM >::GetValue (
    unsigned int idx = 0) [inline]
```

##### Examples

[DeriveSeries.cxx](#), [FixOrientation.cxx](#), [GetSequenceUltrasound.cxx](#), [PatchFile.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#),  
[ReadAndPrintAttributes.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

References [GetNumberOfValues\(\)](#), and [Internal](#).

Referenced by [operator\[\]\(\)](#), and [operator\[\]\(\)](#).

#### 12.17.4.10 GetValue() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType const & gdcm::Attribute< Group, Element, TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

References [GetNumberOfValues\(\)](#), and [Internal](#).

#### 12.17.4.11 GetValues()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
const ArrayType * gdcm::Attribute< Group, Element, TVR, TVM >::GetValues () const [inline]
```

##### Examples

[FixOrientation.cxx](#), [LargeVRDSExplicit.cxx](#), [gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

References [Internal](#).

Referenced by [operator!=\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator!=\(\)](#), [operator<\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator<\(\)](#), [operator==\(\)](#), and [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator==\(\)](#).

**12.17.4.12 GetVM()**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
VM gdcM::Attribute< Group, Element, TVR, TVM >::GetVM () [inline], [static]
```

**12.17.4.13 GetVR()**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
VR gdcM::Attribute< Group, Element, TVR, TVM >::GetVR () [inline], [static]
```

**Examples**

[LargeVRDSExplicit.cxx](#).

Referenced by [GetAsDataElement\(\)](#), and [SetFromDataElement\(\)](#).

**12.17.4.14 operator"!="()**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator!= (
    const Attribute< Group, Element, TVR, TVM > & att) const [inline]
```

References [GetNumberOfValues\(\)](#), [GetValues\(\)](#), and [Internal](#).

**12.17.4.15 operator<()**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator< (
    const Attribute< Group, Element, TVR, TVM > & att) const [inline]
```

References [GetNumberOfValues\(\)](#), [GetValues\(\)](#), and [Internal](#).

**12.17.4.16 operator==(())**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator==(
    const Attribute< Group, Element, TVR, TVM > & att) const [inline]
```

References [GetNumberOfValues\(\)](#), [GetValues\(\)](#), and [Internal](#).

**12.17.4.17 operator[]() [1/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType & gdcm::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx) [inline]
```

References [GetValue\(\)](#).

**12.17.4.18 operator[]() [2/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType const & gdcm::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

References [GetValue\(\)](#).

**12.17.4.19 Print()**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::Print (
    std::ostream & os) const [inline]
```

References [GetNumberOfValues\(\)](#), [GetTag\(\)](#), and [Internal](#).

**12.17.4.20 Set()**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::Set (
    DataSet const & ds) [inline]
```

**Examples**

[LargeVRDSExplicit.cxx](#), [SortImage.cxx](#), and [VolumeSorter.cxx](#).

References [gdcm::DataSet::GetDataElement\(\)](#), and [SetFromDataElement\(\)](#).

**12.17.4.21 SetByteValue()**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValue (
    const ByteValue * bv) [inline], [protected]
```

References [gdcm::ByteValue::GetLength\(\)](#), [GetNumberOfValues\(\)](#), [gdcm::ByteValue::GetPointer\(\)](#), and [Internal](#).

Referenced by [SetFromDataElement\(\)](#).

#### 12.17.4.22 SetByteValueNoSwap()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap (
    const ByteValue * bv) [inline], [protected]
```

References [gdcm::ByteValue::GetLength\(\)](#), [GetNumberOfValues\(\)](#), [gdcm::ByteValue::GetPointer\(\)](#), and [Internal](#).

Referenced by [SetFromDataElement\(\)](#).

#### 12.17.4.23 SetFromDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement (
    DataElement const & de) [inline]
```

##### Examples

[GetSequenceUltrasound.cxx](#), [LargeVRDSExplicit.cxx](#), [PatchFile.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [gdcmrtionplan.cxx](#),  
and [gdcmrtplan.cxx](#).

References [gdcm::DataElement::GetByteValue\(\)](#), [gdcm::DataElement::GetTag\(\)](#), [GetVR\(\)](#), [gdcm::DataElement::GetVR\(\)](#),  
[gdcm::VR::INVALID](#), [gdcm::DataElement::IsEmpty\(\)](#), [SetByteValue\(\)](#), [SetByteValueNoSwap\(\)](#), and [gdcm::VR::UN](#).

Referenced by [Set\(\)](#), and [SetFromDataSet\(\)](#).

#### 12.17.4.24 SetFromDataSet()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet (
    DataSet const & ds) [inline]
```

##### Examples

[DeriveSeries.cxx](#), [FixOrientation.cxx](#), [ReadAndPrintAttributes.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

References [gdcm::DataSet::FindDataElement\(\)](#), [gdcm::DataSet::GetDataElement\(\)](#), and [SetFromDataElement\(\)](#).



#### 12.17.4.25 SetValue()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetValue (
    ArrayType v,
    unsigned int idx = 0) [inline]
```

##### Examples

[CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [FixOrientation.cxx](#), [HelloWorld.cxx](#), [LargeVRDSEExplicit.cxx](#), and [PatchFile.cxx](#).

References [GetNumberOfValues\(\)](#), and [Internal](#).

#### 12.17.4.26 SetValues()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetValues (
    const ArrayType * array,
    unsigned int numel = VMType) [inline]
```

##### Examples

[FixOrientation.cxx](#), and [LargeVRDSEExplicit.cxx](#).

References [GetNumberOfValues\(\)](#), [Internal](#), and [VMType](#).

### 12.17.5 Member Data Documentation

#### 12.17.5.1 Internal

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType gdcm::Attribute< Group, Element, TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

Referenced by [GetAsDataElement\(\)](#), [GetValue\(\)](#), [GetValue\(\)](#), [GetValues\(\)](#), [operator!=\(\)](#), [operator<\(\)](#), [operator==\(\)](#), [Print\(\)](#), [SetByteValue\(\)](#), [SetByteValueNoSwap\(\)](#), [SetValue\(\)](#), and [SetValues\(\)](#).

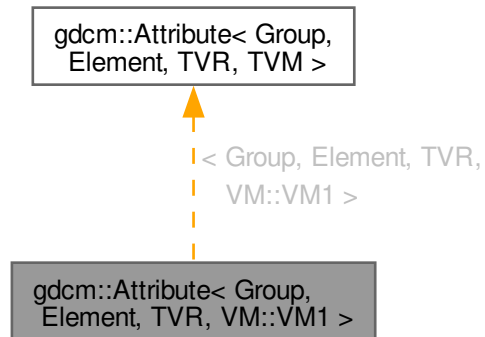
The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

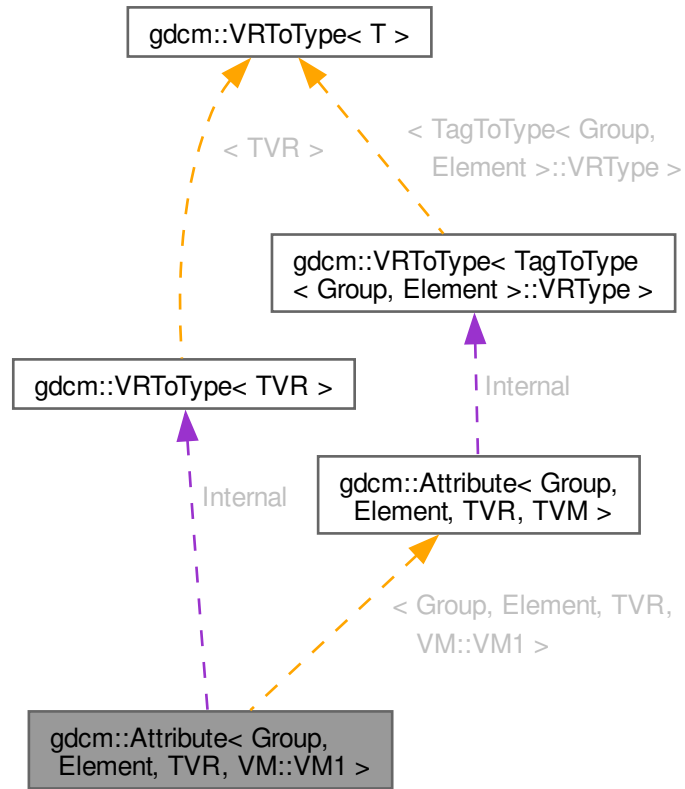
## 12.18 gdcM::Attribute< Group, Element, TVR, VM::VM1 > Class Template Reference

```
#include <gdcMAttribute.h>
```

Inheritance diagram for gdcM::Attribute< Group, Element, TVR, VM::VM1 >:



Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM1 >:



## Public Types

- enum { `VMType` = `VMToLength<VM::VM1>::Length` }
- enum
- typedef `VRTToType< TVR >::Type ArrayType`

## Public Member Functions

- `GDCM_STATIC_ASSERT` (((((VR::VRTType) TVR &VR::VR\_VM1) &&((VM::VMType) VM::VM1==VM::VM1))||!((VR::VRTType) TVR &VR::VR\_VM1)))
- `GDCM_STATIC_ASSERT` (((VM::VMType) VM::VM1 &(VM::VMType)(TagToType< Group, Element >::VMType)))
- `GDCM_STATIC_ASSERT` (((VR::VRTType) TVR &(VR::VRTType)(TagToType< Group, Element >::VRTType)))
- `GDCM_STATIC_ASSERT` (VMToLength< VM::VM1 >::Length==1)
- `DataElement GetAsDataElement` () const
- unsigned int `GetNumberOfValues` () const
- `ArrayType & GetValue` ()

- [ArrayType](#) const & [GetValue](#) () const
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetValue](#) ([ArrayType](#) v)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel=[VMType](#))

### Static Public Member Functions

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Public Attributes

- [ArrayType](#) [Internal](#)

### Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## 12.18.1 Member Typedef Documentation

### 12.18.1.1 ArrayType

```
template<uint16_t Group, uint16_t Element, long long TVR>
typedef VRToType<TVR>::Type gdcmm::Attribute< Group, Element, TVR, VM::VM1 >::ArrayType
```

## 12.18.2 Member Enumeration Documentation

### 12.18.2.1 anonymous enum

```
template<uint16_t Group, uint16_t Element, long long TVR>
anonymous enum
```

#### Enumerator

VMType	
--------	--

### 12.18.2.2 anonymous enum

```
anonymous enum
```

## 12.18.3 Member Function Documentation

### 12.18.3.1 GDCM\_STATIC\_ASSERT() [1/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
    (((VR::VRType) TVR & VR::VR_VM1) && ((VM::VMType) VM::VM1==VM::VM1)) || !((VR::VRType)
TVR & VR::VR_VM1)) )
```

References [gdcm::VM::VM1](#), and [gdcm::VR::VR\\_VM1](#).

### 12.18.3.2 GDCM\_STATIC\_ASSERT() [2/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
    ((VM::VMType) VM::VM1 & (VM::VMType) (TagToType< Group, Element >::VMType)) )
```

References [gdcm::VM::VM1](#).

### 12.18.3.3 GDCM\_STATIC\_ASSERT() [3/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR & (VR::VRType) (TagToType< Group, Element >::VRType)) )
```

### 12.18.3.4 GDCM\_STATIC\_ASSERT() [4/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
    VMToLength< VM::VM1 >::Length == 1)
```

**12.18.3.5 GetAsDataElement()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
DataElement gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement () const [inline]
```

References [GetNumberOfValues\(\)](#), [GetVR\(\)](#), [gdcm::DataElement::GetVR\(\)](#), [Internal](#), [gdcm::DataElement::SetByteValue\(\)](#), [gdcm::DataElement::SetVR\(\)](#), [gdcm::VR::SQ](#), [gdcm::VR::UI](#), and [gdcm::VR::VRASCII](#).

**12.18.3.6 GetDictVM()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetDictVM () [inline], [static]
```

**12.18.3.7 GetDictVR()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
VR gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetDictVR () [inline], [static]
```

**12.18.3.8 GetNumberOfValues()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
unsigned int gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetNumberOfValues () const [inline]
```

Referenced by [GetAsDataElement\(\)](#), [operator!=\(\)](#), [operator<\(\)](#), [operator==\(\)](#), [SetByteValue\(\)](#), and [SetByteValueNoSwap\(\)](#).

**12.18.3.9 GetTag()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
Tag gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetTag () [inline], [static]
```

Referenced by [Print\(\)](#).

**12.18.3.10 GetValue() [1/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType & gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetValue () [inline]
```

References [Internal](#).

**12.18.3.11 GetValue() [2/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType const & gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetValue () const [inline]
```

References [Internal](#).

**12.18.3.12 GetValues()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
const ArrayType * gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetValues () const [inline]
```

References [Internal](#).

**12.18.3.13 GetVM()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetVM () [inline], [static]
```

References [gdcm::VM::VM1](#).

**12.18.3.14 GetVR()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
VR gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetVR () [inline], [static]
```

Referenced by [GetAsDataElement\(\)](#), and [SetFromDataElement\(\)](#).

**12.18.3.15 operator"!="()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
bool gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator!= (
    const Attribute< Group, Element, TVR, VM::VM1 > & att) const [inline]
```

References [GetNumberOfValues\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::GetValues\(\)](#), and [Internal](#).

**12.18.3.16 operator<()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
bool gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator< (
    const Attribute< Group, Element, TVR, VM::VM1 > & att) const [inline]
```

References [gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues\(\)](#), [GetNumberOfValues\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::GetValues\(\)](#), and [Internal](#).

**12.18.3.17 operator==(())**

```
template<uint16_t Group, uint16_t Element, long long TVR>
bool gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator==(
    const Attribute< Group, Element, TVR, VM::VM1 > & att) const [inline]
```

References [GetNumberOfValues\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::GetValues\(\)](#), and [Internal](#).

**12.18.3.18 operator[]()**

```
ArrayType & gdcm::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx) [inline]
```

**12.18.3.19 Print()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::Print (
    std::ostream & os) const [inline]
```

References [GetTag\(\)](#), and [Internal](#).

**12.18.3.20 Set()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::Set (
    DataSet const & ds) [inline]
```

References [gdcm::DataSet::GetDataElement\(\)](#), and [SetFromDataElement\(\)](#).

**12.18.3.21 SetByteValue()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValue (
    const ByteValue * bv) [inline], [protected]
```

References [gdcm::ByteValue::GetLength\(\)](#), [GetNumberOfValues\(\)](#), [gdcm::ByteValue::GetPointer\(\)](#), and [Internal](#).

Referenced by [SetFromDataElement\(\)](#).

**12.18.3.22 SetByteValueNoSwap()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValueNoSwap (
    const ByteValue * bv) [inline], [protected]
```

References [gdcm::ByteValue::GetLength\(\)](#), [GetNumberOfValues\(\)](#), [gdcm::ByteValue::GetPointer\(\)](#), and [Internal](#).

Referenced by [SetFromDataElement\(\)](#).



### 12.18.3.23 SetFromDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement (
    DataElement const & de) [inline]
```

References [gdcm::DataElement::GetByteValue\(\)](#), [gdcm::DataElement::GetTag\(\)](#), [GetVR\(\)](#), [gdcm::DataElement::GetVR\(\)](#), [gdcm::VR::INVALID](#), [gdcm::DataElement::IsEmpty\(\)](#), [SetByteValue\(\)](#), [SetByteValueNoSwap\(\)](#), and [gdcm::VR::UN](#).

Referenced by [Set\(\)](#), and [SetFromDataSet\(\)](#).

### 12.18.3.24 SetFromDataSet()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataSet (
    DataSet const & ds) [inline]
```

References [gdcm::DataSet::FindDataElement\(\)](#), [gdcm::DataSet::GetDataElement\(\)](#), and [SetFromDataElement\(\)](#).

### 12.18.3.25 SetValue()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetValue (
    ArrayType v) [inline]
```

References [Internal](#).

### 12.18.3.26 SetValues()

```
void gdcm::Attribute< Group, Element, TVR, TVM >::SetValues (
    const ArrayType * array,
    unsigned int numel = VMType) [inline]
```

## 12.18.4 Member Data Documentation

### 12.18.4.1 Internal

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType gdcm::Attribute< Group, Element, TVR, VM::VM1 >::Internal
```

Referenced by [GetAsDataElement\(\)](#), [GetValue\(\)](#), [GetValue\(\)](#), [GetValues\(\)](#), [operator!=\(\)](#), [operator<\(\)](#), [operator==\(\)](#), [Print\(\)](#), [SetByteValue\(\)](#), [SetByteValueNoSwap\(\)](#), and [SetValue\(\)](#).

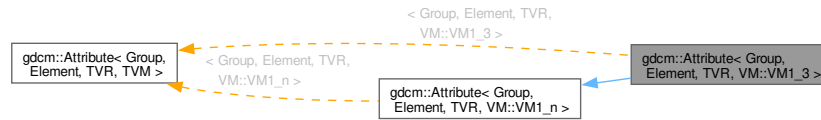
The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 12.19 gdcm::Attribute< Group, Element, TVR, VM::VM1\_3 > Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for `gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >`:



Collaboration diagram for `gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >`:



### Public Types

- enum
- typedef `VRTToType< TVR >::Type` `ArrayType`

### Public Types inherited from `gdcm::Attribute< Group, Element, TVR, VM::VM1_n >`

- enum
- typedef `VRTToType< TVR >::Type` `ArrayType`

### Public Member Functions

- `GDCM_STATIC_ASSERT` (((VR::VRTType) TVR &(VR::VRTType)(TagToType< Group, Element >::VRTType)))
- `DataElement GetAsDataElement ()` const
- `unsigned int GetNumberOfValues ()` const
- `ArrayType & GetValue (unsigned int idx=0)`
- `const ArrayType * GetValues ()` const
- `VM GetVM ()` const
- `bool operator!= (const Attribute &att)` const
- `bool operator< (const Attribute &att)` const
- `bool operator== (const Attribute &att)` const
- `ArrayType & operator[] (unsigned int idx)`
- `void Print (std::ostream &os)` const
- `void Set (DataSet const &ds)`
- `void SetFromDataElement (DataElement const &de)`
- `void SetFromDataSet (DataSet const &ds)`
- `void SetValue (ArrayType v, unsigned int idx=0)`
- `void SetValues (const ArrayType *array, unsigned int numel=VMType)`

## Public Member Functions inherited from gdcm::Attribute< Group, Element, TVR, VM::VM1\_n >

- [Attribute](#) ()
- [~Attribute](#) ()
- [GDCM\\_STATIC\\_ASSERT](#) (((((VR::VRType) TVR &VR::VR\_VM1) &&((VM::VMType) TagToType< Group, [Element](#) >::VMType==VM::VM1))||!((VR::VRType) TVR &VR::VR\_VM1)))
- [GDCM\\_STATIC\\_ASSERT](#) (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, [Element](#) >::VRType)))
- [GDCM\\_STATIC\\_ASSERT](#) ((VM::VM1\_n &(VM::VMType)(TagToType< Group, [Element](#) >::VMType)))
- [DataElement](#) [GetAsDataElement](#) () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- [ArrayType](#) const & [GetValue](#) (unsigned int idx=0) const
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- [ArrayType](#) const & [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetNumberOfValues](#) (unsigned int numel)
- void [SetValue](#) ([ArrayType](#) v)
- void [SetValue](#) (unsigned int idx, [ArrayType](#) v)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel, bool own=false)

## Static Public Member Functions

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VR](#) [GetVR](#) ()

## Static Public Member Functions inherited from gdcm::Attribute< Group, Element, TVR, VM::VM1\_n >

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

## Public Attributes

- [ArrayType](#) [Internal](#) [[VMToLength](#)< TVM >::Length]

## Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## Protected Member Functions inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## 12.19.1 Member Typedef Documentation

### 12.19.1.1 ArrayType

```
typedef VRToType<TVR>::Type gdcmm::Attribute< Group, Element, TVR, TVM >::ArrayType
```

## 12.19.2 Member Enumeration Documentation

### 12.19.2.1 anonymous enum

```
anonymous enum
```

## 12.19.3 Member Function Documentation

### 12.19.3.1 GDCM\_STATIC\_ASSERT()

```
gdcmm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR & (VR::VRType) (TagToType< Group, Element >::VRType)) )
```

### 12.19.3.2 GetAsDataElement()

```
DataElement gdcmm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.19.3.3 GetDictVM()

```
VM gdcmm::Attribute< Group, Element, TVR, TVM >::GetDictVM () [inline], [static]
```

#### 12.19.3.4 GetDictVR()

```
VR gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVR () [inline], [static]
```

#### 12.19.3.5 GetNumberOfValues()

```
unsigned int gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues () const [inline]
```

#### 12.19.3.6 GetTag()

```
Tag gdcm::Attribute< Group, Element, TVR, TVM >::GetTag () [inline], [static]
```

#### 12.19.3.7 GetValue()

```
ArrayType & gdcm::Attribute< Group, Element, TVR, TVM >::GetValue (
    unsigned int idx = 0) [inline]
```

#### 12.19.3.8 GetValues()

```
const ArrayType * gdcm::Attribute< Group, Element, TVR, TVM >::GetValues () const [inline]
```

#### 12.19.3.9 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >::GetVM () const [inline]
```

References [gdcm::VM::VM1\\_3](#).

#### 12.19.3.10 GetVR()

```
VR gdcm::Attribute< Group, Element, TVR, TVM >::GetVR () [inline], [static]
```

#### 12.19.3.11 operator"!==(

```
bool gdcm::Attribute< Group, Element, TVR, TVM >::operator!= (
    const Attribute< Group, Element, TVR, VM::VM1_3 > & att) const [inline]
```

#### 12.19.3.12 operator<()

```
bool gdcm::Attribute< Group, Element, TVR, TVM >::operator< (
    const Attribute< Group, Element, TVR, VM::VM1_3 > & att) const [inline]
```

**12.19.3.13 operator==(**

```
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator== (
    const Attribute< Group, Element, TVR, VM::VM1_3 > & att) const [inline]
```

**12.19.3.14 operator[](**

```
ArrayType & gdcM::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx) [inline]
```

**12.19.3.15 Print()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::Print (
    std::ostream & os) const [inline]
```

**12.19.3.16 Set()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::Set (
    DataSet const & ds) [inline]
```

**12.19.3.17 SetByteValue()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::SetByteValue (
    const ByteValue * bv) [inline], [protected]
```

**12.19.3.18 SetByteValueNoSwap()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap (
    const ByteValue * bv) [inline], [protected]
```

**12.19.3.19 SetFromDataElement()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::SetFromDataElement (
    DataElement const & de) [inline]
```

**12.19.3.20 SetFromDataSet()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::SetFromDataSet (
    DataSet const & ds) [inline]
```

## 12.19.3.21 SetValue()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetValue (
    ArrayType v,
    unsigned int idx = 0) [inline]
```

## 12.19.3.22 SetValues()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetValues (
    const ArrayType * array,
    unsigned int numel = VMType) [inline]
```

## 12.19.4 Member Data Documentation

## 12.19.4.1 Internal

```
ArrayType gdcmm::Attribute< Group, Element, TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

The documentation for this class was generated from the following file:

- [gdcmmAttribute.h](#)

## 12.20 gdcmm::Attribute&lt; Group, Element, TVR, VM::VM1\_8 &gt; Class Template Reference

```
#include <gdcmmAttribute.h>
```

Inheritance diagram for gdcmm::Attribute< Group, Element, TVR, VM::VM1\_8 >:



Collaboration diagram for gdcmm::Attribute< Group, Element, TVR, VM::VM1\_8 >:



**Public Types**

- enum
- typedef [VRToType< TVR >::Type](#) [ArrayType](#)

**Public Types inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)**

- enum
- typedef [VRToType< TVR >::Type](#) [ArrayType](#)

**Public Member Functions**

- [GDCM\\_STATIC\\_ASSERT](#) ((([VR::VRType](#)) TVR &([VR::VRType](#))([TagToType< Group, Element >::VRType](#))))
- [DataElement](#) [GetAsDataElement](#) () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- const [ArrayType](#) \* [GetValues](#) () const
- [VM](#) [GetVM](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetValue](#) ([ArrayType](#) v, unsigned int idx=0)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel=[VMType](#))

**Public Member Functions inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)**

- [Attribute](#) ()
- [~Attribute](#) ()
- [GDCM\\_STATIC\\_ASSERT](#) (((((([VR::VRType](#)) TVR &[VR::VR\\_VM1](#)) &&(([VM::VMType](#)) [TagToType< Group, Element >::VMType==VM::VM1](#)))||!(([VR::VRType](#)) TVR &[VR::VR\\_VM1](#))))
- [GDCM\\_STATIC\\_ASSERT](#) ((([VR::VRType](#)) TVR &([VR::VRType](#))([TagToType< Group, Element >::VRType](#))))
- [GDCM\\_STATIC\\_ASSERT](#) (([VM::VM1\\_n](#) &([VM::VMType](#))([TagToType< Group, Element >::VMType](#))))
- [DataElement](#) [GetAsDataElement](#) () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- [ArrayType](#) const & [GetValue](#) (unsigned int idx=0) const
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- [ArrayType](#) const & [operator\[\]](#) (unsigned int idx) const



- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetNumberOfValues](#) (unsigned int numel)
- void [SetValue](#) ([ArrayType](#) v)
- void [SetValue](#) (unsigned int idx, [ArrayType](#) v)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel, bool own=false)

### Static Public Member Functions

- static [VM GetDictVM](#) ()
- static [VR GetDictVR](#) ()
- static [Tag GetTag](#) ()
- static [VR GetVR](#) ()

### Static Public Member Functions inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- static [VM GetDictVM](#) ()
- static [VR GetDictVR](#) ()
- static [Tag GetTag](#) ()
- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

### Public Attributes

- [ArrayType Internal](#) [[VMToLength](#)< TVM >::Length]

### Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

### Protected Member Functions inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## 12.20.1 Member Typedef Documentation

### 12.20.1.1 ArrayType

```
typedef VRToType<TVR>::Type gdcmm::Attribute< Group, Element, TVR, TVM >::ArrayType
```

## 12.20.2 Member Enumeration Documentation

### 12.20.2.1 anonymous enum

anonymous enum

## 12.20.3 Member Function Documentation

### 12.20.3.1 GDCM\_STATIC\_ASSERT()

```
gdcmm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR & (VR::VRType) (TagToType< Group, Element >::VRType)) )
```

### 12.20.3.2 GetAsDataElement()

```
DataElement gdcmm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.20.3.3 GetDictVM()

```
VM gdcmm::Attribute< Group, Element, TVR, TVM >::GetDictVM () [inline], [static]
```

### 12.20.3.4 GetDictVR()

```
VR gdcmm::Attribute< Group, Element, TVR, TVM >::GetDictVR () [inline], [static]
```

### 12.20.3.5 GetNumberOfValues()

```
unsigned int gdcmm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues () const [inline]
```

### 12.20.3.6 GetTag()

```
Tag gdcmm::Attribute< Group, Element, TVR, TVM >::GetTag () [inline], [static]
```

### 12.20.3.7 GetValue()

```
ArrayType & gdcmm::Attribute< Group, Element, TVR, TVM >::GetValue (
    unsigned int idx = 0) [inline]
```

### 12.20.3.8 GetValues()

```
const ArrayType * gdcM::Attribute< Group, Element, TVR, TVM >::GetValues () const [inline]
```

### 12.20.3.9 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcM::Attribute< Group, Element, TVR, VM::VM1_8 >::GetVM () const [inline]
```

References [gdcM::VM::VM1\\_8](#).

### 12.20.3.10 GetVR()

```
VR gdcM::Attribute< Group, Element, TVR, TVM >::GetVR () [inline], [static]
```

### 12.20.3.11 operator"!="()

```
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator!= (
    const Attribute< Group, Element, TVR, VM::VM1_8 > & att) const [inline]
```

### 12.20.3.12 operator<()

```
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator< (
    const Attribute< Group, Element, TVR, VM::VM1_8 > & att) const [inline]
```

### 12.20.3.13 operator==(())

```
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator==(
    const Attribute< Group, Element, TVR, VM::VM1_8 > & att) const [inline]
```

### 12.20.3.14 operator[]()

```
ArrayType & gdcM::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx) [inline]
```

### 12.20.3.15 Print()

```
void gdcM::Attribute< Group, Element, TVR, TVM >::Print (
    std::ostream & os) const [inline]
```

**12.20.3.16 Set()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::Set (  
    DataSet const & ds) [inline]
```

**12.20.3.17 SetByteValue()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::SetByteValue (  
    const ByteValue * bv) [inline], [protected]
```

**12.20.3.18 SetByteValueNoSwap()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap (  
    const ByteValue * bv) [inline], [protected]
```

**12.20.3.19 SetFromDataElement()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::SetFromDataElement (  
    DataElement const & de) [inline]
```

**12.20.3.20 SetFromDataSet()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::SetFromDataSet (  
    DataSet const & ds) [inline]
```

**12.20.3.21 SetValue()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::SetValue (  
    ArrayType v,  
    unsigned int idx = 0) [inline]
```

**12.20.3.22 SetValues()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::SetValues (  
    const ArrayType * array,  
    unsigned int numel = VMType) [inline]
```

## 12.20.4 Member Data Documentation

### 12.20.4.1 Internal

```
ArrayType gdcmm::Attribute< Group, Element, TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

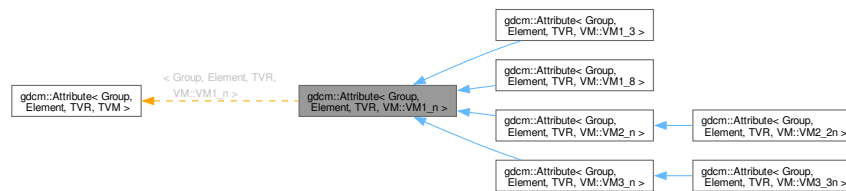
The documentation for this class was generated from the following file:

- [gdcmmAttribute.h](#)

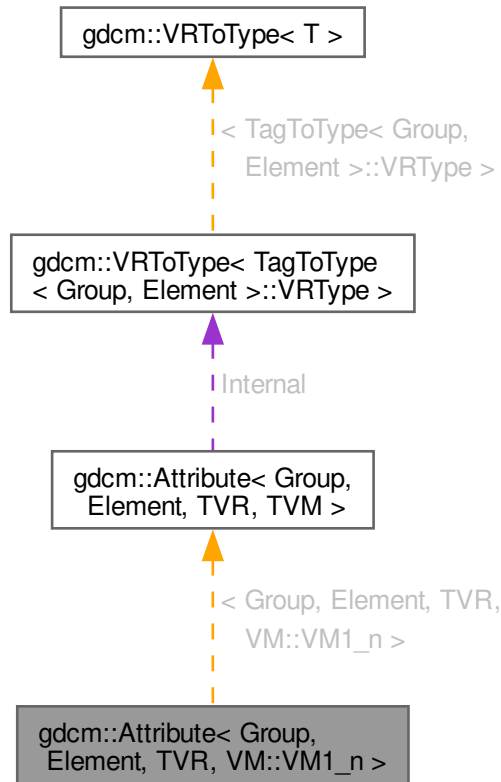
## 12.21 gdcmm::Attribute< Group, Element, TVR, VM::VM1\_n > Class Template Reference

```
#include <gdcmmAttribute.h>
```

Inheritance diagram for gdcmm::Attribute< Group, Element, TVR, VM::VM1\_n >:



Collaboration diagram for `gdcM::Attribute< Group, Element, TVR, VM::VM1_n >`:



## Public Types

- enum
- typedef `VRToType< TVR >::Type ArrayType`

## Public Member Functions

- `Attribute ()`
- `~Attribute ()`
- `GDCM_STATIC_ASSERT (((((VR::VRType) TVR & VR::VR_VM1) && ((VM::VMType) TagToType< Group, Element >::VMType==VM::VM1)) || !((VR::VRType) TVR & VR::VR_VM1)))`
- `GDCM_STATIC_ASSERT (((VR::VRType) TVR & (VR::VRType)(TagToType< Group, Element >::VRType)))`
- `GDCM_STATIC_ASSERT ((VM::VM1_n & (VM::VMType)(TagToType< Group, Element >::VMType)))`
- `DataElement GetAsDataElement () const`
- `unsigned int GetNumberOfValues () const`
- `ArrayType & GetValue (unsigned int idx=0)`

- [ArrayType](#) const & [GetValue](#) (unsigned int idx=0) const
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- [ArrayType](#) const & [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetNumberOfValues](#) (unsigned int numel)
- void [SetValue](#) ([ArrayType](#) v)
- void [SetValue](#) (unsigned int idx, [ArrayType](#) v)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel, bool own=false)

### Static Public Member Functions

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## 12.21.1 Member Typedef Documentation

### 12.21.1.1 ArrayType

```
template<uint16_t Group, uint16_t Element, long long TVR>
typedef VRToType<TVR>::Type gdcm::Attribute< Group, Element, TVR, VM::VM1\_n >::ArrayType
```

## 12.21.2 Member Enumeration Documentation

### 12.21.2.1 anonymous enum

```
anonymous enum
```

## 12.21.3 Constructor & Destructor Documentation

### 12.21.3.1 Attribute()

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::Attribute () [inline], [explicit]
```

### 12.21.3.2 ~Attribute()

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::~~Attribute () [inline]
```

## 12.21.4 Member Function Documentation

### 12.21.4.1 GDCM\_STATIC\_ASSERT() [1/3]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GDCM_STATIC_ASSERT (
    (((VR::VRType) TVR &VR::VR_VM1) &&((VM::VMType) TagToType< Group, Element >::VMType==VM::VM1))||((V
TVR &VR::VR_VM1))) )
```

References [gdcm::VM::VM1](#), and [gdcm::VR::VR\\_VM1](#).

### 12.21.4.2 GDCM\_STATIC\_ASSERT() [2/3]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR &(VR::VRType) (TagToType< Group, Element >::VRType))) )
```

### 12.21.4.3 GDCM\_STATIC\_ASSERT() [3/3]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GDCM_STATIC_ASSERT (
    (VM::VM1_n &(VM::VMType) (TagToType< Group, Element >::VMType))) )
```

References [gdcm::VM::VM1\\_n](#).

### 12.21.4.4 GetAsDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR>
DataElement gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetAsDataElement () const [inline]
```

References [GetNumberOfValues\(\)](#), [GetTag\(\)](#), [GetVR\(\)](#), [gdcm::DataElement::GetVR\(\)](#), [gdcm::DataElement::SetByteValue\(\)](#), [gdcm::DataElement::SetVR\(\)](#), [gdcm::VR::SQ](#), [gdcm::VR::UI](#), and [gdcm::VR::VRASCII](#).



#### 12.21.4.5 GetDictVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetDictVM () [inline], [static]
```

References [GetVM\(\)](#).

#### 12.21.4.6 GetDictVR()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VR gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetDictVR () [inline], [static]
```

#### 12.21.4.7 GetNumberOfValues()

```
template<uint16_t Group, uint16_t Element, long long TVR>
unsigned int gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetNumberOfValues () const [inline]
```

Referenced by [GetAsDataElement\(\)](#), [GetValue\(\)](#), [GetValue\(\)](#), [Print\(\)](#), [SetValue\(\)](#), and [SetValues\(\)](#).

#### 12.21.4.8 GetTag()

```
template<uint16_t Group, uint16_t Element, long long TVR>
Tag gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetTag () [inline], [static]
```

Referenced by [GetAsDataElement\(\)](#), [Print\(\)](#), [Set\(\)](#), [SetFromDataElement\(\)](#), and [SetFromDataSet\(\)](#).

#### 12.21.4.9 GetValue() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType & gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetValue (
    unsigned int idx = 0) [inline]
```

References [GetNumberOfValues\(\)](#).

Referenced by [operator\[\]\(\)](#), and [operator\[\]\(\)](#).

#### 12.21.4.10 GetValue() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType const & gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetValue (
    unsigned int idx = 0) const [inline]
```

References [GetNumberOfValues\(\)](#).

**12.21.4.11 GetValues()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
const ArrayType * gdc::Attribute< Group, Element, TVR, VM::VM1\_n >::GetValues () const [inline]
```

**12.21.4.12 GetVM()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdc::Attribute< Group, Element, TVR, VM::VM1\_n >::GetVM () [inline], [static]
```

References [gdc::VM::VM1\\_n](#).

Referenced by [GetDictVM\(\)](#), and [Print\(\)](#).

**12.21.4.13 GetVR()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
VR gdc::Attribute< Group, Element, TVR, VM::VM1\_n >::GetVR () [inline], [static]
```

Referenced by [GetAsDataElement\(\)](#), [Print\(\)](#), and [SetFromDataElement\(\)](#).

**12.21.4.14 operator"!="()**

```
bool gdc::Attribute< Group, Element, TVR, TVM >::operator!= (
    const Attribute< Group, Element, TVR, VM::VM1\_n > & att) const [inline]
```

**12.21.4.15 operator<()**

```
bool gdc::Attribute< Group, Element, TVR, TVM >::operator< (
    const Attribute< Group, Element, TVR, VM::VM1\_n > & att) const [inline]
```

**12.21.4.16 operator==(**

```
bool gdc::Attribute< Group, Element, TVR, TVM >::operator==(
    const Attribute< Group, Element, TVR, VM::VM1\_n > & att) const [inline]
```

**12.21.4.17 operator[]() [1/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType & gdc::Attribute< Group, Element, TVR, VM::VM1\_n >::operator[] (
    unsigned int idx) [inline]
```

References [GetValue\(\)](#).

**12.21.4.18 operator[]() [2/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType const & gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::operator[] (
    unsigned int idx) const [inline]
```

References [GetValue\(\)](#).

**12.21.4.19 Print()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::Print (
    std::ostream & os) const [inline]
```

References [GetNumberOfValues\(\)](#), [GetTag\(\)](#), [GetVM\(\)](#), and [GetVR\(\)](#).

**12.21.4.20 Set()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::Set (
    DataSet const & ds) [inline]
```

References [gdcm::DataSet::GetDataElement\(\)](#), [GetTag\(\)](#), and [SetFromDataElement\(\)](#).

**12.21.4.21 SetByteValue()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetByteValue (
    const ByteValue * bv) [inline], [protected]
```

References [gdcm::ByteValue::GetLength\(\)](#), [gdcm::ByteValue::GetPointer\(\)](#), and [SetValues\(\)](#).

Referenced by [SetFromDataElement\(\)](#).

**12.21.4.22 SetByteValueNoSwap()**

```
void gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap (
    const ByteValue * bv) [inline], [protected]
```

**12.21.4.23 SetFromDataElement()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetFromDataElement (
    DataElement const & de) [inline]
```

References [gdcm::DataElement::GetByteValue\(\)](#), [GetTag\(\)](#), [gdcm::DataElement::GetTag\(\)](#), [GetVR\(\)](#), [gdcm::DataElement::GetVR\(\)](#), [gdcm::DataElement::IsEmpty\(\)](#), and [SetByteValue\(\)](#).

Referenced by [Set\(\)](#), and [SetFromDataSet\(\)](#).

**12.21.4.24 SetFromDataSet()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::SetFromDataSet (
    DataSet const & ds) [inline]
```

References [gdcM::DataSet::FindDataElement\(\)](#), [gdcM::DataSet::GetDataElement\(\)](#), [GetTag\(\)](#), and [SetFromDataElement\(\)](#).

**12.21.4.25 SetNumberOfValues()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::SetNumberOfValues (
    unsigned int numel) [inline]
```

References [SetValues\(\)](#).

**12.21.4.26 SetValue() [1/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::SetValue (
    ArrayType v) [inline]
```

References [SetValue\(\)](#).

Referenced by [SetValue\(\)](#).

**12.21.4.27 SetValue() [2/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::SetValue (
    unsigned int idx,
    ArrayType v) [inline]
```

References [GetNumberOfValues\(\)](#).

**12.21.4.28 SetValues()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::SetValues (
    const ArrayType * array,
    unsigned int numel,
    bool own = false) [inline]
```

References [GetNumberOfValues\(\)](#).

Referenced by [SetByteValue\(\)](#), and [SetNumberOfValues\(\)](#).

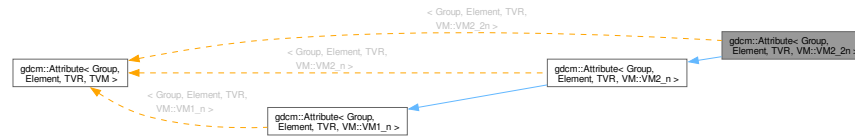
The documentation for this class was generated from the following file:

- [gdcMAttribute.h](#)

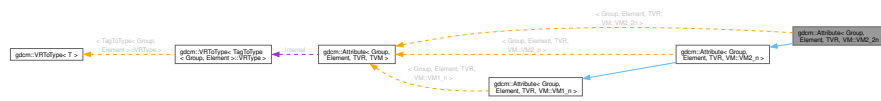
## 12.22 gdcM::Attribute< Group, Element, TVR, VM::VM2\_2n > Class Template Reference

```
#include <gdcMAttribute.h>
```

Inheritance diagram for gdcM::Attribute< Group, Element, TVR, VM::VM2\_2n >:



Collaboration diagram for gdcM::Attribute< Group, Element, TVR, VM::VM2\_2n >:



### Public Types

- enum
- typedef [VRTToType< TVR >::Type ArrayType](#)

### Public Types inherited from [gdcM::Attribute< Group, Element, TVR, VM::VM2\\_n >](#)

- enum
- typedef [VRTToType< TVR >::Type ArrayType](#)

### Public Types inherited from [gdcM::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- enum
- typedef [VRTToType< TVR >::Type ArrayType](#)

## Public Member Functions

- `GDCM_STATIC_ASSERT` (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, Element >::VRType)))
- `DataElement GetAsDataElement` () const
- unsigned int `GetNumberOfValues` () const
- `ArrayType` & `GetValue` (unsigned int idx=0)
- const `ArrayType` \* `GetValues` () const
- bool `operator!=` (const `Attribute` &att) const
- bool `operator<` (const `Attribute` &att) const
- bool `operator==` (const `Attribute` &att) const
- `ArrayType` & `operator[]` (unsigned int idx)
- void `Print` (std::ostream &os) const
- void `Set` (`DataSet` const &ds)
- void `SetFromDataElement` (`DataElement` const &de)
- void `SetFromDataSet` (`DataSet` const &ds)
- void `SetValue` (`ArrayType` v, unsigned int idx=0)
- void `SetValues` (const `ArrayType` \*array, unsigned int numel=`VMType`)

## Public Member Functions inherited from

`gdcm::Attribute< Group, Element, TVR, VM::VM2_n >`

- `GDCM_STATIC_ASSERT` (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, Element >::VRType)))
- `DataElement GetAsDataElement` () const
- unsigned int `GetNumberOfValues` () const
- `ArrayType` & `GetValue` (unsigned int idx=0)
- const `ArrayType` \* `GetValues` () const
- `VM GetVM` () const
- bool `operator!=` (const `Attribute` &att) const
- bool `operator<` (const `Attribute` &att) const
- bool `operator==` (const `Attribute` &att) const
- `ArrayType` & `operator[]` (unsigned int idx)
- void `Print` (std::ostream &os) const
- void `Set` (`DataSet` const &ds)
- void `SetFromDataElement` (`DataElement` const &de)
- void `SetFromDataSet` (`DataSet` const &ds)
- void `SetValue` (`ArrayType` v, unsigned int idx=0)
- void `SetValues` (const `ArrayType` \*array, unsigned int numel=`VMType`)

## Public Member Functions inherited from

`gdcm::Attribute< Group, Element, TVR, VM::VM1_n >`

- `Attribute` ()
- `~Attribute` ()
- `GDCM_STATIC_ASSERT` (((((VR::VRType) TVR &VR::VR\_VM1) &&((VM::VMType) TagToType< Group, Element >::VMType==VM::VM1))||!((VR::VRType) TVR &VR::VR\_VM1)))
- `GDCM_STATIC_ASSERT` (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, Element >::VRType)))
- `GDCM_STATIC_ASSERT` ((VM::VM1\_n &(VM::VMType)(TagToType< Group, Element >::VMType)))
- `DataElement GetAsDataElement` () const
- unsigned int `GetNumberOfValues` () const

- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- [ArrayType](#) const & [GetValue](#) (unsigned int idx=0) const
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- [ArrayType](#) const & [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetNumberOfValues](#) (unsigned int numel)
- void [SetValue](#) ([ArrayType](#) v)
- void [SetValue](#) (unsigned int idx, [ArrayType](#) v)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel, bool own=false)

### Static Public Member Functions

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Static Public Member Functions inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM2\\_n >](#)

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VR](#) [GetVR](#) ()

### Static Public Member Functions inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Public Attributes

- [ArrayType](#) [Internal](#) [[VMToLength](#)< TVM >::Length]

## Public Attributes inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM2\\_n >](#)

- [ArrayType](#) [Internal](#) [[VMToLength](#)< TVM >::Length]

## Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## Protected Member Functions inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM2\\_n >](#)

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## Protected Member Functions inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## 12.22.1 Member Typedef Documentation

### 12.22.1.1 ArrayType

```
typedef VRToType<TVR>::Type gdcmm::Attribute< Group, Element, TVR, TVM >::ArrayType
```

## 12.22.2 Member Enumeration Documentation

### 12.22.2.1 anonymous enum

```
anonymous enum
```

## 12.22.3 Member Function Documentation

### 12.22.3.1 GDCM\_STATIC\_ASSERT()

```
gdcmm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR & (VR::VRType) (TagToType< Group, Element >::VRType)) )
```



### 12.22.3.2 GetAsDataElement()

```
DataElement gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.22.3.3 GetDictVM()

```
VM gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVM () [inline], [static]
```

### 12.22.3.4 GetDictVR()

```
VR gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVR () [inline], [static]
```

### 12.22.3.5 GetNumberOfValues()

```
unsigned int gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues () const [inline]
```

### 12.22.3.6 GetTag()

```
Tag gdcm::Attribute< Group, Element, TVR, TVM >::GetTag () [inline], [static]
```

### 12.22.3.7 GetValue()

```
ArrayType & gdcm::Attribute< Group, Element, TVR, TVM >::GetValue (
    unsigned int idx = 0) [inline]
```

### 12.22.3.8 GetValues()

```
const ArrayType * gdcm::Attribute< Group, Element, TVR, TVM >::GetValues () const [inline]
```

### 12.22.3.9 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcm::Attribute< Group, Element, TVR, VM::VM2_2n >::GetVM () [inline], [static]
```

References [gdcm::VM::VM2\\_2n](#).

### 12.22.3.10 GetVR()

```
VR gdcm::Attribute< Group, Element, TVR, TVM >::GetVR () [inline], [static]
```

**12.22.3.11 operator"!=()**

```
bool gdcmm::Attribute< Group, Element, TVR, TVM >::operator!= (
    const Attribute< Group, Element, TVR, VM::VM2_2n > & att) const [inline]
```

**12.22.3.12 operator<()**

```
bool gdcmm::Attribute< Group, Element, TVR, TVM >::operator< (
    const Attribute< Group, Element, TVR, VM::VM2_2n > & att) const [inline]
```

**12.22.3.13 operator==(())**

```
bool gdcmm::Attribute< Group, Element, TVR, TVM >::operator==(
    const Attribute< Group, Element, TVR, VM::VM2_2n > & att) const [inline]
```

**12.22.3.14 operator[]()**

```
ArrayType & gdcmm::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx) [inline]
```

**12.22.3.15 Print()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::Print (
    std::ostream & os) const [inline]
```

**12.22.3.16 Set()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::Set (
    DataSet const & ds) [inline]
```

**12.22.3.17 SetByteValue()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetByteValue (
    const ByteValue * bv) [inline], [protected]
```

**12.22.3.18 SetByteValueNoSwap()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap (
    const ByteValue * bv) [inline], [protected]
```

### 12.22.3.19 SetFromDataElement()

```
void gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement (
    DataElement const & de) [inline]
```

### 12.22.3.20 SetFromDataSet()

```
void gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet (
    DataSet const & ds) [inline]
```

### 12.22.3.21 SetValue()

```
void gdcm::Attribute< Group, Element, TVR, TVM >::SetValue (
    ArrayType v,
    unsigned int idx = 0) [inline]
```

### 12.22.3.22 SetValues()

```
void gdcm::Attribute< Group, Element, TVR, TVM >::SetValues (
    const ArrayType * array,
    unsigned int numel = VMType) [inline]
```

## 12.22.4 Member Data Documentation

### 12.22.4.1 Internal

```
ArrayType gdcm::Attribute< Group, Element, TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 12.23 gdcm::Attribute< Group, Element, TVR, VM::VM2\_n > Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for `gdcm::Attribute< Group, Element, TVR, VM::VM2_n >`:



Collaboration diagram for `gdcm::Attribute< Group, Element, TVR, VM::VM2_n >`:



### Public Types

- enum
- typedef `VRTToType< TVR >::Type ArrayType`

### Public Types inherited from `gdcm::Attribute< Group, Element, TVR, VM::VM1_n >`

- enum
- typedef `VRTToType< TVR >::Type ArrayType`

### Public Member Functions

- `GDCM_STATIC_ASSERT` (((VR::VRTType) TVR &(VR::VRTType)(TagToType< Group, Element >::VRTType)))
- `DataElement GetAsDataElement () const`
- `unsigned int GetNumberOfValues () const`
- `ArrayType & GetValue (unsigned int idx=0)`
- `const ArrayType * GetValues () const`
- `VM GetVM () const`
- `bool operator!= (const Attribute &att) const`
- `bool operator< (const Attribute &att) const`
- `bool operator== (const Attribute &att) const`
- `ArrayType & operator[] (unsigned int idx)`
- `void Print (std::ostream &os) const`
- `void Set (DataSet const &ds)`
- `void SetFromDataElement (DataElement const &de)`
- `void SetFromDataSet (DataSet const &ds)`
- `void SetValue (ArrayType v, unsigned int idx=0)`
- `void SetValues (const ArrayType *array, unsigned int numel=VMType)`

## Public Member Functions inherited from gdcm::Attribute< Group, Element, TVR, VM::VM1\_n >

- [Attribute](#) ()
- [~Attribute](#) ()
- [GDCM\\_STATIC\\_ASSERT](#) (((((VR::VRType) TVR &VR::VR\_VM1) &&((VM::VMType) TagToType< Group, [Element](#) >::VMType==VM::VM1))||!((VR::VRType) TVR &VR::VR\_VM1)))
- [GDCM\\_STATIC\\_ASSERT](#) (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, [Element](#) >::VRType)))
- [GDCM\\_STATIC\\_ASSERT](#) ((VM::VM1\_n &(VM::VMType)(TagToType< Group, [Element](#) >::VMType)))
- [DataElement](#) [GetAsDataElement](#) () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- [ArrayType](#) const & [GetValue](#) (unsigned int idx=0) const
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- [ArrayType](#) const & [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetNumberOfValues](#) (unsigned int numel)
- void [SetValue](#) ([ArrayType](#) v)
- void [SetValue](#) (unsigned int idx, [ArrayType](#) v)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel, bool own=false)

## Static Public Member Functions

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VR](#) [GetVR](#) ()

## Static Public Member Functions inherited from gdcm::Attribute< Group, Element, TVR, VM::VM1\_n >

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

## Public Attributes

- [ArrayType](#) [Internal](#) [[VMToLength](#)< TVM >::Length]

### Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

### Protected Member Functions inherited from [gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## 12.23.1 Member Typedef Documentation

### 12.23.1.1 ArrayType

```
typedef VRToType<TVR>::Type gdcmm::Attribute< Group, Element, TVR, TVM >::ArrayType
```

## 12.23.2 Member Enumeration Documentation

### 12.23.2.1 anonymous enum

```
anonymous enum
```

## 12.23.3 Member Function Documentation

### 12.23.3.1 GDCM\_STATIC\_ASSERT()

```
gdcmm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR & (VR::VRType) (TagToType< Group, Element >::VRType)) )
```

### 12.23.3.2 GetAsDataElement()

```
DataElement gdcmm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.23.3.3 GetDictVM()

```
VM gdcmm::Attribute< Group, Element, TVR, TVM >::GetDictVM () [inline], [static]
```

#### 12.23.3.4 GetDictVR()

```
VR gdcmm::Attribute< Group, Element, TVR, TVM >::GetDictVR () [inline], [static]
```

#### 12.23.3.5 GetNumberOfValues()

```
unsigned int gdcmm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues () const [inline]
```

#### 12.23.3.6 GetTag()

```
Tag gdcmm::Attribute< Group, Element, TVR, TVM >::GetTag () [inline], [static]
```

#### 12.23.3.7 GetValue()

```
ArrayType & gdcmm::Attribute< Group, Element, TVR, TVM >::GetValue (
    unsigned int idx = 0) [inline]
```

#### 12.23.3.8 GetValues()

```
const ArrayType * gdcmm::Attribute< Group, Element, TVR, TVM >::GetValues () const [inline]
```

#### 12.23.3.9 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcmm::Attribute< Group, Element, TVR, VM::VM2_n >::GetVM () const [inline]
```

References [gdcmm::VM::VM2\\_n](#).

#### 12.23.3.10 GetVR()

```
VR gdcmm::Attribute< Group, Element, TVR, TVM >::GetVR () [inline], [static]
```

#### 12.23.3.11 operator"!="()

```
bool gdcmm::Attribute< Group, Element, TVR, TVM >::operator!= (
    const Attribute< Group, Element, TVR, VM::VM2_n > & att) const [inline]
```

#### 12.23.3.12 operator<()

```
bool gdcmm::Attribute< Group, Element, TVR, TVM >::operator< (
    const Attribute< Group, Element, TVR, VM::VM2_n > & att) const [inline]
```

**12.23.3.13 operator==(**

```
bool gdcmm::Attribute< Group, Element, TVR, TVM >::operator== (
    const Attribute< Group, Element, TVR, VM::VM2_n > & att) const [inline]
```

**12.23.3.14 operator[](**

```
ArrayType & gdcmm::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx) [inline]
```

**12.23.3.15 Print()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::Print (
    std::ostream & os) const [inline]
```

**12.23.3.16 Set()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::Set (
    DataSet const & ds) [inline]
```

**12.23.3.17 SetByteValue()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetByteValue (
    const ByteValue * bv) [inline], [protected]
```

**12.23.3.18 SetByteValueNoSwap()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap (
    const ByteValue * bv) [inline], [protected]
```

**12.23.3.19 SetFromDataElement()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement (
    DataElement const & de) [inline]
```

**12.23.3.20 SetFromDataSet()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet (
    DataSet const & ds) [inline]
```



## 12.23.3.21 SetValue()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetValue (
    ArrayType v,
    unsigned int idx = 0) [inline]
```

## 12.23.3.22 SetValues()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetValues (
    const ArrayType * array,
    unsigned int numel = VMType) [inline]
```

## 12.23.4 Member Data Documentation

## 12.23.4.1 Internal

```
ArrayType gdcmm::Attribute< Group, Element, TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

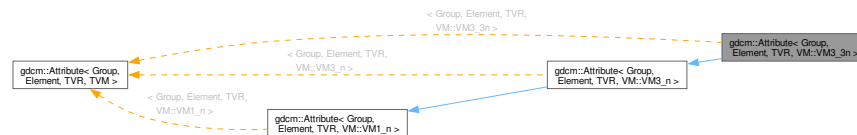
The documentation for this class was generated from the following file:

- [gdcmmAttribute.h](#)

## 12.24 gdcmm::Attribute&lt; Group, Element, TVR, VM::VM3\_3n &gt; Class Template Reference

```
#include <gdcmmAttribute.h>
```

Inheritance diagram for gdcmm::Attribute< Group, Element, TVR, VM::VM3\_3n >:



Collaboration diagram for gdcmm::Attribute< Group, Element, TVR, VM::VM3\_3n >:



**Public Types**

- enum
- typedef [VRToType](#)< TVR >::Type [ArrayType](#)

**Public Types inherited from [gdcmm::Attribute](#)< [Group](#), [Element](#), [TVR](#), [VM::VM3\\_n](#) >**

- enum
- typedef [VRToType](#)< TVR >::Type [ArrayType](#)

**Public Types inherited from [gdcmm::Attribute](#)< [Group](#), [Element](#), [TVR](#), [VM::VM1\\_n](#) >**

- enum
- typedef [VRToType](#)< TVR >::Type [ArrayType](#)

**Public Member Functions**

- [GDCM\\_STATIC\\_ASSERT](#) ((([VR::VRType](#)) TVR &([VR::VRType](#))([TagToType](#)< [Group](#), [Element](#) >::VRType)))
- [DataElement](#) [GetAsDataElement](#) () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetValue](#) ([ArrayType](#) v, unsigned int idx=0)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel=[VMType](#))

**Public Member Functions inherited from [gdcmm::Attribute](#)< [Group](#), [Element](#), [TVR](#), [VM::VM3\\_n](#) >**

- [GDCM\\_STATIC\\_ASSERT](#) ((([VR::VRType](#)) TVR &([VR::VRType](#))([TagToType](#)< [Group](#), [Element](#) >::VRType)))
- [DataElement](#) [GetAsDataElement](#) () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetValue](#) ([ArrayType](#) v, unsigned int idx=0)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel=[VMType](#))

## Public Member Functions inherited from gdcm::Attribute< Group, Element, TVR, VM::VM1\_n >

- [Attribute](#) ()
- [~Attribute](#) ()
- [GDCM\\_STATIC\\_ASSERT](#) (((((VR::VRType) TVR &VR::VR\_VM1) &&((VM::VMType) TagToType< Group, [Element](#) >::VMType==VM::VM1))||!((VR::VRType) TVR &VR::VR\_VM1)))
- [GDCM\\_STATIC\\_ASSERT](#) (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, [Element](#) >::VRType)))
- [GDCM\\_STATIC\\_ASSERT](#) ((VM::VM1\_n &(VM::VMType)(TagToType< Group, [Element](#) >::VMType)))
- [DataElement](#) [GetAsDataElement](#) () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- [ArrayType](#) const & [GetValue](#) (unsigned int idx=0) const
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- [ArrayType](#) const & [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetNumberOfValues](#) (unsigned int numel)
- void [SetValue](#) ([ArrayType](#) v)
- void [SetValue](#) (unsigned int idx, [ArrayType](#) v)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel, bool own=false)

## Static Public Member Functions

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

## Static Public Member Functions inherited from gdcm::Attribute< Group, Element, TVR, VM::VM3\_n >

- static [VM](#) [GetDictVM](#) ()
- static [VR](#) [GetDictVR](#) ()
- static [Tag](#) [GetTag](#) ()
- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Static Public Member Functions inherited from [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- static [VM GetDictVM](#) ()
- static [VR GetDictVR](#) ()
- static [Tag GetTag](#) ()
- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

### Public Attributes

- [ArrayType Internal](#) [[VMToLength](#)< TVM >::Length]

### Public Attributes inherited from [gdcm::Attribute< Group, Element, TVR, VM::VM3\\_n >](#)

- [ArrayType Internal](#) [[VMToLength](#)< TVM >::Length]

### Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

### Protected Member Functions inherited from [gdcm::Attribute< Group, Element, TVR, VM::VM3\\_n >](#)

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

### Protected Member Functions inherited from [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## 12.24.1 Member Typedef Documentation

### 12.24.1.1 ArrayType

```
typedef VRToType<TVR>::Type gdcm::Attribute< Group, Element, TVR, TVM >::ArrayType
```

## 12.24.2 Member Enumeration Documentation

### 12.24.2.1 anonymous enum

anonymous enum

## 12.24.3 Member Function Documentation

### 12.24.3.1 GDCM\_STATIC\_ASSERT()

```
gdcm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR & (VR::VRType) (TagToType< Group, Element >::VRType)) )
```

### 12.24.3.2 GetAsDataElement()

```
DataElement gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.24.3.3 GetDictVM()

```
VM gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVM () [inline], [static]
```

### 12.24.3.4 GetDictVR()

```
VR gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVR () [inline], [static]
```

### 12.24.3.5 GetNumberOfValues()

```
unsigned int gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues () const [inline]
```

### 12.24.3.6 GetTag()

```
Tag gdcm::Attribute< Group, Element, TVR, TVM >::GetTag () [inline], [static]
```

### 12.24.3.7 GetValue()

```
ArrayType & gdcm::Attribute< Group, Element, TVR, TVM >::GetValue (
    unsigned int idx = 0) [inline]
```

**12.24.3.8 GetValues()**

```
const ArrayType * gdcM::Attribute< Group, Element, TVR, TVM >::GetValues () const [inline]
```

**12.24.3.9 GetVM()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcM::Attribute< Group, Element, TVR, VM::VM3_3n >::GetVM () [inline], [static]
```

References [gdcM::VM::VM3\\_3n](#).

**12.24.3.10 GetVR()**

```
VR gdcM::Attribute< Group, Element, TVR, TVM >::GetVR () [inline], [static]
```

**12.24.3.11 operator"!="()**

```
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator!= (
    const Attribute< Group, Element, TVR, VM::VM3_3n > & att) const [inline]
```

**12.24.3.12 operator<()**

```
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator< (
    const Attribute< Group, Element, TVR, VM::VM3_3n > & att) const [inline]
```

**12.24.3.13 operator==(())**

```
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator==(
    const Attribute< Group, Element, TVR, VM::VM3_3n > & att) const [inline]
```

**12.24.3.14 operator[]()**

```
ArrayType & gdcM::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx) [inline]
```

**12.24.3.15 Print()**

```
void gdcM::Attribute< Group, Element, TVR, TVM >::Print (
    std::ostream & os) const [inline]
```

#### 12.24.3.16 Set()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::Set (  
    DataSet const & ds) [inline]
```

#### 12.24.3.17 SetByteValue()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetByteValue (  
    const ByteValue * bv) [inline], [protected]
```

#### 12.24.3.18 SetByteValueNoSwap()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap (  
    const ByteValue * bv) [inline], [protected]
```

#### 12.24.3.19 SetFromDataElement()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement (  
    DataElement const & de) [inline]
```

#### 12.24.3.20 SetFromDataSet()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet (  
    DataSet const & ds) [inline]
```

#### 12.24.3.21 SetValue()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetValue (  
    ArrayType v,  
    unsigned int idx = 0) [inline]
```

#### 12.24.3.22 SetValues()

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetValues (  
    const ArrayType * array,  
    unsigned int numel = VMType) [inline]
```

## 12.24.4 Member Data Documentation

### 12.24.4.1 Internal

```
ArrayType gdcm::Attribute< Group, Element, TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

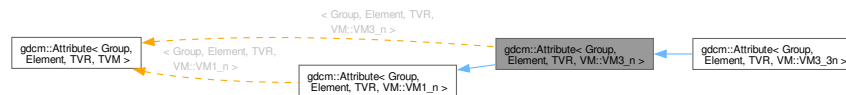
The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

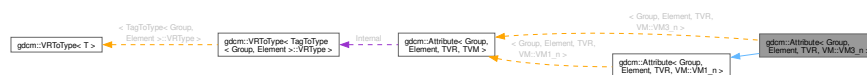
## 12.25 gdcm::Attribute< Group, Element, TVR, VM::VM3\_n > Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for `gdcm::Attribute< Group, Element, TVR, VM::VM3_n >`:



Collaboration diagram for `gdcm::Attribute< Group, Element, TVR, VM::VM3_n >`:



### Public Types

- enum
- typedef `VRTToType< TVR >::Type ArrayType`

### Public Types inherited from `gdcm::Attribute< Group, Element, TVR, VM::VM1_n >`

- enum
- typedef `VRTToType< TVR >::Type ArrayType`



**Public Member Functions**

- [GDCM\\_STATIC\\_ASSERT](#) (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, [Element](#) >::VRType)))
- [DataElement GetAsDataElement](#) () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetValue](#) ([ArrayType](#) v, unsigned int idx=0)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel=[VMType](#))

**Public Member Functions inherited from****[gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)**

- [Attribute](#) ()
- [~Attribute](#) ()
- [GDCM\\_STATIC\\_ASSERT](#) ((((((VR::VRType) TVR &VR::VR\_VM1) &&((VM::VMType) TagToType< Group, [Element](#) >::VMType==VM::VM1))||!((VR::VRType) TVR &VR::VR\_VM1)))
- [GDCM\\_STATIC\\_ASSERT](#) (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, [Element](#) >::VRType)))
- [GDCM\\_STATIC\\_ASSERT](#) ((VM::VM1\_n &(VM::VMType)(TagToType< Group, [Element](#) >::VMType)))
- [DataElement GetAsDataElement](#) () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- [ArrayType](#) const & [GetValue](#) (unsigned int idx=0) const
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- [ArrayType](#) const & [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetNumberOfValues](#) (unsigned int numel)
- void [SetValue](#) ([ArrayType](#) v)
- void [SetValue](#) (unsigned int idx, [ArrayType](#) v)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel, bool own=false)

**Static Public Member Functions**

- static [VM GetDictVM](#) ()
- static [VR GetDictVR](#) ()
- static [Tag GetTag](#) ()
- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

**Static Public Member Functions inherited from**  
[gdcM::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- static [VM GetDictVM](#) ()
- static [VR GetDictVR](#) ()
- static [Tag GetTag](#) ()
- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

**Public Attributes**

- [ArrayType Internal](#) [[VMToLength](#)< TVM >::Length]

**Protected Member Functions**

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

**Protected Member Functions inherited from**  
[gdcM::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

**12.25.1 Member Typedef Documentation****12.25.1.1 ArrayType**

```
typedef VRToType<TVR>::Type gdcM::Attribute< Group, Element, TVR, TVM >::ArrayType
```

**12.25.2 Member Enumeration Documentation****12.25.2.1 anonymous enum**

```
anonymous enum
```

## 12.25.3 Member Function Documentation

### 12.25.3.1 GDCM\_STATIC\_ASSERT()

```
gdcm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR & (VR::VRType) (TagToType< Group, Element >::VRType)) )
```

### 12.25.3.2 GetAsDataElement()

```
DataElement gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.25.3.3 GetDictVM()

```
VM gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVM () [inline], [static]
```

### 12.25.3.4 GetDictVR()

```
VR gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVR () [inline], [static]
```

### 12.25.3.5 GetNumberOfValues()

```
unsigned int gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues () const [inline]
```

### 12.25.3.6 GetTag()

```
Tag gdcm::Attribute< Group, Element, TVR, TVM >::GetTag () [inline], [static]
```

### 12.25.3.7 GetValue()

```
ArrayType & gdcm::Attribute< Group, Element, TVR, TVM >::GetValue (
    unsigned int idx = 0) [inline]
```

### 12.25.3.8 GetValues()

```
const ArrayType * gdcm::Attribute< Group, Element, TVR, TVM >::GetValues () const [inline]
```

**12.25.3.9 GetVM()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcm::Attribute< Group, Element, TVR, VM::VM3_n >::GetVM () [inline], [static]
```

References [gdcm::VM::VM3\\_n](#).

**12.25.3.10 GetVR()**

```
VR gdcm::Attribute< Group, Element, TVR, TVM >::GetVR () [inline], [static]
```

**12.25.3.11 operator"!="()**

```
bool gdcm::Attribute< Group, Element, TVR, TVM >::operator!= (
    const Attribute< Group, Element, TVR, VM::VM3_n > & att) const [inline]
```

**12.25.3.12 operator<()**

```
bool gdcm::Attribute< Group, Element, TVR, TVM >::operator< (
    const Attribute< Group, Element, TVR, VM::VM3_n > & att) const [inline]
```

**12.25.3.13 operator==(**

```
bool gdcm::Attribute< Group, Element, TVR, TVM >::operator==(
    const Attribute< Group, Element, TVR, VM::VM3_n > & att) const [inline]
```

**12.25.3.14 operator[]()**

```
ArrayType & gdcm::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx) [inline]
```

**12.25.3.15 Print()**

```
void gdcm::Attribute< Group, Element, TVR, TVM >::Print (
    std::ostream & os) const [inline]
```

**12.25.3.16 Set()**

```
void gdcm::Attribute< Group, Element, TVR, TVM >::Set (
    DataSet const & ds) [inline]
```

**12.25.3.17 SetByteValue()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetByteValue (
    const ByteValue * bv) [inline], [protected]
```

**12.25.3.18 SetByteValueNoSwap()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap (
    const ByteValue * bv) [inline], [protected]
```

**12.25.3.19 SetFromDataElement()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement (
    DataElement const & de) [inline]
```

**12.25.3.20 SetFromDataSet()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet (
    DataSet const & ds) [inline]
```

**12.25.3.21 SetValue()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetValue (
    ArrayType v,
    unsigned int idx = 0) [inline]
```

**12.25.3.22 SetValues()**

```
void gdcmm::Attribute< Group, Element, TVR, TVM >::SetValues (
    const ArrayType * array,
    unsigned int numel = VMType) [inline]
```

**12.25.4 Member Data Documentation****12.25.4.1 Internal**

```
ArrayType gdcmm::Attribute< Group, Element, TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

The documentation for this class was generated from the following file:

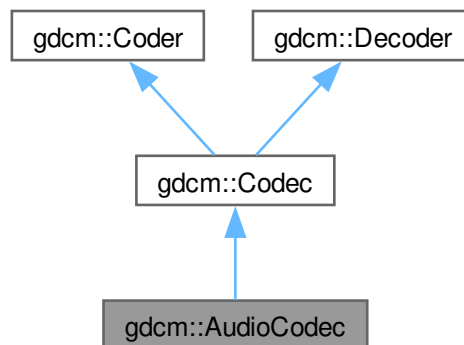
- [gdcmmAttribute.h](#)

## 12.26 gdcm::AudioCodec Class Reference

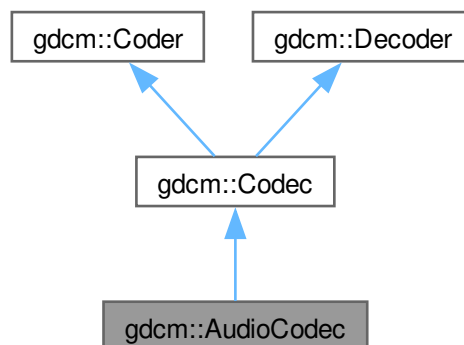
[AudioCodec.](#)

```
#include <gdcmAudioCodec.h>
```

Inheritance diagram for gdcm::AudioCodec:



Collaboration diagram for gdcm::AudioCodec:



### Public Member Functions

- [AudioCodec](#) ()
- [~AudioCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*

### Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default
- virtual bool [Code](#) ([DataElement](#) const &in\_, [DataElement](#) &out\_)  
*Code.*

### Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

### Additional Inherited Members

### Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

### Protected Member Functions inherited from [gdcm::Decoder](#)

- virtual bool [DecodeByStreams](#) (std::istream &, std::ostream &)

## 12.26.1 Detailed Description

[AudioCodec](#).

## 12.26.2 Constructor & Destructor Documentation

### 12.26.2.1 AudioCodec()

```
gdcm::AudioCodec::AudioCodec ()
```

### 12.26.2.2 ~AudioCodec()

```
gdcm::AudioCodec::~~AudioCodec () [override]
```

## 12.26.3 Member Function Documentation

### 12.26.3.1 CanCode()

```
bool gdcm::AudioCodec::CanCode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Implements [gdcm::Coder](#).

### 12.26.3.2 CanDecode()

```
bool gdcm::AudioCodec::CanDecode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Implements [gdcm::Decoder](#).

### 12.26.3.3 Decode()

```
bool gdcm::AudioCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::Decoder](#).

The documentation for this class was generated from the following file:

- [gdcmAudioCodec.h](#)

## 12.27 gdcm::Base64 Class Reference

Class for [Base64](#).

```
#include <gdcmBase64.h>
```



## Public Member Functions

- [Base64](#) (const Base64 &)=delete
- void [operator=](#) (const [Base64](#) &)=delete

## Static Public Member Functions

- static size\_t [Decode](#) (char \*dst, size\_t dlen, const char \*src, size\_t slen)  
*Decode a base64-formatted buffer.*
- static size\_t [Encode](#) (char \*dst, size\_t dlen, const char \*src, size\_t slen)  
*Encode a buffer into base64 format.*
- static size\_t [GetDecodeLength](#) (const char \*src, size\_t len)
- static size\_t [GetEncodeLength](#) (const char \*src, size\_t srclen)

### 12.27.1 Detailed Description

Class for [Base64](#).

### 12.27.2 Constructor & Destructor Documentation

#### 12.27.2.1 Base64()

```
gdcm::Base64::Base64 (
    const Base64 & ) [delete]
```

References [Base64\(\)](#).

Referenced by [Base64\(\)](#), and [operator=\(\)](#).

### 12.27.3 Member Function Documentation

#### 12.27.3.1 Decode()

```
size_t gdcm::Base64::Decode (
    char * dst,
    size_t dlen,
    const char * src,
    size_t slen) [static]
```

Decode a base64-formatted buffer.

#### Parameters

---

<i>dst</i>	destination buffer
<i>dlen</i>	size of the buffer
<i>src</i>	source buffer
<i>slen</i>	amount of data to be decoded

**Returns**

0 if not successful, size of decoded otherwise

**Examples**

[DumpExamCard.cxx](#), and [DumpSiemensBase64.cxx](#).

**12.27.3.2 Encode()**

```
size_t gdcmm::Base64::Encode (
    char * dst,
    size_t dlen,
    const char * src,
    size_t slen) [static]
```

Encode a buffer into base64 format.

**Parameters**

<i>dst</i>	destination buffer
<i>dlen</i>	size of the buffer
<i>src</i>	source buffer
<i>slen</i>	amount of data to be encoded

**Returns**

0 if not successful, size of encoded otherwise

**12.27.3.3 GetDecodeLength()**

```
size_t gdcmm::Base64::GetDecodeLength (
    const char * src,
    size_t len) [static]
```

Call this function to obtain the required buffer size

**Examples**

[DumpExamCard.cxx](#), and [DumpSiemensBase64.cxx](#).

#### 12.27.3.4 GetEncodeLength()

```
size_t gdcm::Base64::GetEncodeLength (
    const char * src,
    size_t srclen) [static]
```

Call this function to obtain the required buffer size

#### 12.27.3.5 operator=()

```
void gdcm::Base64::operator= (
    const Base64 & ) [delete]
```

References [Base64\(\)](#).

The documentation for this class was generated from the following file:

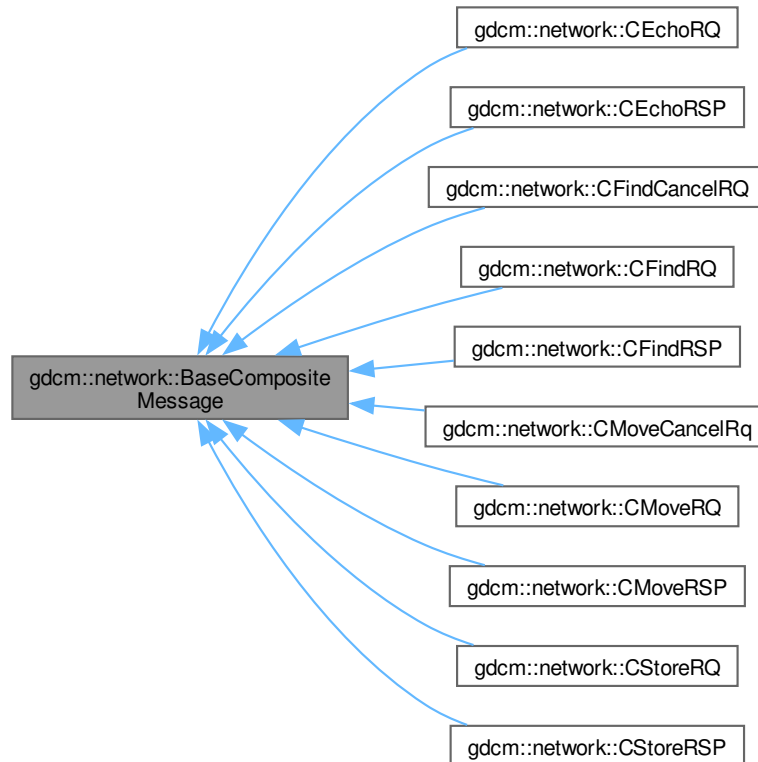
- [gdcmBase64.h](#)

## 12.28 gdcm::network::BaseCompositeMessage Class Reference

[BaseCompositeMessage](#).

```
#include <gdcmBaseCompositeMessage.h>
```

Inheritance diagram for `gdcm::network::BaseCompositeMessage`:



### Public Member Functions

- virtual `~BaseCompositeMessage()`=default
- virtual `std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseRootQuery *inRootQuery)=0`

## 12.28.1 Detailed Description

[BaseCompositeMessage](#).

The Composite events described in section 3.7-2009 of the DICOM standard all use their own messages. These messages are constructed using Presentation Data Values, from section 3.8-2009 of the standard, and then fill in appropriate values in their datasets.

So, for the five composites:

- C-ECHO

- C-FIND
- C-MOVE
- C-GET
- C-STORE there are a series of messages. However, all of these messages are obtained as part of a PDataPDU, and all have to be placed there. Therefore, since they all have shared functionality and construction tropes, that will be put into a base class. Further, the base class will be then returned by the factory class, gdcmComposite←PDUFactory.

This is an abstract class. It cannot be instantiated on its own.

## 12.28.2 Constructor & Destructor Documentation

### 12.28.2.1 ~BaseCompositeMessage()

```
virtual gdcm::network::BaseCompositeMessage::~~BaseCompositeMessage () [virtual], [default]
```

## 12.28.3 Member Function Documentation

### 12.28.3.1 ConstructPDV()

```
virtual std::vector< PresentationDataValue > gdcm::network::BaseCompositeMessage::ConstructPDV (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery) [pure virtual]
```

Implemented in [gdcm::network::CEchoRQ](#), [gdcm::network::CFindRQ](#), and [gdcm::network::CMoveRQ](#).

The documentation for this class was generated from the following file:

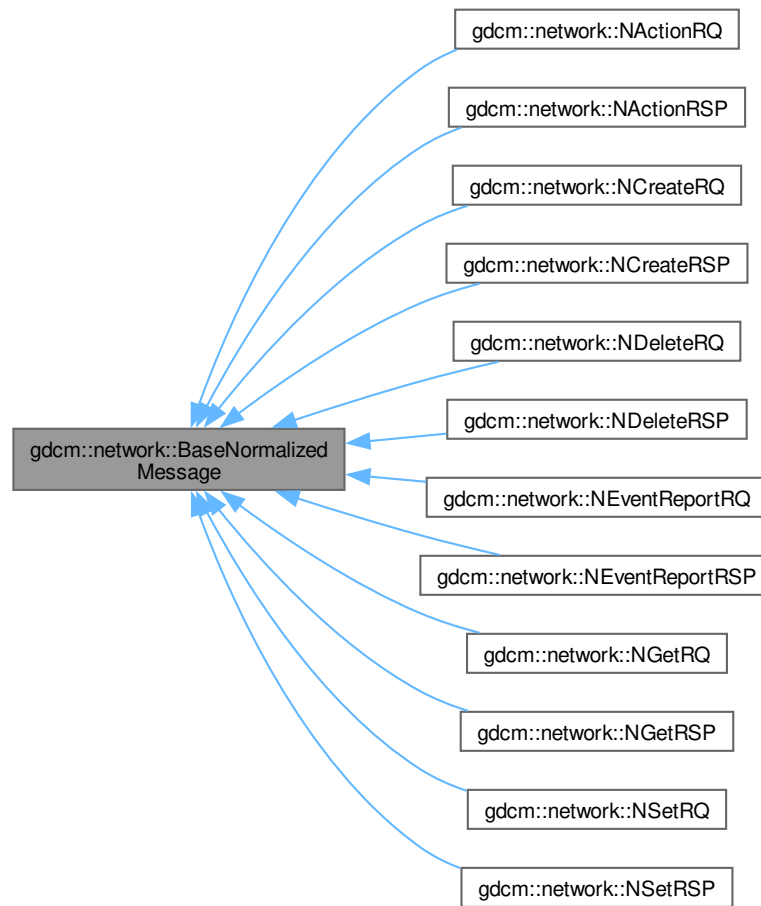
- [gdcmBaseCompositeMessage.h](#)

## 12.29 gdcm::network::BaseNormalizedMessage Class Reference

[BaseNormalizedMessage](#).

```
#include <gdcmBaseNormalizedMessage.h>
```

Inheritance diagram for `gdcm::network::BaseNormalizedMessage`:



### Public Member Functions

- virtual `~BaseNormalizedMessage()`=default
- virtual `std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseQuery *inQuery)=0`

### 12.29.1 Detailed Description

[BaseNormalizedMessage](#).

The Normalized events described in section 3.7-2011 of the DICOM standard all use their own messages. These messages are constructed using Presentation Data Values, from section 3.8-2011 of the standard, and then fill in appropriate values in their datasets.

So, for the five normalized:

- N-ACTION
- N-CREATE
- N-DELETE
- N-EVENT
- N-GET
- N-SET there are a series of messages. However, all of these messages are obtained as part of a PData←PDU, and all have to be placed there. Therefore, since they all have shared functionality and construction tropes, that will be put into a base class. Further, the base class will be then returned by the factory class, [gdcmNormalizedMessageFactory.h](#).

This is an abstract class. It cannot be instantiated on its own.

## 12.29.2 Constructor & Destructor Documentation

### 12.29.2.1 ~BaseNormalizedMessage()

```
virtual gdcm::network::BaseNormalizedMessage::~~BaseNormalizedMessage () [virtual], [default]
```

## 12.29.3 Member Function Documentation

### 12.29.3.1 ConstructPDV()

```
virtual std::vector< PresentationDataValue > gdcm::network::BaseNormalizedMessage::ConstructPDV (  
    const ULConnection & inConnection,  
    const BaseQuery * inQuery) [pure virtual]
```

Implemented in [gdcm::network::NActionRQ](#), [gdcm::network::NCreateRQ](#), [gdcm::network::NDeleteRQ](#), [gdcm::network::NEventReportRQ](#), [gdcm::network::NGetRQ](#), and [gdcm::network::NSetRQ](#).

The documentation for this class was generated from the following file:

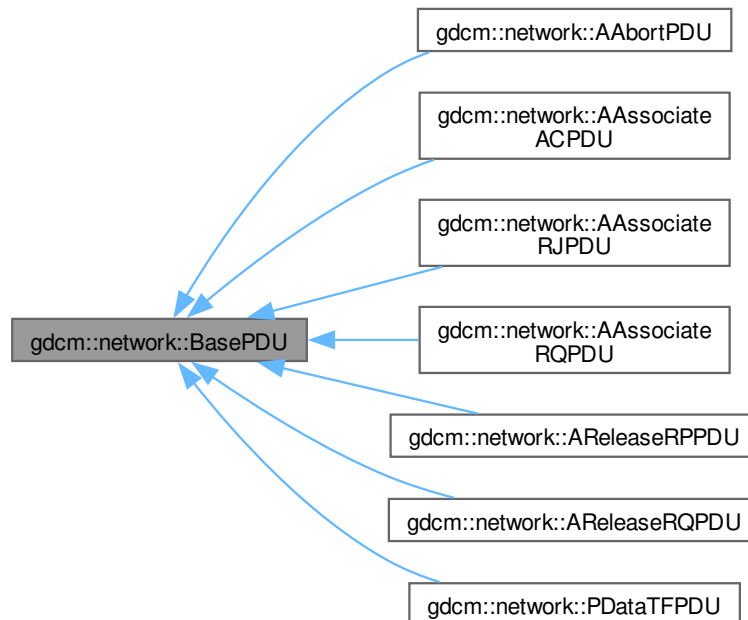
- [gdcmBaseNormalizedMessage.h](#)

## 12.30 gdcm::network::BasePDU Class Reference

[BasePDU](#).

```
#include <gdcmBasePDU.h>
```

Inheritance diagram for gdcm::network::BasePDU:



### Public Member Functions

- virtual [~BasePDU](#) ()=default
- virtual bool [IsLastFragment](#) () const =0
- virtual void [Print](#) (std::ostream &os) const =0
- virtual std::istream & [Read](#) (std::istream &is)=0
- virtual size\_t [Size](#) () const =0
- virtual const std::ostream & [Write](#) (std::ostream &os) const =0

### 12.30.1 Detailed Description

[BasePDU](#).

base class for PDUs



all PDUs start with the first ten bytes as specified: 01 PDU type 02 reserved 3-6 PDU Length (unsigned) 7-10 variable

on some, 7-10 are split (7-8 as protocol version in Associate-RQ, for instance, while associate-rj splits those four bytes differently).

Also common to all the PDUs is their ability to read and write to a stream.

So, let's just get them all bunched together into one (abstract) class, shall we?

Why? 1) so that the [ULEvent](#) can have the PDU stored in it, since the event takes PDUs and not other class structures (other class structures get converted into PDUs) 2) to make reading PDUs in the event loop cleaner

## 12.30.2 Constructor & Destructor Documentation

### 12.30.2.1 ~BasePDU()

```
virtual gdcmm::network::BasePDU::~~BasePDU () [virtual], [default]
```

## 12.30.3 Member Function Documentation

### 12.30.3.1 IsLastFragment()

```
virtual bool gdcmm::network::BasePDU::IsLastFragment () const [pure virtual]
```

Implemented in [gdcmm::network::AAabortPDU](#), [gdcmm::network::AAssociateACPDU](#), [gdcmm::network::AAssociateRJPDU](#), [gdcmm::network::AAssociateRQPDU](#), [gdcmm::network::AReleaseRPPDU](#), [gdcmm::network::AReleaseRQPDU](#), and [gdcmm::network::PDataTFPDU](#).

### 12.30.3.2 Print()

```
virtual void gdcmm::network::BasePDU::Print (
    std::ostream & os) const [pure virtual]
```

Implemented in [gdcmm::network::AAabortPDU](#), [gdcmm::network::AAssociateACPDU](#), [gdcmm::network::AAssociateRJPDU](#), [gdcmm::network::AAssociateRQPDU](#), [gdcmm::network::AReleaseRPPDU](#), [gdcmm::network::AReleaseRQPDU](#), and [gdcmm::network::PDataTFPDU](#).

### 12.30.3.3 Read()

```
virtual std::istream & gdcmm::network::BasePDU::Read (
    std::istream & is) [pure virtual]
```

Implemented in [gdcmm::network::AAabortPDU](#), [gdcmm::network::AAssociateACPDU](#), [gdcmm::network::AAssociateRJPDU](#), [gdcmm::network::AAssociateRQPDU](#), [gdcmm::network::AReleaseRPPDU](#), [gdcmm::network::AReleaseRQPDU](#), and [gdcmm::network::PDataTFPDU](#).

### 12.30.3.4 Size()

```
virtual size_t gdcm::network::BasePDU::Size () const [pure virtual]
```

Implemented in [gdcm::network::AAbortPDU](#), [gdcm::network::AAssociateACPDU](#), [gdcm::network::AAssociateRJPDU](#), [gdcm::network::AAssociateRQPDU](#), [gdcm::network::AReleaseRPPDU](#), [gdcm::network::AReleaseRQPDU](#), and [gdcm::network::PDataTFPDU](#).

### 12.30.3.5 Write()

```
virtual const std::ostream & gdcm::network::BasePDU::Write (
    std::ostream & os) const [pure virtual]
```

Implemented in [gdcm::network::AAbortPDU](#), [gdcm::network::AAssociateACPDU](#), [gdcm::network::AAssociateRJPDU](#), [gdcm::network::AAssociateRQPDU](#), [gdcm::network::AReleaseRPPDU](#), [gdcm::network::AReleaseRQPDU](#), and [gdcm::network::PDataTFPDU](#).

The documentation for this class was generated from the following file:

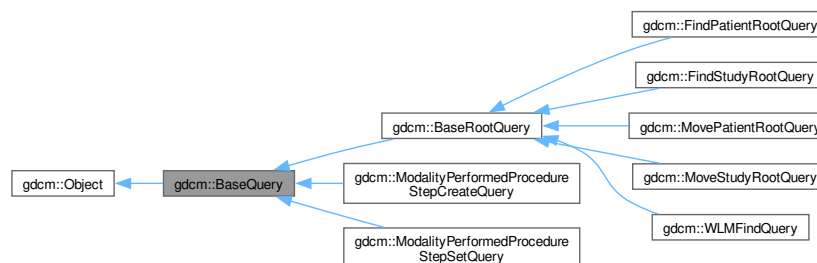
- [gdcmBasePDU.h](#)

## 12.31 gdcm::BaseQuery Class Reference

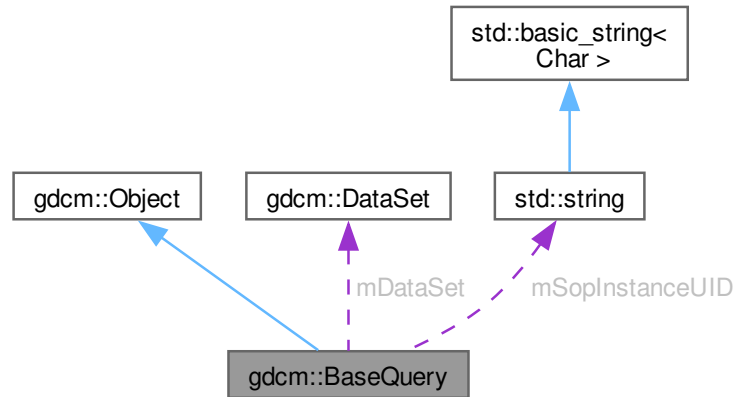
[BaseQuery](#).

```
#include <gdcmBaseQuery.h>
```

Inheritance diagram for `gdcm::BaseQuery`:



Collaboration diagram for gdcm::BaseQuery:



### Public Member Functions

- [~BaseQuery](#) () override
- void [AddQueryDataSet](#) (const [DataSet](#) &ds)
- virtual [UIDs::TSName](#) [GetAbstractSyntaxUID](#) () const =0
- [DataSet](#) & [GetQueryDataSet](#) ()
- [DataSet](#) const & [GetQueryDataSet](#) () const  
*Set/Get the internal representation of the query as a [DataSet](#).*
- std::string [GetSOPInstanceUID](#) () const
- void [Print](#) (std::ostream &os) const override
- void [SetSearchParameter](#) (const std::string &inKeyword, const std::string &inValue)
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const std::string &inValue)
- void [SetSOPInstanceUID](#) (const std::string &iSopInstanceUID)
- virtual bool [ValidateQuery](#) (bool inStrict=true) const =0
- const std::ostream & [WriteHelpFile](#) (std::ostream &os)
- bool [WriteQuery](#) (const std::string &inFileName)

### Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

**Protected Member Functions**

- [BaseQuery](#) ()
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [DictEntry](#) &inDictEntry, const std::string &inValue)
- bool [ValidDataSet](#) (const [DataSet](#) &dataSetToValid, const [DataSet](#) &dataSetReference) const

**Protected Member Functions inherited from [gdcm::Object](#)**

- void [Register](#) ()
- void [UnRegister](#) ()

**Protected Attributes**

- [DataSet](#) [mDataSet](#)
- std::string [mSopInstanceUID](#)

**Friends**

- class [QueryFactory](#)

**12.31.1 Detailed Description**

[BaseQuery](#).

contains: a baseclass which will produce a dataset for all dimse messages

**12.31.2 Constructor & Destructor Documentation****12.31.2.1 BaseQuery()**

```
gdcm::BaseQuery::BaseQuery () [protected]
```

**12.31.2.2 ~BaseQuery()**

```
gdcm::BaseQuery::~~BaseQuery () [override]
```

**12.31.3 Member Function Documentation****12.31.3.1 AddQueryDataSet()**

```
void gdcm::BaseQuery::AddQueryDataSet (
    const DataSet & ds)
```

### 12.31.3.2 GetAbstractSyntaxUID()

```
virtual UIDs::TSName gdcm::BaseQuery::GetAbstractSyntaxUID () const [pure virtual]
```

Implemented in [gdcm::FindPatientRootQuery](#), [gdcm::FindStudyRootQuery](#), [gdcm::ModalityPerformedProcedureStepCreateQuery](#), [gdcm::ModalityPerformedProcedureStepSetQuery](#), [gdcm::MovePatientRootQuery](#), [gdcm::MoveStudyRootQuery](#), and [gdcm::WLMFindQuery](#).

### 12.31.3.3 GetQueryDataSet() [1/2]

```
DataSet & gdcm::BaseQuery::GetQueryDataSet ()
```

### 12.31.3.4 GetQueryDataSet() [2/2]

```
DataSet const & gdcm::BaseQuery::GetQueryDataSet () const
```

Set/Get the internal representation of the query as a [DataSet](#).

### 12.31.3.5 GetSOPInstanceUID()

```
std::string gdcm::BaseQuery::GetSOPInstanceUID () const [inline]
```

References [mSopInstanceUID](#).

### 12.31.3.6 Print()

```
void gdcm::BaseQuery::Print (  
    std::ostream & os) const [override], [virtual]
```

Reimplemented from [gdcm::Object](#).

### 12.31.3.7 SetSearchParameter() [1/3]

```
void gdcm::BaseQuery::SetSearchParameter (  
    const std::string & inKeyword,  
    const std::string & inValue)
```

### 12.31.3.8 SetSearchParameter() [2/3]

```
void gdcm::BaseQuery::SetSearchParameter (  
    const Tag & inTag,  
    const DictEntry & inDictEntry,  
    const std::string & inValue) [protected]
```

### 12.31.3.9 SetSearchParameter() [3/3]

```
void gdcM::BaseQuery::SetSearchParameter (
    const Tag & inTag,
    const std::string & inValue)
```

### 12.31.3.10 SetSOPInstanceUID()

```
void gdcM::BaseQuery::SetSOPInstanceUID (
    const std::string & iSopInstanceUID) [inline]
```

References [mSopInstanceUID](#).

### 12.31.3.11 ValidateQuery()

```
virtual bool gdcM::BaseQuery::ValidateQuery (
    bool inStrict = true) const [pure virtual]
```

Implemented in [gdcM::BaseRootQuery](#), [gdcM::FindPatientRootQuery](#), [gdcM::FindStudyRootQuery](#), [gdcM::ModalityPerformedProcedureStepSetQuery](#), [gdcM::ModalityPerformedProcedureStepSetQuery](#), [gdcM::MovePatientRootQuery](#), [gdcM::MoveStudyRootQuery](#), and [gdcM::WLMFindQuery](#).

### 12.31.3.12 ValidDataSet()

```
bool gdcM::BaseQuery::ValidDataSet (
    const DataSet & dataSetToValid,
    const DataSet & dataSetReference) const [protected]
```

### 12.31.3.13 WriteHelpFile()

```
const std::ostream & gdcM::BaseQuery::WriteHelpFile (
    std::ostream & os)
```

### 12.31.3.14 WriteQuery()

```
bool gdcM::BaseQuery::WriteQuery (
    const std::string & inFileName)
```

## 12.31.4 Friends And Related Symbol Documentation

### 12.31.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

References [QueryFactory](#).

Referenced by [QueryFactory](#).

## 12.31.5 Member Data Documentation

### 12.31.5.1 mDataSet

`DataSet` `gdcm::BaseQuery::mDataSet` [protected]

### 12.31.5.2 mSopInstanceUID

`std::string` `gdcm::BaseQuery::mSopInstanceUID` [protected]

Referenced by [GetSOPInstanceUID\(\)](#), and [SetSOPInstanceUID\(\)](#).

The documentation for this class was generated from the following file:

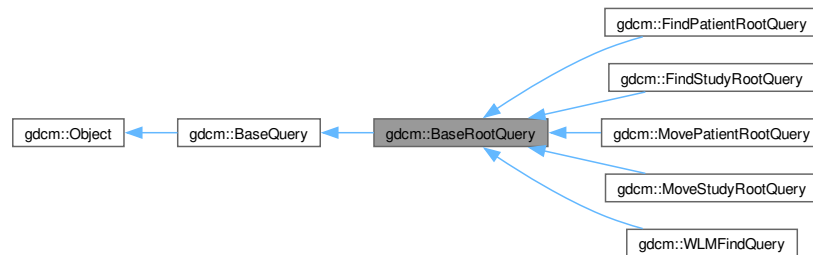
- [gdcmBaseQuery.h](#)

## 12.32 gdcm::BaseRootQuery Class Reference

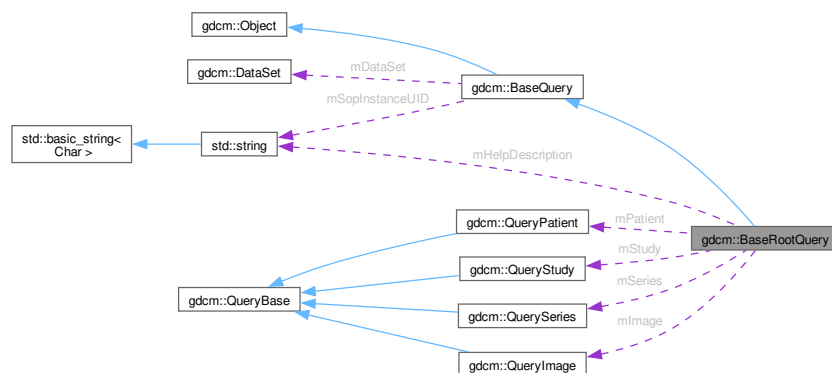
[BaseRootQuery](#).

```
#include <gdcmBaseRootQuery.h>
```

Inheritance diagram for `gdcm::BaseRootQuery`:



Collaboration diagram for `gdcm::BaseRootQuery`:



## Public Member Functions

- [~BaseRootQuery](#) () override=default
- [EQueryLevel](#) [GetQueryLevelFromQueryRoot](#) ([ERootType](#) roottype)
- virtual [std::vector< Tag >](#) [GetTagListByLevel](#) (const [EQueryLevel](#) &inQueryLevel)=0
- virtual void [InitializeDataSet](#) (const [EQueryLevel](#) &inQueryLevel)=0
- bool [ValidateQuery](#) (bool inStrict=true) const override=0

## Public Member Functions inherited from [gdcm::BaseQuery](#)

- [~BaseQuery](#) () override
- void [AddQueryDataSet](#) (const [DataSet](#) &ds)
- virtual [UIDs::TSName](#) [GetAbstractSyntaxUID](#) () const =0
- [DataSet](#) & [GetQueryDataSet](#) ()
- [DataSet](#) const & [GetQueryDataSet](#) () const  
*Set/Get the internal representation of the query as a [DataSet](#).*
- [std::string](#) [GetSOPInstanceUID](#) () const
- void [Print](#) ([std::ostream](#) &os) const override
- void [SetSearchParameter](#) (const [std::string](#) &inKeyword, const [std::string](#) &inValue)
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [std::string](#) &inValue)
- void [SetSOPInstanceUID](#) (const [std::string](#) &iSopInstanceUID)
- const [std::ostream](#) & [WriteHelpFile](#) ([std::ostream](#) &os)
- bool [WriteQuery](#) (const [std::string](#) &inFileName)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

## Static Public Member Functions

- static [QueryBase](#) \* [Construct](#) ([ERootType](#) inRootType, [EQueryLevel](#) qllevel)
- static int [GetQueryLevelFromString](#) (const char \*str)
- static const char \* [GetQueryLevelString](#) ([EQueryLevel](#) ql)

## Protected Member Functions

- [BaseRootQuery](#) ()

## Protected Member Functions inherited from [gdcm::BaseQuery](#)

- [BaseQuery](#) ()
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [DictEntry](#) &inDictEntry, const [std::string](#) &inValue)
- bool [ValidDataSet](#) (const [DataSet](#) &dataSetToValid, const [DataSet](#) &dataSetReference) const



## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## Protected Attributes

- std::string [mHelpDescription](#)
- [QueryImage](#) [mImage](#)
- [QueryPatient](#) [mPatient](#)
- [ERootType](#) [mRootType](#)
- [QuerySeries](#) [mSeries](#)
- [QueryStudy](#) [mStudy](#)

## Protected Attributes inherited from [gdcm::BaseQuery](#)

- [DataSet](#) [mDataSet](#)
- std::string [mSopInstanceUID](#)

## Friends

- class [QueryFactory](#)

## 12.32.1 Detailed Description

[BaseRootQuery](#).

contains: a baseclass which will produce a dataset for c-find and c-move with patient/study root

This class contains the functionality used in patient c-find and c-move queries. [PatientRootQuery](#) and [StudyRootQuery](#) derive from this class.

Namely: 1) list all tags associated with a particular query type 2) produce a query dataset via tag association

Eventually, it can be used to validate a particular dataset type.

The dataset held by this object (or, really, one of its derivatives) should be passed to a c-find or c-move query.

## 12.32.2 Constructor & Destructor Documentation

### 12.32.2.1 [BaseRootQuery](#)()

```
gdcm::BaseRootQuery::BaseRootQuery () [protected]
```

### 12.32.2.2 ~BaseRootQuery()

```
gdcmm::BaseRootQuery::~~BaseRootQuery () [override], [default]
```

## 12.32.3 Member Function Documentation

### 12.32.3.1 Construct()

```
QueryBase * gdcmm::BaseRootQuery::Construct (
    ERootType inRootType,
    EQueryLevel qllevel) [static]
```

### 12.32.3.2 GetQueryLevelFromQueryRoot()

```
EQueryLevel gdcmm::BaseRootQuery::GetQueryLevelFromQueryRoot (
    ERootType roottype)
```

### 12.32.3.3 GetQueryLevelFromString()

```
int gdcmm::BaseRootQuery::GetQueryLevelFromString (
    const char * str) [static]
```

### 12.32.3.4 GetQueryLevelString()

```
const char * gdcmm::BaseRootQuery::GetQueryLevelString (
    EQueryLevel ql) [static]
```

### 12.32.3.5 GetTagListByLevel()

```
virtual std::vector< Tag > gdcmm::BaseRootQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel) [pure virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implemented in [gdcmm::FindPatientRootQuery](#), [gdcmm::FindStudyRootQuery](#), [gdcmm::MovePatientRootQuery](#), [gdcmm::MoveStudyRootQuery](#), and [gdcmm::WLMFindQuery](#).

### 12.32.3.6 InitializeDataSet()

```
virtual void gdcm::BaseRootQuery::InitializeDataSet (  
    const EQueryLevel & inQueryLevel) [pure virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmTk

Implemented in [gdcm::FindPatientRootQuery](#), [gdcm::FindStudyRootQuery](#), [gdcm::MovePatientRootQuery](#), [gdcm::MoveStudyRootQuery](#), and [gdcm::WLMFindQuery](#).

### 12.32.3.7 ValidateQuery()

```
bool gdcm::BaseRootQuery::ValidateQuery (  
    bool inStrict = true) const [override], [pure virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements [gdcm::BaseQuery](#).

Implemented in [gdcm::FindPatientRootQuery](#), [gdcm::FindStudyRootQuery](#), [gdcm::MovePatientRootQuery](#), [gdcm::MoveStudyRootQuery](#), and [gdcm::WLMFindQuery](#).

## 12.32.4 Friends And Related Symbol Documentation

### 12.32.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

References [QueryFactory](#).

Referenced by [QueryFactory](#).

## 12.32.5 Member Data Documentation

### 12.32.5.1 mHelpDescription

```
std::string gdcm::BaseRootQuery::mHelpDescription [protected]
```

### 12.32.5.2 mImage

`QueryImage` `gdcm::BaseRootQuery::mImage` [protected]

### 12.32.5.3 mPatient

`QueryPatient` `gdcm::BaseRootQuery::mPatient` [protected]

### 12.32.5.4 mRootType

`ERootType` `gdcm::BaseRootQuery::mRootType` [protected]

### 12.32.5.5 mSeries

`QuerySeries` `gdcm::BaseRootQuery::mSeries` [protected]

### 12.32.5.6 mStudy

`QueryStudy` `gdcm::BaseRootQuery::mStudy` [protected]

The documentation for this class was generated from the following file:

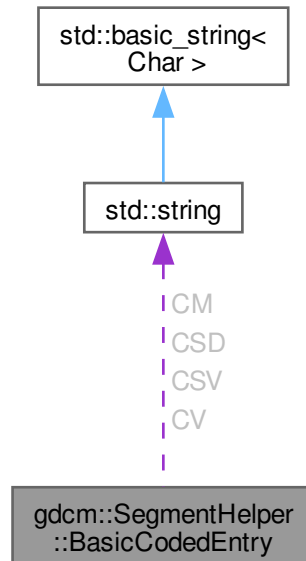
- [gdcmBaseRootQuery.h](#)

## 12.33 gdcm::SegmentHelper::BasicCodedEntry Struct Reference

This structure defines a basic coded entry with all of its attributes.

```
#include <gdcmSegmentHelper.h>
```

Collaboration diagram for gdcm::SegmentHelper::BasicCodedEntry:



### Public Member Functions

- [BasicCodedEntry](#) ()  
*Constructor.*
- [BasicCodedEntry](#) (const char \*\_a\_CV, const char \*\_a\_CSD, const char \*\_a\_CM)  
*constructor which defines type 1 attributes.*
- [BasicCodedEntry](#) (const char \*\_a\_CV, const char \*\_a\_CSD, const char \*\_a\_CSV, const char \*\_a\_CM)  
*constructor which defines attributes.*
- bool [IsEmpty](#) (const bool checkOptionalAttributes=false) const  
*Check if each attributes of the basic coded entry is defined.*

### Public Attributes

- std::string [CM](#)  
*Coding Scheme [Version](#) attribute.*
- std::string [CSD](#)  
*Code [Value](#) attribute.*
- std::string [CSV](#)  
*Coding Scheme Designator attribute.*
- std::string [CV](#)

### 12.33.1 Detailed Description

This structure defines a basic coded entry with all of its attributes.

See also

PS 3.3 section 8.8.

### 12.33.2 Constructor & Destructor Documentation

#### 12.33.2.1 BasicCodedEntry() [1/3]

```
gdcm::SegmentHelper::BasicCodedEntry::BasicCodedEntry () [inline]
```

Constructor.

References [CM](#), [CSD](#), [CSV](#), and [CV](#).

#### 12.33.2.2 BasicCodedEntry() [2/3]

```
gdcm::SegmentHelper::BasicCodedEntry::BasicCodedEntry (  
    const char * a_CV,  
    const char * a_CSD,  
    const char * a_CM) [inline]
```

constructor which defines type 1 attributes.

References [CM](#), [CSD](#), [CSV](#), and [CV](#).

#### 12.33.2.3 BasicCodedEntry() [3/3]

```
gdcm::SegmentHelper::BasicCodedEntry::BasicCodedEntry (  
    const char * a_CV,  
    const char * a_CSD,  
    const char * a_CSV,  
    const char * a_CM) [inline]
```

constructor which defines attributes.

References [CM](#), [CSD](#), [CSV](#), and [CV](#).

## 12.33.3 Member Function Documentation

### 12.33.3.1 IsEmpty()

```
bool gdcm::SegmentHelper::BasicCodedEntry::IsEmpty (
    const bool checkOptionalAttributes = false) const
```

Check if each attributes of the basic coded entry is defined.

#### Parameters

<i>checkOptionalAttributes</i>	Check also type 1C attributes.
--------------------------------	--------------------------------

## 12.33.4 Member Data Documentation

### 12.33.4.1 CM

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CM
```

Coding Scheme [Version](#) attribute.

Referenced by [BasicCodedEntry\(\)](#), [BasicCodedEntry\(\)](#), and [BasicCodedEntry\(\)](#).

### 12.33.4.2 CSD

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CSD
```

Code [Value](#) attribute.

Referenced by [BasicCodedEntry\(\)](#), [BasicCodedEntry\(\)](#), and [BasicCodedEntry\(\)](#).

### 12.33.4.3 CSV

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CSV
```

Coding Scheme Designator attribute.

Referenced by [BasicCodedEntry\(\)](#), [BasicCodedEntry\(\)](#), and [BasicCodedEntry\(\)](#).

### 12.33.4.4 CV

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CV
```

Referenced by [BasicCodedEntry\(\)](#), [BasicCodedEntry\(\)](#), and [BasicCodedEntry\(\)](#).

The documentation for this struct was generated from the following file:

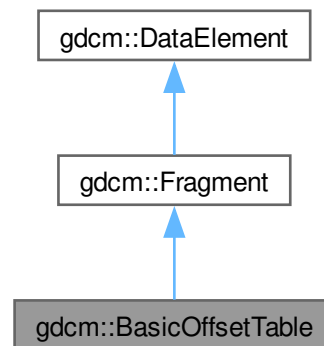
- [gdcmSegmentHelper.h](#)

## 12.34 gdcm::BasicOffsetTable Class Reference

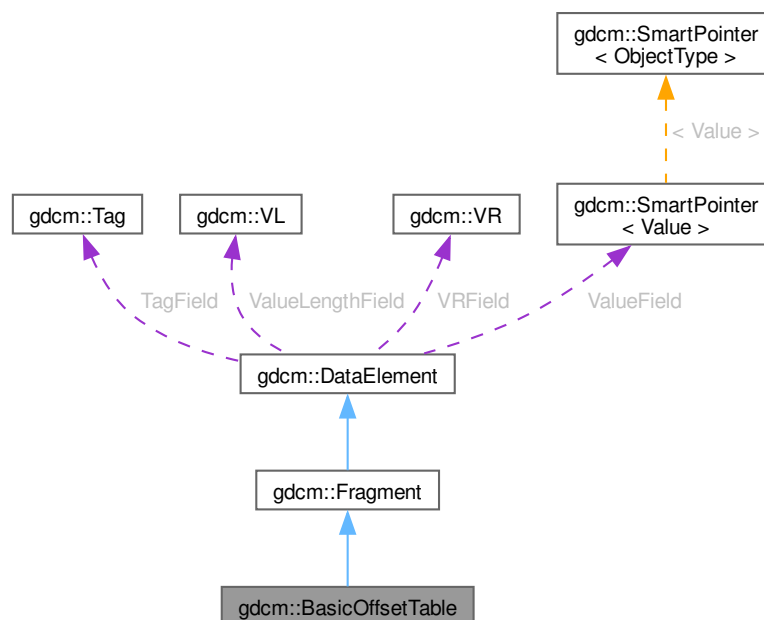
Class to represent a [BasicOffsetTable](#).

```
#include <gdcmBasicOffsetTable.h>
```

Inheritance diagram for gdcm::BasicOffsetTable:



Collaboration diagram for gdcm::BasicOffsetTable:





**Public Member Functions**

- [BasicOffsetTable](#) ()
- `template<typename TSwap>`  
`std::istream & Read (std::istream &is)`

**Public Member Functions inherited from [gdcm::Fragment](#)**

- [Fragment](#) ()
- [VL ComputeLength](#) () const
- [VL GetLength](#) () const
- `template<typename TSwap>`  
`std::istream & Read (std::istream &is)`
- `template<typename TSwap>`  
`std::istream & ReadBacktrack (std::istream &is)`
- `template<typename TSwap>`  
`std::istream & ReadPreValue (std::istream &is)`
- `template<typename TSwap>`  
`std::istream & ReadValue (std::istream &is)`
- `template<typename TSwap>`  
`std::ostream & Write (std::ostream &os) const`

**Public Member Functions inherited from [gdcm::DataElement](#)**

- [DataElement](#) (const [DataElement](#) &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()  
*Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()  
*Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- `template<typename TDE>`  
[VL GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const
- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const  
*Get [Tag](#).*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const  
*Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const  
*Get [VL](#).*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const  
*Check if Data [Element](#) is empty.*

- bool [IsUndefinedLength](#) () const  
*return if [Value](#) Length if of undefined length*
- bool [operator<](#) (const [DataElement](#) &de) const
- [DataElement](#) & [operator=](#) (const [DataElement](#) &)=default
- bool [operator==](#) (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TDE, typename TSwap>  
std::istream & [ReadOrSkip](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadValueWithLength](#) (std::istream &is, [VL](#) &length, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)
- void [SetByteValue](#) (const char \*array, [VL](#) length)
- void [SetTag](#) (const [Tag](#) &t)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVL](#) (const [VL](#) &vl)
- void [SetVLToUndefined](#) ()
- void [SetVR](#) ([VR](#) const &vr)
- template<typename TDE, typename TSwap>  
const std::ostream & [Write](#) (std::ostream &os) const

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [BasicOffsetTable](#) &val)

## Additional Inherited Members

## Protected Types inherited from [gdcm::DataElement](#)

- typedef [SmartPointer](#)< [Value](#) > [ValuePtr](#)

## Protected Member Functions inherited from [gdcm::DataElement](#)

- void [SetValueFieldLength](#) ([VL](#) vl, bool readvalues)

## Protected Attributes inherited from [gdcm::DataElement](#)

- [Tag](#) TagField
- [ValuePtr](#) ValueField
- [VL](#) ValueLengthField
- [VR](#) VRField

## 12.34.1 Detailed Description

Class to represent a [BasicOffsetTable](#).

## 12.34.2 Constructor & Destructor Documentation

### 12.34.2.1 BasicOffsetTable()

```
gdcm::BasicOffsetTable::BasicOffsetTable () [inline]
```

References [gdcm::Fragment::Fragment\(\)](#).

Referenced by [operator<<](#).

## 12.34.3 Member Function Documentation

### 12.34.3.1 Read()

```
template<typename TSwap>
std::istream & gdcm::BasicOffsetTable::Read (
    std::istream & is) [inline]
```

References [gdcmAssertAlwaysMacro](#), [gdcm::ParseException::SetLastElement\(\)](#), [gdcm::DataElement::TagField](#), [gdcm::DataElement::ValueField](#), and [gdcm::DataElement::ValueLengthField](#).

## 12.34.4 Friends And Related Symbol Documentation

### 12.34.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const BasicOffsetTable & val) [friend]
```

References [BasicOffsetTable\(\)](#), [gdcm::DataElement::GetByteValue\(\)](#), [operator<<](#), [gdcm::DataElement::ValueField](#), and [gdcm::DataElement::ValueLengthField](#).

Referenced by [operator<<](#).

The documentation for this class was generated from the following file:

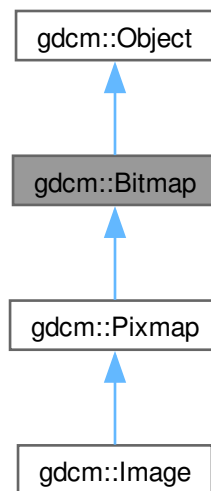
- [gdcmBasicOffsetTable.h](#)

## 12.35 gdcm::Bitmap Class Reference

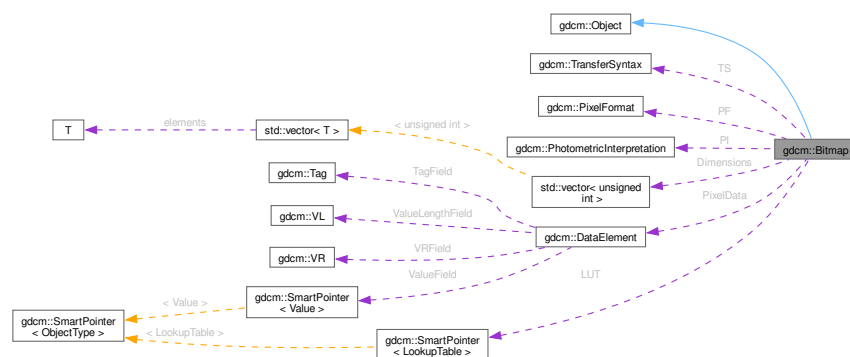
[Bitmap](#) class.

```
#include <gdcmBitmap.h>
```

Inheritance diagram for `gdcm::Bitmap`:



Collaboration diagram for `gdcm::Bitmap`:



## Public Member Functions

- [Bitmap](#) ()
- [~Bitmap](#) () override
- virtual bool [AreOverlaysInPixelData](#) () const
- void [Clear](#) ()
- bool [GetBuffer](#) (char \*buffer) const  
*Access the raw data.*
- unsigned long [GetBufferLength](#) () const
- unsigned int [GetColumns](#) () const
- [DataElement](#) & [GetDataElement](#) ()
- const [DataElement](#) & [GetDataElement](#) () const
- unsigned int [GetDimension](#) (unsigned int idx) const
- const unsigned int \* [GetDimensions](#) () const  
*Return the dimension of the pixel data, first dimension (x), then 2nd (y), then 3rd (z)...*
- [LookupTable](#) & [GetLUT](#) ()
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const  
*INTERNAL do not use.*
- unsigned int [GetNumberOfDimensions](#) () const  
*Return the number of dimension of the pixel data bytes; for example 2 for a 2D matrices of values.*
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const  
*return the photometric interpretation*
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const  
*Get/Set PixelFormat.*
- unsigned int [GetPlanarConfiguration](#) () const  
*return the planar configuration*
- unsigned int [GetRows](#) () const
- const [TransferSyntax](#) & [GetTransferSyntax](#) () const
- bool [IsEmpty](#) () const
- bool [IsLossy](#) () const  
*Return whether or not the image was compressed using a lossy compressor or not.*
- bool [IsTransferSyntaxCompatible](#) ([TransferSyntax](#) const &ts) const
- void [Print](#) (std::ostream &) const override
- void [SetColumns](#) (unsigned int col)
- void [SetDataElement](#) ([DataElement](#) const &de)
- void [SetDimension](#) (unsigned int idx, unsigned int dim)
- void [SetDimensions](#) (const unsigned int dims[3])
- void [SetLossyFlag](#) (bool f)  
*Specifically set that the image was compressed using a lossy compression mechanism.*
- void [SetLUT](#) ([LookupTable](#) const &lut)  
*Set/Get LUT.*
- void [SetNeedByteSwap](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)
- void [SetRows](#) (unsigned int rows)
- void [SetTransferSyntax](#) ([TransferSyntax](#) const &ts)  
*Transfer syntax.*
- virtual bool [UnusedBitsPresentInPixelData](#) () const

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

## Protected Types

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

## Protected Member Functions

- bool [ComputeLossyFlag](#) ()
- bool [GetBuffer2](#) (std::ostream &os) const
- bool [TryJPEG2000Codec](#) (char \*buffer, bool &lossyflag) const
- bool [TryJPEG2000Codec2](#) (std::ostream &os) const
- bool [TryJPEGCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryJPEGCodec2](#) (std::ostream &os) const
- bool [TryJPEGLSCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryKAKADUCoec](#) (char \*buffer, bool &lossyflag) const
- bool [TryPVRGCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryRAWCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryRLECodec](#) (char \*buffer, bool &lossyflag) const

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## Protected Attributes

- std::vector< unsigned int > [Dimensions](#)
- bool [LossyFlag](#)
- [LUTPtr](#) [LUT](#)
- bool [NeedByteSwap](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) [PF](#)
- [PhotometricInterpretation](#) [PI](#)
- [DataElement](#) [PixelData](#)
- unsigned int [PlanarConfiguration](#)
- [TransferSyntax](#) [TS](#)

## Friends

- class [ImageChangeTransferSyntax](#)
- class [PixmapReader](#)

## 12.35.1 Detailed Description

[Bitmap](#) class.

A bitmap based image. Used as parent for both [IconImage](#) and the main Pixel Data [Image](#) It does not contains any World Space information (IPP, IOP)

## 12.35.2 Member Typedef Documentation

### 12.35.2.1 LUTPtr

```
typedef SmartPointer<LookupTable> gdcm::Bitmap::LUTPtr [protected]
```

## 12.35.3 Constructor & Destructor Documentation

### 12.35.3.1 Bitmap()

```
gdcm::Bitmap::Bitmap ()
```

### 12.35.3.2 ~Bitmap()

```
gdcm::Bitmap::~~Bitmap () [override]
```

## 12.35.4 Member Function Documentation

### 12.35.4.1 AreOverlaysInPixelData()

```
virtual bool gdcm::Bitmap::AreOverlaysInPixelData () const [inline], [virtual]
```

Reimplemented in [gdcm::Pixmap](#).

### 12.35.4.2 Clear()

```
void gdcm::Bitmap::Clear ()
```

#### 12.35.4.3 ComputeLossyFlag()

```
bool gdcm::Bitmap::ComputeLossyFlag () [protected]
```

#### 12.35.4.4 GetBuffer()

```
bool gdcm::Bitmap::GetBuffer (
    char * buffer) const
```

Access the raw data.

##### Examples

[BasicImageAnonymizer.cs](#), [ConvertToQImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [GetArray.cs](#), [ReadMultiTimesException.cxx](#), and [threadgdcm.cxx](#).

#### 12.35.4.5 GetBuffer2()

```
bool gdcm::Bitmap::GetBuffer2 (
    std::ostream & os) const [protected]
```

#### 12.35.4.6 GetBufferLength()

```
unsigned long gdcm::Bitmap::GetBufferLength () const
```

Return the length of the image after decompression WARNING for palette color: It will NOT take into account the Palette Color thus you need to multiply this length by 3 if computing the size of equivalent RGB image

##### Examples

[BasicImageAnonymizer.cs](#), [ConvertToQImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [GetArray.cs](#), [PatchFile.cxx](#), [ReadMultiTimesException.cxx](#), [RescaleImage.cs](#), and [threadgdcm.cxx](#).

#### 12.35.4.7 GetColumns()

```
unsigned int gdcm::Bitmap::GetColumns () const [inline]
```

References [GetDimension\(\)](#).

#### 12.35.4.8 GetDataElement() [1/2]

```
DataElement & gdcm::Bitmap::GetDataElement () [inline]
```

References [PixelData](#).



#### 12.35.4.9 GetDataElement() [2/2]

```
const DataElement & gdcm::Bitmap::GetDataElement () const [inline]
```

##### Examples

[ExtractIconFromFile.cxx](#).

References [PixelData](#).

#### 12.35.4.10 GetDimension()

```
unsigned int gdcm::Bitmap::GetDimension (  
    unsigned int idx) const
```

##### Examples

[BasicImageAnonymizer.cs](#), [DecompressImage.cs](#), and [GetArray.cs](#).

Referenced by [GetColumns\(\)](#), and [GetRows\(\)](#).

#### 12.35.4.11 GetDimensions()

```
const unsigned int * gdcm::Bitmap::GetDimensions () const
```

Return the dimension of the pixel data, first dimension (x), then 2nd (y), then 3rd (z)...

##### Examples

[ConvertToQImage.cxx](#), [ExtractIconFromFile.cxx](#), [FixJAIBugJPEGLS.cxx](#), [HelloVizWorld.cxx](#), and [threadgdcm.cxx](#).

#### 12.35.4.12 GetLUT() [1/2]

```
LookupTable & gdcm::Bitmap::GetLUT () [inline]
```

References [LUT](#).

#### 12.35.4.13 GetLUT() [2/2]

```
const LookupTable & gdcm::Bitmap::GetLUT () const [inline]
```

##### Examples

[ExtractIconFromFile.cxx](#), [ExtractImageRegionWithLUT.cs](#), and [PrintLUT.cxx](#).

References [LUT](#).

#### 12.35.4.14 GetNeedByteSwap()

```
bool gdcm::Bitmap::GetNeedByteSwap () const [inline]
```

INTERNAL do not use.

References [NeedByteSwap](#).

#### 12.35.4.15 GetNumberOfDimensions()

```
unsigned int gdcm::Bitmap::GetNumberOfDimensions () const
```

Return the number of dimension of the pixel data bytes; for example 2 for a 2D matrices of values.

Examples

[DecompressImage.cs](#), [GetArray.cs](#), [HelloVizWorld.cxx](#), and [threadgdcm.cxx](#).

#### 12.35.4.16 GetPhotometricInterpretation()

```
const PhotometricInterpretation & gdcm::Bitmap::GetPhotometricInterpretation () const
```

return the photometric interpretation

Examples

[ConvertToQImage.cxx](#), [DecompressImage.cs](#), [ExtractIconFromFile.cxx](#), and [HelloVizWorld.cxx](#).

#### 12.35.4.17 GetPixelFormat() [1/2]

```
PixelFormat & gdcm::Bitmap::GetPixelFormat () [inline]
```

References [PF](#).

#### 12.35.4.18 GetPixelFormat() [2/2]

```
const PixelFormat & gdcm::Bitmap::GetPixelFormat () const [inline]
```

Get/Set [PixelFormat](#).

Examples

[ConvertToQImage.cxx](#), [DecompressImage.cs](#), [ExtractIconFromFile.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [RescaleImage.cs](#), [TemplateEmptyImage.cxx](#), and [threadgdcm.cxx](#).

References [PF](#).

#### 12.35.4.19 GetPlanarConfiguration()

```
unsigned int gdcm::Bitmap::GetPlanarConfiguration () const
```

return the planar configuration

#### 12.35.4.20 GetRows()

```
unsigned int gdcm::Bitmap::GetRows () const [inline]
```

References [GetDimension\(\)](#).

#### 12.35.4.21 GetTransferSyntax()

```
const TransferSyntax & gdcm::Bitmap::GetTransferSyntax () const [inline]
```

##### Examples

[ExtractIconFromFile.cxx](#).

References [TS](#).

#### 12.35.4.22 IsEmpty()

```
bool gdcm::Bitmap::IsEmpty () const [inline]
```

References [Dimensions](#).

#### 12.35.4.23 IsLossy()

```
bool gdcm::Bitmap::IsLossy () const
```

Return whether or not the image was compressed using a lossy compressor or not.

#### 12.35.4.24 IsTransferSyntaxCompatible()

```
bool gdcm::Bitmap::IsTransferSyntaxCompatible (  
    TransferSyntax const & ts) const
```

#### 12.35.4.25 Print()

```
void gdcM::Bitmap::Print (
    std::ostream & ) const [override], [virtual]
```

Reimplemented from [gdcM::Object](#).

Reimplemented in [gdcM::Image](#), and [gdcM::Pixmap](#).

##### Examples

[ExtractIconFromFile.cxx](#).

#### 12.35.4.26 SetColumns()

```
void gdcM::Bitmap::SetColumns (
    unsigned int col) [inline]
```

References [SetDimension\(\)](#).

#### 12.35.4.27 SetDataElement()

```
void gdcM::Bitmap::SetDataElement (
    DataElement const & de) [inline]
```

##### Examples

[BasicImageAnonymizer.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.c](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

References [PixelData](#).

#### 12.35.4.28 SetDimension()

```
void gdcM::Bitmap::SetDimension (
    unsigned int idx,
    unsigned int dim)
```

##### Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

Referenced by [SetColumns\(\)](#), and [SetRows\(\)](#).

#### 12.35.4.29 SetDimensions()

```
void gdcm::Bitmap::SetDimensions (
    const unsigned int dims[3])
```

##### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), and [DecompressImage.cs](#).

#### 12.35.4.30 SetLossyFlag()

```
void gdcm::Bitmap::SetLossyFlag (
    bool f) [inline]
```

Specifically set that the image was compressed using a lossy compression mechanism.

References [LossyFlag](#).

#### 12.35.4.31 SetLUT()

```
void gdcm::Bitmap::SetLUT (
    LookupTable const & lut) [inline]
```

Set/Get LUT.

References [LUT](#), and [gdcm::Object::SmartPointer](#).

#### 12.35.4.32 SetNeedByteSwap()

```
void gdcm::Bitmap::SetNeedByteSwap (
    bool b) [inline]
```

References [NeedByteSwap](#).

#### 12.35.4.33 SetNumberOfDimensions()

```
void gdcm::Bitmap::SetNumberOfDimensions (
    unsigned int dim)
```

##### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

#### 12.35.4.34 SetPhotometricInterpretation()

```
void gdcM::Bitmap::SetPhotometricInterpretation (
    PhotometricInterpretation const & pi)
```

##### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

#### 12.35.4.35 SetPixelFormat()

```
void gdcM::Bitmap::SetPixelFormat (
    PixelFormat const & pf) [inline]
```

##### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

References [PF](#).

#### 12.35.4.36 SetPlanarConfiguration()

```
void gdcM::Bitmap::SetPlanarConfiguration (
    unsigned int pc)
```

##### Warning

you need to call `SetPixelFormat` first (before `SetPlanarConfiguration`) for consistency checking

#### 12.35.4.37 SetRows()

```
void gdcM::Bitmap::SetRows (
    unsigned int rows) [inline]
```

References [SetDimension\(\)](#).

#### 12.35.4.38 SetTransferSyntax()

```
void gdcm::Bitmap::SetTransferSyntax (
    TransferSyntax const & ts) [inline]
```

Transfer syntax.

##### Examples

[BasicImageAnonymizer.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [MergeTwoFiles.cxx](#), and [MpegVideoInfo.cs](#).

References [TS](#).

#### 12.35.4.39 TryJPEG2000Codec()

```
bool gdcm::Bitmap::TryJPEG2000Codec (
    char * buffer,
    bool & lossyflag) const [protected]
```

#### 12.35.4.40 TryJPEG2000Codec2()

```
bool gdcm::Bitmap::TryJPEG2000Codec2 (
    std::ostream & os) const [protected]
```

#### 12.35.4.41 TryJPEGCodec()

```
bool gdcm::Bitmap::TryJPEGCodec (
    char * buffer,
    bool & lossyflag) const [protected]
```

#### 12.35.4.42 TryJPEGCodec2()

```
bool gdcm::Bitmap::TryJPEGCodec2 (
    std::ostream & os) const [protected]
```

#### 12.35.4.43 TryJPEGLSCodec()

```
bool gdcm::Bitmap::TryJPEGLSCodec (
    char * buffer,
    bool & lossyflag) const [protected]
```

#### 12.35.4.44 TryKAKADUCodec()

```
bool gdcmm::Bitmap::TryKAKADUCodec (
    char * buffer,
    bool & lossyflag) const [protected]
```

#### 12.35.4.45 TryPVRGCodec()

```
bool gdcmm::Bitmap::TryPVRGCodec (
    char * buffer,
    bool & lossyflag) const [protected]
```

#### 12.35.4.46 TryRAWCodec()

```
bool gdcmm::Bitmap::TryRAWCodec (
    char * buffer,
    bool & lossyflag) const [protected]
```

#### 12.35.4.47 TryRLECodec()

```
bool gdcmm::Bitmap::TryRLECodec (
    char * buffer,
    bool & lossyflag) const [protected]
```

#### 12.35.4.48 UnusedBitsPresentInPixelData()

```
virtual bool gdcmm::Bitmap::UnusedBitsPresentInPixelData () const [inline], [virtual]
```

Reimplemented in [gdcmm::Pixmap](#).

### 12.35.5 Friends And Related Symbol Documentation

#### 12.35.5.1 ImageChangeTransferSyntax

```
friend class ImageChangeTransferSyntax [friend]
```

References [ImageChangeTransferSyntax](#).

Referenced by [ImageChangeTransferSyntax](#).



### 12.35.5.2 PixmapReader

```
friend class PixmapReader [friend]
```

References [PixmapReader](#).

Referenced by [PixmapReader](#).

## 12.35.6 Member Data Documentation

### 12.35.6.1 Dimensions

```
std::vector<unsigned int> gdcm::Bitmap::Dimensions [protected]
```

Referenced by [IsEmpty\(\)](#).

### 12.35.6.2 LossyFlag

```
bool gdcm::Bitmap::LossyFlag [protected]
```

Referenced by [SetLossyFlag\(\)](#).

### 12.35.6.3 LUT

```
LUTPtr gdcm::Bitmap::LUT [protected]
```

Referenced by [GetLUT\(\)](#), [GetLUT\(\)](#), and [SetLUT\(\)](#).

### 12.35.6.4 NeedByteSwap

```
bool gdcm::Bitmap::NeedByteSwap [protected]
```

Referenced by [GetNeedByteSwap\(\)](#), and [SetNeedByteSwap\(\)](#).

### 12.35.6.5 NumberOfDimensions

```
unsigned int gdcm::Bitmap::NumberOfDimensions [protected]
```

### 12.35.6.6 PF

```
PixelFormat gdcm::Bitmap::PF [protected]
```

Referenced by [GetPixelFormat\(\)](#), [GetPixelFormat\(\)](#), and [SetPixelFormat\(\)](#).

### 12.35.6.7 PI

`PhotometricInterpretation` `gdcm::Bitmap::PI` [protected]

### 12.35.6.8 PixelData

`DataElement` `gdcm::Bitmap::PixelData` [protected]

Referenced by [GetDataElement\(\)](#), [GetDataElement\(\)](#), and [SetDataElement\(\)](#).

### 12.35.6.9 PlanarConfiguration

`unsigned int` `gdcm::Bitmap::PlanarConfiguration` [protected]

### 12.35.6.10 TS

`TransferSyntax` `gdcm::Bitmap::TS` [protected]

Referenced by [GetTransferSyntax\(\)](#), and [SetTransferSyntax\(\)](#).

The documentation for this class was generated from the following file:

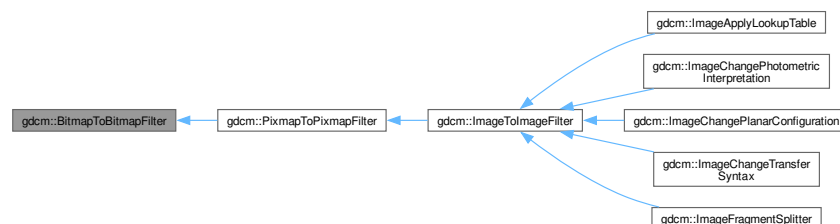
- [gdcmBitmap.h](#)

## 12.36 gdcm::BitmapToBitmapFilter Class Reference

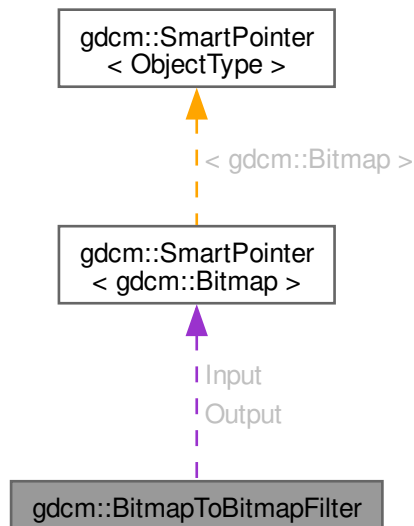
[BitmapToBitmapFilter](#) class.

```
#include <gdcmBitmapToBitmapFilter.h>
```

Inheritance diagram for `gdcm::BitmapToBitmapFilter`:



Collaboration diagram for gdcm::BitmapToBitmapFilter:



### Public Member Functions

- [BitmapToBitmapFilter](#) ()
- [~BitmapToBitmapFilter](#) ()=default
- const [Bitmap](#) & [GetOutput](#) () const  
*Get Output image.*
- const [Bitmap](#) & [GetOutputAsBitmap](#) () const
- void [SetInput](#) (const [Bitmap](#) &image)  
*Set input image.*

### Protected Attributes

- [SmartPointer](#)< [Bitmap](#) > [Input](#)
- [SmartPointer](#)< [Bitmap](#) > [Output](#)

## 12.36.1 Detailed Description

[BitmapToBitmapFilter](#) class.

Super class for all filter taking an image and producing an output image

## 12.36.2 Constructor & Destructor Documentation

### 12.36.2.1 BitmapToBitmapFilter()

```
gdcM::BitmapToBitmapFilter::BitmapToBitmapFilter ()
```

### 12.36.2.2 ~BitmapToBitmapFilter()

```
gdcM::BitmapToBitmapFilter::~~BitmapToBitmapFilter () [default]
```

## 12.36.3 Member Function Documentation

### 12.36.3.1 GetOutput()

```
const Bitmap & gdcM::BitmapToBitmapFilter::GetOutput () const [inline]
```

Get Output image.

References [Output](#).

### 12.36.3.2 GetOutputAsBitmap()

```
const Bitmap & gdcM::BitmapToBitmapFilter::GetOutputAsBitmap () const
```

### 12.36.3.3 SetInput()

```
void gdcM::BitmapToBitmapFilter::SetInput (  
    const Bitmap & image)
```

Set input image.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), and [StandardizeFiles.cs](#).

## 12.36.4 Member Data Documentation

### 12.36.4.1 Input

```
SmartPointer<Bitmap> gdcM::BitmapToBitmapFilter::Input [protected]
```

### 12.36.4.2 Output

`SmartPointer<Bitmap> gdcm::BitmapToBitmapFilter::Output` [protected]

Referenced by `GetOutput()`.

The documentation for this class was generated from the following file:

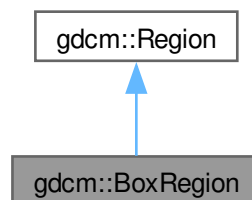
- `gdcmBitmapToBitmapFilter.h`

## 12.37 gdcm::BoxRegion Class Reference

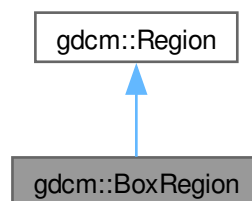
Class for manipulation box region.

```
#include <gdcmBoxRegion.h>
```

Inheritance diagram for `gdcm::BoxRegion`:



Collaboration diagram for `gdcm::BoxRegion`:



## Public Member Functions

- [BoxRegion](#) ()
- [BoxRegion](#) (const [BoxRegion](#) &)  
*copy/cstor and al.*
- [~BoxRegion](#) () override
- [size\\_t Area](#) () const override  
*compute the area*
- [Region \\* Clone](#) () const override
- [BoxRegion ComputeBoundingBox](#) () override  
*Return the Axis-Aligned minimum bounding box for all regions.*
- [bool Empty](#) () const override  
*return whether this domain is empty:*
- [unsigned int GetXMax](#) () const
- [unsigned int GetXMin](#) () const  
*Get domain.*
- [unsigned int GetYMax](#) () const
- [unsigned int GetYMin](#) () const
- [unsigned int GetZMax](#) () const
- [unsigned int GetZMin](#) () const
- [bool IsValid](#) () const override  
*return whether this is valid domain*
- [void operator=](#) (const [BoxRegion](#) &)
- [void Print](#) (std::ostream &os=std::cout) const override  
*Print.*
- [void SetDomain](#) (unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax)  
*Set domain.*

## Public Member Functions inherited from [gdcm::Region](#)

- [Region](#) ()
- virtual [~Region](#) ()

## Static Public Member Functions

- static [BoxRegion BoundingBox](#) ([BoxRegion](#) const &b1, [BoxRegion](#) const &b2)  
*Helper class to compute the bounding box of two [BoxRegion](#).*

### 12.37.1 Detailed Description

Class for manipulation box region.

This is a very simple implementation of the [Region](#) class. It only support 3D box type region. It assumes the 3D Box does not have a tilt Origin is as (0,0,0)

#### Examples

[ExtractImageRegion.cs](#), and [ExtractImageRegionWithLUT.cs](#).

## 12.37.2 Constructor & Destructor Documentation

### 12.37.2.1 BoxRegion() [1/2]

```
gdcm::BoxRegion::BoxRegion ()
```

Referenced by [BoxRegion\(\)](#), [BoundingBox\(\)](#), [ComputeBoundingBox\(\)](#), and [operator=\(\)](#).

### 12.37.2.2 ~BoxRegion()

```
gdcm::BoxRegion::~~BoxRegion () [override]
```

### 12.37.2.3 BoxRegion() [2/2]

```
gdcm::BoxRegion::BoxRegion (  
    const BoxRegion & )
```

copy/cstor and al.

References [BoxRegion\(\)](#).

## 12.37.3 Member Function Documentation

### 12.37.3.1 Area()

```
size_t gdcm::BoxRegion::Area () const [override], [virtual]
```

compute the area

Implements [gdcm::Region](#).

### 12.37.3.2 BoundingBox()

```
BoxRegion gdcm::BoxRegion::BoundingBox (  
    BoxRegion const & b1,  
    BoxRegion const & b2) [static]
```

Helper class to compute the bounding box of two [BoxRegion](#).

References [BoxRegion\(\)](#).

### 12.37.3.3 Clone()

```
Region * gdcM::BoxRegion::Clone () const [override], [virtual]
```

Implements [gdcM::Region](#).

References [gdcM::Region::Region\(\)](#).

### 12.37.3.4 ComputeBoundingBox()

```
BoxRegion gdcM::BoxRegion::ComputeBoundingBox () [override], [virtual]
```

Return the Axis-Aligned minimum bounding box for all regions.

Implements [gdcM::Region](#).

References [BoxRegion\(\)](#).

### 12.37.3.5 Empty()

```
bool gdcM::BoxRegion::Empty () const [override], [virtual]
```

return whether this domain is empty:

Implements [gdcM::Region](#).

### 12.37.3.6 GetXMax()

```
unsigned int gdcM::BoxRegion::GetXMax () const
```

### 12.37.3.7 GetXMin()

```
unsigned int gdcM::BoxRegion::GetXMin () const
```

Get domain.

### 12.37.3.8 GetYMax()

```
unsigned int gdcM::BoxRegion::GetYMax () const
```

### 12.37.3.9 GetYMin()

```
unsigned int gdcM::BoxRegion::GetYMin () const
```



### 12.37.3.10 GetZMax()

```
unsigned int gdcm::BoxRegion::GetZMax () const
```

### 12.37.3.11 GetZMin()

```
unsigned int gdcm::BoxRegion::GetZMin () const
```

### 12.37.3.12 IsValid()

```
bool gdcm::BoxRegion::IsValid () const [override], [virtual]
```

return whether this is valid domain

Implements [gdcm::Region](#).

### 12.37.3.13 operator=()

```
void gdcm::BoxRegion::operator= (
    const BoxRegion & )
```

References [BoxRegion\(\)](#).

### 12.37.3.14 Print()

```
void gdcm::BoxRegion::Print (
    std::ostream & os = std::cout) const [override], [virtual]
```

Print.

Reimplemented from [gdcm::Region](#).

### 12.37.3.15 SetDomain()

```
void gdcm::BoxRegion::SetDomain (
    unsigned int xmin,
    unsigned int xmax,
    unsigned int ymin,
    unsigned int ymax,
    unsigned int zmin,
    unsigned int zmax)
```

Set domain.

#### Examples

[ExtractImageRegion.cs](#), and [ExtractImageRegionWithLUT.cs](#).

The documentation for this class was generated from the following file:

- [gdcmBoxRegion.h](#)

## 12.38 gdcm::ByteBuffer Class Reference

[ByteBuffer](#).

```
#include <gdcmByteBuffer.h>
```

### Public Member Functions

- [ByteBuffer](#) ()
- char \* [Get](#) (int len)
- const char \* [GetStart](#) () const
- void [ShiftEnd](#) (int len)
- void [UpdatePosition](#) ()

### 12.38.1 Detailed Description

[ByteBuffer](#).

Detailed description here

#### Note

looks like a std::streambuf or std::filebuf class with the get and peek pointer

### 12.38.2 Constructor & Destructor Documentation

#### 12.38.2.1 ByteBuffer()

```
gdcm::ByteBuffer::ByteBuffer () [inline]
```

### 12.38.3 Member Function Documentation

#### 12.38.3.1 Get()

```
char * gdcm::ByteBuffer::Get (  
    int len) [inline]
```

#### 12.38.3.2 GetStart()

```
const char * gdcm::ByteBuffer::GetStart () const [inline]
```

### 12.38.3.3 ShiftEnd()

```
void gdcm::ByteBuffer::ShiftEnd (
    int len) [inline]
```

### 12.38.3.4 UpdatePosition()

```
void gdcm::ByteBuffer::UpdatePosition () [inline]
```

The documentation for this class was generated from the following file:

- [gdcmByteBuffer.h](#)

## 12.39 gdcm::ByteSwap< T > Class Template Reference

[ByteSwap](#).

```
#include <gdcmByteSwap.h>
```

### Static Public Member Functions

- static void [Swap](#) (T &p)
- static void [SwapFromSwapCodeIntoSystem](#) (T &p, [SwapCode](#) const &sc)
- static void [SwapRange](#) (T \*p, unsigned int num)
- static void [SwapRangeFromSwapCodeIntoSystem](#) (T \*p, [SwapCode](#) const &sc, std::streamoff num)
- static bool [SystemIsBigEndian](#) ()
- static bool [SystemIsLittleEndian](#) ()

### 12.39.1 Detailed Description

```
template<class T>
class gdcm::ByteSwap< T >
```

[ByteSwap](#).

Perform machine dependent byte swapping (Little Endian, Big Endian, Bad Little Endian, Bad Big Endian). TODO: bswap\_32 / bswap\_64 ...

### 12.39.2 Member Function Documentation

#### 12.39.2.1 Swap()

```
template<class T>
void gdcm::ByteSwap< T >::Swap (
    T & p) [static]
```

### 12.39.2.2 SwapFromSwapCodeIntoSystem()

```
template<class T>
void gdcmm::ByteSwap< T >::SwapFromSwapCodeIntoSystem (
    T & p,
    SwapCode const & sc) [static]
```

#### Examples

[TestByteSwap.cxx](#).

### 12.39.2.3 SwapRange()

```
template<class T>
void gdcmm::ByteSwap< T >::SwapRange (
    T * p,
    unsigned int num) [static]
```

### 12.39.2.4 SwapRangeFromSwapCodeIntoSystem()

```
template<class T>
void gdcmm::ByteSwap< T >::SwapRangeFromSwapCodeIntoSystem (
    T * p,
    SwapCode const & sc,
    std::streamoff num) [static]
```

#### Examples

[TestByteSwap.cxx](#).

### 12.39.2.5 SystemIsBigEndian()

```
template<class T>
bool gdcmm::ByteSwap< T >::SystemIsBigEndian () [static]
```

Query the machine Endian-ness.

#### Examples

[TestByteSwap.cxx](#).

### 12.39.2.6 SystemIsLittleEndian()

```
template<class T>
bool gdcm::ByteSwap< T >::SystemIsLittleEndian () [static]
```

#### Examples

[TestByteSwap.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmByteSwap.h](#)

## 12.40 gdcm::ByteSwapFilter Class Reference

[ByteSwapFilter](#).

```
#include <gdcmByteSwapFilter.h>
```

### Public Member Functions

- [ByteSwapFilter](#) (const [ByteSwapFilter](#) &)=delete
- [ByteSwapFilter](#) ([DataSet](#) &ds)
- [~ByteSwapFilter](#) ()=default
- bool [ByteSwap](#) ()
- [ByteSwapFilter](#) & [operator=](#) (const [ByteSwapFilter](#) &)=delete
- void [SetByteSwapTag](#) (bool b)

### 12.40.1 Detailed Description

[ByteSwapFilter](#).

In place byte-swapping of a dataset FIXME: FL status ??

### 12.40.2 Constructor & Destructor Documentation

#### 12.40.2.1 ByteSwapFilter() [1/2]

```
gdcm::ByteSwapFilter::ByteSwapFilter (
    DataSet & ds) [inline]
```

Referenced by [ByteSwapFilter\(\)](#), and [operator=\(\)](#).

### 12.40.2.2 ~ByteSwapFilter()

```
gdcm::ByteSwapFilter::~~ByteSwapFilter () [default]
```

### 12.40.2.3 ByteSwapFilter() [2/2]

```
gdcm::ByteSwapFilter::ByteSwapFilter (  
    const ByteSwapFilter & ) [delete]
```

References [ByteSwapFilter\(\)](#).

## 12.40.3 Member Function Documentation

### 12.40.3.1 ByteSwap()

```
bool gdcm::ByteSwapFilter::ByteSwap ()
```

Referenced by [gdcm::Item::Read\(\)](#).

### 12.40.3.2 operator=()

```
ByteSwapFilter & gdcm::ByteSwapFilter::operator= (  
    const ByteSwapFilter & ) [delete]
```

References [ByteSwapFilter\(\)](#).

### 12.40.3.3 SetByteSwapTag()

```
void gdcm::ByteSwapFilter::SetByteSwapTag (  
    bool b) [inline]
```

Referenced by [gdcm::Item::Read\(\)](#).

The documentation for this class was generated from the following file:

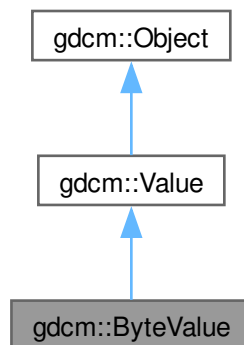
- [gdcmByteSwapFilter.h](#)

## 12.41 gdcm::ByteValue Class Reference

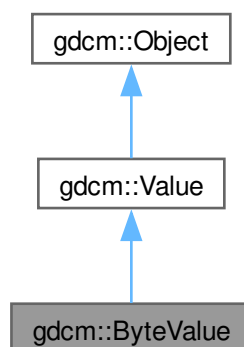
Class to represent binary value (array of bytes).

```
#include <gdcmByteValue.h>
```

Inheritance diagram for gdcm::ByteValue:



Collaboration diagram for gdcm::ByteValue:



## Public Member Functions

- [ByteValue](#) (const char \*array=nullptr, [VL](#) const &vl=0)
- [ByteValue](#) (std::vector< char > &v)
- [~ByteValue](#) () override
- void [Append](#) ([ByteValue](#) const &bv)
- void [Clear](#) () override
- [VL ComputeLength](#) () const
- void [Fill](#) (char c)
- bool [GetBuffer](#) (char \*buffer, unsigned long length) const
- [VL GetLength](#) () const override
- const char \* [GetPointer](#) () const
- void \* [GetVoidPointer](#) ()
- const void \* [GetVoidPointer](#) () const
- bool [IsEmpty](#) () const
- bool [IsPrintable](#) ([VL](#) length) const
 

*Checks whether a 'ByteValue' is printable or not (in order to avoid corrupting the terminal of invocation when printing) I don't think this function is working since it does not handle UNICODE or character set...*
- [operator const std::vector< char > &](#) () const
- [ByteValue](#) & [operator=](#) (const [ByteValue](#) &val)
- bool [operator==](#) (const [ByteValue](#) &val) const
- bool [operator==](#) (const [Value](#) &val) const override
- void [PrintASCII](#) (std::ostream &os, [VL](#) maxlength) const
- void [PrintASCIIXML](#) (std::ostream &os) const
- void [PrintGroupLength](#) (std::ostream &os)
- void [PrintHex](#) (std::ostream &os, [VL](#) maxlength) const
- void [PrintHexXML](#) (std::ostream &os) const
- void [PrintPNXML](#) (std::ostream &os) const
- template<typename TSwap>
   
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap, typename TType>
   
std::istream & [Read](#) (std::istream &is, bool readvalues=true)
- void [SetLength](#) ([VL](#) vl) override
- template<typename TSwap>
   
std::ostream const & [Write](#) (std::ostream &os) const
- template<typename TSwap, typename TType>
   
std::ostream const & [Write](#) (std::ostream &os) const
- bool [WriteBuffer](#) (std::ostream &os) const

## Public Member Functions inherited from [gdcm::Value](#)

- [Value](#) ()=default
- [~Value](#) () override=default

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)
- Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)



### Protected Member Functions

- void [Print](#) (std::ostream &os) const override
- void [SetLengthOnly](#) ([VL](#) vl) override

### Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

#### 12.41.1 Detailed Description

Class to represent binary value (array of bytes).

##### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetSubSequenceData.cxx](#), [MrProtocol.cxx](#), [PatchFile.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

#### 12.41.2 Constructor & Destructor Documentation

##### 12.41.2.1 ByteValue() [1/2]

```
gdcm::ByteValue::ByteValue (
    const char * array = nullptr,
    VL const & vl = 0) [inline]
```

Referenced by [Append\(\)](#), [operator=\(\)](#), [operator==\(\)](#), and [operator==\(\)](#).

##### 12.41.2.2 ByteValue() [2/2]

```
gdcm::ByteValue::ByteValue (
    std::vector< char > & v) [inline]
```

##### Warning

casting to uint32\_t

##### 12.41.2.3 ~ByteValue()

```
gdcm::ByteValue::~ByteValue () [inline], [override]
```

## 12.41.3 Member Function Documentation

### 12.41.3.1 Append()

```
void gdcM::ByteValue::Append (  
    ByteValue const & bv)
```

References [ByteValue\(\)](#).

### 12.41.3.2 Clear()

```
void gdcM::ByteValue::Clear () [inline], [override], [virtual]
```

Implements [gdcM::Value](#).

### 12.41.3.3 ComputeLength()

```
VL gdcM::ByteValue::ComputeLength () const [inline]
```

Referenced by [gdcM::Fragment::Write\(\)](#).

### 12.41.3.4 Fill()

```
void gdcM::ByteValue::Fill (  
    char c) [inline]
```

#### Examples

[DuplicatePCDE.cxx](#).

### 12.41.3.5 GetBuffer()

```
bool gdcM::ByteValue::GetBuffer (  
    char * buffer,  
    unsigned long length) const
```

#### Examples

[ExtractEncapsulatedFile.cs](#), and [FixJAIBugJPEGLS.cxx](#).

### 12.41.3.6 GetLength()

```
VL gdcm::ByteValue::GetLength () const [inline], [override], [virtual]
```

Implements [gdcm::Value](#).

#### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetSubSequenceData.cxx](#), [MrProtocol.cxx](#), [PatchFile.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcm::CSAElement::operator<<](#), [gdcm::SequenceOfFragments::ReadValue\(\)](#), [gdcm::Element< TVR, TVM >::Set\(\)](#), [gdcm::Element< TVR, VM::VM1\\_n >::Set\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValueNoSwap\(\)](#), [gdcm::Element< TVR, TVM >::SetNoSwap\(\)](#), [gdcm::Element< TVR, VM::VM1\\_n >::SetNoSwap\(\)](#), and [gdcm::Fragment::Write\(\)](#).

### 12.41.3.7 GetPointer()

```
const char * gdcm::ByteValue::GetPointer () const [inline]
```

#### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [GetSubSequenceData.cxx](#), [MrProtocol.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcm::CSAElement::operator<<](#), [gdcm::SequenceOfFragments::ReadValue\(\)](#), [gdcm::Element< TVR, TVM >::Set\(\)](#), [gdcm::Element< TVR, VM::VM1\\_n >::Set\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValueNoSwap\(\)](#), [gdcm::Element< TVR, TVM >::SetNoSwap\(\)](#), and [gdcm::Element< TVR, VM::VM1\\_n >::SetNoSwap\(\)](#).

### 12.41.3.8 GetVoidPointer() [1/2]

```
void * gdcm::ByteValue::GetVoidPointer () [inline]
```

### 12.41.3.9 GetVoidPointer() [2/2]

```
const void * gdcm::ByteValue::GetVoidPointer () const [inline]
```

#### Examples

[FixBrokenJ2K.cxx](#).

Referenced by [Read\(\)](#), and [gdcm::Element< TVR, VM::VM1\\_n >::Set\(\)](#).

#### 12.41.3.10 IsEmpty()

```
bool gdcM::ByteValue::IsEmpty () const [inline]
```

#### 12.41.3.11 IsPrintable()

```
bool gdcM::ByteValue::IsPrintable (
    VL length) const [inline]
```

Checks whether a 'ByteValue' is printable or not (in order to avoid corrupting the terminal of invocation when printing) ! don't think this function is working since it does not handle UNICODE or character set...

Referenced by [Print\(\)](#).

#### 12.41.3.12 operator const std::vector< char > &()

```
gdcM::ByteValue::operator const std::vector< char > & () const [inline]
```

#### 12.41.3.13 operator=()

```
ByteValue & gdcM::ByteValue::operator= (
    const ByteValue & val) [inline]
```

References [ByteValue\(\)](#).

#### 12.41.3.14 operator==( ) [1/2]

```
bool gdcM::ByteValue::operator== (
    const ByteValue & val) const [inline]
```

References [ByteValue\(\)](#).

#### 12.41.3.15 operator==( ) [2/2]

```
bool gdcM::ByteValue::operator== (
    const Value & val) const [inline], [override], [virtual]
```

Implements [gdcM::Value](#).

References [ByteValue\(\)](#), and [gdcM::Value::Value\(\)](#).

#### 12.41.3.16 Print()

```
void gdcmm::ByteValue::Print (
    std::ostream & os) const [inline], [override], [protected], [virtual]
```

Reimplemented from [gdcmm::Object](#).

References [IsPrintable\(\)](#).

#### 12.41.3.17 PrintASCII()

```
void gdcmm::ByteValue::PrintASCII (
    std::ostream & os,
    VL maxlength) const
```

#### 12.41.3.18 PrintASCIIXML()

```
void gdcmm::ByteValue::PrintASCIIXML (
    std::ostream & os) const
```

#### 12.41.3.19 PrintGroupLength()

```
void gdcmm::ByteValue::PrintGroupLength (
    std::ostream & os) [inline]
```

#### 12.41.3.20 PrintHex()

```
void gdcmm::ByteValue::PrintHex (
    std::ostream & os,
    VL maxlength) const
```

#### 12.41.3.21 PrintHexXML()

```
void gdcmm::ByteValue::PrintHexXML (
    std::ostream & os) const
```

#### 12.41.3.22 PrintPXML()

```
void gdcmm::ByteValue::PrintPXML (
    std::ostream & os) const
```

To Print Values in Native DICOM format

**12.41.3.23 Read()** [1/2]

```
template<typename TSwap>
std::istream & gdcm::ByteValue::Read (
    std::istream & is) [inline]
```

References [Read\(\)](#).

**12.41.3.24 Read()** [2/2]

```
template<typename TSwap, typename TType>
std::istream & gdcm::ByteValue::Read (
    std::istream & is,
    bool readvalues = true) [inline]
```

References [GetVoidPointer\(\)](#).

Referenced by [Read\(\)](#).

**12.41.3.25 SetLength()**

```
void gdcm::ByteValue::SetLength (
    VL v1) [override], [virtual]
```

Implements [gdcm::Value](#).

**12.41.3.26 SetLengthOnly()**

```
void gdcm::ByteValue::SetLengthOnly (
    VL v1) [inline], [override], [protected], [virtual]
```

Reimplemented from [gdcm::Value](#).

**12.41.3.27 Write()** [1/2]

```
template<typename TSwap>
std::ostream const & gdcm::ByteValue::Write (
    std::ostream & os) const [inline]
```

References [Write\(\)](#).

**12.41.3.28 Write()** [2/2]

```
template<typename TSwap, typename TType>
std::ostream const & gdcm::ByteValue::Write (
    std::ostream & os) const [inline]
```

Referenced by [Write\(\)](#), and [gdcm::Fragment::Write\(\)](#).

### 12.41.3.29 WriteBuffer()

```
bool gdcm::ByteValue::WriteBuffer (
    std::ostream & os) const [inline]
```

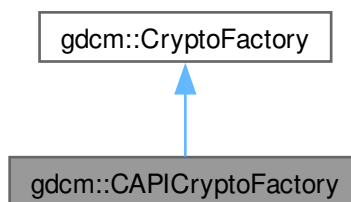
The documentation for this class was generated from the following file:

- [gdcmByteValue.h](#)

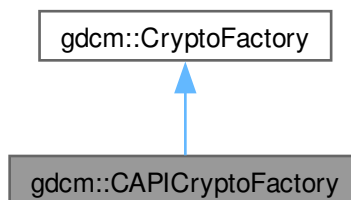
## 12.42 gdcm::CAPICryptoFactory Class Reference

```
#include <gdcmCAPICryptoFactory.h>
```

Inheritance diagram for gdcm::CAPICryptoFactory:



Collaboration diagram for gdcm::CAPICryptoFactory:



### Public Member Functions

- [CAPICryptoFactory](#) ([CryptoLib](#) id)
- [CryptographicMessageSyntax](#) \* [CreateCMSProvider](#) ()

## Additional Inherited Members

### Public Types inherited from [gdcM::CryptoFactory](#)

- enum [CryptoLib](#) {  
    [DEFAULT](#) = 0 ,  
    [OPENSSL](#) = 1 ,  
    [CAPI](#) = 2 ,  
    [OPENSSL7](#) = 3 }

### Static Public Member Functions inherited from [gdcM::CryptoFactory](#)

- static [CryptoFactory](#) \* [GetFactoryInstance](#) ([CryptoLib](#) id=[DEFAULT](#))

### Protected Member Functions inherited from [gdcM::CryptoFactory](#)

- [CryptoFactory](#) ()=default
- [CryptoFactory](#) ([CryptoLib](#) id)
- [~CryptoFactory](#) ()=default

## 12.42.1 Constructor & Destructor Documentation

### 12.42.1.1 CAPICryptoFactory()

```
gdcM::CAPICryptoFactory::CAPICryptoFactory (
    CryptoLib id)
```

Referenced by [CreateCMSProvider\(\)](#).

## 12.42.2 Member Function Documentation

### 12.42.2.1 CreateCMSProvider()

```
CryptographicMessageSyntax * gdcM::CAPICryptoFactory::CreateCMSProvider () [virtual]
```

Implements [gdcM::CryptoFactory](#).

References [CAPICryptoFactory\(\)](#).

The documentation for this class was generated from the following file:

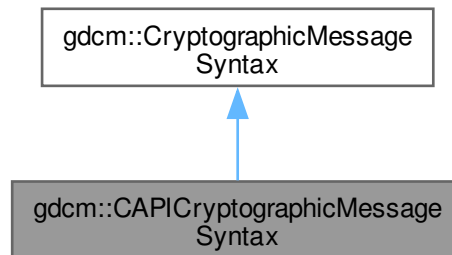
- [gdcMCAPICryptoFactory.h](#)



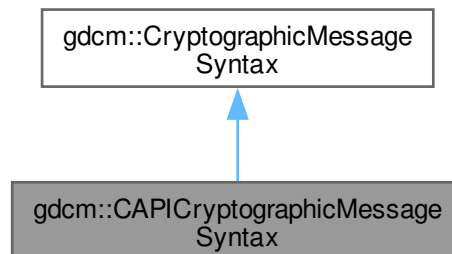
## 12.43 gdcm::CAPICryptographicMessageSyntax Class Reference

```
#include <gdcmCAPICryptographicMessageSyntax.h>
```

Inheritance diagram for gdcm::CAPICryptographicMessageSyntax:



Collaboration diagram for gdcm::CAPICryptographicMessageSyntax:



### Public Member Functions

- [CAPICryptographicMessageSyntax](#) ()
- [~CAPICryptographicMessageSyntax](#) ()
- bool [Decrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*decrypt content from a CMS envelopedData structure*
- bool [Encrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*create a CMS envelopedData structure*
- [CipherTypes GetCipherType](#) () const

- bool [GetInitialized](#) () const
- bool [ParseCertificateFile](#) (const char \*filename)
- bool [ParseKeyFile](#) (const char \*filename)
- void [SetCipherType](#) ([CipherTypes](#) type)
- bool [SetPassword](#) (const char \*pass, size\_t passLen)

## Public Member Functions inherited from [gdcmm::CryptographicMessageSyntax](#)

- [CryptographicMessageSyntax](#) ()=default
- [CryptographicMessageSyntax](#) (const [CryptographicMessageSyntax](#) &)=delete
- virtual [~CryptographicMessageSyntax](#) ()=default
- void [operator=](#) (const [CryptographicMessageSyntax](#) &)=delete

## Additional Inherited Members

## Public Types inherited from [gdcmm::CryptographicMessageSyntax](#)

- enum [CipherTypes](#) {  
[DES3\\_CIPHER](#) ,  
[AES128\\_CIPHER](#) ,  
[AES192\\_CIPHER](#) ,  
[AES256\\_CIPHER](#) }

## 12.43.1 Constructor & Destructor Documentation

### 12.43.1.1 [CAPICryptographicMessageSyntax\(\)](#)

```
gdcmm::CAPICryptographicMessageSyntax::CAPICryptographicMessageSyntax ()
```

### 12.43.1.2 [~CAPICryptographicMessageSyntax\(\)](#)

```
gdcmm::CAPICryptographicMessageSyntax::~~CAPICryptographicMessageSyntax ()
```

## 12.43.2 Member Function Documentation

### 12.43.2.1 [Decrypt\(\)](#)

```
bool gdcmm::CAPICryptographicMessageSyntax::Decrypt (
    char * output,
    size_t & outlen,
    const char * array,
    size_t len) const [virtual]
```

decrypt content from a CMS envelopedData structure

Implements [gdcmm::CryptographicMessageSyntax](#).

### 12.43.2.2 Encrypt()

```
bool gdcmm::CAPICryptographicMessageSyntax::Encrypt (
    char * output,
    size_t & outlen,
    const char * array,
    size_t len) const [virtual]
```

create a CMS envelopedData structure

Implements [gdcmm::CryptographicMessageSyntax](#).

### 12.43.2.3 GetCipherType()

```
CipherTypes gdcmm::CAPICryptographicMessageSyntax::GetCipherType () const [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

### 12.43.2.4 GetInitialized()

```
bool gdcmm::CAPICryptographicMessageSyntax::GetInitialized () const [inline]
```

### 12.43.2.5 ParseCertificateFile()

```
bool gdcmm::CAPICryptographicMessageSyntax::ParseCertificateFile (
    const char * filename) [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

### 12.43.2.6 ParseKeyFile()

```
bool gdcmm::CAPICryptographicMessageSyntax::ParseKeyFile (
    const char * filename) [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

### 12.43.2.7 SetCipherType()

```
void gdcmm::CAPICryptographicMessageSyntax::SetCipherType (
    CipherTypes type) [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

### 12.43.2.8 SetPassword()

```
bool gdcm::CAPICryptographicMessageSyntax::SetPassword (
    const char * pass,
    size_t passLen) [virtual]
```

Implements [gdcm::CryptographicMessageSyntax](#).

The documentation for this class was generated from the following file:

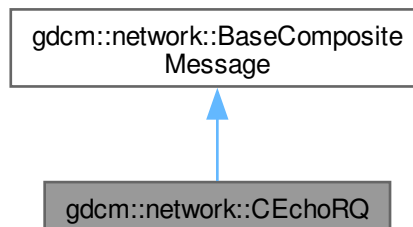
- [gdcmCAPICryptographicMessageSyntax.h](#)

## 12.44 gdcm::network::CEchoRQ Class Reference

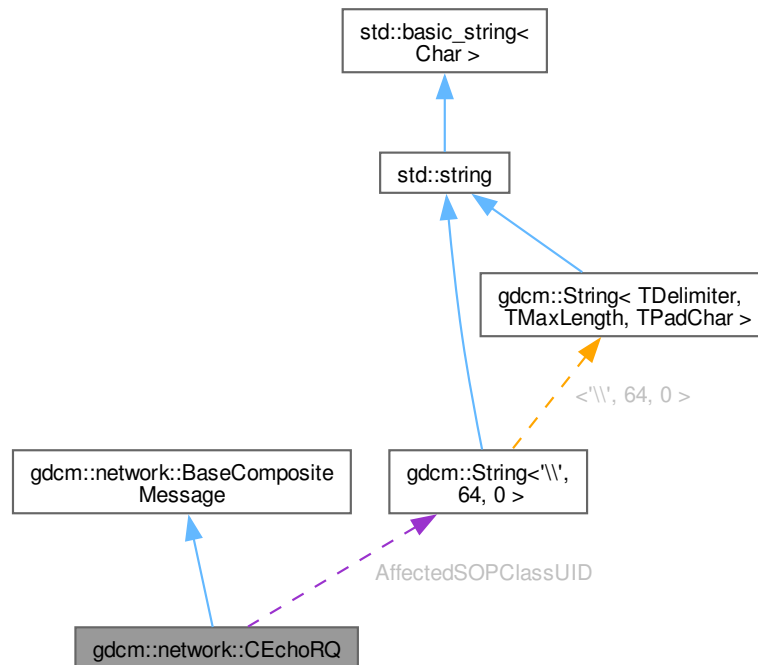
[CEchoRQ](#).

```
#include <gdcmCEchoMessages.h>
```

Inheritance diagram for gdcm::network::CEchoRQ:



Collaboration diagram for gdcm::network::CEchoRQ:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery) override

### Public Member Functions inherited from [gdcm::network::BaseCompositeMessage](#)

- virtual `~BaseCompositeMessage` ()=default

### Public Attributes

- [UIComp](#) `AffectedSOPClassUID`
- `uint16_t` `MessageID`

## 12.44.1 Detailed Description

### [CEchoRQ](#).

this file defines the messages for the cecho action

## 12.44.2 Member Function Documentation

### 12.44.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcM::network::CEchoRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery) [override], [virtual]
```

Implements [gdcM::network::BaseCompositeMessage](#).

## 12.44.3 Member Data Documentation

### 12.44.3.1 AffectedSOPClassUID

```
UIComp gdcM::network::CEchoRQ::AffectedSOPClassUID
```

### 12.44.3.2 MessageID

```
uint16_t gdcM::network::CEchoRQ::MessageID
```

The documentation for this class was generated from the following files:

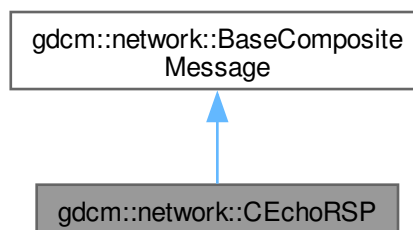
- [gdcMCEchoMessages.h](#)
- [gdcMDIMSE.h](#)

## 12.45 gdcM::network::CEchoRSP Class Reference

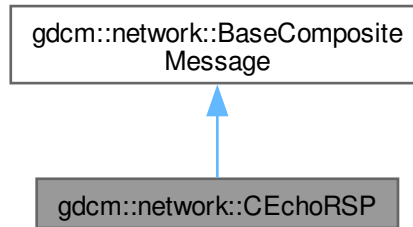
[CEchoRSP](#) this file defines the messages for the cecho action.

```
#include <gdcMCEchoMessages.h>
```

Inheritance diagram for gdcM::network::CEchoRSP:



Collaboration diagram for gdcm::network::CEchoRSP:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### Public Member Functions inherited from [gdcm::network::BaseCompositeMessage](#)

- virtual `~BaseCompositeMessage` ()=default
- virtual `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)=0

## 12.45.1 Detailed Description

[CEchoRSP](#) this file defines the messages for the cecho action.

## 12.45.2 Member Function Documentation

### 12.45.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::CEchoRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

The documentation for this class was generated from the following file:

- [gdcmCEchoMessages.h](#)

## 12.46 gdcm::network::CFind Class Reference

```
#include <gdcmDIMSE.h>
```

### 12.46.1 Detailed Description

PS 3.4 - 2009 [Table B.2-1](#) C-STORE STATUS

The documentation for this class was generated from the following file:

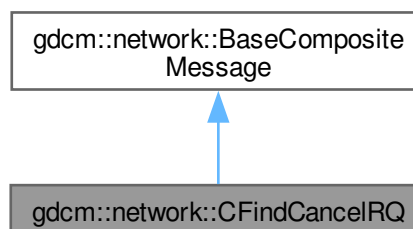
- [gdcmdIMSE.h](#)

## 12.47 gdcmm::network::CFindCancelRQ Class Reference

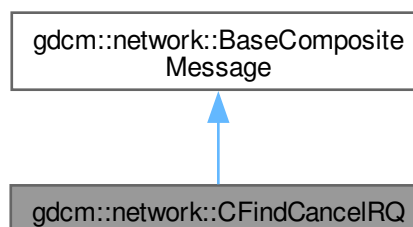
[CFindCancelRQ](#) this file defines the messages for the cfind action.

```
#include <gdcmmCFindMessages.h>
```

Inheritance diagram for gdcmm::network::CFindCancelRQ:



Collaboration diagram for gdcmm::network::CFindCancelRQ:





**Public Member Functions**

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const `DataSet *inDataSet`)

**Public Member Functions inherited from [gdcm::network::BaseCompositeMessage](#)**

- virtual `~BaseCompositeMessage` ()=default
- virtual `std::vector< PresentationDataValue > ConstructPDV` (const `ULConnection &inConnection`, const `BaseRootQuery *inRootQuery`)=0

**12.47.1 Detailed Description**

[CFindCancelRQ](#) this file defines the messages for the cfind action.

**12.47.2 Member Function Documentation****12.47.2.1 ConstructPDVByDataSet()**

```
std::vector< PresentationDataValue > gdcm::network::CFindCancelRQ::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

The documentation for this class was generated from the following file:

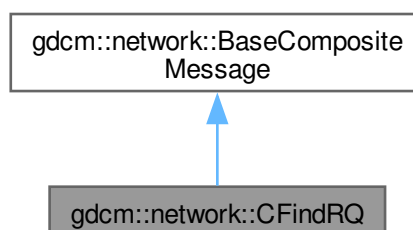
- [gdcmCFindMessages.h](#)

**12.48 gdcm::network::CFindRQ Class Reference**

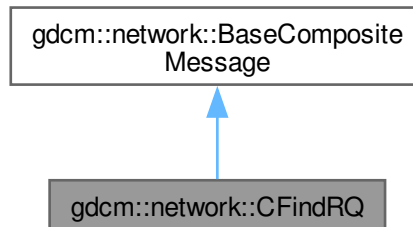
[CFindRQ](#).

```
#include <gdcmCFindMessages.h>
```

Inheritance diagram for `gdcm::network::CFindRQ`:



Collaboration diagram for `gdcm::network::CFindRQ`:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (`const ULConnection &inConnection`, `const BaseRootQuery *inRootQuery`) override

### Public Member Functions inherited from [gdcm::network::BaseCompositeMessage](#)

- virtual `~BaseCompositeMessage` ()=default

## 12.48.1 Detailed Description

[CFindRQ](#).

this file defines the messages for the cfind action

## 12.48.2 Member Function Documentation

### 12.48.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::CFindRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery) [override], [virtual]
```

Implements [gdcm::network::BaseCompositeMessage](#).

The documentation for this class was generated from the following file:

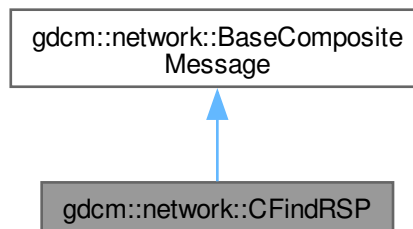
- [gdcmCFindMessages.h](#)

## 12.49 gdcm::network::CFindRSP Class Reference

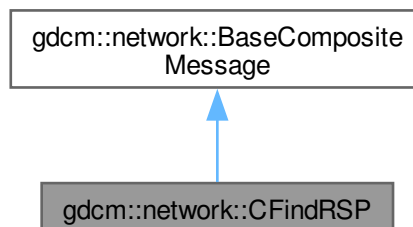
[CFindRSP](#) this file defines the messages for the cfind action.

```
#include <gdcmCFindMessages.h>
```

Inheritance diagram for gdcm::network::CFindRSP:



Collaboration diagram for gdcm::network::CFindRSP:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### Public Member Functions inherited from [gdcm::network::BaseCompositeMessage](#)

- virtual `~BaseCompositeMessage` ()=default
- virtual `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)=0

### 12.49.1 Detailed Description

[CFindRSP](#) this file defines the messages for the cfind action.

### 12.49.2 Member Function Documentation

#### 12.49.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcM::network::CFindRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

The documentation for this class was generated from the following file:

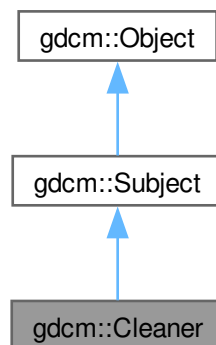
- [gdcMCFindMessages.h](#)

## 12.50 gdcM::Cleaner Class Reference

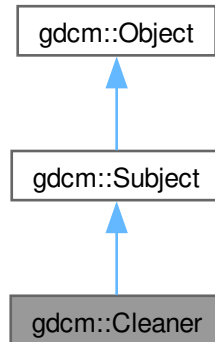
[Cleaner](#).

```
#include <gdcMCleaner.h>
```

Inheritance diagram for gdcM::Cleaner:



Collaboration diagram for gdcmm::Cleaner:



### Public Member Functions

- [Cleaner](#) ()
- [~Cleaner](#) () override
- bool [Clean](#) ()
  - main loop*
- bool [Empty](#) (DPath const &dpath)
- bool [Empty](#) (PrivateTag const &pt)
- bool [Empty](#) (Tag const &t)
- bool [Empty](#) (VR const &vr)
- void [EmptyWhenScrubFails](#) (bool empty)
  - Should I empty instead of scrub upon failure.*
- [File](#) & [GetFile](#) ()
- bool [Preserve](#) (DPath const &dpath)
- bool [Remove](#) (DPath const &dpath)
- bool [Remove](#) (PrivateTag const &pt)
- bool [Remove](#) (Tag const &t)
- bool [Remove](#) (VR const &vr)
- void [RemoveAllGroupLength](#) (bool remove)
  - Should I remove all group length (deprecated). Default: true.*
- void [RemoveAllIllegal](#) (bool remove)
  - Should I remove all illegal attribute. Default: true.*
- void [RemoveAllMissingPrivateCreator](#) (bool remove)
- bool [RemoveMissingPrivateCreator](#) (Tag const &t)
- bool [Scrub](#) (DPath const &dpath)
- bool [Scrub](#) (PrivateTag const &pt)
- bool [Scrub](#) (Tag const &t)
  - Clean digital tash (typically SIEMENS CSA header):*
- bool [Scrub](#) (VR const &vr)
- void [SetFile](#) (const [File](#) &f)
  - Set/Get File.*

## Public Member Functions inherited from [gdcmm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

## Public Member Functions inherited from [gdcmm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Static Public Member Functions

- static [SmartPointer](#)< [Cleaner](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Additional Inherited Members

## Protected Member Functions inherited from [gdcmm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### 12.50.1 Detailed Description

[Cleaner](#).

This class implement the Subject/Observer pattern trigger the following event:

- [AnonymizeEvent](#)
- [IterationEvent](#)
- [StartEvent](#)
- [EndEvent](#)

#### Examples

[Cleaner.cs](#).

## 12.50.2 Constructor & Destructor Documentation

### 12.50.2.1 Cleaner()

```
gdcm::Cleaner::Cleaner ()
```

Referenced by [New\(\)](#).

### 12.50.2.2 ~Cleaner()

```
gdcm::Cleaner::~~Cleaner () [override]
```

## 12.50.3 Member Function Documentation

### 12.50.3.1 Clean()

```
bool gdcm::Cleaner::Clean ()
```

main loop

Examples

[Cleaner.cs](#).

### 12.50.3.2 Empty() [1/4]

```
bool gdcm::Cleaner::Empty (  
    DPath const & dpath)
```

### 12.50.3.3 Empty() [2/4]

```
bool gdcm::Cleaner::Empty (  
    PrivateTag const & pt)
```

### 12.50.3.4 Empty() [3/4]

```
bool gdcm::Cleaner::Empty (  
    Tag const & t)
```

Examples

[Cleaner.cs](#).

### 12.50.3.5 Empty() [4/4]

```
bool gdcmm::Cleaner::Empty (
    VR const & vr)
```

### 12.50.3.6 EmptyWhenScrubFails()

```
void gdcmm::Cleaner::EmptyWhenScrubFails (
    bool empty)
```

Should I empty instead of scrub upon failure.

### 12.50.3.7 GetFile()

```
File & gdcmm::Cleaner::GetFile () [inline]
```

#### Examples

[Cleaner.cs](#).

### 12.50.3.8 New()

```
SmartPointer< Cleaner > gdcmm::Cleaner::New () [inline], [static]
```

for wrapped language: instantiate a reference counted object

References [Cleaner\(\)](#).

### 12.50.3.9 Preserve()

```
bool gdcmm::Cleaner::Preserve (
    DPath const & dpath)
```

#### Examples

[Cleaner.cs](#).

### 12.50.3.10 Remove() [1/4]

```
bool gdcmm::Cleaner::Remove (
    DPath const & dpath)
```



**12.50.3.11 Remove() [2/4]**

```
bool gdcmm::Cleaner::Remove (
    PrivateTag const & pt)
```

**12.50.3.12 Remove() [3/4]**

```
bool gdcmm::Cleaner::Remove (
    Tag const & t)
```

**Examples**

[Cleaner.cs](#).

**12.50.3.13 Remove() [4/4]**

```
bool gdcmm::Cleaner::Remove (
    VR const & vr)
```

**12.50.3.14 RemoveAllGroupLength()**

```
void gdcmm::Cleaner::RemoveAllGroupLength (
    bool remove)
```

Should I remove all group length (deprecated). Default: true.

**12.50.3.15 RemoveAllIllegal()**

```
void gdcmm::Cleaner::RemoveAllIllegal (
    bool remove)
```

Should I remove all illegal attribute. Default: true.

**12.50.3.16 RemoveAllMissingPrivateCreator()**

```
void gdcmm::Cleaner::RemoveAllMissingPrivateCreator (
    bool remove)
```

Should I remove all private tag for which no private creator is found. Default: true

### 12.50.3.17 RemoveMissingPrivateCreator()

```
bool gdcmm::Cleaner::RemoveMissingPrivateCreator (  
    Tag const & t)
```

Specify a private tag (odd number) without a private creator (root level only for now):

### 12.50.3.18 Scrub() [1/4]

```
bool gdcmm::Cleaner::Scrub (  
    DPath const & dpath)
```

### 12.50.3.19 Scrub() [2/4]

```
bool gdcmm::Cleaner::Scrub (  
    PrivateTag const & pt)
```

### 12.50.3.20 Scrub() [3/4]

```
bool gdcmm::Cleaner::Scrub (  
    Tag const & t)
```

Clean digital tash (typically SIEMENS CSA header):

#### Examples

[Cleaner.cs.](#)

### 12.50.3.21 Scrub() [4/4]

```
bool gdcmm::Cleaner::Scrub (  
    VR const & vr)
```

### 12.50.3.22 SetFile()

```
void gdcmm::Cleaner::SetFile (  
    const File & f) [inline]
```

Set/Get [File](#).

#### Examples

[Cleaner.cs.](#)

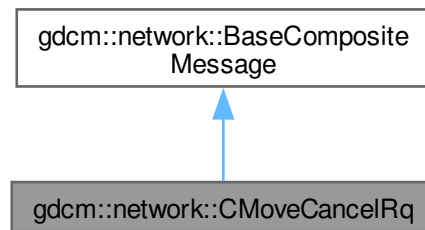
The documentation for this class was generated from the following file:

- [gdcmmCleaner.h](#)

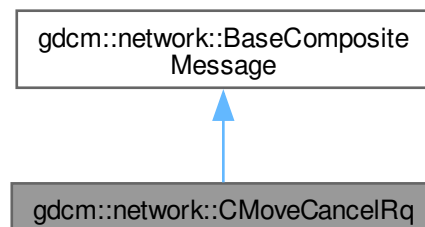
## 12.51 gdcm::network::CMoveCancelRq Class Reference

```
#include <gdcmCMoveMessages.h>
```

Inheritance diagram for gdcm::network::CMoveCancelRq:



Collaboration diagram for gdcm::network::CMoveCancelRq:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### Public Member Functions inherited from [gdcm::network::BaseCompositeMessage](#)

- virtual `~BaseCompositeMessage` ()=default
- virtual `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)=0

## 12.51.1 Member Function Documentation

### 12.51.1.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcM::network::CMoveCancelRq::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

The documentation for this class was generated from the following file:

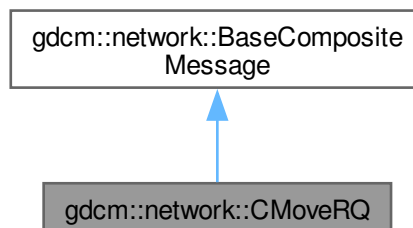
- [gdcMCMoveMessages.h](#)

## 12.52 gdcM::network::CMoveRQ Class Reference

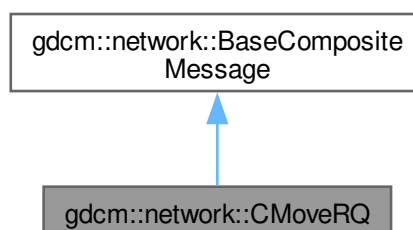
[CMoveRQ](#).

```
#include <gdcMCMoveMessages.h>
```

Inheritance diagram for gdcM::network::CMoveRQ:



Collaboration diagram for gdcM::network::CMoveRQ:



**Public Member Functions**

- `std::vector< PresentationDataValue > ConstructPDV` (`const ULConnection &inConnection`, `const BaseRootQuery *inRootQuery`) override

**Public Member Functions inherited from [gdcm::network::BaseCompositeMessage](#)**

- `virtual ~BaseCompositeMessage ()=default`

**12.52.1 Detailed Description**

[CMoveRQ](#).

this file defines the messages for the cmove action

**12.52.2 Member Function Documentation****12.52.2.1 ConstructPDV()**

```
std::vector< PresentationDataValue > gdcm::network::CMoveRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery) [override], [virtual]
```

Implements [gdcm::network::BaseCompositeMessage](#).

The documentation for this class was generated from the following file:

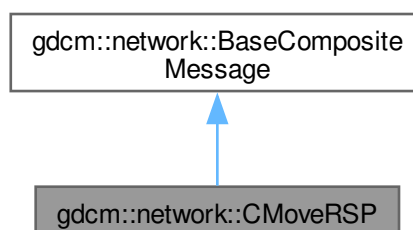
- [gdcmCMoveMessages.h](#)

**12.53 gdcm::network::CMoveRSP Class Reference**

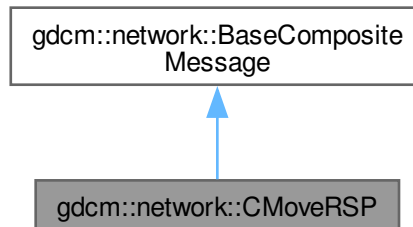
[CMoveRSP](#) this file defines the messages for the cmove action.

```
#include <gdcmCMoveMessages.h>
```

Inheritance diagram for `gdcm::network::CMoveRSP`:



Collaboration diagram for `gdcm::network::CMoveRSP`:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### Public Member Functions inherited from [gdcm::network::BaseCompositeMessage](#)

- virtual `~BaseCompositeMessage` ()=default
- virtual `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)=0

## 12.53.1 Detailed Description

[CMoveRSP](#) this file defines the messages for the cmove action.

## 12.53.2 Member Function Documentation

### 12.53.2.1 ConstructPDVByDataSet()

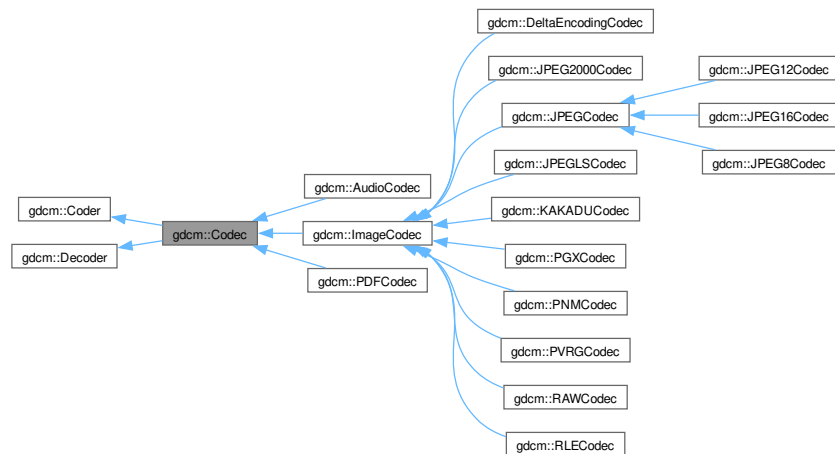
```
std::vector< PresentationDataValue > gdcm::network::CMoveRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

The documentation for this class was generated from the following file:

- [gdcmCMoveMessages.h](#)

Codec class.

Inheritance diagram for `gdcm::Codec`:



```
graph BT; gdcm::Codec --> gdcm::Coder; gdcm::Codec --> gdcm::Decoder;
```

## Public Member Functions inherited from `gdcm::Coder`

- virtual `~Coder()`=default
- virtual bool `CanCode (TransferSyntax const &) const` =0  
*Return whether this coder support this transfer syntax (can code it).*
- virtual bool `Code (DataElement const &in_, DataElement &out_)`  
*Code.*

## Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default
- virtual bool [CanDecode](#) ([TransferSyntax](#) const &) const =0  
*Return whether this decoder support this transfer syntax (can decode it).*
- virtual bool [Decode](#) ([DataElement](#) const &, [DataElement](#) &)  
*Decode.*

## Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

## Protected Member Functions inherited from [gdcm::Decoder](#)

- virtual bool [DecodeByStreams](#) (std::istream &, std::ostream &)

### 12.54.1 Detailed Description

[Codec](#) class.

The documentation for this class was generated from the following file:

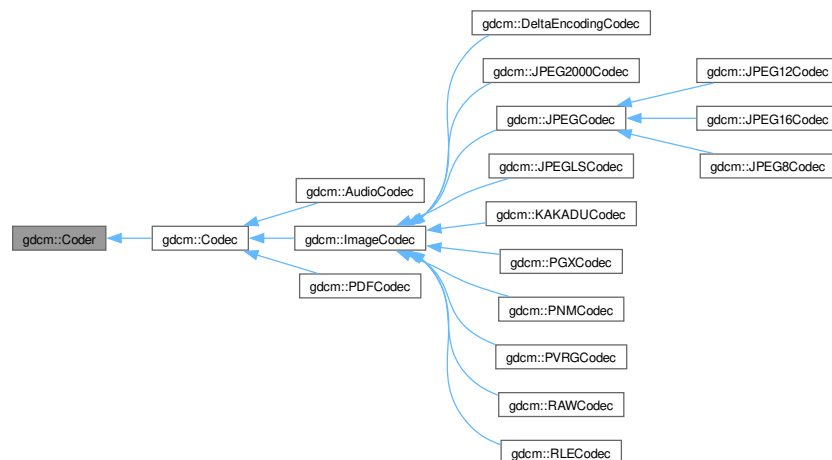
- [gdcmCodec.h](#)

## 12.55 [gdcm::Coder](#) Class Reference

[Coder](#).

```
#include <gdcmCoder.h>
```

Inheritance diagram for [gdcm::Coder](#):





## Public Member Functions

- virtual [~Coder](#) ()=default
- virtual bool [CanCode](#) ([TransferSyntax](#) const &) const =0  
*Return whether this coder support this transfer syntax (can code it).*
- virtual bool [Code](#) ([DataElement](#) const &in\_, [DataElement](#) &out\_)  
*Code.*

## Protected Member Functions

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

### 12.55.1 Detailed Description

[Coder](#).

### 12.55.2 Constructor & Destructor Documentation

#### 12.55.2.1 ~Coder()

```
virtual gdcm::Coder::~~Coder () [virtual], [default]
```

### 12.55.3 Member Function Documentation

#### 12.55.3.1 CanCode()

```
virtual bool gdcm::Coder::CanCode (
    TransferSyntax const & ) const [pure virtual]
```

Return whether this coder support this transfer syntax (can code it).

Implemented in [gdcm::AudioCodec](#), [gdcm::ImageCodec](#), [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PDFCodec](#), [gdcm::PGXCodec](#), [gdcm::PNMCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

#### 12.55.3.2 Code()

```
virtual bool gdcm::Coder::Code (
    DataElement const & in_,
    DataElement & out_) [inline], [virtual]
```

Code.

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

### 12.55.3.3 InternalCode()

```
virtual bool gdcm::Coder::InternalCode (
    const char * bv,
    unsigned long len,
    std::ostream & os) [inline], [protected], [virtual]
```

Reimplemented in [gdcm::JPEG12Codec](#), [gdcm::JPEG16Codec](#), and [gdcm::JPEG8Codec](#).

The documentation for this class was generated from the following file:

- [gdcmCoder.h](#)

## 12.56 gdcm::CodeString Class Reference

[CodeString](#).

```
#include <gdcmCodeString.h>
```

### Public Types

- typedef [InternalClass::const\\_iterator](#) const\_iterator
- typedef [InternalClass::const\\_reference](#) const\_reference
- typedef [InternalClass::const\\_reverse\\_iterator](#) const\_reverse\_iterator
- typedef [InternalClass::difference\\_type](#) difference\_type
- typedef [InternalClass::iterator](#) iterator
- typedef [InternalClass::pointer](#) pointer
- typedef [InternalClass::reference](#) reference
- typedef [InternalClass::reverse\\_iterator](#) reverse\_iterator
- typedef [InternalClass::size\\_type](#) size\_type
- typedef [InternalClass::value\\_type](#) value\_type

### Public Member Functions

- [CodeString](#) ()  
*CodeString constructors.*
- [CodeString](#) (const [InternalClass](#) &s, [size\\_type](#) pos=0, [size\\_type](#) n=[InternalClass::npos](#))
- [CodeString](#) (const [value\\_type](#) \*s)
- [CodeString](#) (const [value\\_type](#) \*s, [size\\_type](#) n)
- [std::string](#) [GetAsString](#) () const  
*Return the full code string as std::string.*
- bool [IsValid](#) () const  
*Check if CodeString obj is correct..*
- [size\\_type](#) [Size](#) () const  
*Return the size of the string.*

## Protected Member Functions

- `std::string TrimInternal () const`

## Friends

- `bool operator!= (const CodeString &ref, const CodeString &cs)`
- `std::ostream & operator<< (std::ostream &os, const CodeString &str)`
- `bool operator== (const CodeString &ref, const CodeString &cs)`

## 12.56.1 Detailed Description

`CodeString`.

This is an implementation of DICOM [VR](#): CS The ctor will properly Trim so that operator== is correct.

### Note

the ctor of `CodeString` will Trim the string on the fly so as to remove the extra leading and ending spaces. However it will not perform validation on the fly (`CodeString` obj can contains invalid char such as lower cases). This design was chosen to be a little tolerant to broken DICOM implementation, and thus allow user to compare lower case CS from there input file without the need to first rewrite them to get rid of invalid character (validation is a different operation from searching, querying).

### Warning

when writing out DICOM file it is highly recommended to perform the `IsValid()` call, at least to check that the length of the string match the definition in the standard.

## 12.56.2 Member Typedef Documentation

### 12.56.2.1 `const_iterator`

```
typedef InternalClass::const_iterator gdcm::CodeString::const_iterator
```

### 12.56.2.2 `const_reference`

```
typedef InternalClass::const_reference gdcm::CodeString::const_reference
```

### 12.56.2.3 `const_reverse_iterator`

```
typedef InternalClass::const_reverse_iterator gdcm::CodeString::const_reverse_iterator
```

#### 12.56.2.4 difference\_type

```
typedef InternalClass::difference_type gdcm::CodeString::difference_type
```

#### 12.56.2.5 iterator

```
typedef InternalClass::iterator gdcm::CodeString::iterator
```

#### 12.56.2.6 pointer

```
typedef InternalClass::pointer gdcm::CodeString::pointer
```

#### 12.56.2.7 reference

```
typedef InternalClass::reference gdcm::CodeString::reference
```

#### 12.56.2.8 reverse\_iterator

```
typedef InternalClass::reverse_iterator gdcm::CodeString::reverse_iterator
```

#### 12.56.2.9 size\_type

```
typedef InternalClass::size_type gdcm::CodeString::size_type
```

#### 12.56.2.10 value\_type

```
typedef InternalClass::value_type gdcm::CodeString::value_type
```

### 12.56.3 Constructor & Destructor Documentation

#### 12.56.3.1 CodeString() [1/4]

```
gdcm::CodeString::CodeString () [inline]
```

[CodeString](#) constructors.

Referenced by [operator!=](#), [operator<<](#), and [operator==](#).

### 12.56.3.2 CodeString() [2/4]

```
gdcm::CodeString::CodeString (  
    const value_type * s) [inline]
```

### 12.56.3.3 CodeString() [3/4]

```
gdcm::CodeString::CodeString (  
    const value_type * s,  
    size_type n) [inline]
```

### 12.56.3.4 CodeString() [4/4]

```
gdcm::CodeString::CodeString (  
    const InternalClass & s,  
    size_type pos = 0,  
    size_type n = InternalClass::npos) [inline]
```

## 12.56.4 Member Function Documentation

### 12.56.4.1 GetAsString()

```
std::string gdcm::CodeString::GetAsString () const [inline]
```

Return the full code string as std::string.

### 12.56.4.2 IsValid()

```
bool gdcm::CodeString::IsValid () const
```

Check if [CodeString](#) obj is correct..

### 12.56.4.3 Size()

```
size_type gdcm::CodeString::Size () const [inline]
```

Return the size of the string.

### 12.56.4.4 TrimInternal()

```
std::string gdcm::CodeString::TrimInternal () const [inline], [protected]
```

## 12.56.5 Friends And Related Symbol Documentation

### 12.56.5.1 operator"!=

```
bool operator!= (
    const CodeString & ref,
    const CodeString & cs) [friend]
```

References [CodeString\(\)](#).

### 12.56.5.2 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const CodeString & str) [friend]
```

References [CodeString\(\)](#).

### 12.56.5.3 operator==

```
bool operator== (
    const CodeString & ref,
    const CodeString & cs) [friend]
```

References [CodeString\(\)](#).

The documentation for this class was generated from the following file:

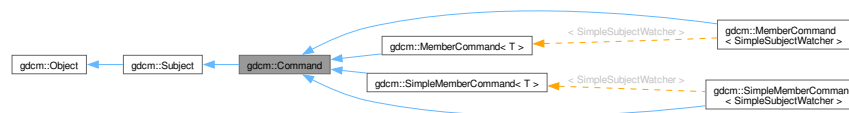
- [gdcmmCodeString.h](#)

## 12.57 gdcmm::Command Class Reference

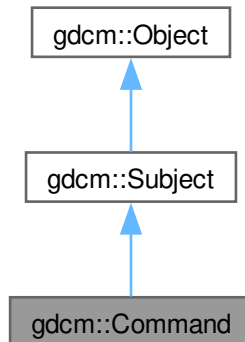
[Command](#) superclass for callback/observer methods.

```
#include <gdcmmCommand.h>
```

Inheritance diagram for gdcmm::Command:



Collaboration diagram for gdcm::Command:



### Public Member Functions

- `Command` (const Command &)=delete
- virtual void `Execute` (const `Subject` \*caller, const `Event` &event)=0
- virtual void `Execute` (`Subject` \*caller, const `Event` &event)=0
- *Abstract method that defines the action to be taken by the command.*
- void `operator=` (const `Command` &)=delete

### Public Member Functions inherited from `gdcm::Subject`

- `Subject` ()
- `~Subject` () override
- unsigned long `AddObserver` (const `Event` &event, `Command` \*)
- unsigned long `AddObserver` (const `Event` &event, `Command` \*) const
- `Command` \* `GetCommand` (unsigned long tag)
- bool `HasObserver` (const `Event` &event) const
- void `InvokeEvent` (const `Event` &)
- void `InvokeEvent` (const `Event` &) const
- void `RemoveAllObservers` ()
- void `RemoveObserver` (unsigned long tag)

### Public Member Functions inherited from `gdcm::Object`

- `Object` ()
- `Object` (const Object &)
- *Special requirement for copy/cstor, assignment operator.*
- virtual `~Object` ()
- void `operator=` (const `Object` &)
- virtual void `Print` (std::ostream &) const

### Protected Member Functions

- [Command](#) ()
- [~Command](#) () override

### Protected Member Functions inherited from [gdcM::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## 12.57.1 Detailed Description

[Command](#) superclass for callback/observer methods.

See also

[Subject](#)

## 12.57.2 Constructor & Destructor Documentation

### 12.57.2.1 [Command](#)() [1/2]

```
gdcM::Command::Command (
    const Command & ) [delete]
```

References [Command](#)() .

Referenced by [Command](#)() , and [operator=](#)() .

### 12.57.2.2 [Command](#)() [2/2]

```
gdcM::Command::Command () [protected]
```

### 12.57.2.3 [~Command](#)()

```
gdcM::Command::~~Command () [override], [protected]
```



## 12.57.3 Member Function Documentation

### 12.57.3.1 Execute() [1/2]

```
virtual void gdcm::Command::Execute (
    const Subject * caller,
    const Event & event) [pure virtual]
```

Abstract method that defines the action to be taken by the command. This variant is expected to be used when requests comes from a const [Object](#)

Implemented in [gdcm::MemberCommand< T >](#), [gdcm::MemberCommand< SimpleSubjectWatcher >](#), [gdcm::SimpleMemberCommand](#) and [gdcm::SimpleMemberCommand< SimpleSubjectWatcher >](#).

References [gdcm::Subject::Subject\(\)](#).

### 12.57.3.2 Execute() [2/2]

```
virtual void gdcm::Command::Execute (
    Subject * caller,
    const Event & event) [pure virtual]
```

Abstract method that defines the action to be taken by the command.

Implemented in [gdcm::MemberCommand< T >](#), [gdcm::MemberCommand< SimpleSubjectWatcher >](#), [gdcm::SimpleMemberCommand](#) and [gdcm::SimpleMemberCommand< SimpleSubjectWatcher >](#).

References [gdcm::Subject::Subject\(\)](#).

### 12.57.3.3 operator=()

```
void gdcm::Command::operator= (
    const Command & ) [delete]
```

References [Command\(\)](#).

The documentation for this class was generated from the following file:

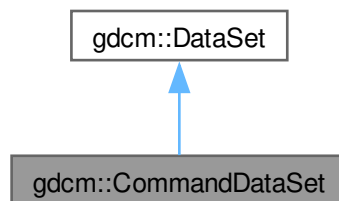
- [gdcmCommand.h](#)

## 12.58 gdcm::CommandDataSet Class Reference

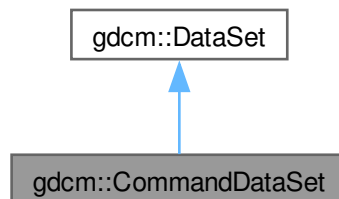
Class to represent a [Command DataSet](#).

```
#include <gdcmCommandDataSet.h>
```

Inheritance diagram for gdcm::CommandDataSet:



Collaboration diagram for gdcm::CommandDataSet:



### Public Member Functions

- [CommandDataSet](#) ()=default
- [~CommandDataSet](#) ()=default
- void [Insert](#) (const [DataElement](#) &de)
- std::istream & [Read](#) (std::istream &is)  
*Read.*
- void [Replace](#) (const [DataElement](#) &de)
- std::ostream & [Write](#) (std::ostream &os) const  
*Write.*

## Public Member Functions inherited from `gdcm::DataSet`

- `Iterator Begin ()`
- `ConstIterator Begin () const`
- `void Clear ()`
- `template<typename TDE>`  
`unsigned int ComputeGroupLength (Tag const &tag) const`
- `Iterator End ()`
- `ConstIterator End () const`
- `bool FindDataElement (const PrivateTag &t) const`  
*Look up if private tag 't' is present in the dataset:*
- `bool FindDataElement (const Tag &t) const`
- `const DataElement & FindNextDataElement (const Tag &t) const`
- `const DataElement & GetDataElement (const PrivateTag &t) const`  
*Return the dataelement.*
- `const DataElement & GetDataElement (const Tag &t) const`
- `DataElementSet & GetDES ()`
- `const DataElementSet & GetDES () const`
- `template<typename TDE>`  
`VL GetLength () const`
- `MediaStorage GetMediaStorage () const`
- `std::string GetPrivateCreator (const Tag &t) const`
- `PrivateTag GetPrivateTag (const Tag &t) const`  
*Return the private tag of the private tag 't', private creator will be set to empty if not found.*
- `void Insert (const DataElement &de)`
- `bool IsEmpty () const`  
*Returns if the dataset is empty.*
- `const DataElement & operator() (uint16_t group, uint16_t element) const`
- `DataSet & operator= (DataSet const &)=default`
- `const DataElement & operator[] (const Tag &t) const`
- `void Print (std::ostream &os, std::string const &indent="") const`
- `template<typename TDE, typename TSwap>`  
`std::istream & Read (std::istream &is)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadNested (std::istream &is)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadSelectedPrivateTags (std::istream &is, const std::set< PrivateTag > &tags, bool readvalues=true)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadSelectedPrivateTagsWithLength (std::istream &is, const std::set< PrivateTag > &tags, VL &length, bool readvalues=true)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadSelectedTags (std::istream &is, const std::set< Tag > &tags, bool readvalues=true)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadSelectedTagsWithLength (std::istream &is, const std::set< Tag > &tags, VL &length, bool readvalues=true)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadUpToTag (std::istream &is, const Tag &t, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadUpToTagWithLength (std::istream &is, const Tag &t, std::set< Tag > const &skiptags, VL &length)`

- `template<typename TDE, typename TSwap>`  
`std::istream & ReadWithLength (std::istream &is, VL &length)`
- [SizeType Remove](#) (const [Tag](#) &tag)  
*Completely remove a dataelement from the dataset.*
- `void Replace (const DataElement &de)`  
*Replace a dataelement with another one.*
- `void ReplaceEmpty (const DataElement &de)`  
*Only replace a DICOM attribute when it is missing or empty.*
- [SizeType Size](#) () const
- `template<typename TDE, typename TSwap>`  
`std::ostream const & Write (std::ostream &os) const`

## Friends

- `std::ostream & operator<< (std::ostream &_os, const CommandDataSet &_val)`

## Additional Inherited Members

### Public Types inherited from [gdcm::DataSet](#)

- `typedef DataSet::const_iterator ConstIterator`
- `typedef std::set< DataElement > DataElementSet`
- `typedef DataSet::iterator Iterator`
- `typedef DataSet::size_type SizeType`

### Protected Member Functions inherited from [gdcm::DataSet](#)

- `Tag ComputeDataElement (const PrivateTag &t) const`
- `const DataElement & GetDEEnd () const`
- `void InsertDataElement (const DataElement &de)`

## 12.58.1 Detailed Description

Class to represent a [Command DataSet](#).

See also

[DataSet](#)

## 12.58.2 Constructor & Destructor Documentation

### 12.58.2.1 CommandDataSet()

```
gdcm::CommandDataSet::CommandDataSet () [default]
```

Referenced by [~CommandDataSet\(\)](#), and [operator<<](#).

### 12.58.2.2 ~CommandDataSet()

```
gdcm::CommandDataSet::~~CommandDataSet () [default]
```

References [CommandDataSet\(\)](#), and [operator<<](#).

## 12.58.3 Member Function Documentation

### 12.58.3.1 Insert()

```
void gdcm::CommandDataSet::Insert (
    const DataElement & de) [inline]
```

References [gdcmErrorMacro](#), [gdcm::Tag::GetGroup\(\)](#), [gdcm::DataElement::GetTag\(\)](#), and [gdcm::DataSet::InsertDataElement\(\)](#).

Referenced by [Replace\(\)](#).

### 12.58.3.2 Read()

```
std::istream & gdcm::CommandDataSet::Read (
    std::istream & is)
```

Read.

### 12.58.3.3 Replace()

```
void gdcm::CommandDataSet::Replace (
    const DataElement & de) [inline]
```

References [gdcm::DataElement::GetTag\(\)](#), [Insert\(\)](#), and [gdcm::DataSet::Remove\(\)](#).

### 12.58.3.4 Write()

```
std::ostream & gdcm::CommandDataSet::Write (
    std::ostream & os) const
```

Write.

## 12.58.4 Friends And Related Symbol Documentation

### 12.58.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const CommandDataSet & _val) [friend]
```

References [CommandDataSet\(\)](#), and [gdcmm::DataSet::Print\(\)](#).

Referenced by [~CommandDataSet\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmmCommandDataSet.h](#)

## 12.59 gdcmm::network::CompositeMessageFactory Class Reference

[CompositeMessageFactory](#).

```
#include <gdcmmCompositeMessageFactory.h>
```

### Static Public Member Functions

- static std::vector< [PresentationDataValue](#) > [ConstructCEchoRQ](#) (const [ULConnection](#) &inConnection)
- static std::vector< [PresentationDataValue](#) > [ConstructCFindRQ](#) (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructCMoveRQ](#) (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructCStoreRQ](#) (const [ULConnection](#) &inConnection, const [File](#) &file, bool writeDataSet=true)
- static std::vector< [PresentationDataValue](#) > [ConstructCStoreRSP](#) (const [DataSet](#) \*inDataSet, const [BasePDU](#) \*inPC)

### 12.59.1 Detailed Description

[CompositeMessageFactory](#).

This class constructs PDataPDUs, but that have been specifically constructed for the composite DICOM services (C-Echo, C-Find, C-Get, C-Move, and C-Store). It will also handle parsing the incoming data to determine which of the CompositePDUs the incoming data is, and so therefore allowing the scu to determine what to do with incoming data (if acting as a storescp server, for instance).

## 12.59.2 Member Function Documentation

### 12.59.2.1 ConstructCEchoRQ()

```
std::vector< PresentationDataValue > gdcm::network::CompositeMessageFactory::ConstructCEchoRQ (
    const ULConnection & inConnection) [static]
```

### 12.59.2.2 ConstructCFindRQ()

```
std::vector< PresentationDataValue > gdcm::network::CompositeMessageFactory::ConstructCFindRQ (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery) [static]
```

### 12.59.2.3 ConstructCMoveRQ()

```
std::vector< PresentationDataValue > gdcm::network::CompositeMessageFactory::ConstructCMoveRQ (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery) [static]
```

### 12.59.2.4 ConstructCStoreRQ()

```
std::vector< PresentationDataValue > gdcm::network::CompositeMessageFactory::ConstructCStoreRQ (
    const ULConnection & inConnection,
    const File & file,
    bool writeDataSet = true) [static]
```

### 12.59.2.5 ConstructCStoreRSP()

```
std::vector< PresentationDataValue > gdcm::network::CompositeMessageFactory::ConstructCStoreRSP (
    const DataSet * inDataSet,
    const BasePDU * inPC) [static]
```

The documentation for this class was generated from the following file:

- [gdcmCompositeMessageFactory.h](#)

## 12.60 gdcm::CompositeNetworkFunctions Class Reference

Composite Network Functions.

```
#include <gdcmCompositeNetworkFunctions.h>
```

## Public Types

- typedef std::vector< [KeyValuePairType](#) > [KeyValuePairArrayType](#)
- typedef std::pair< [Tag](#), std::string > [KeyValuePairType](#)

## Static Public Member Functions

- static bool [CEcho](#) (const char \*remote, uint16\_t portno, const char \*aetitle=nullptr, const char \*call=nullptr)
- static bool [CFind](#) (const char \*remote, uint16\_t portno, const [BaseRootQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle=nullptr, const char \*call=nullptr)
- static bool [CMove](#) (const char \*remote, uint16\_t portno, const [BaseRootQuery](#) \*query, uint16\_t portscp, const char \*aetitle=nullptr, const char \*call=nullptr, const char \*outputdir=nullptr)
- static [BaseRootQuery](#) \* [ConstructQuery](#) ([ERootType](#) inRootType, [EQueryLevel](#) inQueryLevel, const [DataSet](#) &queryds, [EQueryType](#) queryType=eFind)
- static [BaseRootQuery](#) \* [ConstructQuery](#) ([ERootType](#) inRootType, [EQueryLevel](#) inQueryLevel, const [KeyValuePairArrayType](#) &keys, [EQueryType](#) queryType=eFind)
- static bool [CStore](#) (const char \*remote, uint16\_t portno, const [Directory::FileNamesType](#) &filenames, const char \*aetitle=nullptr, const char \*call=nullptr)

### 12.60.1 Detailed Description

Composite Network Functions.

These functions provide a generic API to the DICOM functions implemented in GDCM. Advanced users can use this code as a template for building their own versions of these functions (for instance, to provide progress bars or some other way of handling returned query information), but for most users, these functions should be sufficient to interface with a PACS to a local machine. Note that these functions are not contained within a static class or some other class-style interface, because multiple connections can be instantiated in the same program. The DICOM standard is much more function oriented rather than class oriented in this instance, so the design of this API reflects that functional approach. These functions implements the following SCU operations:

- C-ECHO SCU
- C-FIND SCU
- C-STORE SCU
- C-MOVE SCU (+internal C-STORE SCP)

#### Examples

[SendFileSCU.cs](#).

### 12.60.2 Member Typedef Documentation

#### 12.60.2.1 KeyValuePairArrayType

```
typedef std::vector< KeyValuePairType > gdcm::CompositeNetworkFunctions::KeyValuePairArrayType
```



### 12.60.2.2 KeyValuePairType

```
typedef std::pair<Tag, std::string> gdcm::CompositeNetworkFunctions::KeyValuePairType
```

## 12.60.3 Member Function Documentation

### 12.60.3.1 CEcho()

```
bool gdcm::CompositeNetworkFunctions::CEcho (
    const char * remote,
    uint16_t portno,
    const char * aetitle = nullptr,
    const char * call = nullptr) [static]
```

The most basic network function. Use this function to ensure that the remote server is responding on the given IP and port number as expected.

#### Parameters

<i>aetitle</i>	when not set will default to 'GDCMSCU'
<i>call</i>	when not set will default to 'ANY-SCP'

#### Warning

This is an error to set remote to NULL or portno to 0

#### Returns

true if it worked.

#### Examples

[SendFileSCU.cs](#).

### 12.60.3.2 CFind()

```
bool gdcm::CompositeNetworkFunctions::CFind (
    const char * remote,
    uint16_t portno,
    const BaseRootQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle = nullptr,
    const char * call = nullptr) [static]
```

This function will use the provided query to determine what files a remote server contains that match the query strings. The return is a vector of datasets that contain tags as reported by the server. If the dataset is empty, then it is possible that an error condition was encountered; in which case, the user should monitor the error and warning streams.

#### Parameters

<i>aetitle</i>	when not set will default to 'GDCMSCU'
<i>call</i>	when not set will default to 'ANY-SCP'

#### Warning

This is an error to set remote to NULL or portno to 0

#### Returns

true if it worked.

### 12.60.3.3 CMove()

```
bool gdcmm::CompositeNetworkFunctions::CMove (
    const char * remote,
    uint16_t portno,
    const BaseRootQuery * query,
    uint16_t portscp,
    const char * aetitle = nullptr,
    const char * call = nullptr,
    const char * outputdir = nullptr) [static]
```

This function will use the provided query to get files from a remote server. NOTE that this functionality is essentially equivalent to C-GET in the DICOM standard; however, C-GET has been deprecated, so this function allows for the user to ask a remote server for files matching a query and return them to the local machine. Files will be written to the given output directory. If the operation succeeds, the function returns true. This function is a prime candidate for being overwritten by expert users; if the datasets should remain in memory, for instance, that behavior can be changed by creating a user-level version of this function.

#### Parameters

<i>aetitle</i>	when not set will default to 'GDCMSCU'
<i>call</i>	when not set will default to 'ANY-SCP' This is an error to set remote to NULL or portno to 0 when
<i>outputdir</i>	is not set default to current dir ('.')

#### Returns

true if it worked.

**12.60.3.4 ConstructQuery() [1/2]**

```
BaseRootQuery * gdcmm::CompositeNetworkFunctions::ConstructQuery (
    ERootType inRootType,
    EQueryLevel inQueryLevel,
    const DataSet & queryds,
    EQueryType queryType = eFind) [static]
```

This function will take a list of strings and tags and fill in a query that can be used for either CFind or CMove (depending on the input boolean

**Parameters**

<i>inMove).</i>	Note that the caller is responsible for deleting the constructed query. This function is used to build both a move and a find query (true for inMove if it's move, false if it's find)
-----------------	--

References [gdcmm::eFind](#).

**12.60.3.5 ConstructQuery() [2/2]**

```
BaseRootQuery * gdcmm::CompositeNetworkFunctions::ConstructQuery (
    ERootType inRootType,
    EQueryLevel inQueryLevel,
    const KeyValuePairArrayType & keys,
    EQueryType queryType = eFind) [static]
```

**Deprecated**

References [gdcmm::eFind](#).

**12.60.3.6 CStore()**

```
bool gdcmm::CompositeNetworkFunctions::CStore (
    const char * remote,
    uint16_t portno,
    const Directory::FileNamesType & filenames,
    const char * aetitle = nullptr,
    const char * call = nullptr) [static]
```

This function will place the provided files into the remote server. The function returns true if it worked for all files.

**Warning**

the server side can refuse an association on a given file

**Parameters**

<i>aetitle</i>	when not set will default to 'GDCMSCU'
<i>call</i>	when not set will default to 'ANY-SCP'

**Warning**

This is an error to set remote to NULL or portno to 0

**Returns**

true if it worked for all files

**Examples**

[SendFileSCU.cs](#).

The documentation for this class was generated from the following file:

- [gdcmCompositeNetworkFunctions.h](#)

## 12.61 gdcm::ConstCharWrapper Class Reference

Do not use me.

```
#include <gdcmConstCharWrapper.h>
```

**Public Member Functions**

- [ConstCharWrapper](#) (const char \*i=0)
- [operator const char \\*](#) () const

### 12.61.1 Detailed Description

Do not use me.

## 12.61.2 Constructor & Destructor Documentation

### 12.61.2.1 ConstCharWrapper()

```
gdcm::ConstCharWrapper::ConstCharWrapper (  
    const char * i = 0) [inline]
```

## 12.61.3 Member Function Documentation

### 12.61.3.1 operator const char \*()

```
gdcm::ConstCharWrapper::operator const char * () const [inline]
```

The documentation for this class was generated from the following file:

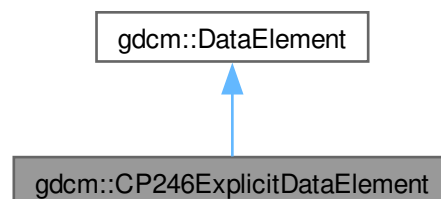
- [gdcmConstCharWrapper.h](#)

## 12.62 gdcm::CP246ExplicitDataElement Class Reference

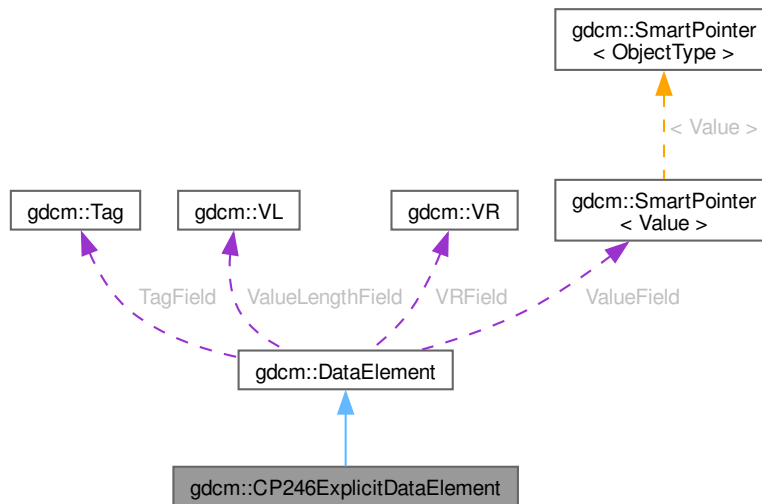
Class to read/write a [DataElement](#) as CP246Explicit Data [Element](#).

```
#include <gdcmCP246ExplicitDataElement.h>
```

Inheritance diagram for gdcm::CP246ExplicitDataElement:



Collaboration diagram for `gdcm::CP246ExplicitDataElement`:



### Public Member Functions

- [VL GetLength](#) () const
- template<typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap>  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)

### Public Member Functions inherited from [gdcm::DataElement](#)

- [DataElement](#) (const DataElement &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()  
*Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()  
*Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE>  
[VL GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const

- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const  
*Get Tag.*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const  
*Set/Get Value (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const  
*Get VL.*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const  
*Check if Data Element is empty.*
- bool [IsUndefinedLength](#) () const  
*return if Value Length if of undefined length*
- bool [operator](#)< (const [DataElement](#) &de) const
- [DataElement](#) & [operator](#)= (const [DataElement](#) &)=default
- bool [operator](#)== (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TDE, typename TSwap>  
std::istream & [ReadOrSkip](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadValueWithLength](#) (std::istream &is, [VL](#) &length, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)
- void [SetByteValue](#) (const char \*array, [VL](#) length)
- void [SetTag](#) (const [Tag](#) &t)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVL](#) (const [VL](#) &vl)
- void [SetVLToUndefined](#) ()
- void [SetVR](#) ([VR](#) const &vr)
- template<typename TDE, typename TSwap>  
const std::ostream & [Write](#) (std::ostream &os) const

### Additional Inherited Members

### Protected Types inherited from [gdcm::DataElement](#)

- typedef [SmartPointer](#)< [Value](#) > [ValuePtr](#)

### Protected Member Functions inherited from [gdcm::DataElement](#)

- void [SetValueFieldLength](#) ([VL](#) vl, bool readvalues)

## Protected Attributes inherited from [gdcm::DataElement](#)

- [Tag](#) [TagField](#)
- [ValuePtr](#) [ValueField](#)
- [VL](#) [ValueLengthField](#)
- [VR](#) [VRField](#)

### 12.62.1 Detailed Description

Class to read/write a [DataElement](#) as CP246Explicit Data [Element](#).

#### Note

Some system are producing SQ, declare them as UN, but encode the SQ as 'Explicit' instead of Implicit

### 12.62.2 Member Function Documentation

#### 12.62.2.1 GetLength()

```
VL gdcm::CP246ExplicitDataElement::GetLength () const
```

#### 12.62.2.2 Read()

```
template<typename TSwap>
std::istream & gdcm::CP246ExplicitDataElement::Read (
    std::istream & is)
```

#### 12.62.2.3 ReadPreValue()

```
template<typename TSwap>
std::istream & gdcm::CP246ExplicitDataElement::ReadPreValue (
    std::istream & is)
```

#### 12.62.2.4 ReadValue()

```
template<typename TSwap>
std::istream & gdcm::CP246ExplicitDataElement::ReadValue (
    std::istream & is,
    bool readvalues = true)
```



### 12.62.2.5 ReadWithLength()

```
template<typename TSwap>
std::istream & gdcm::CP246ExplicitDataElement::ReadWithLength (
    std::istream & is,
    VL & length)
```

The documentation for this class was generated from the following file:

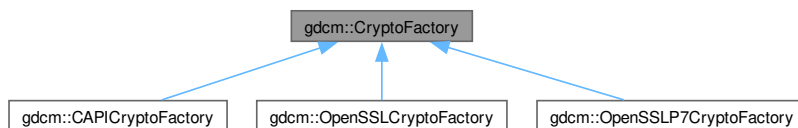
- [gdcmCP246ExplicitDataElement.h](#)

## 12.63 gdcm::CryptoFactory Class Reference

Class to do handle the crypto factory.

```
#include <gdcmCryptoFactory.h>
```

Inheritance diagram for gdcm::CryptoFactory:



### Public Types

- enum [CryptoLib](#) {  
[DEFAULT](#) = 0 ,  
[OPENSSL](#) = 1 ,  
[CAPI](#) = 2 ,  
[OPENSSL7](#) = 3 }

### Public Member Functions

- virtual [CryptographicMessageSyntax](#) \* [CreateCMSProvider](#) ()=0

### Static Public Member Functions

- static [CryptoFactory](#) \* [GetFactoryInstance](#) ([CryptoLib](#) id=[DEFAULT](#))

## Protected Member Functions

- [CryptoFactory](#) ()=default
- [CryptoFactory](#) ([CryptoLib](#) id)
- [~CryptoFactory](#) ()=default

### 12.63.1 Detailed Description

Class to do handle the crypto factory.

GDCM needs to access in a platform independent way the user specified crypto engine. It can be:

- CAPI (windows only)
- OPENSSL (portable)
- OPENSSLP7 (portable) By default the factory will try: CAPI if on windows OPENSSL if possible OPENSSLP7 when older OpenSSL is used.

### 12.63.2 Member Enumeration Documentation

#### 12.63.2.1 CryptoLib

```
enum gdcm::CryptoFactory::CryptoLib
```

#### Enumerator

DEFAULT	
OPENSSL	
CAPI	
OPENSSLP7	

### 12.63.3 Constructor & Destructor Documentation

#### 12.63.3.1 CryptoFactory() [1/2]

```
gdcm::CryptoFactory::CryptoFactory (
    CryptoLib id) [inline], [protected]
```

Referenced by [gdcm::OpenSSLCryptoFactory::OpenSSLCryptoFactory\(\)](#), [gdcm::OpenSSLP7CryptoFactory::OpenSSLP7CryptoFactory\(\)](#) and [GetFactoryInstance\(\)](#).

### 12.63.3.2 CryptoFactory() [2/2]

```
gdcmm::CryptoFactory::CryptoFactory () [protected], [default]
```

### 12.63.3.3 ~CryptoFactory()

```
gdcmm::CryptoFactory::~~CryptoFactory () [protected], [default]
```

## 12.63.4 Member Function Documentation

### 12.63.4.1 CreateCMSProvider()

```
virtual CryptographicMessageSyntax * gdcmm::CryptoFactory::CreateCMSProvider () [pure virtual]
```

Implemented in [gdcmm::CAPICryptoFactory](#), [gdcmm::OpenSSLCryptoFactory](#), and [gdcmm::OpenSSL7CryptoFactory](#).

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 12.63.4.2 GetFactoryInstance()

```
CryptoFactory * gdcmm::CryptoFactory::GetFactoryInstance (
    CryptoLib id = DEFAULT) [static]
```

References [CryptoFactory\(\)](#), and [DEFAULT](#).

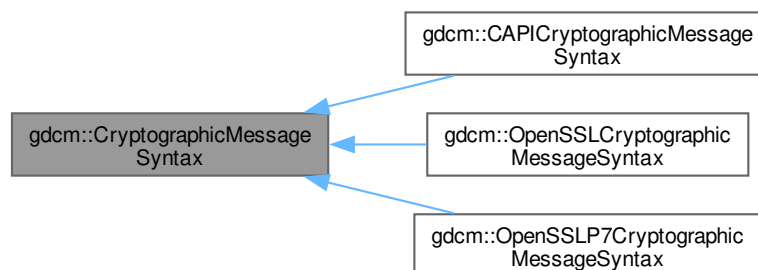
The documentation for this class was generated from the following file:

- [gdcmmCryptoFactory.h](#)

## 12.64 gdcmm::CryptographicMessageSyntax Class Reference

```
#include <gdcmmCryptographicMessageSyntax.h>
```

Inheritance diagram for gdcmm::CryptographicMessageSyntax:



## Public Types

- enum [CipherTypes](#) {  
[DES3\\_CIPHER](#) ,  
[AES128\\_CIPHER](#) ,  
[AES192\\_CIPHER](#) ,  
[AES256\\_CIPHER](#) }

## Public Member Functions

- [CryptographicMessageSyntax](#) ()=default
- [CryptographicMessageSyntax](#) (const [CryptographicMessageSyntax](#) &)=delete
- virtual [~CryptographicMessageSyntax](#) ()=default
- virtual bool [Decrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const =0  
*decrypt content from a CMS envelopedData structure*
- virtual bool [Encrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const =0  
*create a CMS envelopedData structure*
- virtual [CipherTypes](#) [GetCipherType](#) () const =0
- void [operator=](#) (const [CryptographicMessageSyntax](#) &)=delete
- virtual bool [ParseCertificateFile](#) (const char \*filename)=0
- virtual bool [ParseKeyFile](#) (const char \*filename)=0
- virtual void [SetCipherType](#) ([CipherTypes](#) type)=0
- virtual bool [SetPassword](#) (const char \*pass, size\_t passLen)=0

## 12.64.1 Member Enumeration Documentation

### 12.64.1.1 CipherTypes

```
enum gdcm::CryptographicMessageSyntax::CipherTypes
```

#### Enumerator

DES3_CIPHER	
AES128_CIPHER	
AES192_CIPHER	
AES256_CIPHER	

## 12.64.2 Constructor & Destructor Documentation

### 12.64.2.1 CryptographicMessageSyntax() [1/2]

```
gdcm::CryptographicMessageSyntax::CryptographicMessageSyntax () [default]
```

Referenced by [CryptographicMessageSyntax\(\)](#), and [operator=\(\)](#).

### 12.64.2.2 ~CryptographicMessageSyntax()

```
virtual gdcmm::CryptographicMessageSyntax::~~CryptographicMessageSyntax () [virtual], [default]
```

### 12.64.2.3 CryptographicMessageSyntax() [2/2]

```
gdcmm::CryptographicMessageSyntax::CryptographicMessageSyntax (  
    const CryptographicMessageSyntax & ) [delete]
```

References [CryptographicMessageSyntax\(\)](#).

## 12.64.3 Member Function Documentation

### 12.64.3.1 Decrypt()

```
virtual bool gdcmm::CryptographicMessageSyntax::Decrypt (  
    char * output,  
    size_t & outlen,  
    const char * array,  
    size_t len) const [pure virtual]
```

decrypt content from a CMS envelopedData structure

Implemented in [gdcmm::CAPICryptographicMessageSyntax](#), [gdcmm::OpenSSLCryptographicMessageSyntax](#), and [gdcmm::OpenSSL7CryptographicMessageSyntax](#).

### 12.64.3.2 Encrypt()

```
virtual bool gdcmm::CryptographicMessageSyntax::Encrypt (  
    char * output,  
    size_t & outlen,  
    const char * array,  
    size_t len) const [pure virtual]
```

create a CMS envelopedData structure

Implemented in [gdcmm::CAPICryptographicMessageSyntax](#), [gdcmm::OpenSSLCryptographicMessageSyntax](#), and [gdcmm::OpenSSL7CryptographicMessageSyntax](#).

### 12.64.3.3 GetCipherType()

```
virtual CipherTypes gdcmm::CryptographicMessageSyntax::GetCipherType () const [pure virtual]
```

Implemented in [gdcmm::CAPICryptographicMessageSyntax](#), [gdcmm::OpenSSLCryptographicMessageSyntax](#), and [gdcmm::OpenSSL7CryptographicMessageSyntax](#).

#### 12.64.3.4 operator=()

```
void gdcm::CryptographicMessageSyntax::operator= (
    const CryptographicMessageSyntax & ) [delete]
```

References [CryptographicMessageSyntax\(\)](#).

#### 12.64.3.5 ParseCertificateFile()

```
virtual bool gdcm::CryptographicMessageSyntax::ParseCertificateFile (
    const char * filename) [pure virtual]
```

Implemented in [gdcm::CAPICryptographicMessageSyntax](#), [gdcm::OpenSSLCryptographicMessageSyntax](#), and [gdcm::OpenSSLP7CryptographicMessageSyntax](#).

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

#### 12.64.3.6 ParseKeyFile()

```
virtual bool gdcm::CryptographicMessageSyntax::ParseKeyFile (
    const char * filename) [pure virtual]
```

Implemented in [gdcm::CAPICryptographicMessageSyntax](#), [gdcm::OpenSSLCryptographicMessageSyntax](#), and [gdcm::OpenSSLP7CryptographicMessageSyntax](#).

#### 12.64.3.7 SetCipherType()

```
virtual void gdcm::CryptographicMessageSyntax::SetCipherType (
    CipherTypes type) [pure virtual]
```

Implemented in [gdcm::CAPICryptographicMessageSyntax](#), [gdcm::OpenSSLCryptographicMessageSyntax](#), and [gdcm::OpenSSLP7CryptographicMessageSyntax](#).

#### 12.64.3.8 SetPassword()

```
virtual bool gdcm::CryptographicMessageSyntax::SetPassword (
    const char * pass,
    size_t passLen) [pure virtual]
```

Implemented in [gdcm::CAPICryptographicMessageSyntax](#), [gdcm::OpenSSLCryptographicMessageSyntax](#), and [gdcm::OpenSSLP7CryptographicMessageSyntax](#).

The documentation for this class was generated from the following file:

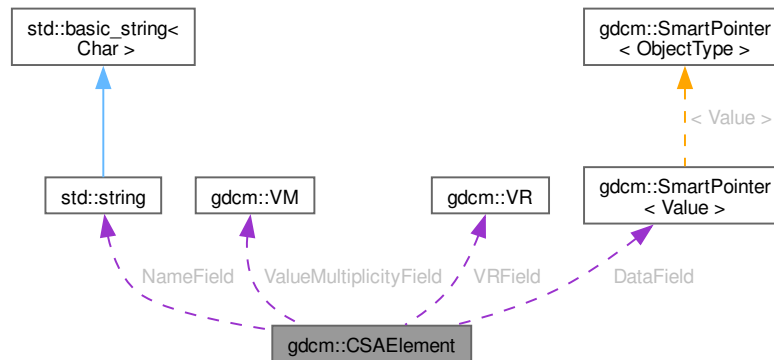
- [gdcmCryptographicMessageSyntax.h](#)

## 12.65 gdcm::CSAElement Class Reference

Class to represent a CSA [Element](#).

```
#include <gdcmCSAElement.h>
```

Collaboration diagram for gdcm::CSAElement:



### Public Member Functions

- [CSAElement](#) (const CSAElement &\_val)
- [CSAElement](#) (unsigned int kf=0)
- const [ByteValue](#) \* [GetByteValue](#) () const
- unsigned int [GetKey](#) () const  
*Set/Get Key.*
- const char \* [GetName](#) () const  
*Set/Get Name.*
- unsigned int [GetNoOfItems](#) () const  
*Set/Get NoOfItems.*
- unsigned int [GetSyngoDT](#) () const  
*Set/Get SyngoDT.*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const  
*Set/Get Value (bytes array, SQ of items, SQ of fragments):*
- const [VM](#) & [GetVM](#) () const  
*Set/Get VM.*
- [VR](#) const & [GetVR](#) () const  
*Set/Get VR.*
- bool [IsEmpty](#) () const  
*Check if CSA Element is empty.*
- bool [operator<](#) (const [CSAElement](#) &de) const

- [CSAElement](#) & [operator=](#) (const [CSAElement](#) &de)=default
- bool [operator==](#) (const [CSAElement](#) &de) const
- void [SetByteValue](#) (const char \*array, [VL](#) length)  
    *Set.*
- void [SetKey](#) (unsigned int key)
- void [SetName](#) (const char \*name)
- void [SetNoOfItems](#) (unsigned int items)
- void [SetSyngoDT](#) (unsigned int syngodt)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVM](#) (const [VM](#) &vm)
- void [SetVR](#) ([VR](#) const &vr)

### Protected Types

- typedef [SmartPointer](#)< [Value](#) > [DataPtr](#)

### Protected Attributes

- [DataPtr](#) [DataField](#)
- unsigned int [KeyField](#)
- std::string [NameField](#)
- unsigned int [NoOfItemsField](#)
- unsigned int [SyngoDTField](#)
- [VM](#) [ValueMultiplicityField](#)
- [VR](#) [VRField](#)

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [CSAElement](#) &val)

## 12.65.1 Detailed Description

Class to represent a CSA [Element](#).

See also

[CSAHeader](#)

Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [MrProtocol.cxx](#), and [csa2img.cxx](#).



## 12.65.2 Member Typedef Documentation

### 12.65.2.1 DataPtr

```
typedef SmartPointer<Value> gdcm::CSAElement::DataPtr [protected]
```

## 12.65.3 Constructor & Destructor Documentation

### 12.65.3.1 CSAElement() [1/2]

```
gdcm::CSAElement::CSAElement (  
    unsigned int kf = 0) [inline]
```

References [KeyField](#).

Referenced by [CSAElement\(\)](#), [operator<\(\)](#), [operator<<](#), [operator=\(\)](#), and [operator==\(\)](#).

### 12.65.3.2 CSAElement() [2/2]

```
gdcm::CSAElement::CSAElement (  
    const CSAElement & _val) [inline]
```

References [CSAElement\(\)](#).

## 12.65.4 Member Function Documentation

### 12.65.4.1 GetByteValue()

```
const ByteValue * gdcm::CSAElement::GetByteValue () const [inline]
```

Return the [Value](#) of [CSAElement](#) as a [ByteValue](#) (if possible)

#### Warning

: You need to check for NULL return value

#### Examples

[DumpSiemensBase64.cxx](#), and [MrProtocol.cxx](#).

References [DataField](#).

#### 12.65.4.2 GetKey()

```
unsigned int gdcm::CSAElement::GetKey () const [inline]
```

Set/Get Key.

References [KeyField](#).

Referenced by [operator<\(\)](#).

#### 12.65.4.3 GetName()

```
const char * gdcm::CSAElement::GetName () const [inline]
```

Set/Get Name.

References [NameField](#).

#### 12.65.4.4 GetNoOfItems()

```
unsigned int gdcm::CSAElement::GetNoOfItems () const [inline]
```

Set/Get NoOfItems.

References [NoOfItemsField](#).

#### 12.65.4.5 GetSyngoDT()

```
unsigned int gdcm::CSAElement::GetSyngoDT () const [inline]
```

Set/Get SyngoDT.

References [SyngoDTField](#).

#### 12.65.4.6 GetValue() [1/2]

```
Value & gdcm::CSAElement::GetValue () [inline]
```

References [DataField](#).

#### 12.65.4.7 GetValue() [2/2]

```
Value const & gdcm::CSAElement::GetValue () const [inline]
```

Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):

##### Examples

[csa2img.cxx](#).

References [DataField](#).

#### 12.65.4.8 GetVM()

```
const VM & gdcm::CSAElement::GetVM () const [inline]
```

Set/Get [VM](#).

References [ValueMultiplicityField](#).

#### 12.65.4.9 GetVR()

```
VR const & gdcm::CSAElement::GetVR () const [inline]
```

Set/Get [VR](#).

References [VRField](#).

#### 12.65.4.10 IsEmpty()

```
bool gdcm::CSAElement::IsEmpty () const [inline]
```

Check if CSA [Element](#) is empty.

##### Examples

[csa2img.cxx](#).

References [DataField](#).

#### 12.65.4.11 operator<()

```
bool gdcm::CSAElement::operator< (  
    const CSAElement & de) const [inline]
```

References [CSAElement\(\)](#), and [GetKey\(\)](#).

**12.65.4.12 operator=()**

```
CSAElement & gdcM::CSAElement::operator= (  
    const CSAElement & de) [default]
```

References [CSAElement\(\)](#).

**12.65.4.13 operator==()**

```
bool gdcM::CSAElement::operator== (  
    const CSAElement & de) const [inline]
```

References [CSAElement\(\)](#), [KeyField](#), [NameField](#), [SyngoDTField](#), [ValueMultiplicityField](#), and [VRField](#).

**12.65.4.14 SetByteValue()**

```
void gdcM::CSAElement::SetByteValue (  
    const char * array,  
    VL length) [inline]
```

Set.

References [SetValue\(\)](#).

**12.65.4.15 SetKey()**

```
void gdcM::CSAElement::SetKey (  
    unsigned int key) [inline]
```

References [KeyField](#).

**12.65.4.16 SetName()**

```
void gdcM::CSAElement::SetName (  
    const char * name) [inline]
```

References [NameField](#).

**12.65.4.17 SetNoOfItems()**

```
void gdcM::CSAElement::SetNoOfItems (  
    unsigned int items) [inline]
```

References [NoOfItemsField](#).

#### 12.65.4.18 SetSyngoDT()

```
void gdcm::CSAElement::SetSyngoDT (
    unsigned int syngodt) [inline]
```

References [SyngoDTField](#).

#### 12.65.4.19 SetValue()

```
void gdcm::CSAElement::SetValue (
    Value const & vl) [inline]
```

References [DataField](#).

Referenced by [SetByteValue\(\)](#).

#### 12.65.4.20 SetVM()

```
void gdcm::CSAElement::SetVM (
    const VM & vm) [inline]
```

References [ValueMultiplicityField](#).

#### 12.65.4.21 SetVR()

```
void gdcm::CSAElement::SetVR (
    VR const & vr) [inline]
```

References [VRField](#).

### 12.65.5 Friends And Related Symbol Documentation

#### 12.65.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const CSAElement & val) [friend]
```

References [CSAElement\(\)](#), [DataField](#), [gdcm::ByteValue::GetLength\(\)](#), [gdcm::ByteValue::GetPointer\(\)](#), [KeyField](#), [NameField](#), [NoOfItemsField](#), [SyngoDTField](#), [ValueMultiplicityField](#), [gdcm::VM::VM1](#), and [VRField](#).

## 12.65.6 Member Data Documentation

### 12.65.6.1 DataField

`DataPtr` `gdcm::CSAElement::DataField` [protected]

Referenced by [GetByteValue\(\)](#), [GetValue\(\)](#), [GetValue\(\)](#), [IsEmpty\(\)](#), [operator<<](#), and [SetValue\(\)](#).

### 12.65.6.2 KeyField

`unsigned int` `gdcm::CSAElement::KeyField` [protected]

Referenced by [CSAElement\(\)](#), [GetKey\(\)](#), [operator<<](#), [operator==\(\)](#), and [SetKey\(\)](#).

### 12.65.6.3 NameField

`std::string` `gdcm::CSAElement::NameField` [protected]

Referenced by [GetName\(\)](#), [operator<<](#), [operator==\(\)](#), and [SetName\(\)](#).

### 12.65.6.4 NoOfItemsField

`unsigned int` `gdcm::CSAElement::NoOfItemsField` [protected]

Referenced by [GetNoOfItems\(\)](#), [operator<<](#), and [SetNoOfItems\(\)](#).

### 12.65.6.5 SyngoDTField

`unsigned int` `gdcm::CSAElement::SyngoDTField` [protected]

Referenced by [GetSyngoDT\(\)](#), [operator<<](#), [operator==\(\)](#), and [SetSyngoDT\(\)](#).

### 12.65.6.6 ValueMultiplicityField

`VM` `gdcm::CSAElement::ValueMultiplicityField` [protected]

Referenced by [GetVM\(\)](#), [operator<<](#), [operator==\(\)](#), and [SetVM\(\)](#).

### 12.65.6.7 VRField

VR gdcm::CSAElement::VRField [protected]

Referenced by [GetVR\(\)](#), [operator<<](#), [operator==\(\)](#), and [SetVR\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmCSAElement.h](#)

## 12.66 gdcm::CSAHeader Class Reference

Class for [CSAHeader](#).

```
#include <gdcmCSAHeader.h>
```

### Public Types

- enum [CSAHeaderType](#) {  
[UNKNOWN](#) = 0 ,  
[SV10](#) ,  
[NOMAGIC](#) ,  
[DATASET\\_FORMAT](#) ,  
[INTERFILE](#) ,  
[ZEROED\\_OUT](#) }

*Diverse format of [CSAHeader](#) as found 'in the wild'.*

### Public Member Functions

- [CSAHeader](#) ()
- [~CSAHeader](#) ()=default
- bool [FindCSAElementByName](#) (const char \*name)
- const [CSAElement](#) & [GetCSAElementByName](#) (const char \*name)
- const [DataSet](#) & [GetDataSet](#) () const  
*Return the [DataSet](#) output (use only if Format == DATASET\_FORMAT).*
- [CSAHeaderType](#) [GetFormat](#) () const
- const char \* [GetInterfile](#) () const  
*Return the string output (use only if Format == Interfile).*
- bool [GetMrProtocol](#) (const [DataSet](#) &ds, [MrProtocol](#) &mrProtocol)
- bool [LoadFromDataElement](#) ([DataElement](#) const &de)  
*Decode the [CSAHeader](#) from element 'de'.*
- void [Print](#) (std::ostream &os) const  
*Print the [CSAHeader](#) (use only if Format == SV10 or NOMAGIC).*

### Static Public Member Functions

- static const [PrivateTag](#) & [GetCSADataInfo](#) ()
- static const [PrivateTag](#) & [GetCSAImageHeaderInfoTag](#) ()
- static const [PrivateTag](#) & [GetCSASeriesHeaderInfoTag](#) ()

### Protected Member Functions

- const [CSAElement](#) & [GetCSAEEnd](#) () const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [CSAHeader](#) &d)

## 12.66.1 Detailed Description

Class for [CSAHeader](#).

SIEMENS store private information in tag (0x0029,0x10,"SIEMENS CSA HEADER") this class is meant for user wishing to access values stored within this private attribute. There are basically two main 'format' for this attribute : SV10/↵NOMAGIC and DATASET\_FORMAT SV10 and NOMAGIC are from a user prospective identical, see CSAHeader.xml for possible name / value stored in this format. DATASET\_FORMAT is in fact simply just another DICOM dataset (implicit) with -currently unknown- value. This can be only be printed for now.

### Warning

Everything you do with this code is at your own risk, since decoding process was not written from specification documents.

the API of this class might change.

**Todo** MrEvaProtocol in 29,1020 contains ^M that would be nice to get rid of on UNIX system...

### See also

[PDBHeader](#)

External references: 5.1.3.2.4.1 MEDCOM History Information and 5.1.4.3 CSA Non-Image [Module](#) in [http://tamsinfo.toshiba.com/docrequest/pdf/E.Soft\\_v2.0.pdf](http://tamsinfo.toshiba.com/docrequest/pdf/E.Soft_v2.0.pdf)

### Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [MrProtocol.cxx](#), and [csa2img.cxx](#).



## 12.66.2 Member Enumeration Documentation

### 12.66.2.1 CSAHeaderType

enum `gdcm::CSAHeader::CSAHeaderType`

Diverse format of [CSAHeader](#) as found 'in the wild'.

#### Enumerator

UNKNOWN	
SV10	
NOMAGIC	
DATASET_FORMAT	
INTERFILE	
ZEROED_OUT	

## 12.66.3 Constructor & Destructor Documentation

### 12.66.3.1 CSAHeader()

```
gdcm::CSAHeader::CSAHeader () [inline]
```

References [UNKNOWN](#).

Referenced by [operator<<](#).

### 12.66.3.2 ~CSAHeader()

```
gdcm::CSAHeader::~~CSAHeader () [default]
```

## 12.66.4 Member Function Documentation

### 12.66.4.1 FindCSAElementByName()

```
bool gdcm::CSAHeader::FindCSAElementByName (
    const char * name)
```

Return true if the CSA element matching 'name' is found or not

#### Warning

Case Sensitive

#### Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [MrProtocol.cxx](#), and [csa2img.cxx](#).

#### 12.66.4.2 GetCSADataInfo()

```
const PrivateTag & gdcm::CSAHeader::GetCSADataInfo () [static]
```

Return the private tag used by SIEMENS to store the CSA Data Info This is: [PrivateTag](#)(0x0029,0x10,"SIEMENS CSA NON-IMAGE");

#### 12.66.4.3 GetCSAEEnd()

```
const CSAElement & gdcm::CSAHeader::GetCSAEEnd () const [protected]
```

#### 12.66.4.4 GetCSAElementByName()

```
const CSAElement & gdcm::CSAHeader::GetCSAElementByName (
    const char * name)
```

Return the [CSAElement](#) corresponding to name 'name'

##### Warning

Case Sensitive

##### Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [MrProtocol.cxx](#), and [csa2img.cxx](#).

#### 12.66.4.5 GetCSAImageHeaderInfoTag()

```
const PrivateTag & gdcm::CSAHeader::GetCSAImageHeaderInfoTag () [static]
```

Return the private tag used by SIEMENS to store the CSA [Image](#) Header This is: [PrivateTag](#)(0x0029,0x10,"SIEMENS CSA HEADER");

##### Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [PublicDict.cxx](#), and [csa2img.cxx](#).

#### 12.66.4.6 GetCSASeriesHeaderInfoTag()

```
const PrivateTag & gdcm::CSAHeader::GetCSASeriesHeaderInfoTag () [static]
```

Return the private tag used by SIEMENS to store the CSA [Series](#) Header This is: [PrivateTag](#)(0x0029,0x20,"SIEMENS CSA HEADER");

##### Examples

[MrProtocol.cxx](#).

#### 12.66.4.7 GetDataSet()

```
const DataSet & gdcm::CSAHeader::GetDataSet () const [inline]
```

Return the [DataSet](#) output (use only if Format == DATASET\_FORMAT ).

#### 12.66.4.8 GetFormat()

```
CSAHeaderType gdcm::CSAHeader::GetFormat () const
```

return the format of the [CSAHeader](#) SV10 and NOMAGIC are equivalent.

#### 12.66.4.9 GetInterfile()

```
const char * gdcm::CSAHeader::GetInterfile () const [inline]
```

Return the string output (use only if Format == Interfile).

#### 12.66.4.10 GetMrProtocol()

```
bool gdcm::CSAHeader::GetMrProtocol (
    const DataSet & ds,
    MrProtocol & mrProtocol)
```

Retrieve the ASCII portion stored within the MrProtocol/MrPhoenixProtocol:

##### Examples

[MrProtocol.cxx](#).

#### 12.66.4.11 LoadFromDataElement()

```
bool gdcm::CSAHeader::LoadFromDataElement (
    DataElement const & de)
```

Decode the [CSAHeader](#) from element 'de'.

##### Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [MrProtocol.cxx](#), and [csa2img.cxx](#).

### 12.66.4.12 Print()

```
void gdcM::CSAHeader::Print (
    std::ostream & os) const
```

Print the [CSAHeader](#) (use only if Format == SV10 or NOMAGIC).

#### Examples

[csa2img.cxx](#).

Referenced by [operator<<](#).

## 12.66.5 Friends And Related Symbol Documentation

### 12.66.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const CSAHeader & d) [friend]
```

References [CSAHeader\(\)](#), and [Print\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMCSAHeader.h](#)

## 12.67 gdcM::CSAHeaderDict Class Reference

Class to represent a map of [CSAHeaderDictEntry](#).

```
#include <gdcMCSAHeaderDict.h>
```

### Public Types

- typedef MapCSAHeaderDictEntry::const\_iterator [ConstIterator](#)
- typedef MapCSAHeaderDictEntry::iterator [Iterator](#)
- typedef std::set< [CSAHeaderDictEntry](#) > [MapCSAHeaderDictEntry](#)

### Public Member Functions

- [CSAHeaderDict](#) ()
- [CSAHeaderDict](#) (const CSAHeaderDict &\_val)=delete
- void [AddCSAHeaderDictEntry](#) (const [CSAHeaderDictEntry](#) &de)
- [ConstIterator](#) [Begin](#) () const
- [ConstIterator](#) [End](#) () const
- const [CSAHeaderDictEntry](#) & [GetCSAHeaderDictEntry](#) (const char \*name) const
- bool [IsEmpty](#) () const
- [CSAHeaderDict](#) & [operator=](#) (const [CSAHeaderDict](#) &\_val)=delete

## Protected Member Functions

- void [LoadDefault](#) ()

## Friends

- class [Dicts](#)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [CSAHeaderDict](#) &\_val)

## 12.67.1 Detailed Description

Class to represent a map of [CSAHeaderDictEntry](#).

### Examples

[MrProtocol.cxx](#).

## 12.67.2 Member Typedef Documentation

### 12.67.2.1 ConstIterator

```
typedef MapCSAHeaderDictEntry::const_iterator gdcm::CSAHeaderDict::ConstIterator
```

### 12.67.2.2 Iterator

```
typedef MapCSAHeaderDictEntry::iterator gdcm::CSAHeaderDict::Iterator
```

### 12.67.2.3 MapCSAHeaderDictEntry

```
typedef std::set<CSAHeaderDictEntry> gdcm::CSAHeaderDict::MapCSAHeaderDictEntry
```

## 12.67.3 Constructor & Destructor Documentation

### 12.67.3.1 CSAHeaderDict() [1/2]

```
gdcm::CSAHeaderDict::CSAHeaderDict () [inline]
```

Referenced by [CSAHeaderDict\(\)](#), [operator<<](#), and [operator=\(\)](#).

### 12.67.3.2 CSAHeaderDict() [2/2]

```
gdcM::CSAHeaderDict::CSAHeaderDict (  
    const CSAHeaderDict & _val) [delete]
```

References [CSAHeaderDict\(\)](#), and [operator<<](#).

## 12.67.4 Member Function Documentation

### 12.67.4.1 AddCSAHeaderDictEntry()

```
void gdcM::CSAHeaderDict::AddCSAHeaderDictEntry (  
    const CSAHeaderDictEntry & de) [inline]
```

### 12.67.4.2 Begin()

```
ConstIterator gdcM::CSAHeaderDict::Begin () const [inline]
```

### 12.67.4.3 End()

```
ConstIterator gdcM::CSAHeaderDict::End () const [inline]
```

### 12.67.4.4 GetCSAHeaderDictEntry()

```
const CSAHeaderDictEntry & gdcM::CSAHeaderDict::GetCSAHeaderDictEntry (  
    const char * name) const [inline]
```

#### Examples

[MrProtocol.cxx](#).

### 12.67.4.5 IsEmpty()

```
bool gdcM::CSAHeaderDict::IsEmpty () const [inline]
```

### 12.67.4.6 LoadDefault()

```
void gdcM::CSAHeaderDict::LoadDefault () [protected]
```

#### 12.67.4.7 operator=()

```
CSAHeaderDict & gdcm::CSAHeaderDict::operator= (  
    const CSAHeaderDict & _val) [delete]
```

References [CSAHeaderDict\(\)](#).

### 12.67.5 Friends And Related Symbol Documentation

#### 12.67.5.1 Dicts

```
friend class Dicts [friend]
```

References [Dicts](#).

Referenced by [Dicts](#).

#### 12.67.5.2 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const CSAHeaderDict & _val) [friend]
```

References [CSAHeaderDict\(\)](#).

Referenced by [CSAHeaderDict\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmCSAHeaderDict.h](#)

## 12.68 gdcm::CSAHeaderDictEntry Class Reference

Class to represent an Entry in the [Dict](#).

```
#include <gdcmCSAHeaderDictEntry.h>
```

## Public Member Functions

- [CSAHeaderDictEntry](#) (const char \*name="", [VR](#) const &vr=[VR::INVALID](#), [VM](#) const &vm=[VM::VM0](#), const char \*desc="")
- const char \* [GetDescription](#) () const  
*Set/Get Description.*
- const char \* [GetName](#) () const  
*Set/Get Name.*
- const [VM](#) & [GetVM](#) () const  
*Set/Get VM.*
- const [VR](#) & [GetVR](#) () const  
*Set/Get VR.*
- bool [operator<](#) (const [CSAHeaderDictEntry](#) &entry) const
- void [SetDescription](#) (const char \*desc)
- void [SetName](#) (const char \*name)
- void [SetVM](#) ([VM](#) const &vm)
- void [SetVR](#) (const [VR](#) &vr)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [CSAHeaderDictEntry](#) &\_val)

## 12.68.1 Detailed Description

Class to represent an Entry in the [Dict](#).

Does not really exist within the DICOM definition, just a way to minimize storage and have a mapping from [gdcm::Tag](#) to the needed information

### Note

bla TODO FIXME: Need a PublicCSAHeaderDictEntry...indeed [CSAHeaderDictEntry](#) has a notion of retired which does not exist in PrivateCSAHeaderDictEntry...

### See also

[gdcm::Dict](#)

### Examples

[MrProtocol.cxx](#).



## 12.68.2 Constructor & Destructor Documentation

### 12.68.2.1 CSAHeaderDictEntry()

```
gdcm::CSAHeaderDictEntry::CSAHeaderDictEntry (  
    const char * name = "",  
    VR const & vr = VR::INVALID,  
    VM const & vm = VM::VM0,  
    const char * desc = "") [inline]
```

References [gdcm::VR::INVALID](#), and [gdcm::VM::VM0](#).

Referenced by [operator<\(\)](#), and [operator<<](#).

## 12.68.3 Member Function Documentation

### 12.68.3.1 GetDescription()

```
const char * gdcm::CSAHeaderDictEntry::GetDescription () const [inline]
```

Set/Get Description.

### 12.68.3.2 GetName()

```
const char * gdcm::CSAHeaderDictEntry::GetName () const [inline]
```

Set/Get Name.

Referenced by [operator<\(\)](#).

### 12.68.3.3 GetVM()

```
const VM & gdcm::CSAHeaderDictEntry::GetVM () const [inline]
```

Set/Get [VM](#).

### 12.68.3.4 GetVR()

```
const VR & gdcm::CSAHeaderDictEntry::GetVR () const [inline]
```

Set/Get [VR](#).

### 12.68.3.5 operator<()

```
bool gdcM::CSAHeaderDictEntry::operator< (
    const CSAHeaderDictEntry & entry) const [inline]
```

References [CSAHeaderDictEntry\(\)](#), and [GetName\(\)](#).

### 12.68.3.6 SetDescription()

```
void gdcM::CSAHeaderDictEntry::SetDescription (
    const char * desc) [inline]
```

### 12.68.3.7 SetName()

```
void gdcM::CSAHeaderDictEntry::SetName (
    const char * name) [inline]
```

### 12.68.3.8 SetVM()

```
void gdcM::CSAHeaderDictEntry::SetVM (
    VM const & vm) [inline]
```

### 12.68.3.9 SetVR()

```
void gdcM::CSAHeaderDictEntry::SetVR (
    const VR & vr) [inline]
```

## 12.68.4 Friends And Related Symbol Documentation

### 12.68.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const CSAHeaderDictEntry & _val) [friend]
```

References [CSAHeaderDictEntry\(\)](#).

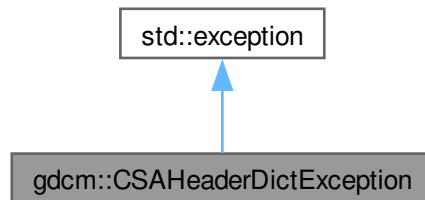
The documentation for this class was generated from the following file:

- [gdcMCSAHeaderDictEntry.h](#)

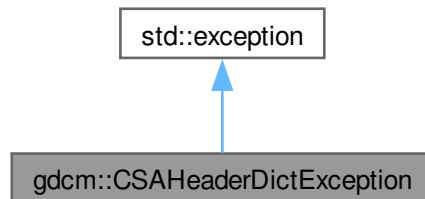
## 12.69 gdcm::CSAHeaderDictException Class Reference

```
#include <gdcmCSAHeaderDict.h>
```

Inheritance diagram for gdcm::CSAHeaderDictException:



Collaboration diagram for gdcm::CSAHeaderDictException:



The documentation for this class was generated from the following file:

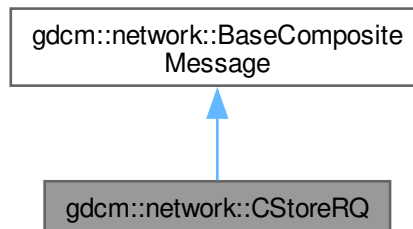
- [gdcmCSAHeaderDict.h](#)

## 12.70 gdcm::network::CStoreRQ Class Reference

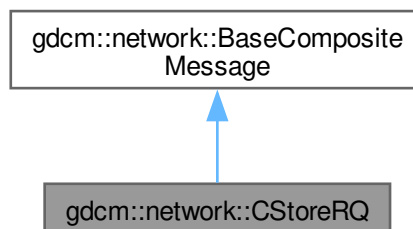
[CStoreRQ](#).

```
#include <gdcmCStoreMessages.h>
```

Inheritance diagram for `gdcm::network::CStoreRQ`:



Collaboration diagram for `gdcm::network::CStoreRQ`:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [File](#) &file, bool writeDataSet=true)

### Public Member Functions inherited from [gdcm::network::BaseCompositeMessage](#)

- virtual `~BaseCompositeMessage` ()=default

## 12.70.1 Detailed Description

[CStoreRQ](#).

this file defines the messages for the cecho action

## 12.70.2 Member Function Documentation

### 12.70.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::CStoreRQ::ConstructPDV (
    const ULConnection & inConnection,
    const File & file,
    bool writeDataSet = true)
```

The documentation for this class was generated from the following file:

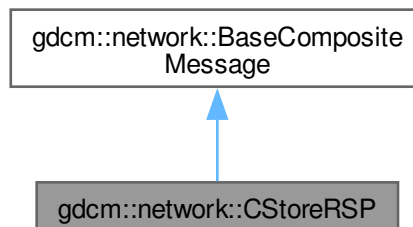
- [gdcmCStoreMessages.h](#)

## 12.71 gdcm::network::CStoreRSP Class Reference

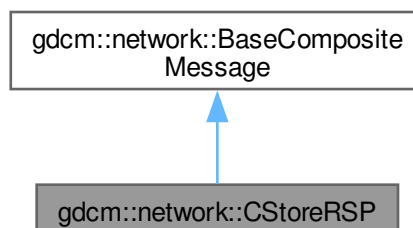
[CStoreRSP](#) this file defines the messages for the cecho action.

```
#include <gdcmCStoreMessages.h>
```

Inheritance diagram for gdcm::network::CStoreRSP:



Collaboration diagram for gdcm::network::CStoreRSP:



## Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [DataSet](#) \*inDataSet, const [BasePDU](#) \*inPC)

## Public Member Functions inherited from [gdcm::network::BaseCompositeMessage](#)

- virtual `~BaseCompositeMessage` ()=default

### 12.71.1 Detailed Description

[CStoreRSP](#) this file defines the messages for the cecho action.

### 12.71.2 Member Function Documentation

#### 12.71.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::CStoreRSP::ConstructPDV (
    const DataSet * inDataSet,
    const BasePDU * inPC)
```

The documentation for this class was generated from the following file:

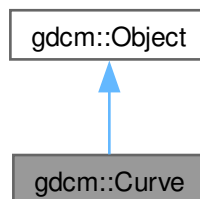
- [gdcmCStoreMessages.h](#)

## 12.72 gdcm::Curve Class Reference

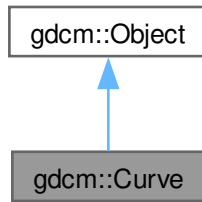
[Curve](#) class to handle element 50xx,3000 [Curve](#) Data.

```
#include <gdcmCurve.h>
```

Inheritance diagram for `gdcm::Curve`:



Collaboration diagram for gdcm::Curve:



### Public Member Functions

- [Curve](#) ()
- [Curve](#) (Curve const &ov)
- [~Curve](#) () override
- void [Decode](#) (std::istream &is, std::ostream &os)
- void [GetAsPoints](#) (float \*array) const
- std::vector< unsigned short > const & [GetCurveDataDescriptor](#) () const
- unsigned short [GetDataValueRepresentation](#) () const
- unsigned short [GetDimensions](#) () const
- unsigned short [GetGroup](#) () const
- unsigned short [GetNumberOfPoints](#) () const
- const char \* [GetTypeOfData](#) () const
- const char \* [GetTypeOfDataDescription](#) () const
- bool [IsEmpty](#) () const
- void [Print](#) (std::ostream &) const override
- void [SetCoordinateStartValue](#) (unsigned short v)
- void [SetCoordinateStepValue](#) (unsigned short v)
- void [SetCurve](#) (const char \*array, unsigned int length)
- void [SetCurveDataDescriptor](#) (const uint16\_t \*values, size\_t num)
- void [SetCurveDescription](#) (const char \*curvedescription)
- void [SetDataValueRepresentation](#) (unsigned short datavaluerepresentation)
- void [SetDimensions](#) (unsigned short dimensions)
- void [SetGroup](#) (unsigned short group)
- void [SetNumberOfPoints](#) (unsigned short numberofpoints)
- void [SetTypeOfData](#) (const char \*typeofdata)
- void [Update](#) (const [DataElement](#) &de)

### Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const Object &)
- *Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

### Static Public Member Functions

- static unsigned int [GetNumberOfCurves](#) ([DataSet](#) const &ds)

### Additional Inherited Members

### Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## 12.72.1 Detailed Description

[Curve](#) class to handle element 50xx,3000 [Curve](#) Data.

WARNING: This is deprecated and lastly defined in PS 3.3 - 2004

Examples:

- GE\_DLX-8-MONO2-Multiframe-Jpeg\_Lossless.dcm
- GE\_DLX-8-MONO2-Multiframe.dcm
- gdcmSampleData/Philips\_Medical\_Images/integris\_HV\_5000/xa\_integris.dcm
- TOSHIBA-CurveData[1-3].dcm

## 12.72.2 Constructor & Destructor Documentation

### 12.72.2.1 [Curve\(\)](#) [1/2]

```
gdcm::Curve::Curve ()
```

Referenced by [Curve\(\)](#).

### 12.72.2.2 [~Curve\(\)](#)

```
gdcm::Curve::~~Curve () [override]
```

### 12.72.2.3 [Curve\(\)](#) [2/2]

```
gdcm::Curve::Curve (  
    Curve const & ov)
```

References [Curve\(\)](#).



## 12.72.3 Member Function Documentation

### 12.72.3.1 Decode()

```
void gdcm::Curve::Decode (
    std::istream & is,
    std::ostream & os)
```

### 12.72.3.2 GetAsPoints()

```
void gdcm::Curve::GetAsPoints (
    float * array) const
```

### 12.72.3.3 GetCurveDataDescriptor()

```
std::vector< unsigned short > const & gdcm::Curve::GetCurveDataDescriptor () const
```

### 12.72.3.4 GetDataValueRepresentation()

```
unsigned short gdcm::Curve::GetDataValueRepresentation () const
```

### 12.72.3.5 GetDimensions()

```
unsigned short gdcm::Curve::GetDimensions () const
```

### 12.72.3.6 GetGroup()

```
unsigned short gdcm::Curve::GetGroup () const
```

### 12.72.3.7 GetNumberOfCurves()

```
unsigned int gdcm::Curve::GetNumberOfCurves (
    DataSet const & ds) [static]
```

### 12.72.3.8 GetNumberOfPoints()

```
unsigned short gdcm::Curve::GetNumberOfPoints () const
```

### 12.72.3.9 GetTypeOfData()

```
const char * gdcm::Curve::GetTypeOfData () const
```

### 12.72.3.10 GetTypeOfDataDescription()

```
const char * gdcm::Curve::GetTypeOfDataDescription () const
```

### 12.72.3.11 IsEmpty()

```
bool gdcm::Curve::IsEmpty () const
```

### 12.72.3.12 Print()

```
void gdcm::Curve::Print (
    std::ostream & ) const [override], [virtual]
```

Reimplemented from [gdcm::Object](#).

### 12.72.3.13 SetCoordinateStartValue()

```
void gdcm::Curve::SetCoordinateStartValue (
    unsigned short v)
```

### 12.72.3.14 SetCoordinateStepValue()

```
void gdcm::Curve::SetCoordinateStepValue (
    unsigned short v)
```

### 12.72.3.15 SetCurve()

```
void gdcm::Curve::SetCurve (
    const char * array,
    unsigned int length)
```

### 12.72.3.16 SetCurveDataDescriptor()

```
void gdcm::Curve::SetCurveDataDescriptor (
    const uint16_t * values,
    size_t num)
```

**12.72.3.17 SetCurveDescription()**

```
void gdcm::Curve::SetCurveDescription (
    const char * curvedescription)
```

**12.72.3.18 SetDataValueRepresentation()**

```
void gdcm::Curve::SetDataValueRepresentation (
    unsigned short datavaluerepresentation)
```

**12.72.3.19 SetDimensions()**

```
void gdcm::Curve::SetDimensions (
    unsigned short dimensions)
```

**12.72.3.20 SetGroup()**

```
void gdcm::Curve::SetGroup (
    unsigned short group)
```

**12.72.3.21 SetNumberOfPoints()**

```
void gdcm::Curve::SetNumberOfPoints (
    unsigned short numberofpoints)
```

**12.72.3.22 SetTypeOfData()**

```
void gdcm::Curve::SetTypeOfData (
    const char * typeofdata)
```

**12.72.3.23 Update()**

```
void gdcm::Curve::Update (
    const DataElement & de)
```

The documentation for this class was generated from the following file:

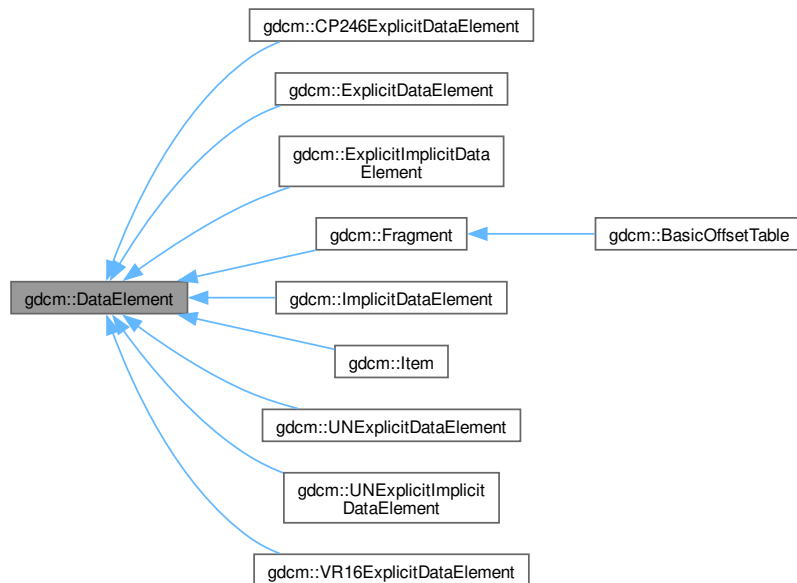
- [gdcmCurve.h](#)

## 12.73 gdcm::DataElement Class Reference

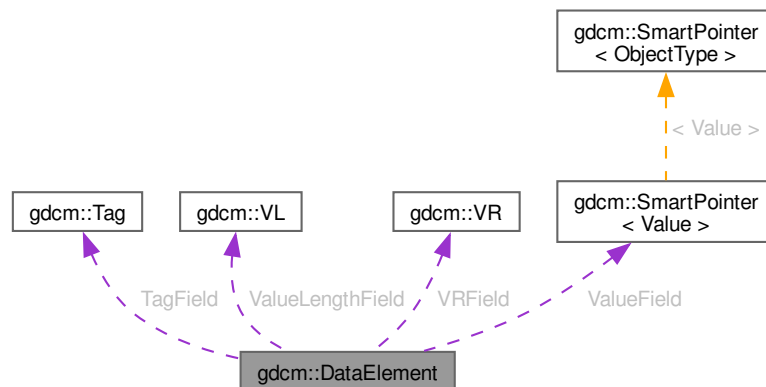
Class to represent a Data [Element](#) either Implicit or Explicit.

```
#include <gdcmDataElement.h>
```

Inheritance diagram for gdcm::DataElement:



Collaboration diagram for gdcm::DataElement:



## Public Member Functions

- [DataElement](#) (const [DataElement](#) &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()
  - Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()
  - Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE>
  - [VL](#) [GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const
- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const
  - Get [Tag](#).*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const
  - Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const
  - Get [VL](#).*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const
  - Check if Data [Element](#) is empty.*
- bool [IsUndefinedLength](#) () const
  - return if [Value](#) Length if of undefined length*
- bool [operator<](#) (const [DataElement](#) &de) const
- [DataElement](#) & [operator=](#) (const [DataElement](#) &)=default
- bool [operator==](#) (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>
  - std::istream & [Read](#) (std::istream &is)
- template<typename TDE, typename TSwap>
  - std::istream & [ReadOrSkip](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
  - std::istream & [ReadPreValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
  - std::istream & [ReadValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
  - std::istream & [ReadValueWithLength](#) (std::istream &is, [VL](#) &length, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
  - std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)
- void [SetByteValue](#) (const char \*array, [VL](#) length)
- void [SetTag](#) (const [Tag](#) &t)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVL](#) (const [VL](#) &vl)
- void [SetVLToUndefined](#) ()
- void [SetVR](#) ([VR](#) const &vr)
- template<typename TDE, typename TSwap>
  - const std::ostream & [Write](#) (std::ostream &os) const

**Protected Types**

- typedef [SmartPointer](#)< [Value](#) > [ValuePtr](#)

**Protected Member Functions**

- void [SetValueFieldLength](#) ([VL](#) vl, bool readvalues)

**Protected Attributes**

- [Tag](#) TagField
- [ValuePtr](#) ValueField
- [VL](#) ValueLengthField
- [VR](#) VRField

**Friends**

- std::ostream & [operator<<](#) (std::ostream &\_os, const [DataElement](#) &\_val)

**12.73.1 Detailed Description**

Class to represent a Data [Element](#) either Implicit or Explicit.

DATA ELEMENT: A unit of information as defined by a single entry in the data dictionary. An encoded Information [Object](#) Definition (IOD) [Attribute](#) that is composed of, at a minimum, three fields: a Data [Element](#) [Tag](#), a [Value](#) Length, and a [Value](#) Field. For some specific Transfer Syntaxes, a Data [Element](#) also contains a [VR](#) Field where the [Value](#) Representation of that Data [Element](#) is specified explicitly.

Design:

- A [DataElement](#) in GDCM always store [VL](#) ([Value](#) Length) on a 32 bits integer even when [VL](#) is 16 bits
- A [DataElement](#) always store the [VR](#) even for Implicit TS, in which case [VR](#) is defaulted to [VR::INVALID](#)
- For [Item](#) start/end (See 0xfffe tags), [Value](#) is NULL

See also

[ExplicitDataElement](#) [ImplicitDataElement](#)

**Examples**

[BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDT1.cxx](#), [DumpToshibaDT12.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [MpegVideoInfo.cs](#), [NewSequence.cs](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [SimplePrint.cs](#), [StreamImageReaderTest.cxx](#), [csa2img.cxx](#), [gdcmrtonplan.cxx](#), [gdcmrtpplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

## 12.73.2 Member Typedef Documentation

### 12.73.2.1 ValuePtr

```
typedef SmartPointer<Value> gdcm::DataElement::ValuePtr [protected]
```

## 12.73.3 Constructor & Destructor Documentation

### 12.73.3.1 DataElement() [1/2]

```
gdcm::DataElement::DataElement (
    const Tag & t = Tag(0),
    const VL & vl = 0,
    const VR & vr = VR::INVALID) [inline]
```

References [gdcm::VR::INVALID](#), [TagField](#), [ValueField](#), [ValueLengthField](#), and [VRField](#).

Referenced by [DataElement\(\)](#), [gdcm::Fragment::Fragment\(\)](#), [gdcm::Item::Item\(\)](#), [gdcm::Item::Item\(\)](#), [gdcm::Item::GetDataElement\(\)](#), [gdcm::Item::InsertDataElement\(\)](#), [operator<\(\)](#), [operator<<\(\)](#), [operator=\(\)](#), and [operator==\(\)](#).

### 12.73.3.2 DataElement() [2/2]

```
gdcm::DataElement::DataElement (
    const DataElement & _val) [inline]
```

References [DataElement\(\)](#).

## 12.73.4 Member Function Documentation

### 12.73.4.1 Clear()

```
void gdcm::DataElement::Clear () [inline]
```

Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).

References [gdcm::VR::INVALID](#), [TagField](#), [ValueField](#), [ValueLengthField](#), and [VRField](#).

Referenced by [gdcm::Item::Clear\(\)](#).

### 12.73.4.2 Empty()

```
void gdcm::DataElement::Empty () [inline]
```

Make Data [Element](#) empty (no [Value](#)).

References [ValueField](#), and [ValueLengthField](#).

### 12.73.4.3 GetByteValue()

```
const ByteValue * gdcm::DataElement::GetByteValue () const [inline]
```

Return the [Value](#) of [DataElement](#) as a [ByteValue](#) (if possible)

#### Warning

: You need to check for NULL return value

#### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetSubSequenceData.cxx](#), [PatchFile.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

References [ValueField](#).

Referenced by [IsEmpty\(\)](#), [gdcm::BasicOffsetTable::operator<<](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#), [gdcm::Element< TVR, TVM >::SetFromDataElement\(\)](#), [gdcm::Element< TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#), and [gdcm::Fragment::Write\(\)](#).

### 12.73.4.4 GetLength()

```
template<typename TDE>
VL gdcm::DataElement::GetLength () const [inline]
```

References [GetLength\(\)](#).

Referenced by [GetLength\(\)](#).

### 12.73.4.5 GetSequenceOfFragments() [1/2]

```
SequenceOfFragments * gdcm::DataElement::GetSequenceOfFragments ()
```

### 12.73.4.6 GetSequenceOfFragments() [2/2]

```
const SequenceOfFragments * gdcm::DataElement::GetSequenceOfFragments () const
```

Return the [Value](#) of [DataElement](#) as a Sequence Of Fragments (if possible)

#### Warning

: You need to check for NULL return value

#### Examples

[DecompressImage.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), and [GetJPEGSamplePrecision.cxx](#).



#### 12.73.4.7 GetTag() [1/2]

```
Tag & gdcm::DataElement::GetTag () [inline]
```

References [TagField](#).

#### 12.73.4.8 GetTag() [2/2]

```
const Tag & gdcm::DataElement::GetTag () const [inline]
```

Get [Tag](#).

##### Examples

[DumpGEMSMovieGroup.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [SimplePrint.cs](#), and [pmsct\\_rgb1.cxx](#).

References [TagField](#).

Referenced by [gdcm::CommandDataSet::Insert\(\)](#), [gdcm::DataSet::Insert\(\)](#), [gdcm::FileMetaInformation::Insert\(\)](#), [operator<\(\)](#), [gdcm::SequenceOfItems::Read\(\)](#), [gdcm::SequenceOfFragments::ReadValue\(\)](#), [gdcm::CommandDataSet::Replace\(\)](#), [gdcm::FileMetaInformation::Replace\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement\(\)](#), and [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#).

#### 12.73.4.9 GetValue() [1/2]

```
Value & gdcm::DataElement::GetValue () [inline]
```

References [gdcmAssertAlwaysMacro](#), and [ValueField](#).

#### 12.73.4.10 GetValue() [2/2]

```
Value const & gdcm::DataElement::GetValue () const [inline]
```

Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):

##### Examples

[ReadAndDumpDICOMDIR.cxx](#).

References [gdcmAssertAlwaysMacro](#), and [ValueField](#).

Referenced by [gdcm::DataSet::InsertDataElement\(\)](#), [gdcm::Element< TVR, TVM >::SetFromDataElement\(\)](#), and [gdcm::Element< TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#).

#### 12.73.4.11 GetValueAsSQ()

```
SmartPointer< SequenceOfItems > gdcm::DataElement::GetValueAsSQ () const
```

Interpret the [Value](#) stored in the [DataElement](#). This is more robust (but also more expensive) to call this function rather than the simplest form: [GetSequenceOfItems\(\)](#) It also return NULL when the [Value](#) is NOT of type [SequenceOfItems](#)

##### Warning

in case [GetSequenceOfItems\(\)](#) succeed the function return this value, otherwise it creates a new [SequenceOfItems](#), you should handle that in your case, for instance: `SmartPointer<SequenceOfItems> sqi = de.GetValueAsSQ();`

##### Examples

[ChangeSequenceUltrasound.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ExtractEncryptedContent.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [SimplePrint.cs](#), [gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

#### 12.73.4.12 GetVL() [1/2]

```
VL & gdcm::DataElement::GetVL () [inline]
```

References [ValueLengthField](#).

#### 12.73.4.13 GetVL() [2/2]

```
const VL & gdcm::DataElement::GetVL () const [inline]
```

Get [VL](#).

##### Examples

[SimplePrint.cs](#).

References [ValueLengthField](#).

Referenced by [gdcm::DataSet::InsertDataElement\(\)](#), [gdcm::SequenceOfItems::Read\(\)](#), and [gdcm::SequenceOfFragments::ReadValue\(\)](#).

#### 12.73.4.14 GetVR()

```
VR const & gdcm::DataElement::GetVR () const [inline]
```

Get [VR](#) do not set [VR::SQ](#) on bytevalue data element

##### Examples

[DuplicatePCDE.cxx](#), and [GenFakeIdentifyFile.cxx](#).

References [VRField](#).

Referenced by [gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#), [gdcm::Element< TVR, TVM >::GetAsDataElement\(\)](#), [gdcm::Element< TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#), [gdcm::Element< TVR, TVM >::SetFromDataElement\(\)](#), and [gdcm::Element< TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#).

#### 12.73.4.15 IsEmpty()

```
bool gdcm::DataElement::IsEmpty () const [inline]
```

Check if Data [Element](#) is empty.

##### Examples

[DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [ELSCINT1WaveToText.cxx](#), [FixJAIBugJPEGLS.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

References [GetByteValue\(\)](#), and [ValueField](#).

Referenced by [gdcm::DataSet::InsertDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#), and [gdcm::Fragment::Write\(\)](#).

#### 12.73.4.16 IsUndefinedLength()

```
bool gdcm::DataElement::IsUndefinedLength () const [inline]
```

return if [Value](#) Length if of undefined length

References [ValueLengthField](#).

Referenced by [gdcm::Item::InsertDataElement\(\)](#).

#### 12.73.4.17 operator<()

```
bool gdcm::DataElement::operator< (
    const DataElement & de) const [inline]
```

References [DataElement\(\)](#), and [GetTag\(\)](#).

#### 12.73.4.18 operator=()

```
DataElement & gdcm::DataElement::operator= (
    const DataElement & ) [default]
```

References [DataElement\(\)](#).

#### 12.73.4.19 operator==()

```
bool gdcm::DataElement::operator== (
    const DataElement & de) const [inline]
```

References [DataElement\(\)](#), [TagField](#), [ValueField](#), [ValueLengthField](#), and [VRField](#).

#### 12.73.4.20 Read()

```
template<typename TDE, typename TSwap>
std::istream & gdcm::DataElement::Read (
    std::istream & is) [inline]
```

##### Examples

[DumpSiemensBase64.cxx](#).

References [Read\(\)](#).

Referenced by [Read\(\)](#), and [ReadOrSkip\(\)](#).

#### 12.73.4.21 ReadOrSkip()

```
template<typename TDE, typename TSwap>
std::istream & gdcm::DataElement::ReadOrSkip (
    std::istream & is,
    std::set< Tag > const & skiptags) [inline]
```

References [Read\(\)](#).

#### 12.73.4.22 ReadPreValue()

```
template<typename TDE, typename TSwap>
std::istream & gdcmm::DataElement::ReadPreValue (
    std::istream & is,
    std::set< Tag > const & skiptags) [inline]
```

References [ReadPreValue\(\)](#).

Referenced by [ReadPreValue\(\)](#).

#### 12.73.4.23 ReadValue()

```
template<typename TDE, typename TSwap>
std::istream & gdcmm::DataElement::ReadValue (
    std::istream & is,
    std::set< Tag > const & skiptags) [inline]
```

References [ReadValue\(\)](#).

Referenced by [ReadValue\(\)](#).

#### 12.73.4.24 ReadValueWithLength()

```
template<typename TDE, typename TSwap>
std::istream & gdcmm::DataElement::ReadValueWithLength (
    std::istream & is,
    VL & length,
    std::set< Tag > const & skiptags) [inline]
```

References [ReadValueWithLength\(\)](#).

Referenced by [ReadValueWithLength\(\)](#).

#### 12.73.4.25 ReadWithLength()

```
template<typename TDE, typename TSwap>
std::istream & gdcmm::DataElement::ReadWithLength (
    std::istream & is,
    VL & length) [inline]
```

References [ReadWithLength\(\)](#).

Referenced by [gdcmm::Item::Read\(\)](#), and [ReadWithLength\(\)](#).

#### 12.73.4.26 SetByteValue()

```
void gdcmm::DataElement::SetByteValue (
    const char * array,
    VL length) [inline]
```

Set the byte value

##### Warning

user need to read DICOM standard for an understanding of:

- even padding
- \0 vs space padding By default even padding is achieved using \0 regardless of the of [VR](#)

##### Examples

[BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [NewSequence.cs](#), [StreamImageReaderTest.cxx](#), [iU22tomultisc.cxx](#), and [rle2img.cxx](#).

References [SetValue\(\)](#).

Referenced by [gdcmm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement\(\)](#), [gdcmm::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement\(\)](#), [gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#), [gdcmm::Element< TVR, TVM >::GetAsDataElement\(\)](#), and [gdcmm::Element< TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#).

#### 12.73.4.27 SetTag()

```
void gdcmm::DataElement::SetTag (
    const Tag & t) [inline]
```

Set [Tag](#) Use with cautious (need to match Part 6)

##### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GenFakeIdentifyFile.cxx](#), and [GetSubSequenceData.cxx](#).

References [TagField](#).

#### 12.73.4.28 SetValue()

```
void gdcm::DataElement::SetValue (
    Value const & vl) [inline]
```

##### Warning

you need to set the ValueLengthField explicitly

##### Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [DuplicatePCDE.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixBrokenJ2K.cxx](#), [GenFakeldentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [MpegVideoInfo.cs](#), and [NewSequence.cs](#).

References [gdcm::Value::GetLength\(\)](#), [ValueField](#), and [ValueLengthField](#).

Referenced by [SetByteValue\(\)](#).

#### 12.73.4.29 SetValueFieldLength()

```
void gdcm::DataElement::SetValueFieldLength (
    VL vl,
    bool readvalues) [protected]
```

#### 12.73.4.30 SetVL()

```
void gdcm::DataElement::SetVL (
    const VL & vl) [inline]
```

Set [VL](#) Use with cautious (need to match Part 6), advanced user only

##### See also

[SetByteValue](#)

References [ValueLengthField](#).

#### 12.73.4.31 SetVLToUndefined()

```
void gdcm::DataElement::SetVLToUndefined ()
```

##### Examples

[Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GenAllVR.cxx](#), [GenFakeldentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), and [NewSequence.cs](#).

### 12.73.4.32 SetVR()

```
void gdcmm::DataElement::SetVR (
    VR const & vr) [inline]
```

Set [VR](#) Use with cautious (need to match Part 6), advanced user only

#### Precondition

vr is a [VR::VRALL](#) (not a dual one such as OB\_OW)

#### Examples

[Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSubSequenceData.cxx](#), [NewSequence.cs](#), [StreamImageReaderTest.cxx](#), [iU22tomultisc.cxx](#), and [rle2img.cxx](#).

References [gdcmm::VR::IsVRFile\(\)](#), and [VRField](#).

Referenced by [gdcmm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement\(\)](#), [gdcmm::Attribute< Group, Element, TVR, VM::VM1 gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#), [gdcmm::Element< TVR, TVM >::GetAsDataElement\(\)](#), and [gdcmm::Element< TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#).

### 12.73.4.33 Write()

```
template<typename TDE, typename TSwap>
const std::ostream & gdcmm::DataElement::Write (
    std::ostream & os) const [inline]
```

References [Write\(\)](#).

Referenced by [Write\(\)](#).

## 12.73.5 Friends And Related Symbol Documentation

### 12.73.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const DataElement & _val) [friend]
```

References [DataElement\(\)](#), [operator<<](#), [gdcmm::Object::Print\(\)](#), [TagField](#), [ValueField](#), [ValueLengthField](#), and [VRField](#).

Referenced by [operator<<](#).



## 12.73.6 Member Data Documentation

### 12.73.6.1 TagField

`Tag` `gdcm::DataElement::TagField` [protected]

Referenced by [DataElement\(\)](#), [Clear\(\)](#), [GetTag\(\)](#), [GetTag\(\)](#), [operator<<](#), [gdcm::Fragment::operator<<](#), [gdcm::Item::operator<<](#), [operator==\(\)](#), [gdcm::BasicOffsetTable::Read\(\)](#), [gdcm::Item::Read\(\)](#), [gdcm::Fragment::ReadBacktrack\(\)](#), [gdcm::Fragment::ReadPreValue\(\)](#), [SetTag\(\)](#), [gdcm::Fragment::Write\(\)](#), and [gdcm::Item::Write\(\)](#).

### 12.73.6.2 ValueField

`ValuePtr` `gdcm::DataElement::ValueField` [protected]

Referenced by [DataElement\(\)](#), [Clear\(\)](#), [Empty\(\)](#), [GetByteValue\(\)](#), [GetValue\(\)](#), [GetValue\(\)](#), [IsEmpty\(\)](#), [gdcm::BasicOffsetTable::operator<<](#), [operator<<](#), [gdcm::Fragment::operator<<](#), [operator==\(\)](#), [gdcm::BasicOffsetTable::Read\(\)](#), [gdcm::Fragment::ReadBacktrack\(\)](#), [gdcm::Fragment::ReadValue\(\)](#), and [SetValue\(\)](#).

### 12.73.6.3 ValueLengthField

`VL` `gdcm::DataElement::ValueLengthField` [protected]

Referenced by [DataElement\(\)](#), [Clear\(\)](#), [Empty\(\)](#), [GetVL\(\)](#), [GetVL\(\)](#), [IsUndefinedLength\(\)](#), [gdcm::BasicOffsetTable::operator<<](#), [operator<<](#), [gdcm::Fragment::operator<<](#), [gdcm::Item::operator<<](#), [operator==\(\)](#), [gdcm::BasicOffsetTable::Read\(\)](#), [gdcm::Item::Read\(\)](#), [gdcm::Fragment::ReadBacktrack\(\)](#), [gdcm::Fragment::ReadPreValue\(\)](#), [gdcm::Fragment::ReadValue\(\)](#), [SetValue\(\)](#), [SetVL\(\)](#), [gdcm::Fragment::Write\(\)](#), and [gdcm::Item::Write\(\)](#).

### 12.73.6.4 VRField

`VR` `gdcm::DataElement::VRField` [protected]

Referenced by [DataElement\(\)](#), [Clear\(\)](#), [GetVR\(\)](#), [operator<<](#), [operator==\(\)](#), and [SetVR\(\)](#).

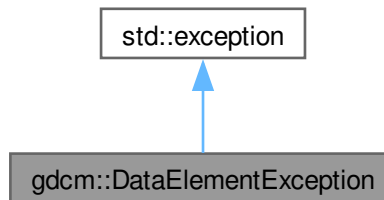
The documentation for this class was generated from the following file:

- [gdcmDataElement.h](#)

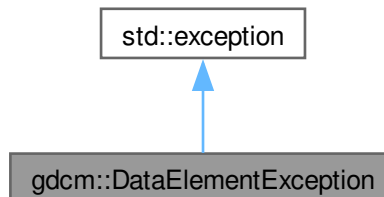
## 12.74 gdcm::DataElementException Class Reference

```
#include <gdcmDataSet.h>
```

Inheritance diagram for `gdcm::DataElementException`:



Collaboration diagram for `gdcm::DataElementException`:



The documentation for this class was generated from the following file:

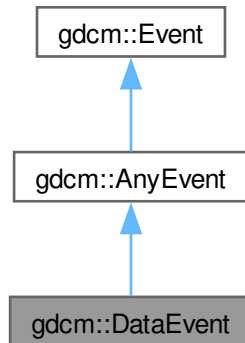
- [gdcmDataSet.h](#)

## 12.75 gdcm::DataEvent Class Reference

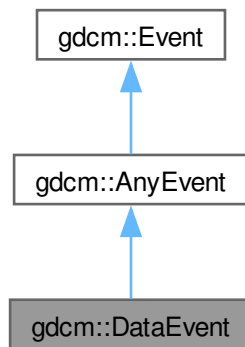
[DataEvent](#).

```
#include <gdcmDataEvent.h>
```

Inheritance diagram for gdcm::DataEvent:



Collaboration diagram for gdcm::DataEvent:



### Public Types

- typedef [DataEvent](#) Self
- typedef [AnyEvent](#) Superclass

### Public Member Functions

- [DataEvent](#) (const char \*bytes=nullptr, size\_t len=0)

- [DataEvent](#) (const [Self](#) &s)
- [~DataEvent](#) () override=default
- bool [CheckEvent](#) (const [::gdcm::Event](#) \*e) const override
- const char \* [GetData](#) () const
- size\_t [GetDataLength](#) () const
- const char \* [GetEventName](#) () const override
- [::gdcm::Event](#) \* [MakeObject](#) () const override
- void [operator=](#) (const [Self](#) &)=delete
- void [SetData](#) (const char \*bytes, size\_t len)

## Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()
- [Event](#) (const Event &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

## 12.75.1 Detailed Description

[DataEvent](#).

## 12.75.2 Member Typedef Documentation

### 12.75.2.1 Self

```
typedef DataEvent gdcm::DataEvent::Self
```

### 12.75.2.2 Superclass

```
typedef AnyEvent gdcm::DataEvent::Superclass
```

## 12.75.3 Constructor & Destructor Documentation

### 12.75.3.1 DataEvent() [1/2]

```
gdcm::DataEvent::DataEvent (
    const char * bytes = nullptr,
    size_t len = 0) [inline]
```

### 12.75.3.2 ~DataEvent()

```
gdcm::DataEvent::~DataEvent () [override], [default]
```

### 12.75.3.3 DataEvent() [2/2]

```
gdcm::DataEvent::DataEvent (
    const Self & s) [inline]
```

## 12.75.4 Member Function Documentation

### 12.75.4.1 CheckEvent()

```
bool gdcm::DataEvent::CheckEvent (
    const ::gdcm::Event * e) const [inline], [override]
```

### 12.75.4.2 GetData()

```
const char * gdcm::DataEvent::GetData () const [inline]
```

### 12.75.4.3 GetDataLength()

```
size_t gdcm::DataEvent::GetDataLength () const [inline]
```

### 12.75.4.4 GetEventName()

```
const char * gdcm::DataEvent::GetEventName () const [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements [gdcm::Event](#).

### 12.75.4.5 MakeObject()

```
::gdcm::Event * gdcm::DataEvent::MakeObject () const [inline], [override], [virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implements [gdcm::Event](#).

#### 12.75.4.6 operator=()

```
void gdcM::DataEvent::operator= (
    const Self & ) [delete]
```

#### 12.75.4.7 SetData()

```
void gdcM::DataEvent::SetData (
    const char * bytes,
    size_t len) [inline]
```

The documentation for this class was generated from the following file:

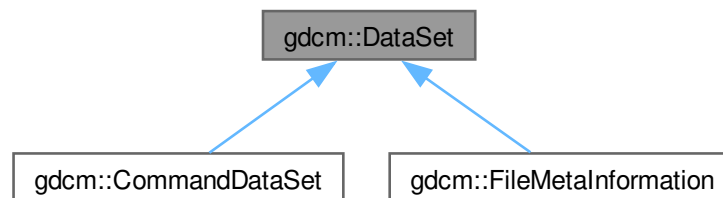
- [gdcMDataEvent.h](#)

## 12.76 gdcM::DataSet Class Reference

Class to represent a Data Set (which contains Data Elements).

```
#include <gdcMDataSet.h>
```

Inheritance diagram for gdcM::DataSet:



### Public Types

- typedef DataElementSet::const\_iterator [ConstIterator](#)
- typedef std::set< [DataElement](#) > [DataElementSet](#)
- typedef DataElementSet::iterator [Iterator](#)
- typedef DataElementSet::size\_type [SizeType](#)

## Public Member Functions

- [Iterator Begin](#) ()
- [ConstIterator Begin](#) () const
- void [Clear](#) ()
- template<typename TDE>  
unsigned int [ComputeGroupLength](#) ([Tag](#) const &tag) const
- [Iterator End](#) ()
- [ConstIterator End](#) () const
- bool [FindDataElement](#) (const [PrivateTag](#) &t) const  
*Look up if private tag 't' is present in the dataset:*
- bool [FindDataElement](#) (const [Tag](#) &t) const
- const [DataElement](#) & [FindNextDataElement](#) (const [Tag](#) &t) const
- const [DataElement](#) & [GetDataElement](#) (const [PrivateTag](#) &t) const  
*Return the dataelement.*
- const [DataElement](#) & [GetDataElement](#) (const [Tag](#) &t) const
- [DataElementSet](#) & [GetDES](#) ()
- const [DataElementSet](#) & [GetDES](#) () const
- template<typename TDE>  
[VL](#) [GetLength](#) () const
- [MediaStorage](#) [GetMediaStorage](#) () const
- std::string [GetPrivateCreator](#) (const [Tag](#) &t) const
- [PrivateTag](#) [GetPrivateTag](#) (const [Tag](#) &t) const  
*Return the private tag of the private tag 't', private creator will be set to empty if not found.*
- void [Insert](#) (const [DataElement](#) &de)
- bool [IsEmpty](#) () const  
*Returns if the dataset is empty.*
- const [DataElement](#) & [operator\(\)](#) (uint16\_t group, uint16\_t element) const
- [DataSet](#) & [operator=](#) ([DataSet](#) const &)=default
- const [DataElement](#) & [operator\[\]](#) (const [Tag](#) &t) const
- void [Print](#) (std::ostream &os, std::string const &indent="") const
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TDE, typename TSwap>  
std::istream & [ReadNested](#) (std::istream &is)
- template<typename TDE, typename TSwap>  
std::istream & [ReadSelectedPrivateTags](#) (std::istream &is, const std::set< [PrivateTag](#) > &tags, bool readvalues=true)
- template<typename TDE, typename TSwap>  
std::istream & [ReadSelectedPrivateTagsWithLength](#) (std::istream &is, const std::set< [PrivateTag](#) > &tags, [VL](#) &length, bool readvalues=true)
- template<typename TDE, typename TSwap>  
std::istream & [ReadSelectedTags](#) (std::istream &is, const std::set< [Tag](#) > &tags, bool readvalues=true)
- template<typename TDE, typename TSwap>  
std::istream & [ReadSelectedTagsWithLength](#) (std::istream &is, const std::set< [Tag](#) > &tags, [VL](#) &length, bool readvalues=true)
- template<typename TDE, typename TSwap>  
std::istream & [ReadUpToTag](#) (std::istream &is, const [Tag](#) &t, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadUpToTagWithLength](#) (std::istream &is, const [Tag](#) &t, std::set< [Tag](#) > const &skiptags, [VL](#) &length)

- `template<typename TDE, typename TSwap>`  
`std::istream & ReadWithLength (std::istream &is, VL &length)`
- `SizeType Remove` (const `Tag` &tag)  
*Completely remove a dataelement from the dataset.*
- `void Replace` (const `DataElement` &de)  
*Replace a dataelement with another one.*
- `void ReplaceEmpty` (const `DataElement` &de)  
*Only replace a DICOM attribute when it is missing or empty.*
- `SizeType Size` () const
- `template<typename TDE, typename TSwap>`  
`std::ostream const & Write (std::ostream &os) const`

### Protected Member Functions

- `Tag ComputeDataElement` (const `PrivateTag` &t) const
- const `DataElement` & `GetDEEnd` () const
- `void InsertDataElement` (const `DataElement` &de)

### Friends

- class `CSAHeader`
- `std::ostream & operator<<` (std::ostream &\_os, const `DataSet` &val)

## 12.76.1 Detailed Description

Class to represent a Data Set (which contains Data Elements).

A Data Set represents an instance of a real world Information [Object](#)

### Note

DATA SET: Exchanged information consisting of a structured set of [Attribute](#) values directly or indirectly related to Information Objects. The value of each [Attribute](#) in a Data Set is expressed as a Data [Element](#). A collection of Data Elements ordered by increasing Data [Element Tag](#) number that is an encoding of the values of Attributes of a real world object.

Implementation note. If one do: `DataSet ds; ds.SetLength(0); ds.Read(is);` setting length to 0 actually means try to read is as if it was a root [DataSet](#). Other value are undefined (nested dataset with undefined length) or defined length (different from 0) means nested dataset with defined length.



### Warning

a [DataSet](#) does not have a Transfer Syntax type, only a [File](#) does.

### Examples

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CompressLossyJPEG.cs](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Write.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MergeTwoFiles.cxx](#), [MrProtocol.cxx](#), [NewSequence.cs](#), [PatchFile.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [SimplePrint.cs](#), [SortImage.cxx](#), [SortImage2.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), [VolumeSorter.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

## 12.76.2 Member Typedef Documentation

### 12.76.2.1 ConstIterator

```
typedef DataSet::const_iterator gdcm::DataSet::ConstIterator
```

### Examples

[DiffFile.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpVisusChange.cxx](#), and [DuplicatePCDE.cxx](#).

### 12.76.2.2 DataSet

```
typedef std::set<DataElement> gdcm::DataSet::DataSet
```

### 12.76.2.3 Iterator

```
typedef DataSet::iterator gdcm::DataSet::Iterator
```

### 12.76.2.4 SizeType

```
typedef DataSet::size_type gdcm::DataSet::SizeType
```

## 12.76.3 Member Function Documentation

### 12.76.3.1 Begin() [1/2]

```
Iterator gdcm::DataSet::Begin () [inline]
```

### 12.76.3.2 Begin() [2/2]

```
ConstIterator gdcm::DataSet::Begin () const [inline]
```

#### Examples

[DiffFile.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpVisusChange.cxx](#), and [DuplicatePCDE.cxx](#).

### 12.76.3.3 Clear()

```
void gdcm::DataSet::Clear () [inline]
```

Referenced by [gdcm::Item::Read\(\)](#).

### 12.76.3.4 ComputeDataElement()

```
Tag gdcm::DataSet::ComputeDataElement (  
    const PrivateTag & t) const [protected]
```

References [operator<<](#).

### 12.76.3.5 ComputeGroupLength()

```
template<typename TDE>  
unsigned int gdcm::DataSet::ComputeGroupLength (  
    Tag const & tag) const [inline]
```

References [gdcm::Tag::GetElement\(\)](#), and [gdcm::Tag::GetGroup\(\)](#).

### 12.76.3.6 End() [1/2]

```
Iterator gdcm::DataSet::End () [inline]
```

**12.76.3.7 End()** [2/2]

```
ConstIterator gdcm::DataSet::End () const [inline]
```

**Examples**

[DiffFile.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpVisusChange.cxx](#), and [DuplicatePCDE.cxx](#).

**12.76.3.8 FindDataElement()** [1/2]

```
bool gdcm::DataSet::FindDataElement (
    const PrivateTag & t) const
```

Look up if private tag 't' is present in the dataset:

**Examples**

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [MrProtocol.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadGEMSSDO.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataSet\(\)](#), and [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataSet\(\)](#).

**12.76.3.9 FindDataElement()** [2/2]

```
bool gdcm::DataSet::FindDataElement (
    const Tag & t) const [inline]
```

References [GetDataElement\(\)](#), and [GetDEEnd\(\)](#).

**12.76.3.10 FindNextDataElement()**

```
const DataElement & gdcm::DataSet::FindNextDataElement (
    const Tag & t) const [inline]
```

**Examples**

[DuplicatePCDE.cxx](#).

References [GetDEEnd\(\)](#).

**12.76.3.11 GetDataElement() [1/2]**

```
const DataElement & gdcM::DataSet::GetDataElement (
    const PrivateTag & t) const
```

Return the dataelement.

**12.76.3.12 GetDataElement() [2/2]**

```
const DataElement & gdcM::DataSet::GetDataElement (
    const Tag & t) const [inline]
```

Return the [DataElement](#) with [Tag](#) 't'

**Warning**

: This only search at the 'root level' of the [DataSet](#)

**Examples**

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [MrProtocol.cxx](#), [PatchFile.cxx](#), [ReadAndDumpDICOmdir.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [csa2img.cxx](#), [gdcMrtionplan.cxx](#), [gdcMrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

References [GetDEEnd\(\)](#).

Referenced by [FindDataElement\(\)](#), [operator\(\)\(\)](#), [operator\[\]\(\)](#), [gdcM::Attribute< Group, Element, TVR, TVM >::Set\(\)](#), [gdcM::Attribute< Group, Element, TVR, VM::VM1 >::Set\(\)](#), [gdcM::Attribute< Group, Element, TVR, VM::VM1\\_n >::Set\(\)](#), [gdcM::Attribute< Group, Element, TVR, TVM >::SetFromDataSet\(\)](#), [gdcM::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataSet\(\)](#) and [gdcM::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataSet\(\)](#).

**12.76.3.13 GetDEEnd()**

```
const DataElement & gdcM::DataSet::GetDEEnd () const [protected]
```

Referenced by [FindDataElement\(\)](#), [FindNextDataElement\(\)](#), and [GetDataElement\(\)](#).

**12.76.3.14 GetDES() [1/2]**

```
DataElementSet & gdcM::DataSet::GetDES () [inline]
```

### 12.76.3.15 GetDES() [2/2]

```
const DataSet & gdcm::DataSet::GetDES () const [inline]
```

#### Examples

[ReadAndDumpDICOMDIR.cxx](#).

### 12.76.3.16 GetLength()

```
template<typename TDE>  
int gdcm::DataSet::GetLength () const [inline]
```

Referenced by [gdcm::FileMetaInformation::GetFullLength\(\)](#).

### 12.76.3.17 GetMediaStorage()

```
std::string gdcm::DataSet::GetMediaStorage () const
```

### 12.76.3.18 GetPrivateCreator()

```
std::string gdcm::DataSet::GetPrivateCreator (  
    const Tag & t) const
```

Return the private creator of the private tag 't': or an empty string when not found

#### Examples

[DuplicatePCDE.cxx](#).

### 12.76.3.19 GetPrivateTag()

```
std::string gdcm::DataSet::GetPrivateTag (  
    const Tag & t) const
```

Return the private tag of the private tag 't', private creator will be set to empty if not found.

### 12.76.3.20 Insert()

```
void gdcm::DataSet::Insert (
    const DataElement & de) [inline]
```

Insert a [DataElement](#) in the [DataSet](#).

#### Warning

: [Tag](#) need to be  $\geq 0x8$  to be considered valid data element

#### Examples

[CreateJPIPDataSet.cxx](#), [DumpSiemensBase64.cxx](#), [DuplicatePCDE.cxx](#), [Extracting\\_All\\_Resolution.cxx](#),  
[Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [GenAllVR.cxx](#),  
[GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [NewSequence.cs](#), [StreamImageReaderTest.cxx](#),  
and [TemplateEmptyImage.cxx](#).

References [gdcmErrorMacro](#), [gdcm::Tag::GetGroup\(\)](#), [gdcm::DataElement::GetTag\(\)](#), and [InsertDataElement\(\)](#).

### 12.76.3.21 InsertDataElement()

```
void gdcm::DataSet::InsertDataElement (
    const DataElement & de) [inline], [protected]
```

References [gdcmWarningMacro](#), [gdcm::Value::GetLength\(\)](#), [gdcm::DataElement::GetValue\(\)](#), [gdcm::DataElement::GetVL\(\)](#),  
and [gdcm::DataElement::IsEmpty\(\)](#).

Referenced by [gdcm::CommandDataSet::Insert\(\)](#), [Insert\(\)](#), and [gdcm::FileMetaInformation::Insert\(\)](#).

### 12.76.3.22 IsEmpty()

```
bool gdcm::DataSet::IsEmpty () const [inline]
```

Returns if the dataset is empty.

Referenced by [gdcm::Item::Read\(\)](#).

### 12.76.3.23 operator>()()

```
const DataElement & gdcm::DataSet::operator() (
    uint16_t group,
    uint16_t element) const [inline]
```

References [GetDataElement\(\)](#).

**12.76.3.24 operator=()**

```
DataSet & gdcm::DataSet::operator= (
    DataSet const & ) [default]
```

**12.76.3.25 operator[]()**

```
const DataElement & gdcm::DataSet::operator[] (
    const Tag & t) const [inline]
```

References [GetDataElement\(\)](#).

**12.76.3.26 Print()**

```
void gdcm::DataSet::Print (
    std::ostream & os,
    std::string const & indent = "") const [inline]
```

Referenced by [gdcm::CommandDataSet::operator<<](#), [operator<<](#), [gdcm::FileMetaInformation::operator<<](#), and [gdcm::Item::operator<<](#).

**12.76.3.27 Read()**

```
template<typename TDE, typename TSwap>
std::istream & gdcm::DataSet::Read (
    std::istream & is)
```

**Examples**

[DumpToshibaDTI.cxx](#), and [DumpToshibaDTI2.cxx](#).

**12.76.3.28 ReadNested()**

```
template<typename TDE, typename TSwap>
std::istream & gdcm::DataSet::ReadNested (
    std::istream & is)
```

**12.76.3.29 ReadSelectedPrivateTags()**

```
template<typename TDE, typename TSwap>
std::istream & gdcm::DataSet::ReadSelectedPrivateTags (
    std::istream & is,
    const std::set< PrivateTag > & tags,
    bool readvalues = true)
```

### 12.76.3.30 ReadSelectedPrivateTagsWithLength()

```
template<typename TDE, typename TSwap>
std::istream & gdcmm::DataSet::ReadSelectedPrivateTagsWithLength (
    std::istream & is,
    const std::set< PrivateTag > & tags,
    VL & length,
    bool readvalues = true)
```

### 12.76.3.31 ReadSelectedTags()

```
template<typename TDE, typename TSwap>
std::istream & gdcmm::DataSet::ReadSelectedTags (
    std::istream & is,
    const std::set< Tag > & tags,
    bool readvalues = true)
```

### 12.76.3.32 ReadSelectedTagsWithLength()

```
template<typename TDE, typename TSwap>
std::istream & gdcmm::DataSet::ReadSelectedTagsWithLength (
    std::istream & is,
    const std::set< Tag > & tags,
    VL & length,
    bool readvalues = true)
```

### 12.76.3.33 ReadUpToTag()

```
template<typename TDE, typename TSwap>
std::istream & gdcmm::DataSet::ReadUpToTag (
    std::istream & is,
    const Tag & t,
    std::set< Tag > const & skiptags)
```

### 12.76.3.34 ReadUpToTagWithLength()

```
template<typename TDE, typename TSwap>
std::istream & gdcmm::DataSet::ReadUpToTagWithLength (
    std::istream & is,
    const Tag & t,
    std::set< Tag > const & skiptags,
    VL & length)
```



### 12.76.3.35 ReadWithLength()

```
template<typename TDE, typename TSwap>
std::istream & gdcmm::DataSet::ReadWithLength (
    std::istream & is,
    VL & length)
```

### 12.76.3.36 Remove()

```
SizeType gdcmm::DataSet::Remove (
    const Tag & tag) [inline]
```

Completely remove a dataelement from the dataset.

#### Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [GenFakeIdentifyFile.cxx](#), [LargeVRDSExplicit.cxx](#), [MergeTwoFiles.cxx](#), [ReformatFile.cs](#), [StandardizeFiles.cs](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcmm::CommandDataSet::Replace\(\)](#), and [gdcmm::FileMetaInformation::Replace\(\)](#).

### 12.76.3.37 Replace()

```
void gdcmm::DataSet::Replace (
    const DataElement & de) [inline]
```

Replace a dataelement with another one.

#### Examples

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CreateFakeRTDOSE.cxx](#), [DeriveSeries.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenFakeIdentifyFile.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [PatchFile.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

References [gdcmmAssertAlwaysMacro](#).

### 12.76.3.38 ReplaceEmpty()

```
void gdcmm::DataSet::ReplaceEmpty (
    const DataElement & de) [inline]
```

Only replace a DICOM attribute when it is missing or empty.

#### Examples

[rle2img.cxx](#).

References [gdcmmAssertAlwaysMacro](#).

### 12.76.3.39 Size()

```
SizeType gdcM::DataSet::Size () const [inline]
```

#### Examples

[DumpGEMSMovieGroup.cxx](#).

Referenced by [gdcM::SequenceOfItems::Read\(\)](#).

### 12.76.3.40 Write()

```
template<typename TDE, typename TSwap>
std::ostream const & gdcM::DataSet::Write (
    std::ostream & os) const
```

## 12.76.4 Friends And Related Symbol Documentation

### 12.76.4.1 CSAHeader

```
friend class CSAHeader [friend]
```

References [CSAHeader](#).

Referenced by [CSAHeader](#).

### 12.76.4.2 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const DataSet & val) [friend]
```

References [operator<<](#), and [Print\(\)](#).

Referenced by [ComputeDataElement\(\)](#), and [operator<<](#).

The documentation for this class was generated from the following file:

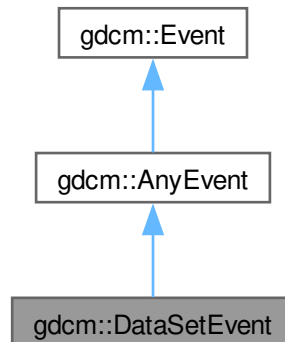
- [gdcMDataSet.h](#)

## 12.77 gdcm::DataSetEvent Class Reference

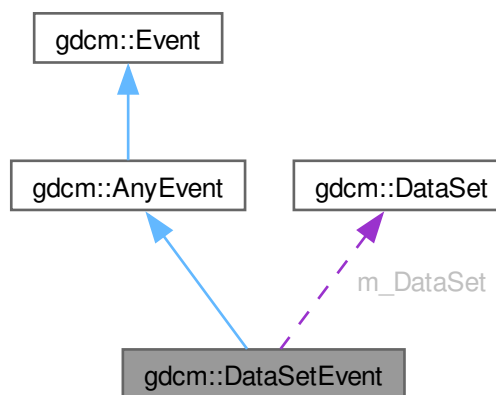
[DataSetEvent](#).

```
#include <gdcmDataSetEvent.h>
```

Inheritance diagram for gdcm::DataSetEvent:



Collaboration diagram for gdcm::DataSetEvent:



### Public Types

- typedef [DataSetEvent](#) Self
- typedef [AnyEvent](#) Superclass

## Public Member Functions

- [DataSetEvent](#) (const [Self](#) &s)
- [DataSetEvent](#) ([DataSet](#) const \*ds=nullptr)
- [~DataSetEvent](#) () override=default
- bool [CheckEvent](#) (const [::gdcm::Event](#) \*e) const override
- [DataSet](#) const & [GetDataSet](#) () const
- const char \* [GetEventName](#) () const override
- [::gdcm::Event](#) \* [MakeObject](#) () const override
- void [operator=](#) (const [Self](#) &)=delete

## Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()
- [Event](#) (const [Event](#) &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

## Public Attributes

- const [DataSet](#) \* [m\\_DataSet](#)

## 12.77.1 Detailed Description

[DataSetEvent](#).

Special type of event triggered during the [DataSet](#) store/move process

## 12.77.2 Member Typedef Documentation

### 12.77.2.1 Self

```
typedef DataSetEvent gdcm::DataSetEvent::Self
```

### 12.77.2.2 Superclass

```
typedef AnyEvent gdcm::DataSetEvent::Superclass
```

## 12.77.3 Constructor & Destructor Documentation

### 12.77.3.1 DataSetEvent() [1/2]

```
gdcm::DataSetEvent::DataSetEvent (
    DataSet const * ds = nullptr) [inline]
```

References [m\\_DataSet](#).

### 12.77.3.2 ~DataSetEvent()

```
gdcm::DataSetEvent::~~DataSetEvent () [override], [default]
```

### 12.77.3.3 DataSetEvent() [2/2]

```
gdcm::DataSetEvent::DataSetEvent (
    const Self & s) [inline]
```

## 12.77.4 Member Function Documentation

### 12.77.4.1 CheckEvent()

```
bool gdcm::DataSetEvent::CheckEvent (
    const ::gdcm::Event * e) const [inline], [override]
```

### 12.77.4.2 GetDataSet()

```
DataSet const & gdcm::DataSetEvent::GetDataSet () const [inline]
```

References [m\\_DataSet](#).

### 12.77.4.3 GetEventName()

```
const char * gdcm::DataSetEvent::GetEventName () const [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements [gdcm::Event](#).

#### 12.77.4.4 MakeObject()

```
::gdcmm::Event * gdcmm::DataSetEvent::MakeObject () const [inline], [override], [virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implements [gdcmm::Event](#).

#### 12.77.4.5 operator=()

```
void gdcmm::DataSetEvent::operator= (
    const Self & ) [delete]
```

### 12.77.5 Member Data Documentation

#### 12.77.5.1 m\_DataSet

```
const DataSet* gdcmm::DataSetEvent::m_DataSet
```

Referenced by [DataSetEvent\(\)](#), and [GetDataSet\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmmDataSetEvent.h](#)

## 12.78 gdcm::DataSetHelper Class Reference

[DataSetHelper](#) (internal class, not intended for user level).

```
#include <gdcmDataSetHelper.h>
```

### Static Public Member Functions

- static [VR ComputeVR](#) ([File](#) const &file, [DataSet](#) const &ds, const [Tag](#) &tag)

#### 12.78.1 Detailed Description

[DataSetHelper](#) (internal class, not intended for user level).

#### Examples

[SimplePrint.cs](#).

## 12.78.2 Member Function Documentation

### 12.78.2.1 ComputeVR()

```
VR gdcm::DataSetHelper::ComputeVR (
    File const & file,
    DataSet const & ds,
    const Tag & tag) [static]
```

ds -> current dataset, which is not the same as the root dataset return [VR::INVALID](#) in case of error

#### Examples

[SimplePrint.cs](#).

The documentation for this class was generated from the following file:

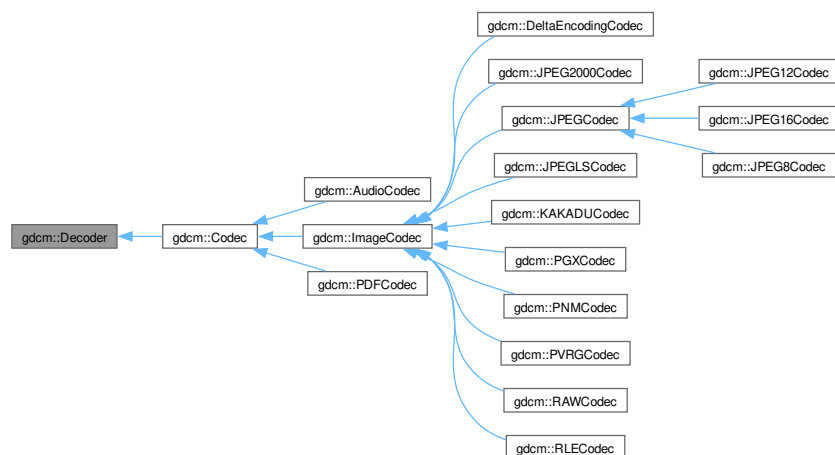
- [gdcmDataSetHelper.h](#)

## 12.79 gdcm::Decoder Class Reference

[Decoder](#).

```
#include <gdcmDecoder.h>
```

Inheritance diagram for gdcm::Decoder:



## Public Member Functions

- virtual [~Decoder](#) ()=default
- virtual bool [CanDecode](#) ([TransferSyntax](#) const &) const =0  
*Return whether this decoder support this transfer syntax (can decode it).*
- virtual bool [Decode](#) ([DataElement](#) const &, [DataElement](#) &)  
*Decode.*

## Protected Member Functions

- virtual bool [DecodeByStreams](#) (std::istream &, std::ostream &)

## 12.79.1 Detailed Description

[Decoder](#).

## 12.79.2 Constructor & Destructor Documentation

### 12.79.2.1 ~Decoder()

```
virtual gdcm::Decoder::~Decoder () [virtual], [default]
```

## 12.79.3 Member Function Documentation

### 12.79.3.1 CanDecode()

```
virtual bool gdcm::Decoder::CanDecode (  
    TransferSyntax const & ) const [pure virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Implemented in [gdcm::AudioCodec](#), [gdcm::ImageCodec](#), [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PDFCodec](#), [gdcm::PGXCodec](#), [gdcm::PNMCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

### 12.79.3.2 Decode()

```
virtual bool gdcm::Decoder::Decode (  
    DataElement const & ,  
    DataElement & ) [inline], [virtual]
```

Decode.

Reimplemented in [gdcm::AudioCodec](#), [gdcm::DeltaEncodingCodec](#), [gdcm::ImageCodec](#), [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PDFCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).



### 12.79.3.3 DecodeByStreams()

```
virtual bool gdcm::Decoder::DecodeByStreams (
    std::istream & ,
    std::ostream & ) [inline], [protected], [virtual]
```

Reimplemented in [gdcm::ImageCodec](#), [gdcm::JPEG12Codec](#), [gdcm::JPEG16Codec](#), [gdcm::JPEG2000Codec](#), [gdcm::JPEG8Codec](#), [gdcm::JPEGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

The documentation for this class was generated from the following file:

- [gdcmDecoder.h](#)

## 12.80 gdcm::DefinedTerms Class Reference

Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data [Element](#) with Defined Terms that does not contain a [Value](#) equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation [Type](#) ID (4008,0210) is an example of a Data [Element](#) having Defined Terms. It is defined to have a [Value](#) that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data [Element](#) has Defined Terms other Interpretation [Type](#) IDs may be defined by the implementor.

```
#include <gdcmDefinedTerms.h>
```

### Public Member Functions

- [DefinedTerms](#) ()=default

### 12.80.1 Detailed Description

Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data [Element](#) with Defined Terms that does not contain a [Value](#) equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation [Type](#) ID (4008,0210) is an example of a Data [Element](#) having Defined Terms. It is defined to have a [Value](#) that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data [Element](#) has Defined Terms other Interpretation [Type](#) IDs may be defined by the implementor.

### 12.80.2 Constructor & Destructor Documentation

#### 12.80.2.1 DefinedTerms()

```
gdcm::DefinedTerms::DefinedTerms () [default]
```

The documentation for this class was generated from the following file:

- [gdcmDefinedTerms.h](#)

## 12.81 gdcM::Defs Class Reference

FIXME I do not like the name 'Defs'.

```
#include <gdcMDefs.h>
```

### Public Member Functions

- [Defs](#) ()
- [Defs](#) (const [Defs](#) &val)=delete
- [~Defs](#) ()
- const [IOD](#) & [GetIODFromFile](#) (const [File](#) &file) const
- [IODs](#) & [GetIODs](#) ()
- const [IODs](#) & [GetIODs](#) () const
- [Macros](#) & [GetMacros](#) ()
- const [Macros](#) & [GetMacros](#) () const
- [Modules](#) & [GetModules](#) ()
- const [Modules](#) & [GetModules](#) () const
- [Type](#) [GetTypeFromTag](#) (const [File](#) &file, const [Tag](#) &tag) const
- bool [IsEmpty](#) () const
- [Defs](#) & [operator=](#) (const [Defs](#) &val)=delete
- bool [Verify](#) (const [DataSet](#) &ds) const
- bool [Verify](#) (const [File](#) &file) const

### Static Public Member Functions

- static const char \* [GetIODNameFromMediaStorage](#) ([MediaStorage](#) const &ms)

### Protected Member Functions

- void [LoadDefaults](#) ()
- void [LoadFromFile](#) (const char \*filename)

### Friends

- class [Global](#)

### 12.81.1 Detailed Description

FIXME I do not like the name 'Defs'.

#### Note

bla

#### Examples

[GenerateStandardSOPClasses.cxx](#), and [TraverseModules.cxx](#).

## 12.81.2 Constructor & Destructor Documentation

### 12.81.2.1 Defs() [1/2]

```
gdcm::Defs::Defs ()
```

Referenced by [Defs\(\)](#), and [operator=\(\)](#).

### 12.81.2.2 ~Defs()

```
gdcm::Defs::~~Defs ()
```

### 12.81.2.3 Defs() [2/2]

```
gdcm::Defs::Defs (  
    const Defs & val) [delete]
```

References [Defs\(\)](#).

## 12.81.3 Member Function Documentation

### 12.81.3.1 GetIODFromFile()

```
const IOD & gdcm::Defs::GetIODFromFile (  
    const File & file) const
```

### 12.81.3.2 GetIODNameFromMediaStorage()

```
const char * gdcm::Defs::GetIODNameFromMediaStorage (  
    MediaStorage const & ms) [static]
```

#### Examples

[GenerateStandardSOPClasses.cxx](#).

### 12.81.3.3 GetIODs() [1/2]

```
IODs & gdcm::Defs::GetIODs () [inline]
```

#### 12.81.3.4 GetIODs() [2/2]

```
const IODs & gdcm::Defs::GetIODs () const [inline]
```

##### Examples

[TraverseModules.cxx](#).

#### 12.81.3.5 GetMacros() [1/2]

```
Macros & gdcm::Defs::GetMacros () [inline]
```

#### 12.81.3.6 GetMacros() [2/2]

```
const Macros & gdcm::Defs::GetMacros () const [inline]
```

Users should not directly use [Macro](#). [Macro](#) are simply a way for DICOM WG to re-use Tables. [Macros](#) are conveniently wrapped within [Modules](#). See [gdcm::Module](#) API directly

##### Examples

[TraverseModules.cxx](#).

#### 12.81.3.7 GetModules() [1/2]

```
Modules & gdcm::Defs::GetModules () [inline]
```

#### 12.81.3.8 GetModules() [2/2]

```
const Modules & gdcm::Defs::GetModules () const [inline]
```

##### Examples

[TraverseModules.cxx](#).

Referenced by [IsEmpty\(\)](#).

#### 12.81.3.9 GetTypeFromTag()

```
Type gdcm::Defs::GetTypeFromTag (  
    const File & file,  
    const Tag & tag) const
```

### 12.81.3.10 IsEmpty()

```
bool gdcmm::Defs::IsEmpty () const [inline]
```

References [GetModules\(\)](#).

### 12.81.3.11 LoadDefaults()

```
void gdcmm::Defs::LoadDefaults () [protected]
```

### 12.81.3.12 LoadFromFile()

```
void gdcmm::Defs::LoadFromFile (  
    const char * filename) [protected]
```

### 12.81.3.13 operator=()

```
Defs & gdcmm::Defs::operator= (  
    const Defs & val) [delete]
```

References [Defs\(\)](#).

### 12.81.3.14 Verify() [1/2]

```
bool gdcmm::Defs::Verify (  
    const DataSet & ds) const
```

### 12.81.3.15 Verify() [2/2]

```
bool gdcmm::Defs::Verify (  
    const File & file) const
```

## 12.81.4 Friends And Related Symbol Documentation

### 12.81.4.1 Global

```
friend class Global [friend]
```

References [Global](#).

Referenced by [Global](#).

The documentation for this class was generated from the following file:

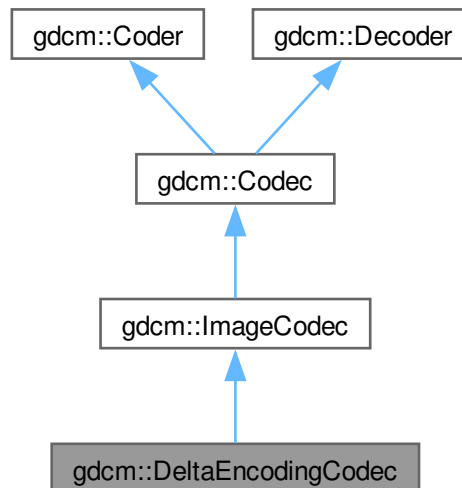
- [gdcmmDefs.h](#)

## 12.82 gdcm::DeltaEncodingCodec Class Reference

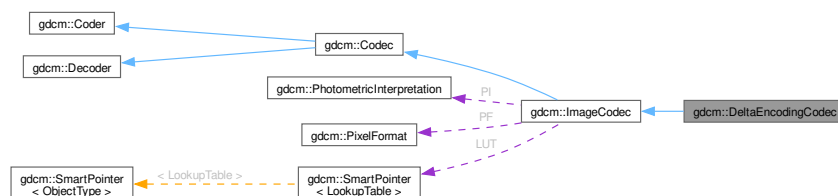
[DeltaEncodingCodec](#) compression used by some private vendor.

```
#include <gdcmDeltaEncodingCodec.h>
```

Inheritance diagram for `gdcm::DeltaEncodingCodec`:



Collaboration diagram for `gdcm::DeltaEncodingCodec`:



### Public Member Functions

- [DeltaEncodingCodec](#) ()
- [~DeltaEncodingCodec](#) ()
- bool [CanDecode](#) ([TransferSyntax](#) const &ts)
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os)

*Decode.*

## Public Member Functions inherited from [gdcm::ImageCodec](#)

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- virtual [ImageCodec](#) \* [Clone](#) () const =0
- bool [Decode](#) ([DataElement](#) const &is\_, [DataElement](#) &os) override  
*Decode.*
- const unsigned int \* [GetDimensions](#) () const
- virtual bool [GetHeaderInfo](#) (std::istream &is\_, [TransferSyntax](#) &ts)
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

## Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default
- virtual bool [Code](#) ([DataElement](#) const &in\_, [DataElement](#) &out\_)  
*Code.*

## Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

## Protected Member Functions

- bool [Decode](#) (std::istream &is, std::ostream &os)

## Protected Member Functions inherited from [gdcm::ImageCodec](#)

- virtual bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- virtual bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- bool [DecodeByStreams](#) (std::istream &is\_, std::ostream &os) override
- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsFrameEncoder](#) ()
- virtual bool [IsRowEncoder](#) ()
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)
- virtual bool [StartEncode](#) (std::ostream &os)
- virtual bool [StopEncode](#) (std::ostream &os)

## Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

## Additional Inherited Members

## Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

## Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) [LUT](#)
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) [PF](#)
- [PhotometricInterpretation](#) [PI](#)
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

### 12.82.1 Detailed Description

[DeltaEncodingCodec](#) compression used by some private vendor.



## 12.82.2 Constructor & Destructor Documentation

### 12.82.2.1 DeltaEncodingCodec()

```
gdcm::DeltaEncodingCodec::DeltaEncodingCodec ()
```

### 12.82.2.2 ~DeltaEncodingCodec()

```
gdcm::DeltaEncodingCodec::~~DeltaEncodingCodec ()
```

## 12.82.3 Member Function Documentation

### 12.82.3.1 CanDecode()

```
bool gdcm::DeltaEncodingCodec::CanDecode (
    TransferSyntax const & ts)
```

### 12.82.3.2 Decode() [1/2]

```
bool gdcm::DeltaEncodingCodec::Decode (
    DataElement const & ,
    DataElement & ) [virtual]
```

Decode.

Reimplemented from [gdcm::Decoder](#).

### 12.82.3.3 Decode() [2/2]

```
bool gdcm::DeltaEncodingCodec::Decode (
    std::istream & is,
    std::ostream & os) [protected]
```

The documentation for this class was generated from the following file:

- [gdcmDeltaEncodingCodec.h](#)

## 12.83 gdcm::DICOMDIR Class Reference

[DICOMDIR](#) class.

```
#include <gdcmDICOMDIR.h>
```

## Public Member Functions

- [DICOMDIR](#) ()=default
- [DICOMDIR](#) ([FileSet](#) fs)

### 12.83.1 Detailed Description

[DICOMDIR](#) class.

Structured for handling [DICOMDIR](#)

### 12.83.2 Constructor & Destructor Documentation

#### 12.83.2.1 DICOMDIR() [1/2]

```
gdcm::DICOMDIR::DICOMDIR () [default]
```

#### 12.83.2.2 DICOMDIR() [2/2]

```
gdcm::DICOMDIR::DICOMDIR (
    FileSet fs) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmDICOMDIR.h](#)

## 12.84 gdcm::DICOMDIRGenerator Class Reference

[DICOMDIRGenerator](#) class.

```
#include <gdcmDICOMDIRGenerator.h>
```

## Public Types

- typedef [Directory::FileNamesType](#) FileNamesType
- typedef [Directory::FilenameType](#) FilenameType

### Public Member Functions

- [DICOMDIRGenerator](#) ()
- [~DICOMDIRGenerator](#) ()
- bool [Generate](#) ()  
*Main function to generate the [DICOMDIR](#).*
- [File](#) & [GetFile](#) ()
- void [SetDescriptor](#) (const char \*d)
- void [SetFile](#) (const [File](#) &f)  
*Set/Get file. The [DICOMDIR](#) file will be valid once a call to Generate has been done.*
- void [SetFilenames](#) ([FilenamesType](#) const &fns)  
*Set the list of filenames from which the [DICOMDIR](#) should be generated from.*
- void [SetRootDirectory](#) ([FilenameType](#) const &root)  
*Set the root directory from which the filenames should be considered.*

### Protected Member Functions

- bool [AddImageDirectoryRecord](#) ()
- bool [AddPatientDirectoryRecord](#) ()
- bool [AddSeriesDirectoryRecord](#) ()
- bool [AddStudyDirectoryRecord](#) ()
- [Scanner](#) & [GetScanner](#) ()

## 12.84.1 Detailed Description

[DICOMDIRGenerator](#) class.

This is a STD-GEN-CD [DICOMDIR](#) generator. ref: PS 3.11-2008 Annex D (Normative) - General Purpose CD-R and DVD Interchange Profiles

#### Note

PS 3.11 - 2008 / D.3.2 Physical Medium And Medium Format The STD-GEN-CD and STD-GEN-SEC-CD application profiles require the 120 mm CD-R physical medium with the ISO/IEC 9660 Media Format, as defined in PS3.12. See also PS 3.12 - 2008 / Annex F 120mm CD-R Medium (Normative) and PS 3.10 - 2008 / 8 DICOM [File](#) Service / 8.1 FILE-SET

#### Warning

: PS 3.11 - 2008 / D.3.1 SOP Classes and Transfer Syntaxes Composite [Image](#) & Stand-alone Storage are required to be stored as Explicit [VR](#) Little Endian Uncompressed (1.2.840.10008.1.2.1). When a DICOM file is found using another Transfer Syntax the generator will simply stops.

- Input files should be Explicit [VR](#) Little Endian
- filenames should be valid [VR::CS](#) value (16 bytes, upper case ...)

**Bug** : There is a current limitation of not handling Referenced SOP Class UID / Referenced SOP Instance UID simply because the [Scanner](#) does not allow us See PS 3.11 / [Table](#) D.3-2 STD-GEN Additional [DICOMDIR](#) Keys

#### Examples

[GenerateDICOMDIR.cs](#).

## 12.84.2 Member Typedef Documentation

### 12.84.2.1 FilenamesType

```
typedef Directory::FilenamesType gdcm::DICOMDIRGenerator::FilenamesType
```

### 12.84.2.2 FilenameType

```
typedef Directory::FilenameType gdcm::DICOMDIRGenerator::FilenameType
```

## 12.84.3 Constructor & Destructor Documentation

### 12.84.3.1 DICOMDIRGenerator()

```
gdcm::DICOMDIRGenerator::DICOMDIRGenerator ()
```

### 12.84.3.2 ~DICOMDIRGenerator()

```
gdcm::DICOMDIRGenerator::~~DICOMDIRGenerator ()
```

## 12.84.4 Member Function Documentation

### 12.84.4.1 AddImageDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddImageDirectoryRecord () [protected]
```

### 12.84.4.2 AddPatientDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddPatientDirectoryRecord () [protected]
```

### 12.84.4.3 AddSeriesDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddSeriesDirectoryRecord () [protected]
```

### 12.84.4.4 AddStudyDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddStudyDirectoryRecord () [protected]
```

#### 12.84.4.5 Generate()

```
bool gdcmm::DICOMDIRGenerator::Generate ()
```

Main function to generate the [DICOMDIR](#).

##### Examples

[GenerateDICOMDIR.cs](#).

#### 12.84.4.6 GetFile()

```
File & gdcmm::DICOMDIRGenerator::GetFile ()
```

##### Examples

[GenerateDICOMDIR.cs](#).

#### 12.84.4.7 GetScanner()

```
Scanner & gdcmm::DICOMDIRGenerator::GetScanner () [protected]
```

#### 12.84.4.8 SetDescriptor()

```
void gdcmm::DICOMDIRGenerator::SetDescriptor (  
    const char * d)
```

Set the [File](#) Set ID.

##### Warning

this need to be a valid [VR::CS](#) value

##### Examples

[GenerateDICOMDIR.cs](#).

#### 12.84.4.9 SetFile()

```
void gdcmm::DICOMDIRGenerator::SetFile (  
    const File & f)
```

Set/Get file. The [DICOMDIR](#) file will be valid once a call to Generate has been done.

#### 12.84.4.10 SetFileNames()

```
void gdcmm::DICOMDIRGenerator::SetFileNames (
    FilenamesType const & fns)
```

Set the list of filenames from which the [DICOMDIR](#) should be generated from.

##### Examples

[GenerateDICOMDIR.cs.](#)

#### 12.84.4.11 SetRootDirectory()

```
void gdcmm::DICOMDIRGenerator::SetRootDirectory (
    FilenameType const & root)
```

Set the root directory from which the filenames should be considered.

The documentation for this class was generated from the following file:

- [gdcmmDICOMDIRGenerator.h](#)

## 12.85 gdcmm::Dict Class Reference

Class to represent a map of [DictEntry](#).

```
#include <gdcmmDict.h>
```

### Public Types

- typedef MapDictEntry::const\_iterator [ConstIterator](#)
- typedef MapDictEntry::iterator [Iterator](#)
- typedef std::map< [Tag](#), [DictEntry](#) > [MapDictEntry](#)

### Public Member Functions

- [Dict](#) ()
  - [Dict](#) (const Dict & \_val)=delete
  - void [AddDictEntry](#) (const [Tag](#) &tag, const [DictEntry](#) &de)
  - [ConstIterator](#) [Begin](#) () const
  - [ConstIterator](#) [End](#) () const
  - const [DictEntry](#) & [GetDictEntry](#) (const [Tag](#) &tag) const
  - const [DictEntry](#) & [GetDictEntryByKeyword](#) (const char \*keyword, [Tag](#) &tag) const
  - const [DictEntry](#) & [GetDictEntryByName](#) (const char \*name, [Tag](#) &tag) const
  - const char \* [GetKeywordFromTag](#) ([Tag](#) const &tag) const
- Function to return the Keyword from a [Tag](#).*
- bool [IsEmpty](#) () const
  - [Dict](#) & [operator=](#) (const [Dict](#) & \_val)=delete

## Protected Member Functions

- void [LoadDefault](#) ()

## Friends

- class [Dicts](#)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Dict](#) &\_val)

## 12.85.1 Detailed Description

Class to represent a map of [DictEntry](#).

### Note

bla TODO FIXME: For [Element](#) == 0x0 need to return Name = Group Length ValueRepresentation = UL Value← Multiplicity = 1

### Examples

[GenAllVR.cxx](#), [GenFakeldentifyFile.cxx](#), [PublicDict.cxx](#), and [ReadAndPrintAttributes.cxx](#).

## 12.85.2 Member Typedef Documentation

### 12.85.2.1 ConstIterator

```
typedef MapDictEntry::const_iterator gdcm::Dict::ConstIterator
```

### 12.85.2.2 Iterator

```
typedef MapDictEntry::iterator gdcm::Dict::Iterator
```

### 12.85.2.3 MapDictEntry

```
typedef std::map<Tag, DictEntry> gdcm::Dict::MapDictEntry
```

## 12.85.3 Constructor & Destructor Documentation

### 12.85.3.1 Dict() [1/2]

```
gdcm::Dict::Dict () [inline]
```

Referenced by [Dict\(\)](#), [operator<<](#), and [operator=\(\)](#).

### 12.85.3.2 Dict() [2/2]

```
gdcmm::Dict::Dict (  
    const Dict & _val) [delete]
```

References [Dict\(\)](#), and [operator<<](#).

## 12.85.4 Member Function Documentation

### 12.85.4.1 AddDictEntry()

```
void gdcmm::Dict::AddDictEntry (  
    const Tag & tag,  
    const DictEntry & de) [inline]
```

### 12.85.4.2 Begin()

```
ConstIterator gdcmm::Dict::Begin () const [inline]
```

#### Examples

[GenAllVR.cxx](#), and [GenFakeIdentifyFile.cxx](#).

### 12.85.4.3 End()

```
ConstIterator gdcmm::Dict::End () const [inline]
```

#### Examples

[GenAllVR.cxx](#), and [GenFakeIdentifyFile.cxx](#).

### 12.85.4.4 GetDictEntry()

```
const DictEntry & gdcmm::Dict::GetDictEntry (  
    const Tag & tag) const [inline]
```

#### Examples

[GenFakeIdentifyFile.cxx](#), and [PublicDict.cxx](#).



#### 12.85.4.5 GetDictEntryByKeyword()

```
const DictEntry & gdcmm::Dict::GetDictEntryByKeyword (
    const char * keyword,
    Tag & tag) const [inline]
```

Lookup [DictEntry](#) by keyword. Even if DICOM standard defines keyword as being unique. The lookup table is built on [Tag](#). Therefore looking up a [DictEntry](#) by Keyword is more inefficient than looking up by [Tag](#).

#### 12.85.4.6 GetDictEntryByName()

```
const DictEntry & gdcmm::Dict::GetDictEntryByName (
    const char * name,
    Tag & tag) const [inline]
```

Inefficient way of looking up tag by name. Technically DICOM does not guarantee uniqueness (and [Curve](#) / [Overlay](#) are there to prove it). But most of the time name is in fact uniq and can be uniquely link to a tag

#### Examples

[ReadAndPrintAttributes.cxx](#).

#### 12.85.4.7 GetKeywordFromTag()

```
const char * gdcmm::Dict::GetKeywordFromTag (
    Tag const & tag) const [inline]
```

Function to return the Keyword from a [Tag](#).

#### 12.85.4.8 IsEmpty()

```
bool gdcmm::Dict::IsEmpty () const [inline]
```

#### 12.85.4.9 LoadDefault()

```
void gdcmm::Dict::LoadDefault () [protected]
```

#### 12.85.4.10 operator=()

```
Dict & gdcmm::Dict::operator= (
    const Dict & _val) [delete]
```

References [Dict\(\)](#).

## 12.85.5 Friends And Related Symbol Documentation

### 12.85.5.1 Dicts

```
friend class Dicts [friend]
```

References [Dicts](#).

Referenced by [Dicts](#).

### 12.85.5.2 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const Dict & _val) [friend]
```

References [Dict\(\)](#).

Referenced by [Dict\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmDict.h](#)

## 12.86 gdcm::DictConverter Class Reference

Class to convert a .dic file into something else:

```
#include <gdcmDictConverter.h>
```

### Public Types

- enum [OutputTypes](#) {  
    [DICT\\_DEFAULT](#) = 0 ,  
    [DICT\\_DEBUG](#) ,  
    [DICT\\_XML](#) }

### Public Member Functions

- [DictConverter](#) ()
- [~DictConverter](#) ()
- void [Convert](#) ()
- const std::string & [GetDictName](#) () const
- const std::string & [GetInputFilename](#) () const
- const std::string & [GetOutputFilename](#) () const
- int [GetOutputType](#) () const
- void [SetDictName](#) (const char \*name)
- void [SetInputFileName](#) (const char \*filename)
- void [SetOutputFileName](#) (const char \*filename)
- void [SetOutputType](#) (int type)

### Static Public Member Functions

- static bool [Readuint16](#) (const char \*raw, uint16\_t &ov)
- static bool [ReadVM](#) (const char \*raw, [VM::VMType](#) &type)
- static bool [ReadVR](#) (const char \*raw, [VR::VRType](#) &type)

### Protected Member Functions

- void [AddGroupLength](#) ()
- bool [ConvertToCXX](#) (const char \*raw, std::string &cxx)
- bool [ConvertToXML](#) (const char \*raw, std::string &cxx)
- void [WriteFooter](#) ()
- void [WriteHeader](#) ()

## 12.86.1 Detailed Description

Class to convert a .dic file into something else:

- CXX code : embed dict into shared lib (DICT\_DEFAULT)
- Debug mode (DICT\_DEBUG)
- XML dict (DICT\_XML)

Note

## 12.86.2 Member Enumeration Documentation

### 12.86.2.1 OutputTypes

```
enum gdcm::DictConverter::OutputTypes
```

#### Enumerator

DICT_DEFAULT	
DICT_DEBUG	
DICT_XML	

## 12.86.3 Constructor & Destructor Documentation

### 12.86.3.1 DictConverter()

```
gdcm::DictConverter::DictConverter ()
```

### 12.86.3.2 ~DictConverter()

```
gdcM::DictConverter::~~DictConverter ()
```

## 12.86.4 Member Function Documentation

### 12.86.4.1 AddGroupLength()

```
void gdcM::DictConverter::AddGroupLength () [protected]
```

### 12.86.4.2 Convert()

```
void gdcM::DictConverter::Convert ()
```

### 12.86.4.3 ConvertToCXX()

```
bool gdcM::DictConverter::ConvertToCXX (  
    const char * raw,  
    std::string & cxx) [protected]
```

### 12.86.4.4 ConvertToXML()

```
bool gdcM::DictConverter::ConvertToXML (  
    const char * raw,  
    std::string & cxx) [protected]
```

### 12.86.4.5 GetDictName()

```
const std::string & gdcM::DictConverter::GetDictName () const
```

### 12.86.4.6 GetInputFilename()

```
const std::string & gdcM::DictConverter::GetInputFilename () const
```

### 12.86.4.7 GetOutputFilename()

```
const std::string & gdcM::DictConverter::GetOutputFilename () const
```

#### 12.86.4.8 GetOutputType()

```
int gdcm::DictConverter::GetOutputType () const [inline]
```

#### 12.86.4.9 Readuint16()

```
bool gdcm::DictConverter::Readuint16 (  
    const char * raw,  
    uint16_t & ov) [static]
```

#### 12.86.4.10 ReadVM()

```
bool gdcm::DictConverter::ReadVM (  
    const char * raw,  
    VM::VMType & type) [static]
```

#### 12.86.4.11 ReadVR()

```
bool gdcm::DictConverter::ReadVR (  
    const char * raw,  
    VR::VRType & type) [static]
```

#### 12.86.4.12 SetDictName()

```
void gdcm::DictConverter::SetDictName (  
    const char * name)
```

#### 12.86.4.13 SetInputFileName()

```
void gdcm::DictConverter::SetInputFileName (  
    const char * filename)
```

#### 12.86.4.14 SetOutputFileName()

```
void gdcm::DictConverter::SetOutputFileName (  
    const char * filename)
```

#### 12.86.4.15 SetOutputType()

```
void gdcm::DictConverter::SetOutputType (  
    int type) [inline]
```

#### 12.86.4.16 WriteFooter()

```
void gdcm::DictConverter::WriteFooter () [protected]
```

#### 12.86.4.17 WriteHeader()

```
void gdcm::DictConverter::WriteHeader () [protected]
```

The documentation for this class was generated from the following file:

- [gdcmDictConverter.h](#)

## 12.87 gdcm::DictEntry Class Reference

Class to represent an Entry in the [Dict](#).

```
#include <gdcmDictEntry.h>
```

### Public Member Functions

- [DictEntry](#) (const char \*name="", const char \*keyword="", [VR](#) const &vr=[VR::INVALID](#), [VM](#) const &vm=[VM::VM0](#), bool ret=false)
- const char \* [GetKeyword](#) () const  
*same as GetName but without spaces...*
- const char \* [GetName](#) () const  
*Set/Get Name.*
- bool [GetRetired](#) () const  
*Set/Get Retired flag.*
- const [VM](#) & [GetVM](#) () const  
*Set/Get VM.*
- const [VR](#) & [GetVR](#) () const  
*Set/Get VR.*
- bool [IsUnique](#) () const
- void [SetElementXX](#) (bool v)  
*Set whether element is shared in multiple elements (Source [Image](#) IDs typically).*
- void [SetGroupXX](#) (bool v)  
*Set whether element is shared in multiple groups (Curve/Overlay typically).*
- void [SetKeyword](#) (const char \*keyword)
- void [SetName](#) (const char \*name)
- void [SetRetired](#) (bool retired)
- void [SetVM](#) ([VM](#) const &vm)
- void [SetVR](#) (const [VR](#) &vr)

## Friends

- class [Dict](#)
- `std::ostream & operator<< (std::ostream &_os, const DictEntry &_val)`

## 12.87.1 Detailed Description

Class to represent an Entry in the [Dict](#).

Does not really exist within the DICOM definition, just a way to minimize storage and have a mapping from [gdcm::Tag](#) to the needed information

### Note

bla TODO FIXME: Need a PublicDictEntry...indeed [DictEntry](#) has a notion of retired which does not exist in PrivateDictEntry...

### See also

[gdcm::Dict](#)

### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [PublicDict.cxx](#), and [TraverseModules.cxx](#).

## 12.87.2 Constructor & Destructor Documentation

### 12.87.2.1 DictEntry()

```
gdcm::DictEntry::DictEntry (  
    const char * name = "",  
    const char * keyword = "",  
    VR const & vr = VR::INVALID,  
    VM const & vm = VM::VM0,  
    bool ret = false) [inline]
```

References [gdcm::VR::INVALID](#), and [gdcm::VM::VM0](#).

Referenced by [operator<<](#).

## 12.87.3 Member Function Documentation

### 12.87.3.1 GetKeyword()

```
const char * gdcm::DictEntry::GetKeyword () const [inline]
```

same as GetName but without spaces...

### 12.87.3.2 GetName()

```
const char * gdcM::DictEntry::GetName () const [inline]
```

Set/Get Name.

Referenced by [gdcM::PrivateDict::PrintXML\(\)](#).

### 12.87.3.3 GetRetired()

```
bool gdcM::DictEntry::GetRetired () const [inline]
```

Set/Get Retired flag.

Examples

[GenAllVR.cxx](#).

### 12.87.3.4 GetVM()

```
const VM & gdcM::DictEntry::GetVM () const [inline]
```

Set/Get VM.

Referenced by [gdcM::PrivateDict::AddDictEntry\(\)](#), and [gdcM::PrivateDict::PrintXML\(\)](#).

### 12.87.3.5 GetVR()

```
const VR & gdcM::DictEntry::GetVR () const [inline]
```

Set/Get VR.

Examples

[GenAllVR.cxx](#), and [GenFakeIdentifyFile.cxx](#).

Referenced by [gdcM::PrivateDict::AddDictEntry\(\)](#), and [gdcM::PrivateDict::PrintXML\(\)](#).

### 12.87.3.6 IsUnique()

```
bool gdcM::DictEntry::IsUnique () const [inline]
```

Return whether the name of the [DataElement](#) can be considered to be unique. As of 2008 all elements name were unique (except the explicitly 'XX' ones)



### 12.87.3.7 SetElementXX()

```
void gdcm::DictEntry::SetElementXX (
    bool v) [inline]
```

Set whether element is shared in multiple elements (Source [Image](#) IDs typically).

### 12.87.3.8 SetGroupXX()

```
void gdcm::DictEntry::SetGroupXX (
    bool v) [inline]
```

Set whether element is shared in multiple groups (Curve/Overlay typically).

### 12.87.3.9 SetKeyword()

```
void gdcm::DictEntry::SetKeyword (
    const char * keyword) [inline]
```

### 12.87.3.10 SetName()

```
void gdcm::DictEntry::SetName (
    const char * name) [inline]
```

### 12.87.3.11 SetRetired()

```
void gdcm::DictEntry::SetRetired (
    bool retired) [inline]
```

### 12.87.3.12 SetVM()

```
void gdcm::DictEntry::SetVM (
    VM const & vm) [inline]
```

Referenced by [gdcm::PrivateDict::AddDictEntry\(\)](#).

### 12.87.3.13 SetVR()

```
void gdcm::DictEntry::SetVR (
    const VR & vr) [inline]
```

Referenced by [gdcm::PrivateDict::AddDictEntry\(\)](#).

## 12.87.4 Friends And Related Symbol Documentation

### 12.87.4.1 Dict

```
friend class Dict [friend]
```

References [Dict](#).

Referenced by [Dict](#).

### 12.87.4.2 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const DictEntry & _val) [friend]
```

References [DictEntry\(\)](#).

The documentation for this class was generated from the following file:

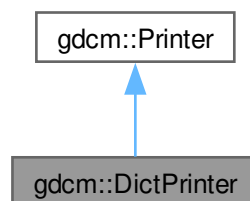
- [gdcmDictEntry.h](#)

## 12.88 gdcm::DictPrinter Class Reference

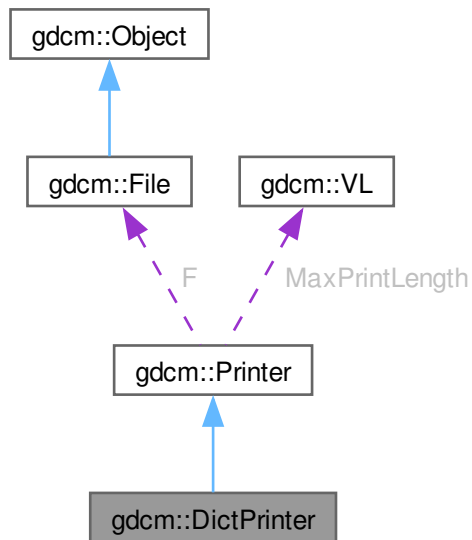
[DictPrinter](#) class.

```
#include <gdcmDictPrinter.h>
```

Inheritance diagram for `gdcm::DictPrinter`:



Collaboration diagram for gdcm::DictPrinter:



### Public Member Functions

- [DictPrinter](#) ()
- [~DictPrinter](#) ()=default
- void [Print](#) (std::ostream &os)

### Public Member Functions inherited from [gdcm::Printer](#)

- [Printer](#) ()
- [~Printer](#) ()=default
- [PrintStyles GetPrintStyle](#) () const  
*Get PrintStyle value.*
- void [Print](#) (std::ostream &os)  
*Print.*
- void [PrintDataSet](#) (const [DataSet](#) &ds, std::ostream &os, const std::string &s="")  
*Print an individual dataset.*
- void [SetColor](#) (bool c)  
*Set color mode or not.*
- void [SetFile](#) ([File](#) const &f)  
*Set file.*
- void [SetStyle](#) ([PrintStyles](#) ps)  
*Set PrintStyle value.*

### Protected Member Functions

- void [PrintDataElement2](#) (std::ostream &os, const [DataSet](#) &ds, const [DataElement](#) &ide)
- void [PrintDataSet2](#) (std::ostream &os, const [DataSet](#) &ds)

### Protected Member Functions inherited from [gdcm::Printer](#)

- [VR PrintDataElement](#) (std::ostream &os, const [Dicts](#) &dicts, const [DataSet](#) &ds, const [DataElement](#) &de, std::ostream &out, std::string const &indent)
- void [PrintSQ](#) (const [SequenceOfItems](#) \*sqi, std::ostream &os, std::string const &indent)

### Additional Inherited Members

### Public Types inherited from [gdcm::Printer](#)

- enum [PrintStyles](#) {  
[VERBOSE\\_STYLE](#) = 0 ,  
[CONDENSED\\_STYLE](#) ,  
[XML](#) ,  
[CXX](#) }

### Protected Attributes inherited from [gdcm::Printer](#)

- const [File](#) \* [F](#)
- [VL MaxPrintLength](#)
- [PrintStyles](#) [PrintStyle](#)

## 12.88.1 Detailed Description

[DictPrinter](#) class.

## 12.88.2 Constructor & Destructor Documentation

### 12.88.2.1 DictPrinter()

```
gdcm::DictPrinter::DictPrinter ()
```

### 12.88.2.2 ~DictPrinter()

```
gdcm::DictPrinter::~~DictPrinter () [default]
```

## 12.88.3 Member Function Documentation

### 12.88.3.1 Print()

```
void gdcm::DictPrinter::Print (
    std::ostream & os)
```

### 12.88.3.2 PrintDataElement2()

```
void gdcm::DictPrinter::PrintDataElement2 (
    std::ostream & os,
    const DataSet & ds,
    const DataElement & ide) [protected]
```

### 12.88.3.3 PrintDataSet2()

```
void gdcm::DictPrinter::PrintDataSet2 (
    std::ostream & os,
    const DataSet & ds) [protected]
```

The documentation for this class was generated from the following file:

- [gdcmDictPrinter.h](#)

## 12.89 gdcm::Dicts Class Reference

Class to manipulate the sum of knowledge (all the dict user load).

```
#include <gdcmDicts.h>
```

### Public Member Functions

- [Dicts](#) ()
- [Dicts](#) (const Dicts &\_val)=delete
- [~Dicts](#) ()
- const [CSAHeaderDict](#) & [GetCSAHeaderDict](#) () const
- const [DictEntry](#) & [GetDictEntry](#) (const [PrivateTag](#) &tag) const
- const [DictEntry](#) & [GetDictEntry](#) (const [Tag](#) &tag, const char \*owner=nullptr) const
- *THREAD SAFE.*
- [PrivateDict](#) & [GetPrivateDict](#) ()
- const [PrivateDict](#) & [GetPrivateDict](#) () const
- const [Dict](#) & [GetPublicDict](#) () const
- bool [IsEmpty](#) () const
- [Dicts](#) & [operator=](#) (const [Dicts](#) &\_val)=delete

### Protected Types

- enum [ConstructorType](#) {  
    [PHILIPS](#) ,  
    [GEMS](#) ,  
    [SIEMENS](#) }

### Protected Member Functions

- void [LoadDefaults](#) ()

### Static Protected Member Functions

- static const char \* [GetConstructorString](#) ([ConstructorType](#) type)

### Friends

- class [Global](#)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Dicts](#) &d)

## 12.89.1 Detailed Description

Class to manipulate the sum of knowledge (all the dict user load).

#### Note

bla

#### Examples

[GenAllVR.cxx](#), [GenFakeldentifyFile.cxx](#), [PublicDict.cxx](#), [ReadAndPrintAttributes.cxx](#), and [TraverseModules.cxx](#).

## 12.89.2 Member Enumeration Documentation

### 12.89.2.1 ConstructorType

```
enum gdcmm::Dicts::ConstructorType [protected]
```

#### Enumerator

PHILIPS	
GEMS	

SIEMENS	
---------	--

## 12.89.3 Constructor & Destructor Documentation

### 12.89.3.1 Dicts() [1/2]

```
gdcm::Dicts::Dicts ()
```

Referenced by [Dicts\(\)](#), [operator<<](#), and [operator=\(\)](#).

### 12.89.3.2 ~Dicts()

```
gdcm::Dicts::~~Dicts ()
```

### 12.89.3.3 Dicts() [2/2]

```
gdcm::Dicts::Dicts (  
    const Dicts & _val) [delete]
```

References [Dicts\(\)](#).

## 12.89.4 Member Function Documentation

### 12.89.4.1 GetConstructorString()

```
const char * gdcm::Dicts::GetConstructorString (  
    ConstructorType type) [static], [protected]
```

### 12.89.4.2 GetCSAHeaderDict()

```
const CSAHeaderDict & gdcm::Dicts::GetCSAHeaderDict () const
```

#### Examples

[MrProtocol.cxx](#).

### 12.89.4.3 GetDictEntry() [1/2]

```
const DictEntry & gdcm::Dicts::GetDictEntry (  
    const PrivateTag & tag) const
```

#### 12.89.4.4 GetDictEntry() [2/2]

```
const DictEntry & gdc::Dicts::GetDictEntry (
    const Tag & tag,
    const char * owner = nullptr) const
```

THREAD SAFE.

works for both public and private dicts: owner is null for public dict

##### Warning

owner need to be set to appropriate owner for call to work. see

##### Examples

[PublicDict.cxx](#), and [TraverseModules.cxx](#).

#### 12.89.4.5 GetPrivateDict() [1/2]

```
PrivateDict & gdc::Dicts::GetPrivateDict ()
```

#### 12.89.4.6 GetPrivateDict() [2/2]

```
const PrivateDict & gdc::Dicts::GetPrivateDict () const
```

#### 12.89.4.7 GetPublicDict()

```
const Dict & gdc::Dicts::GetPublicDict () const
```

##### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [PublicDict.cxx](#), and [ReadAndPrintAttributes.cxx](#).

Referenced by [IsEmpty\(\)](#).

#### 12.89.4.8 IsEmpty()

```
bool gdc::Dicts::IsEmpty () const [inline]
```

References [GetPublicDict\(\)](#).



#### 12.89.4.9 LoadDefaults()

```
void gdcm::Dicts::LoadDefaults () [protected]
```

#### 12.89.4.10 operator=()

```
Dicts & gdcm::Dicts::operator= (
    const Dicts & _val) [delete]
```

References [Dicts\(\)](#).

### 12.89.5 Friends And Related Symbol Documentation

#### 12.89.5.1 Global

```
friend class Global [friend]
```

References [Global](#).

Referenced by [Global](#).

#### 12.89.5.2 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Dicts & d) [friend]
```

References [Dicts\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmDicts.h](#)

## 12.90 gdcm::network::DIMSE Class Reference

[DIMSE](#).

```
#include <gdcmDIMSE.h>
```

## Public Types

- enum [CommandTypes](#) {  
[C\\_STORE\\_RQ](#) = 0x0001 ,  
[C\\_STORE\\_RSP](#) = 0x8001 ,  
[C\\_GET\\_RQ](#) = 0x0010 ,  
[C\\_GET\\_RSP](#) = 0x8010 ,  
[C\\_FIND\\_RQ](#) = 0x0020 ,  
[C\\_FIND\\_RSP](#) = 0x8020 ,  
[C\\_MOVE\\_RQ](#) = 0x0021 ,  
[C\\_MOVE\\_RSP](#) = 0x8021 ,  
[C\\_ECHO\\_RQ](#) = 0x0030 ,  
[C\\_ECHO\\_RSP](#) = 0x8030 ,  
[N\\_EVENT\\_REPORT\\_RQ](#) = 0x0100 ,  
[N\\_EVENT\\_REPORT\\_RSP](#) = 0x8100 ,  
[N\\_GET\\_RQ](#) = 0x0110 ,  
[N\\_GET\\_RSP](#) = 0x8110 ,  
[N\\_SET\\_RQ](#) = 0x0120 ,  
[N\\_SET\\_RSP](#) = 0x8120 ,  
[N\\_ACTION\\_RQ](#) = 0x0130 ,  
[N\\_ACTION\\_RSP](#) = 0x8130 ,  
[N\\_CREATE\\_RQ](#) = 0x0140 ,  
[N\\_CREATE\\_RSP](#) = 0x8140 ,  
[N\\_DELETE\\_RQ](#) = 0x0150 ,  
[N\\_DELETE\\_RSP](#) = 0x8150 ,  
[C\\_CANCEL\\_RQ](#) = 0x0FFF }

## 12.90.1 Detailed Description

[DIMSE](#).

PS 3.7 - 2009 Annex E [Command](#) Dictionary (Normative) E.1 REGISTRY OF DICOM COMMAND ELEMENTS [Table E.1-1](#) COMMAND FIELDS (PART 1)

## 12.90.2 Member Enumeration Documentation

### 12.90.2.1 CommandTypes

enum [gdcm::network::DIMSE::CommandTypes](#)

#### Enumerator

<a href="#">C_STORE_RQ</a>	
<a href="#">C_STORE_RSP</a>	
<a href="#">C_GET_RQ</a>	
<a href="#">C_GET_RSP</a>	
<a href="#">C_FIND_RQ</a>	

C_FIND_RSP	
C_MOVE_RQ	
C_MOVE_RSP	
C_ECHO_RQ	
C_ECHO_RSP	
N_EVENT_REPORT_RQ	
N_EVENT_REPORT_RSP	
N_GET_RQ	
N_GET_RSP	
N_SET_RQ	
N_SET_RSP	
N_ACTION_RQ	
N_ACTION_RSP	
N_CREATE_RQ	
N_CREATE_RSP	
N_DELETE_RQ	
N_DELETE_RSP	
C_CANCEL_RQ	

The documentation for this class was generated from the following file:

- [gdcmDIMSE.h](#)

## 12.91 gdcm::DirectionCosines Class Reference

class to handle [DirectionCosines](#)

```
#include <gdcmDirectionCosines.h>
```

### Public Member Functions

- [DirectionCosines](#) ()
- [DirectionCosines](#) (const double dircos[6])
- [~DirectionCosines](#) ()
- double [ComputeDistAlongNormal](#) (const double ipp[3]) const  
*Compute the distance along the normal.*
- void [Cross](#) (double z[3]) const  
*Compute Cross product.*
- double [CrossDot](#) ([DirectionCosines](#) const &dc) const  
*Compute the Dot product of the two cross vector of both [DirectionCosines](#) object.*
- double [Dot](#) () const

*Compute Dot.*

- bool [IsValid](#) () const

*Return whether or not this is a valid direction cosines.*

- void [Normalize](#) ()

*Normalize in-place.*

- [operator const double \\*](#) () const

*Make the class behave like a const double \*.*

- void [Print](#) (std::ostream &) const

*Print.*

- bool [SetFromString](#) (const char \*str)

### Static Public Member Functions

- static double [Dot](#) (const double x[3], const double y[3])

*Compute Dot.*

- static double [Norm](#) (const double v[3])

*Return norm of the vector.*

- static void [Normalize](#) (double v[3])

*Normalize in-place.*

## 12.91.1 Detailed Description

class to handle [DirectionCosines](#)

Examples

[DiscriminateVolume.cxx](#).

## 12.91.2 Constructor & Destructor Documentation

### 12.91.2.1 [DirectionCosines\(\)](#) [1/2]

```
gdc::DirectionCosines::DirectionCosines ()
```

Referenced by [CrossDot\(\)](#).

### 12.91.2.2 [DirectionCosines\(\)](#) [2/2]

```
gdc::DirectionCosines::DirectionCosines (
    const double dircos[6])
```

### 12.91.2.3 ~DirectionCosines()

```
gdcmm::DirectionCosines::~~DirectionCosines ()
```

## 12.91.3 Member Function Documentation

### 12.91.3.1 ComputeDistAlongNormal()

```
double gdcmm::DirectionCosines::ComputeDistAlongNormal (  
    const double ipp[3]) const
```

Compute the distance along the normal.

### 12.91.3.2 Cross()

```
void gdcmm::DirectionCosines::Cross (  
    double z[3]) const
```

Compute Cross product.

### 12.91.3.3 CrossDot()

```
double gdcmm::DirectionCosines::CrossDot (  
    DirectionCosines const & dc) const
```

Compute the Dot product of the two cross vector of both [DirectionCosines](#) object.

#### Examples

[DiscriminateVolume.cxx](#).

References [DirectionCosines\(\)](#).

### 12.91.3.4 Dot() [1/2]

```
double gdcmm::DirectionCosines::Dot () const
```

Compute Dot.

### 12.91.3.5 Dot() [2/2]

```
double gdcmm::DirectionCosines::Dot (  
    const double x[3],  
    const double y[3]) [static]
```

Compute Dot.

#### 12.91.3.6 IsValid()

```
bool gdcm::DirectionCosines::IsValid () const
```

Return whether or not this is a valid direction cosines.

#### 12.91.3.7 Norm()

```
double gdcm::DirectionCosines::Norm (  
    const double v[3]) [static]
```

Return norm of the vector.

#### 12.91.3.8 Normalize() [1/2]

```
void gdcm::DirectionCosines::Normalize ()
```

Normalize in-place.

#### 12.91.3.9 Normalize() [2/2]

```
void gdcm::DirectionCosines::Normalize (  
    double v[3]) [static]
```

Normalize in-place.

#### 12.91.3.10 operator const double \*()

```
gdcm::DirectionCosines::operator const double * () const [inline]
```

Make the class behave like a const double \*.

#### 12.91.3.11 Print()

```
void gdcm::DirectionCosines::Print (  
    std::ostream & ) const
```

Print.

### 12.91.3.12 SetFromString()

```
bool gdcm::DirectionCosines::SetFromString (
    const char * str)
```

Initialize from string str. It requires 6 floating point separated by a backslash character.

#### Examples

[DiscriminateVolume.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmDirectionCosines.h](#)

## 12.92 gdcm::Directory Class Reference

Class for manipulation directories.

```
#include <gdcmDirectory.h>
```

### Public Types

- typedef std::vector< [FilenameType](#) > [FileNamesType](#)
- typedef std::string [FilenameType](#)

### Public Member Functions

- [Directory](#) ()=default
- [~Directory](#) ()=default
- [FileNamesType](#) const & [GetDirectories](#) () const  
*Return the Directories traversed.*
- [FileNamesType](#) const & [GetFileNames](#) () const  
*Set/Get the file names within the directory.*
- [FilenameType](#) const & [GetToplevel](#) () const  
*Get the name of the toplevel directory.*
- unsigned int [Load](#) ([FilenameType](#) const &name, bool recursive=false)
- void [Print](#) (std::ostream &os=std::cout) const  
*Print.*

### Protected Member Functions

- unsigned int [Explore](#) ([FilenameType](#) const &name, bool recursive)  
*Return number of file found when 'recursive'ly exploring directory name.*

## Friends

- `std::ostream & operator<< (std::ostream &_os, const Directory &d)`

## 12.92.1 Detailed Description

Class for manipulation directories.

### Note

This implementation provide a cross platform implementation for manipulating directories: basically traversing directories and harvesting files

will not take into account unix type hidden file recursive option will not look into UNIX type hidden directory (those starting with a '.')

Since python or C# provide there own equivalent implementation, in which case `gdcmm::Directory` does not make much sense.

### Examples

`DecompressImageMultiframe.cs`, `DiscriminateVolume.cxx`, `DumpToSQLITE3.cxx`, `DumpVisusChange.cxx`, `GenerateDICOMDIR.cs`, `GenerateRTSTRUCT.cxx`, `ReadUTF8QtDir.cxx`, `ScanDirectory.cs`, `SortImage.cxx`, `StandardizeFiles.cs`, `VolumeSorter.cxx`, `gdcmmorphoplanes.cxx`, and `threadgdcmm.cxx`.

## 12.92.2 Member Typedef Documentation

### 12.92.2.1 FilenamesType

```
typedef std::vector<FilenameType> gdcmm::Directory::FilenamesType
```

### Examples

`CStoreQtProgress.cxx`, `DumpVisusChange.cxx`, `GenerateRTSTRUCT.cxx`, `ReadUTF8QtDir.cxx`, `SimpleScanner.cxx`, `VolumeSorter.cxx`, `gdcmmorphoplanes.cxx`, `reslicesphere.cxx`, and `threadgdcmm.cxx`.

### 12.92.2.2 FilenameType

```
typedef std::string gdcmm::Directory::FilenameType
```

## 12.92.3 Constructor & Destructor Documentation

### 12.92.3.1 Directory()

```
gdcmm::Directory::Directory () [default]
```

Referenced by `operator<<`.



### 12.92.3.2 ~Directory()

```
gdcm::Directory::~~Directory () [default]
```

## 12.92.4 Member Function Documentation

### 12.92.4.1 Explore()

```
unsigned int gdcm::Directory::Explore (
    FilenameType const & name,
    bool recursive) [protected]
```

Return number of file found when 'recursive'ly exploring directory name.

### 12.92.4.2 GetDirectories()

```
FilenameType const & gdcm::Directory::GetDirectories () const [inline]
```

Return the Directories traversed.

### 12.92.4.3 GetFileNames()

```
FilenameType const & gdcm::Directory::GetFileNames () const [inline]
```

Set/Get the file names within the directory.

#### Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [DecompressImageMultiframe.cs](#), [DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [DumpVisusChange.cxx](#), [GenerateDICOMDIR.cs](#), [GenerateRTSTRUCT.cxx](#), [ReadUTF8QtDir.cxx](#), [ScanDirectory.cs](#), [SortImage.cxx](#), [StandardizeFiles.cs](#), [VolumeSorter.cxx](#), [gdcmorthoplanes.cxx](#), [reslicesphere.cxx](#), and [threadgdcm.cxx](#).

### 12.92.4.4 GetToplevel()

```
FilenameType const & gdcm::Directory::GetToplevel () const [inline]
```

Get the name of the toplevel directory.

#### 12.92.4.5 Load()

```
unsigned int gdcM::Directory::Load (  
    FilenameType const & name,  
    bool recursive = false)
```

construct a list of filenames and subdirectory beneath directory: name

##### Warning

: hidden file and hidden directory are not loaded.

##### Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [DecompressImageMultiframe.cs](#), [DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [DumpVisusChange.cxx](#), [GenerateDICOMDIR.cs](#), [GenerateRTSTRUCT.cxx](#), [ReadUTF8QtDir.cxx](#), [ScanDirectory.cs](#), [SortImage.cxx](#), [StandardizeFiles.cs](#), [VolumeSorter.cxx](#), [gdcMorthoplanes.cxx](#), [reslicesphere.cxx](#), and [threadgdcM.cxx](#).

#### 12.92.4.6 Print()

```
void gdcM::Directory::Print (  
    std::ostream & os = std::cout) const
```

Print.

##### Examples

[SortImage.cxx](#).

Referenced by [operator<<](#).

### 12.92.5 Friends And Related Symbol Documentation

#### 12.92.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const Directory & d) [friend]
```

References [Directory\(\)](#), and [Print\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMDirectory.h](#)

## 12.93 gdcm::DirectoryHelper Class Reference

[DirectoryHelper](#).

```
#include <gdcmDirectoryHelper.h>
```

### Static Public Member Functions

- static [Directory::FilenamesType GetCTImageSeriesUIDs](#) (const std::string &inDirectory)
- static [Directory::FilenamesType GetFilenamesFromSeriesUIDs](#) (const std::string &inDirectory, const std::string &inSeriesUID)
- static std::string [GetFrameOfReference](#) (const std::vector< [DataSet](#) > &inDS)
- static [Directory::FilenamesType GetMRImageSeriesUIDs](#) (const std::string &inDirectory)
- static [Directory::FilenamesType GetRTStructSeriesUIDs](#) (const std::string &inDirectory)
- static [Directory::FilenamesType GetSeriesUIDsBySOPClassUID](#) (const std::string &inDirectory, const std::string &inSOPClassUID)
- static std::string [GetSOPClassUID](#) (const std::vector< [DataSet](#) > &inDS)
- static std::string [GetStringValueFromTag](#) (const [Tag](#) &t, const [DataSet](#) &ds)
- static std::vector< [DataSet](#) > [LoadImageFromFiles](#) (const std::string &inDirectory, const std::string &inSeriesUID)
- static std::string [RetrieveSOPInstanceUIDFromIndex](#) (int inIndex, const std::vector< [DataSet](#) > &inDS)
- static std::string [RetrieveSOPInstanceUIDFromZPosition](#) (double inZPos, const std::vector< [DataSet](#) > &inDS)

### 12.93.1 Detailed Description

[DirectoryHelper](#).

this class is designed to help mitigate some of the commonly performed operations on directories. namely: 1) the ability to determine the number of series in a directory by what type of series is present 2) the ability to find all ct series in a directory 3) the ability to find all mr series in a directory 4) to load a set of DataSets from a series that's already been sorted by the IPP sorter 5) For rtstruct stuff, you need to know the sopinstanceuid of each z plane, so there's a retrieval function for that 6) then a few other functions for rtstruct writeouts

### 12.93.2 Member Function Documentation

#### 12.93.2.1 GetCTImageSeriesUIDs()

```
Directory::FilenamesType gdcm::DirectoryHelper::GetCTImageSeriesUIDs (
    const std::string & inDirectory) [static]
```

#### 12.93.2.2 GetFilenamesFromSeriesUIDs()

```
Directory::FilenamesType gdcm::DirectoryHelper::GetFilenamesFromSeriesUIDs (
    const std::string & inDirectory,
    const std::string & inSeriesUID) [static]
```

### Examples

[GenerateRTSTRUCT.cxx](#).

### 12.93.2.3 GetFrameOfReference()

```
std::string gdcm::DirectoryHelper::GetFrameOfReference (
    const std::vector< DataSet > & inDS) [static]
```

### 12.93.2.4 GetMRImageSeriesUIDs()

```
Directory::FilenamesType gdcm::DirectoryHelper::GetMRImageSeriesUIDs (
    const std::string & inDirectory) [static]
```

### 12.93.2.5 GetRTStructSeriesUIDs()

```
Directory::FilenamesType gdcm::DirectoryHelper::GetRTStructSeriesUIDs (
    const std::string & inDirectory) [static]
```

#### Examples

[GenerateRTSTRUCT.cxx](#).

### 12.93.2.6 GetSeriesUIDsBySOPClassUID()

```
Directory::FilenamesType gdcm::DirectoryHelper::GetSeriesUIDsBySOPClassUID (
    const std::string & inDirectory,
    const std::string & inSOPClassUID) [static]
```

### 12.93.2.7 GetSOPClassUID()

```
std::string gdcm::DirectoryHelper::GetSOPClassUID (
    const std::vector< DataSet > & inDS) [static]
```

### 12.93.2.8 GetStringValueFromTag()

```
std::string gdcm::DirectoryHelper::GetStringValueFromTag (
    const Tag & t,
    const DataSet & ds) [static]
```

### 12.93.2.9 LoadImageFromFiles()

```
std::vector< DataSet > gdcm::DirectoryHelper::LoadImageFromFiles (
    const std::string & inDirectory,
    const std::string & inSeriesUID) [static]
```

### 12.93.2.10 RetrieveSOPInstanceUIDFromIndex()

```
std::string gdcm::DirectoryHelper::RetrieveSOPInstanceUIDFromIndex (
    int inIndex,
    const std::vector< DataSet > & inDS) [static]
```

### 12.93.2.11 RetrieveSOPInstanceUIDFromZPosition()

```
std::string gdcm::DirectoryHelper::RetrieveSOPInstanceUIDFromZPosition (
    double inZPos,
    const std::vector< DataSet > & inDS) [static]
```

The documentation for this class was generated from the following file:

- [gdcmDirectoryHelper.h](#)

## 12.94 gdcm::DPath Class Reference

class to handle a DICOM path While supp 118 did introduced a notion of XPath for XML Native model this convention is too XML-centric. Instead prefer DCMTK style notation <https://groups.google.com/g/comp.protocols.dicom/c/IyIH0IOBMPA>

```
#include <gdcmDPath.h>
```

### Public Member Functions

- [DPath](#) ()
- [~DPath](#) ()
- bool [ConstructFromString](#) (const char \*path)
- bool [Match](#) ([DPath](#) const &other) const  
*Return whether or not 'other' match the template [DPath](#).*
- bool [operator<](#) (const [DPath](#) &rhs) const
- void [Print](#) (std::ostream &) const

### Static Public Member Functions

- static bool [IsValid](#) (const char \*path)  
*Return if path is valid or not.*

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [DPath](#) &\_val)

### 12.94.1 Detailed Description

class to handle a DICOM path While supp 118 did introduced a notion of XPath for XML Native model this convention is too XML-centric. Instead prefer DCMTK style notation [https://groups.google.com/g/comp.↵protocols.dicom/c/IyIH0IOBMPA](https://groups.google.com/g/comp.protocols.dicom/c/IyIH0IOBMPA)

### 12.94.2 Constructor & Destructor Documentation

#### 12.94.2.1 DPath()

```
gdcm::DPath::DPath ()
```

Referenced by [Match\(\)](#), [operator<\(\)](#), and [operator<<](#).

#### 12.94.2.2 ~DPath()

```
gdcm::DPath::~~DPath ()
```

### 12.94.3 Member Function Documentation

#### 12.94.3.1 ConstructFromString()

```
bool gdcm::DPath::ConstructFromString (
    const char * path)
```

##### Examples

[Cleaner.cs](#).

#### 12.94.3.2 IsValid()

```
bool gdcm::DPath::IsValid (
    const char * path) [static]
```

Return if path is valid or not.

#### 12.94.3.3 Match()

```
bool gdcm::DPath::Match (
    DPath const & other) const
```

Return whether or not 'other' match the template [DPath](#).

References [DPath\(\)](#).

#### 12.94.3.4 operator<()

```
bool gdcm::DPath::operator< (
    const DPath & rhs) const
```

References [DPath\(\)](#).

#### 12.94.3.5 Print()

```
void gdcm::DPath::Print (
    std::ostream & ) const
```

### 12.94.4 Friends And Related Symbol Documentation

#### 12.94.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const DPath & _val) [friend]
```

References [DPath\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmDPath.h](#)

## 12.95 gdcm::DummyValueGenerator Class Reference

Class for generating dummy value.

```
#include <gdcmDummyValueGenerator.h>
```

### Static Public Member Functions

- static const char \* [Generate](#) (const char \*input)

#### 12.95.1 Detailed Description

Class for generating dummy value.

See also

[Anonymizer](#)

## 12.95.2 Member Function Documentation

### 12.95.2.1 Generate()

```
const char * gdcm::DummyValueGenerator::Generate (  
    const char * input)    [static]
```

Generate a dummy value from an input value. This is guarantee to always return the same output value when input is identical. Return an array of bytes that can be used for anonymization purpose, return NULL on error NOT THREAD SAFE

The documentation for this class was generated from the following file:

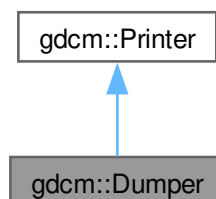
- [gdcmDummyValueGenerator.h](#)

## 12.96 gdcm::Dumper Class Reference

[Codec](#) class.

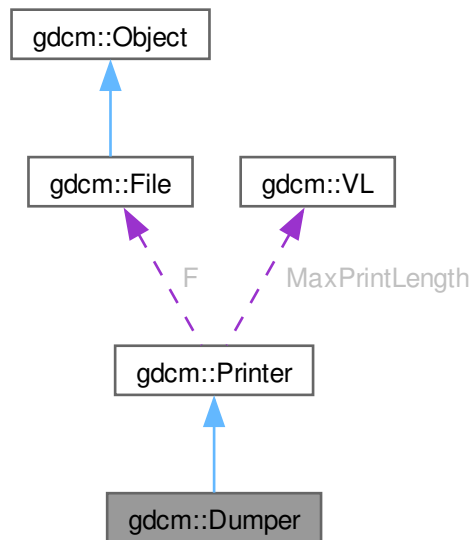
```
#include <gdcmDumper.h>
```

Inheritance diagram for gdcm::Dumper:





Collaboration diagram for gdcmm::Dumper:



### Public Member Functions

- [Dumper](#) ()
- [~Dumper](#) ()=default

### Public Member Functions inherited from [gdcmm::Printer](#)

- [Printer](#) ()
- [~Printer](#) ()=default
- [PrintStyles](#) [GetPrintStyle](#) () const  
*Get PrintStyle value.*
- void [Print](#) (std::ostream &os)  
*Print.*
- void [PrintDataSet](#) (const [DataSet](#) &ds, std::ostream &os, const std::string &s="")  
*Print an individual dataset.*
- void [SetColor](#) (bool c)  
*Set color mode or not.*
- void [SetFile](#) ([File](#) const &f)  
*Set file.*
- void [SetStyle](#) ([PrintStyles](#) ps)  
*Set PrintStyle value.*

## Additional Inherited Members

### Public Types inherited from [gdcm::Printer](#)

- enum [PrintStyles](#) {  
[VERBOSE\\_STYLE](#) = 0 ,  
[CONDENSED\\_STYLE](#) ,  
[XML](#) ,  
[CXX](#) }

### Protected Member Functions inherited from [gdcm::Printer](#)

- [VR PrintDataElement](#) (std::ostream &os, const [Dicts](#) &dicts, const [DataSet](#) &ds, const [DataElement](#) &de, std::ostream &out, std::string const &indent)
- void [PrintSQ](#) (const [SequenceOfItems](#) \*sqi, std::ostream &os, std::string const &indent)

### Protected Attributes inherited from [gdcm::Printer](#)

- const [File](#) \* [F](#)
- [VL MaxPrintLength](#)
- [PrintStyles](#) [PrintStyle](#)

## 12.96.1 Detailed Description

[Codec](#) class.

### Note

Use it to simply dump value read from the file. No interpretation is done. But it is real fast ! Almost no overhead

## 12.96.2 Constructor & Destructor Documentation

### 12.96.2.1 Dumper()

```
gdcm::Dumper::Dumper () [inline]
```

References [gdcm::Printer::CONDENSED\\_STYLE](#), and [gdcm::Printer::PrintStyle](#).

### 12.96.2.2 ~Dumper()

```
gdcm::Dumper::~Dumper () [default]
```

The documentation for this class was generated from the following file:

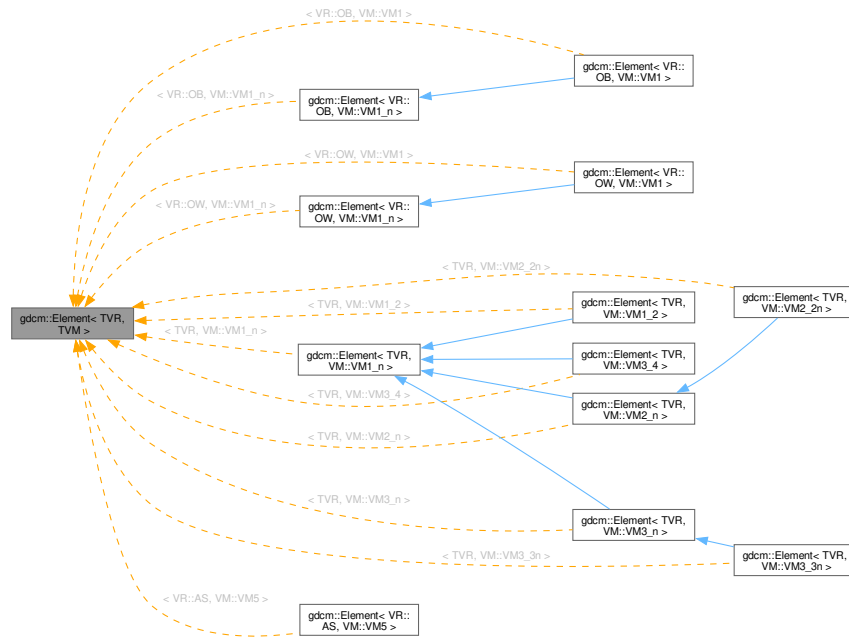
- [gdcmDumper.h](#)

## 12.97 gdcmm::Element< TVR, TVM > Class Template Reference

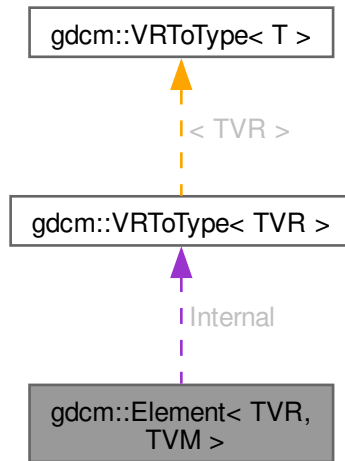
[Element](#) class.

```
#include <gdcmmElement.h>
```

Inheritance diagram for gdcmm::Element< TVR, TVM >:



Collaboration diagram for `gdcm::Element< TVR, TVM >`:



## Public Types

- typedef `VRTToType< TVR >::Type` `Type`

## Public Member Functions

- `DataElement GetAsDataElement ()` const
- unsigned long `GetLength ()` const
- `VRTToType< TVR >::Type & GetValue` (unsigned int idx=0)
- const `VRTToType< TVR >::Type & GetValue` (unsigned int idx=0) const
- const `VRTToType< TVR >::Type * GetValues ()` const
- `VRTToType< TVR >::Type operator[]` (unsigned int idx) const
- void `Print` (std::ostream &\_os) const
- void `Read` (std::istream &\_is)
- void `Set` (Value const &v)
- void `SetFromDataElement` (DataElement const &de)
- void `SetValue` (typename `VRTToType< TVR >::Type` v, unsigned int idx=0)
- void `Write` (std::ostream &\_os) const

## Static Public Member Functions

- static `VM GetVM ()`
- static `VR GetVR ()`

## Public Attributes

- [VRToType](#)< TVR >::Type [Internal](#) [[VMToLength](#)< TVM >::Length]

## Protected Member Functions

- void [SetNoSwap](#) ([Value](#) const &v)

### 12.97.1 Detailed Description

```
template<long long TVR, int TVM>
class gdcm::Element< TVR, TVM >
```

[Element](#) class.

#### Note

TODO

#### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GetSubSequenceData.cxx](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

### 12.97.2 Member Typedef Documentation

#### 12.97.2.1 Type

```
template<long long TVR, int TVM>
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

### 12.97.3 Member Function Documentation

#### 12.97.3.1 GetAsDataElement()

```
template<long long TVR, int TVM>
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement () const [inline]
```

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), and [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#).

References [GetLength\(\)](#), [gdcm::DataElement::GetVR\(\)](#), [GetVR\(\)](#), [Internal](#), [gdcm::DataElement::SetByteValue\(\)](#), [gdcm::DataElement::SetVR\(\)](#), [gdcm::VR::SQ](#), [gdcm::VR::UI](#), [gdcm::VR::VRASCII](#), and [Write\(\)](#).

### 12.97.3.2 GetLength()

```
template<long long TVR, int TVM>
unsigned long gdcm::Element< TVR, TVM >::GetLength () const [inline]
```

#### Examples

[DumpGEMSMovieGroup.cxx](#).

Referenced by [GetAsDataElement\(\)](#), [Read\(\)](#), [Set\(\)](#), [SetNoSwap\(\)](#), and [Write\(\)](#).

### 12.97.3.3 GetValue() [1/2]

```
template<long long TVR, int TVM>
VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) [inline]
```

References [Internal](#).

### 12.97.3.4 GetValue() [2/2]

```
template<long long TVR, int TVM>
const VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

#### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [GetSubSequenceData.cxx](#), and [csa2img.cxx](#).

References [Internal](#).

Referenced by [operator\[\]\(\)](#).

### 12.97.3.5 GetValues()

```
template<long long TVR, int TVM>
const VRToType< TVR >::Type * gdcm::Element< TVR, TVM >::GetValues () const [inline]
```

References [Internal](#).

### 12.97.3.6 GetVM()

```
template<long long TVR, int TVM>
VM gdcm::Element< TVR, TVM >::GetVM () [inline], [static]
```

### 12.97.3.7 GetVR()

```
template<long long TVR, int TVM>
VR gdcmm::Element< TVR, TVM >::GetVR () [inline], [static]
```

Referenced by [GetAsDataElement\(\)](#).

### 12.97.3.8 operator[]()

```
template<long long TVR, int TVM>
VRToType< TVR >::Type gdcmm::Element< TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

References [GetValue\(\)](#).

### 12.97.3.9 Print()

```
template<long long TVR, int TVM>
void gdcmm::Element< TVR, TVM >::Print (
    std::ostream & _os) const [inline]
```

#### Examples

[DumpGEMSMovieGroup.cxx](#).

References [Internal](#).

### 12.97.3.10 Read()

```
template<long long TVR, int TVM>
void gdcmm::Element< TVR, TVM >::Read (
    std::istream & _is) [inline]
```

References [GetLength\(\)](#), [Internal](#), and [Read\(\)](#).

Referenced by [Read\(\)](#), and [Set\(\)](#).

### 12.97.3.11 Set()

```
template<long long TVR, int TVM>
void gdcmm::Element< TVR, TVM >::Set (
    Value const & v) [inline]
```

#### Examples

[csa2img.cxx](#).

References [gdcmm::ByteValue::GetLength\(\)](#), [GetLength\(\)](#), [gdcmm::ByteValue::GetPointer\(\)](#), [Internal](#), and [Read\(\)](#).

Referenced by [SetFromDataElement\(\)](#).

**12.97.3.12 SetFromDataElement()**

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< TVR, TVM > const & de) [inline]
```

**Examples**

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [GetSubSequenceData.cxx](#), and [iU22tomultisc.cxx](#).

References [gdcm::DataElement::GetByteValue\(\)](#), [gdcm::DataElement::GetValue\(\)](#), [gdcm::DataElement::GetVR\(\)](#), [gdcm::VR::INVALID](#), [Set\(\)](#), [SetNoSwap\(\)](#), and [gdcm::VR::UN](#).

**12.97.3.13 SetNoSwap()**

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::SetNoSwap (
    Value const & v) [inline], [protected]
```

References [gdcm::ByteValue::GetLength\(\)](#), [GetLength\(\)](#), [gdcm::ByteValue::GetPointer\(\)](#), and [Internal](#).

Referenced by [SetFromDataElement\(\)](#).

**12.97.3.14 SetValue()**

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::SetValue (
    typename VRToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

**Examples**

[Extracting\\_All\\_Resolution.cxx](#), and [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#).

References [Internal](#).

**12.97.3.15 Write()**

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::Write (
    std::ostream & _os) const [inline]
```

References [GetLength\(\)](#), [Internal](#), and [Write\(\)](#).

Referenced by [GetAsDataElement\(\)](#), and [Write\(\)](#).



## 12.97.4 Member Data Documentation

### 12.97.4.1 Internal

```
template<long long TVR, int TVM>
VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

Referenced by [GetAsDataElement\(\)](#), [GetValue\(\)](#), [GetValue\(\)](#), [GetValues\(\)](#), [Print\(\)](#), [Read\(\)](#), [Set\(\)](#), [SetNoSwap\(\)](#), [SetValue\(\)](#), and [Write\(\)](#).

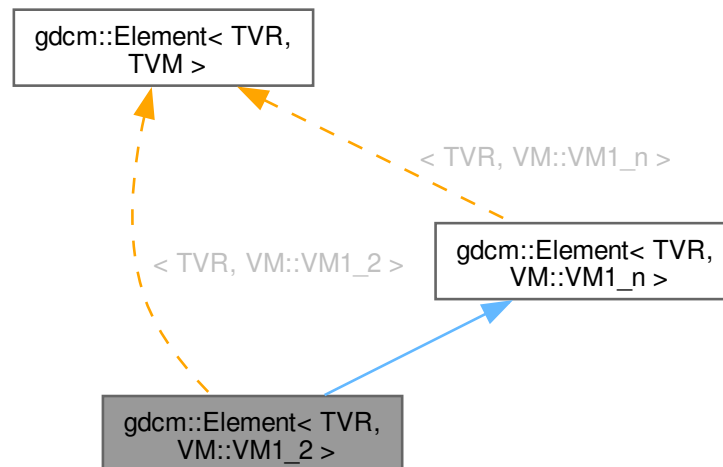
The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

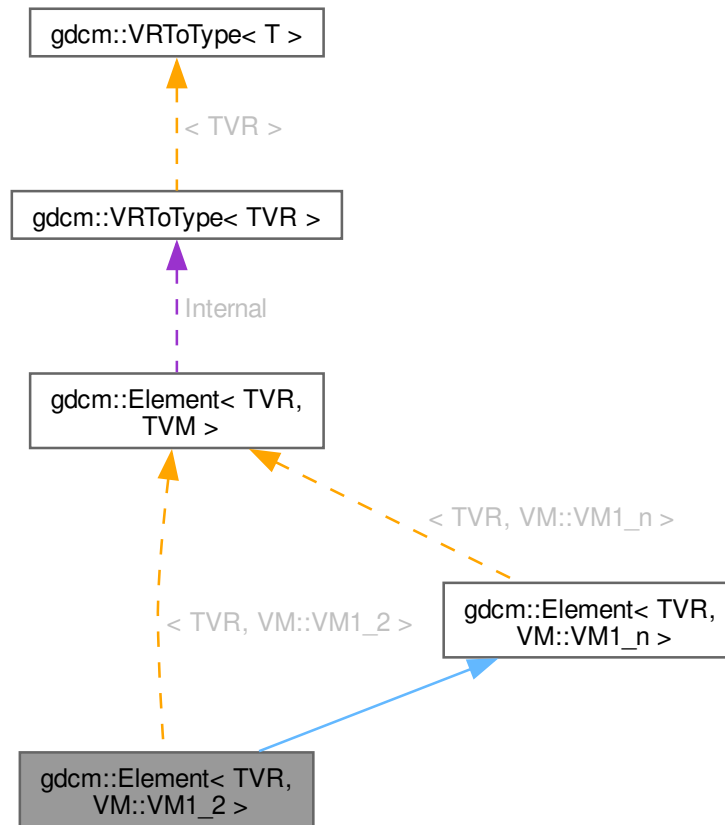
## 12.98 gdcm::Element< TVR, VM::VM1\_2 > Class Template Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< TVR, VM::VM1\_2 >:



Collaboration diagram for `gdcm::Element< TVR, VM::VM1_2 >`:



## Public Types

- typedef `Element< TVR, VM::VM1_n >` `Parent`
- typedef `VRTToType< TVR >::Type` `Type`

## Public Types inherited from `gdcm::Element< TVR, VM::VM1_n >`

- typedef `VRTToType< TVR >::Type` `Type`

## Public Member Functions

- `DataElement GetAsDataElement ()` const
- unsigned long `GetLength ()` const
- const `VRTToType< TVR >::Type & GetValue` (unsigned int idx=0) const

- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (int len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

### Public Member Functions inherited from [gdcm::Element](#)< TVR, VM::VM1\_n >

- [Element](#) ()
- [Element](#) (const Element &\_val)
- [~Element](#) ()
- DataElement [GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0)
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- Element & [operator=](#) (const Element &\_val)
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetArray](#) (const Type \*array, unsigned long len, bool save=false)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (unsigned long len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const
- void [WriteASCII](#) (std::ostream &os) const

### Static Public Member Functions

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Static Public Member Functions inherited from [gdcm::Element](#)< TVR, VM::VM1\_n >

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Public Attributes

- [VRToType](#)< TVR >::Type [Internal](#) [[VMToLength](#)< TVM >::Length]

## Protected Member Functions

- void [SetNoSwap](#) ([Value](#) const &v)

## Protected Member Functions inherited from [gdcm::Element< TVR, VM::VM1\\_n >](#)

- void [SetNoSwap](#) ([Value](#) const &v)

## 12.98.1 Member Typedef Documentation

### 12.98.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM1\_n> gdcm::Element< TVR, VM::VM1\_2 >::Parent
```

### 12.98.1.2 Type

```
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

## 12.98.2 Member Function Documentation

### 12.98.2.1 GetAsDataElement()

```
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.98.2.2 GetLength()

```
unsigned long gdcm::Element< TVR, TVM >::GetLength () const [inline]
```

### 12.98.2.3 GetValue()

```
const VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

### 12.98.2.4 GetValues()

```
const VRToType< TVR >::Type * gdcm::Element< TVR, TVM >::GetValues () const [inline]
```

### 12.98.2.5 GetVM()

```
VM gdcm::Element< TVR, TVM >::GetVM () [inline], [static]
```

### 12.98.2.6 GetVR()

```
VR gdcm::Element< TVR, TVM >::GetVR () [inline], [static]
```

### 12.98.2.7 operator[]()

```
VRToType< TVR >::Type gdcm::Element< TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

### 12.98.2.8 Print()

```
void gdcm::Element< TVR, TVM >::Print (
    std::ostream & _os) const [inline]
```

### 12.98.2.9 Read()

```
void gdcm::Element< TVR, TVM >::Read (
    std::istream & _is) [inline]
```

### 12.98.2.10 Set()

```
void gdcm::Element< TVR, TVM >::Set (
    Value const & v) [inline]
```

### 12.98.2.11 SetFromDataElement()

```
void gdcm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< TVR, VM::VM1_2 > const & de) [inline]
```

### 12.98.2.12 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_2 >::SetLength (
    int len) [inline]
```

References [gdcm::Element< TVR, VM::VM1\\_n >::SetLength\(\)](#).

### 12.98.2.13 SetNoSwap()

```
void gdcM::Element< TVR, TVM >::SetNoSwap (
    Value const & v) [inline], [protected]
```

### 12.98.2.14 SetValue()

```
void gdcM::Element< TVR, TVM >::SetValue (
    typename VRToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

### 12.98.2.15 Write()

```
void gdcM::Element< TVR, TVM >::Write (
    std::ostream & _os) const [inline]
```

## 12.98.3 Member Data Documentation

### 12.98.3.1 Internal

```
VRToType<TVR>::Type gdcM::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

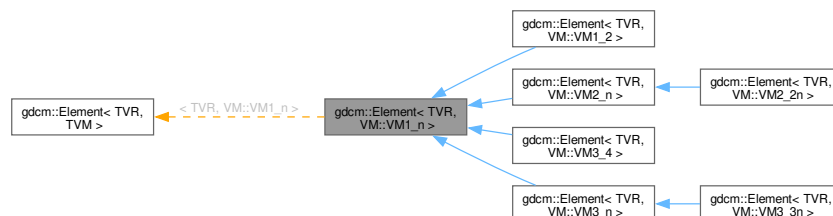
The documentation for this class was generated from the following file:

- [gdcMElement.h](#)

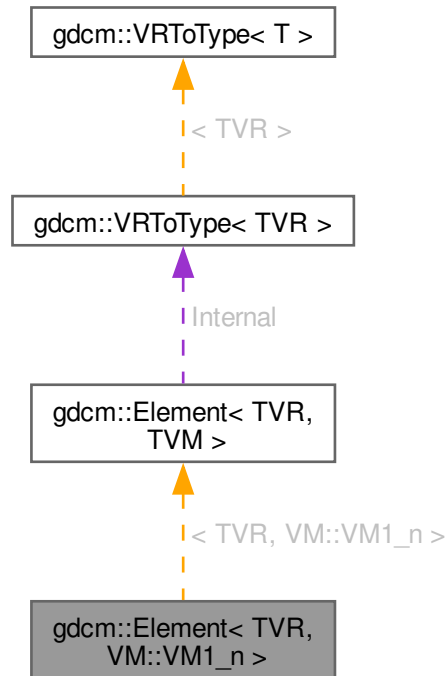
## 12.99 gdcM::Element< TVR, VM::VM1\_n > Class Template Reference

```
#include <gdcMElement.h>
```

Inheritance diagram for gdcM::Element< TVR, VM::VM1\_n >:



Collaboration diagram for gdcm::Element< TVR, VM::VM1\_n >:



## Public Types

- typedef `VRToType< TVR >::Type` `Type`

## Public Member Functions

- `Element` ()
- `Element` (const `Element` &\_val)
- `~Element` ()
- `DataElement GetAsDataElement` () const
- unsigned long `GetLength` () const
- `VRToType< TVR >::Type` & `GetValue` (unsigned int idx=0)
- const `VRToType< TVR >::Type` & `GetValue` (unsigned int idx=0) const
- const `VRToType< TVR >::Type` \* `GetValues` () const
- `Element` & `operator=` (const `Element` &\_val)
- `VRToType< TVR >::Type` `operator[]` (unsigned int idx) const
- void `Print` (std::ostream &\_os) const
- void `Read` (std::istream &\_is)
- void `Set` (`Value` const &v)

- void [SetArray](#) (const [Type](#) \*array, unsigned long len, bool save=false)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetLength](#) (unsigned long len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const
- void [WriteASCII](#) (std::ostream &os) const

### Static Public Member Functions

- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

### Protected Member Functions

- void [SetNoSwap](#) ([Value](#) const &v)

## 12.99.1 Member Typedef Documentation

### 12.99.1.1 Type

```
template<long long TVR>
typedef VRToType<TVR>::Type gdcmm::Element< TVR, VM::VM1\_n >::Type
```

## 12.99.2 Constructor & Destructor Documentation

### 12.99.2.1 Element() [1/2]

```
template<long long TVR>
gdcmm::Element< TVR, VM::VM1\_n >::Element () [inline], [explicit]
```

Referenced by [Element\(\)](#), and [operator=\(\)](#).

### 12.99.2.2 ~Element()

```
template<long long TVR>
gdcmm::Element< TVR, VM::VM1\_n >::~~Element () [inline]
```

### 12.99.2.3 Element() [2/2]

```
template<long long TVR>
gdcmm::Element< TVR, VM::VM1\_n >::Element (
    const Element< TVR, VM::VM1\_n > &_val) [inline]
```

References [Element\(\)](#).



## 12.99.3 Member Function Documentation

### 12.99.3.1 GetAsDataElement()

```
template<long long TVR>
DataElement gdcm::Element< TVR, VM::VM1_n >::GetAsDataElement () const [inline]
```

References [GetLength\(\)](#), [gdcm::DataElement::GetVR\(\)](#), [GetVR\(\)](#), [gdcm::DataElement::SetByteValue\(\)](#), [gdcm::DataElement::SetVR\(\)](#), [gdcm::VR::SQ](#), [gdcm::VR::UI](#), [gdcm::VR::VRASCII](#), and [Write\(\)](#).

### 12.99.3.2 GetLength()

```
template<long long TVR>
unsigned long gdcm::Element< TVR, VM::VM1_n >::GetLength () const [inline]
```

Referenced by [GetAsDataElement\(\)](#), [Print\(\)](#), [Read\(\)](#), [Set\(\)](#), [SetNoSwap\(\)](#), [Write\(\)](#), and [WriteASCII\(\)](#).

### 12.99.3.3 GetValue() [1/2]

```
template<long long TVR>
VRToType< TVR >::Type & gdcm::Element< TVR, VM::VM1_n >::GetValue (
    unsigned int idx = 0) [inline]
```

### 12.99.3.4 GetValue() [2/2]

```
template<long long TVR>
const VRToType< TVR >::Type & gdcm::Element< TVR, VM::VM1_n >::GetValue (
    unsigned int idx = 0) const [inline]
```

Referenced by [operator\[\]\(\)](#).

### 12.99.3.5 GetValues()

```
const VRToType< TVR >::Type * gdcm::Element< TVR, TVM >::GetValues () const [inline]
```

### 12.99.3.6 GetVM()

```
template<long long TVR>
VM gdcm::Element< TVR, VM::VM1_n >::GetVM () [inline], [static]
```

References [gdcm::VM::VM1\\_n](#).

### 12.99.3.7 GetVR()

```
template<long long TVR>
VR gdcm::Element< TVR, VM::VM1_n >::GetVR () [inline], [static]
```

Referenced by [GetAsDataElement\(\)](#).

### 12.99.3.8 operator=()

```
template<long long TVR>
Element & gdcm::Element< TVR, VM::VM1_n >::operator= (
    const Element< TVR, VM::VM1_n > & _val) [inline]
```

References [Element\(\)](#), and [SetArray\(\)](#).

### 12.99.3.9 operator[]()

```
template<long long TVR>
VRToType< TVR >::Type gdcm::Element< TVR, VM::VM1_n >::operator[] (
    unsigned int idx) const [inline]
```

References [GetValue\(\)](#).

### 12.99.3.10 Print()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::Print (
    std::ostream & _os) const [inline]
```

References [GetLength\(\)](#).

### 12.99.3.11 Read()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::Read (
    std::istream & _is) [inline]
```

References [GetLength\(\)](#), and [Read\(\)](#).

Referenced by [Read\(\)](#), and [Set\(\)](#).

**12.99.3.12 Set()**

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM1_n >::Set (
    Value const & v) [inline]
```

References [gdcmm::ByteValue::GetLength\(\)](#), [GetLength\(\)](#), [gdcmm::ByteValue::GetPointer\(\)](#), [gdcmm::ByteValue::GetVoidPointer\(\)](#), [Read\(\)](#), [SetArray\(\)](#), and [gdcmm::VR::VRBINARY](#).

Referenced by [SetFromDataElement\(\)](#).

**12.99.3.13 SetArray()**

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM1_n >::SetArray (
    const Type * array,
    unsigned long len,
    bool save = false) [inline]
```

References [SetLength\(\)](#).

Referenced by [operator=\(\)](#), [Set\(\)](#), and [SetNoSwap\(\)](#).

**12.99.3.14 SetFromDataElement()**

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM1_n >::SetFromDataElement (
    DataElement< TVR, VM::VM1_n > const & de) [inline]
```

References [gdcmm::DataElement::GetByteValue\(\)](#), [gdcmm::DataElement::GetValue\(\)](#), [gdcmm::DataElement::GetVR\(\)](#), [gdcmm::VR::INVALID](#), [Set\(\)](#), [SetNoSwap\(\)](#), and [gdcmm::VR::UN](#).

**12.99.3.15 SetLength()**

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM1_n >::SetLength (
    unsigned long len) [inline]
```

Referenced by [SetArray\(\)](#), [gdcmm::Element< TVR, VM::VM1\\_2 >::SetLength\(\)](#), [gdcmm::Element< TVR, VM::VM2\\_n >::SetLength\(\)](#), [gdcmm::Element< TVR, VM::VM3\\_4 >::SetLength\(\)](#), and [gdcmm::Element< TVR, VM::VM3\\_n >::SetLength\(\)](#).

**12.99.3.16 SetNoSwap()**

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM1_n >::SetNoSwap (
    Value const & v) [inline], [protected]
```

References [gdcmm::ByteValue::GetLength\(\)](#), [GetLength\(\)](#), [gdcmm::ByteValue::GetPointer\(\)](#), [SetArray\(\)](#), and [gdcmm::VR::VRBINARY](#).

Referenced by [SetFromDataElement\(\)](#).

### 12.99.3.17 SetValue()

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM1_n >::SetValue (
    typename VRToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

### 12.99.3.18 Write()

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM1_n >::Write (
    std::ostream & _os) const [inline]
```

References [GetLength\(\)](#), and [Write\(\)](#).

Referenced by [GetAsDataElement\(\)](#), and [Write\(\)](#).

### 12.99.3.19 WriteASCII()

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM1_n >::WriteASCII (
    std::ostream & os) const [inline]
```

References [GetLength\(\)](#).

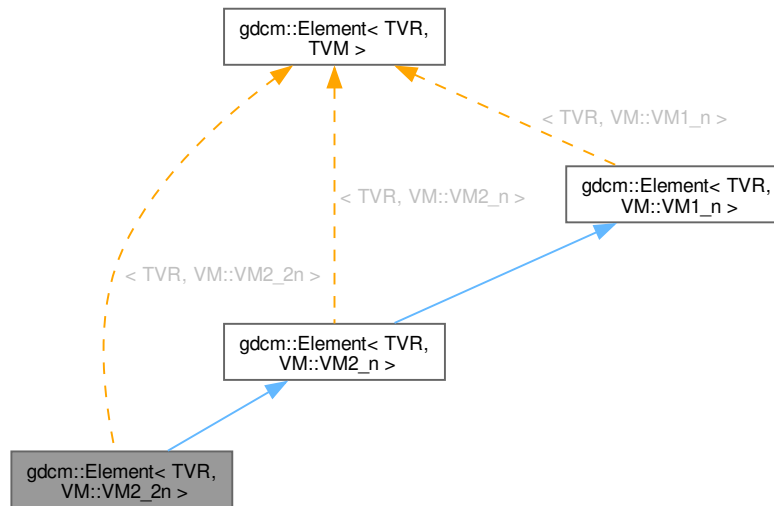
The documentation for this class was generated from the following file:

- [gdcmmElement.h](#)

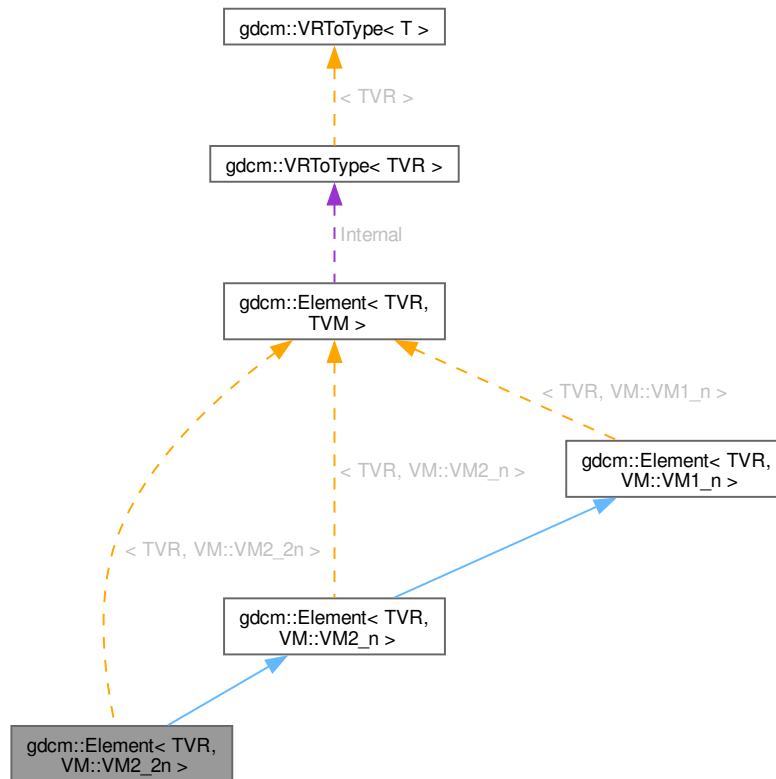
## 12.100 gdcmm::Element< TVR, VM::VM2\_2n > Class Template Reference

```
#include <gdcmmElement.h>
```

Inheritance diagram for gdcM::Element< TVR, VM::VM2\_2n >:



Collaboration diagram for `gdc::Element< TVR, VM::VM2_2n >`:



## Public Types

- typedef `Element< TVR, VM::VM2_n >` `Parent`
- typedef `VRTToType< TVR >::Type` `Type`

## Public Types inherited from `gdc::Element< TVR, VM::VM2_n >`

- typedef `Element< TVR, VM::VM1_n >` `Parent`
- typedef `VRTToType< TVR >::Type` `Type`

## Public Types inherited from `gdc::Element< TVR, VM::VM1_n >`

- typedef `VRTToType< TVR >::Type` `Type`

**Public Member Functions**

- [DataElement GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (int len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

**Public Member Functions inherited from [gdcm::Element< TVR, VM::VM2\\_n >](#)**

- [DataElement GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (int len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

**Public Member Functions inherited from [gdcm::Element< TVR, VM::VM1\\_n >](#)**

- [Element](#) ()
- [Element](#) (const Element &\_val)
- [~Element](#) ()
- [DataElement GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0)
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [Element & operator=](#) (const [Element](#) &\_val)
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetArray](#) (const [Type](#) \*array, unsigned long len, bool save=false)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (unsigned long len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const
- void [WriteASCII](#) (std::ostream &os) const

**Static Public Member Functions**

- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

**Static Public Member Functions inherited from [gdcm::Element< TVR, VM::VM2\\_n >](#)**

- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

**Static Public Member Functions inherited from [gdcm::Element< TVR, VM::VM1\\_n >](#)**

- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

**Public Attributes**

- [VRToType< TVR >::Type Internal](#) [[VMToLength< TVM >::Length](#)]

**Public Attributes inherited from [gdcm::Element< TVR, VM::VM2\\_n >](#)**

- [VRToType< TVR >::Type Internal](#) [[VMToLength< TVM >::Length](#)]

**Protected Member Functions**

- void [SetNoSwap](#) ([Value](#) const &v)

**Protected Member Functions inherited from [gdcm::Element< TVR, VM::VM2\\_n >](#)**

- void [SetNoSwap](#) ([Value](#) const &v)

**Protected Member Functions inherited from [gdcm::Element< TVR, VM::VM1\\_n >](#)**

- void [SetNoSwap](#) ([Value](#) const &v)

**12.100.1 Member Typedef Documentation****12.100.1.1 Parent**

```
template<long long TVR>
typedef Element<TVR, VM::VM2\_n> gdcm::Element< TVR, VM::VM2\_n >::Parent
```



### 12.100.1.2 Type

```
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

## 12.100.2 Member Function Documentation

### 12.100.2.1 GetAsDataElement()

```
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.100.2.2 GetLength()

```
unsigned long gdcm::Element< TVR, TVM >::GetLength () const [inline]
```

### 12.100.2.3 GetValue()

```
const VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

### 12.100.2.4 GetValues()

```
const VRToType< TVR >::Type * gdcm::Element< TVR, TVM >::GetValues () const [inline]
```

### 12.100.2.5 GetVM()

```
VM gdcm::Element< TVR, TVM >::GetVM () [inline], [static]
```

### 12.100.2.6 GetVR()

```
VR gdcm::Element< TVR, TVM >::GetVR () [inline], [static]
```

### 12.100.2.7 operator[]()

```
VRToType< TVR >::Type gdcm::Element< TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

### 12.100.2.8 Print()

```
void gdcm::Element< TVR, TVM >::Print (
    std::ostream & _os) const [inline]
```

#### 12.100.2.9 Read()

```
void gdcmm::Element< TVR, TVM >::Read (
    std::istream & _is) [inline]
```

#### 12.100.2.10 Set()

```
void gdcmm::Element< TVR, TVM >::Set (
    Value const & v) [inline]
```

#### 12.100.2.11 SetFromDataElement()

```
void gdcmm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< TVR, VM::VM2_2n > const & de) [inline]
```

#### 12.100.2.12 SetLength()

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM2_2n >::SetLength (
    int len) [inline]
```

References [gdcmm::Element< TVR, VM::VM2\\_n >::SetLength\(\)](#).

#### 12.100.2.13 SetNoSwap()

```
void gdcmm::Element< TVR, TVM >::SetNoSwap (
    Value const & v) [inline], [protected]
```

#### 12.100.2.14 SetValue()

```
void gdcmm::Element< TVR, TVM >::SetValue (
    typename VRTToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

#### 12.100.2.15 Write()

```
void gdcmm::Element< TVR, TVM >::Write (
    std::ostream & _os) const [inline]
```

### 12.100.3 Member Data Documentation

#### 12.100.3.1 Internal

```
VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

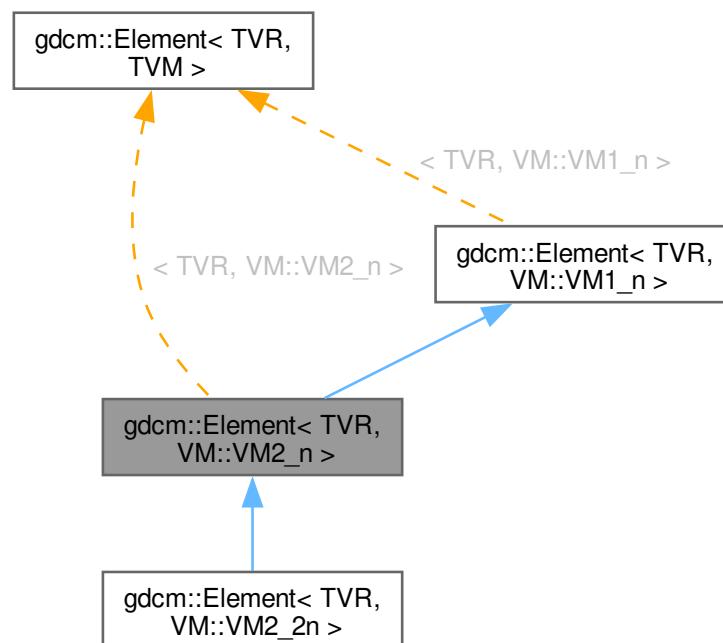
The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

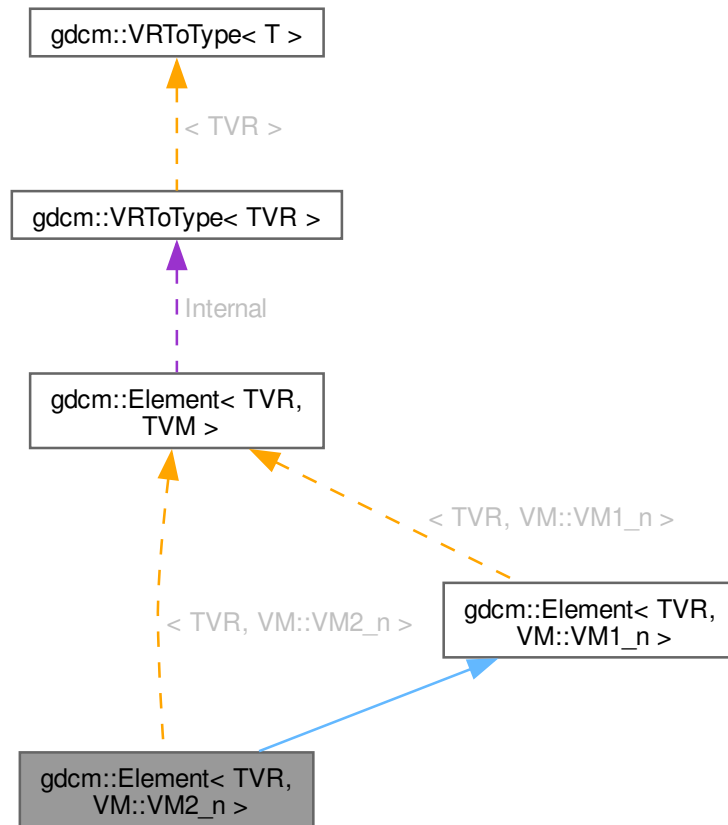
## 12.101 gdcm::Element< TVR, VM::VM2\_n > Class Template Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< TVR, VM::VM2\_n >:



Collaboration diagram for `gdcm::Element< TVR, VM::VM2_n >`:



## Public Types

- typedef `Element< TVR, VM::VM1_n >` `Parent`
- typedef `VRTToType< TVR >::Type` `Type`

## Public Types inherited from `gdcm::Element< TVR, VM::VM1_n >`

- typedef `VRTToType< TVR >::Type` `Type`

## Public Member Functions

- `DataElement GetAsDataElement ()` const
- unsigned long `GetLength ()` const
- const `VRTToType< TVR >::Type & GetValue` (unsigned int idx=0) const

- `const VRToType< TVR >::Type * GetValues () const`
- `VRToType< TVR >::Type operator[] (unsigned int idx) const`
- `void Print (std::ostream &_os) const`
- `void Read (std::istream &_is)`
- `void Set (Value const &v)`
- `void SetFromDataElement (DataElement const &de)`
- `void SetLength (int len)`
- `void SetValue (typename VRToType< TVR >::Type v, unsigned int idx=0)`
- `void Write (std::ostream &_os) const`

### Public Member Functions inherited from `gdcmm::Element< TVR, VM::VM1_n >`

- `Element ()`
- `Element (const Element &_val)`
- `~Element ()`
- `DataElement GetAsDataElement () const`
- `unsigned long GetLength () const`
- `VRToType< TVR >::Type & GetValue (unsigned int idx=0)`
- `const VRToType< TVR >::Type & GetValue (unsigned int idx=0) const`
- `const VRToType< TVR >::Type * GetValues () const`
- `Element & operator= (const Element &_val)`
- `VRToType< TVR >::Type operator[] (unsigned int idx) const`
- `void Print (std::ostream &_os) const`
- `void Read (std::istream &_is)`
- `void Set (Value const &v)`
- `void SetArray (const Type *array, unsigned long len, bool save=false)`
- `void SetFromDataElement (DataElement const &de)`
- `void SetLength (unsigned long len)`
- `void SetValue (typename VRToType< TVR >::Type v, unsigned int idx=0)`
- `void Write (std::ostream &_os) const`
- `void WriteASCII (std::ostream &os) const`

### Static Public Member Functions

- `static VM GetVM ()`
- `static VR GetVR ()`

### Static Public Member Functions inherited from `gdcmm::Element< TVR, VM::VM1_n >`

- `static VM GetVM ()`
- `static VR GetVR ()`

### Public Attributes

- `VRToType< TVR >::Type Internal [VMToLength< TVM >::Length]`

## Protected Member Functions

- void [SetNoSwap](#) ([Value](#) const &v)

## Protected Member Functions inherited from [gdcm::Element< TVR, VM::VM1\\_n >](#)

- void [SetNoSwap](#) ([Value](#) const &v)

## 12.101.1 Member Typedef Documentation

### 12.101.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM1_n> gdcm::Element< TVR, VM::VM2_n >::Parent
```

### 12.101.1.2 Type

```
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

## 12.101.2 Member Function Documentation

### 12.101.2.1 GetAsDataElement()

```
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.101.2.2 GetLength()

```
unsigned long gdcm::Element< TVR, TVM >::GetLength () const [inline]
```

### 12.101.2.3 GetValue()

```
const VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

### 12.101.2.4 GetValues()

```
const VRToType< TVR >::Type * gdcm::Element< TVR, TVM >::GetValues () const [inline]
```

### 12.101.2.5 GetVM()

```
VM gdcm::Element< TVR, TVM >::GetVM () [inline], [static]
```

### 12.101.2.6 GetVR()

```
VR gdcm::Element< TVR, TVM >::GetVR () [inline], [static]
```

### 12.101.2.7 operator[]()

```
VRToType< TVR >::Type gdcm::Element< TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

### 12.101.2.8 Print()

```
void gdcm::Element< TVR, TVM >::Print (
    std::ostream & _os) const [inline]
```

### 12.101.2.9 Read()

```
void gdcm::Element< TVR, TVM >::Read (
    std::istream & _is) [inline]
```

### 12.101.2.10 Set()

```
void gdcm::Element< TVR, TVM >::Set (
    Value const & v) [inline]
```

### 12.101.2.11 SetFromDataElement()

```
void gdcm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< TVR, VM::VM2_n > const & de) [inline]
```

### 12.101.2.12 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM2_n >::SetLength (
    int len) [inline]
```

References [gdcm::Element< TVR, VM::VM1\\_n >::SetLength\(\)](#).

Referenced by [gdcm::Element< TVR, VM::VM2\\_2n >::SetLength\(\)](#).

#### 12.101.2.13 SetNoSwap()

```
void gdcM::Element< TVR, TVM >::SetNoSwap (
    Value const & v) [inline], [protected]
```

#### 12.101.2.14 SetValue()

```
void gdcM::Element< TVR, TVM >::SetValue (
    typename VRToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

#### 12.101.2.15 Write()

```
void gdcM::Element< TVR, TVM >::Write (
    std::ostream & _os) const [inline]
```

### 12.101.3 Member Data Documentation

#### 12.101.3.1 Internal

```
VRToType<TVR>::Type gdcM::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

The documentation for this class was generated from the following file:

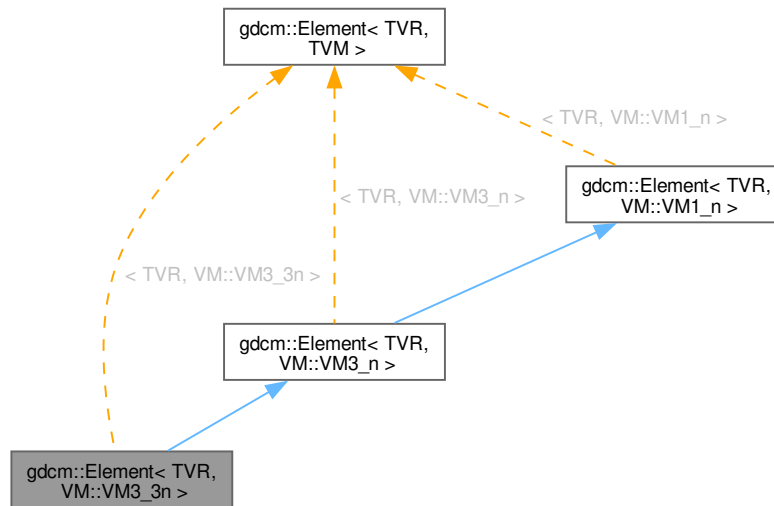
- [gdcMElement.h](#)

## 12.102 gdcM::Element< TVR, VM::VM3\_3n > Class Template Reference

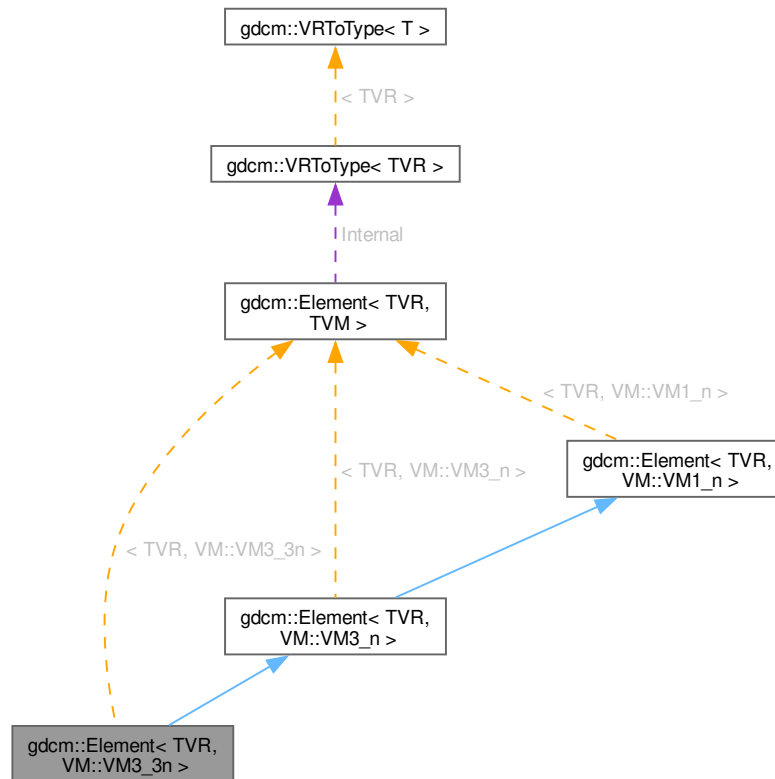
```
#include <gdcMElement.h>
```



Inheritance diagram for gdcM::Element< TVR, VM::VM3\_3n >:



Collaboration diagram for `gdc::Element< TVR, VM::VM3_3n >`:



## Public Types

- typedef `Element< TVR, VM::VM3_n >` `Parent`
- typedef `VRTToType< TVR >::Type` `Type`

## Public Types inherited from `gdc::Element< TVR, VM::VM3_n >`

- typedef `Element< TVR, VM::VM1_n >` `Parent`
- typedef `VRTToType< TVR >::Type` `Type`

## Public Types inherited from `gdc::Element< TVR, VM::VM1_n >`

- typedef `VRTToType< TVR >::Type` `Type`

**Public Member Functions**

- [DataElement GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (int len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

**Public Member Functions inherited from [gdcm::Element< TVR, VM::VM3\\_n >](#)**

- [DataElement GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (int len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

**Public Member Functions inherited from [gdcm::Element< TVR, VM::VM1\\_n >](#)**

- [Element](#) ()
- [Element](#) (const Element &\_val)
- [~Element](#) ()
- [DataElement GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0)
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [Element & operator=](#) (const [Element](#) &\_val)
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetArray](#) (const [Type](#) \*array, unsigned long len, bool save=false)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (unsigned long len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const
- void [WriteASCII](#) (std::ostream &os) const

**Static Public Member Functions**

- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

**Static Public Member Functions inherited from [gdcm::Element< TVR, VM::VM3\\_n >](#)**

- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

**Static Public Member Functions inherited from [gdcm::Element< TVR, VM::VM1\\_n >](#)**

- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

**Public Attributes**

- [VRToType< TVR >::Type Internal](#) [[VMToLength< TVM >::Length](#)]

**Public Attributes inherited from [gdcm::Element< TVR, VM::VM3\\_n >](#)**

- [VRToType< TVR >::Type Internal](#) [[VMToLength< TVM >::Length](#)]

**Protected Member Functions**

- void [SetNoSwap](#) ([Value](#) const &v)

**Protected Member Functions inherited from [gdcm::Element< TVR, VM::VM3\\_n >](#)**

- void [SetNoSwap](#) ([Value](#) const &v)

**Protected Member Functions inherited from [gdcm::Element< TVR, VM::VM1\\_n >](#)**

- void [SetNoSwap](#) ([Value](#) const &v)

**12.102.1 Member Typedef Documentation****12.102.1.1 Parent**

```
template<long long TVR>
typedef Element<TVR, VM::VM3_n> gdcm::Element< TVR, VM::VM3_3n >::Parent
```

### 12.102.1.2 Type

```
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

## 12.102.2 Member Function Documentation

### 12.102.2.1 GetAsDataElement()

```
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.102.2.2 GetLength()

```
unsigned long gdcm::Element< TVR, TVM >::GetLength () const [inline]
```

### 12.102.2.3 GetValue()

```
const VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

### 12.102.2.4 GetValues()

```
const VRToType< TVR >::Type * gdcm::Element< TVR, TVM >::GetValues () const [inline]
```

### 12.102.2.5 GetVM()

```
VM gdcm::Element< TVR, TVM >::GetVM () [inline], [static]
```

### 12.102.2.6 GetVR()

```
VR gdcm::Element< TVR, TVM >::GetVR () [inline], [static]
```

### 12.102.2.7 operator[]()

```
VRToType< TVR >::Type gdcm::Element< TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

### 12.102.2.8 Print()

```
void gdcm::Element< TVR, TVM >::Print (
    std::ostream & _os) const [inline]
```

#### 12.102.2.9 Read()

```
void gdcmm::Element< TVR, TVM >::Read (
    std::istream & _is) [inline]
```

#### 12.102.2.10 Set()

```
void gdcmm::Element< TVR, TVM >::Set (
    Value const & v) [inline]
```

#### 12.102.2.11 SetFromDataElement()

```
void gdcmm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< TVR, VM::VM3_3n > const & de) [inline]
```

#### 12.102.2.12 SetLength()

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM3_3n >::SetLength (
    int len) [inline]
```

References [gdcmm::Element< TVR, VM::VM3\\_n >::SetLength\(\)](#).

#### 12.102.2.13 SetNoSwap()

```
void gdcmm::Element< TVR, TVM >::SetNoSwap (
    Value const & v) [inline], [protected]
```

#### 12.102.2.14 SetValue()

```
void gdcmm::Element< TVR, TVM >::SetValue (
    typename VRTToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

#### 12.102.2.15 Write()

```
void gdcmm::Element< TVR, TVM >::Write (
    std::ostream & _os) const [inline]
```

### 12.102.3 Member Data Documentation

#### 12.102.3.1 Internal

```
VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

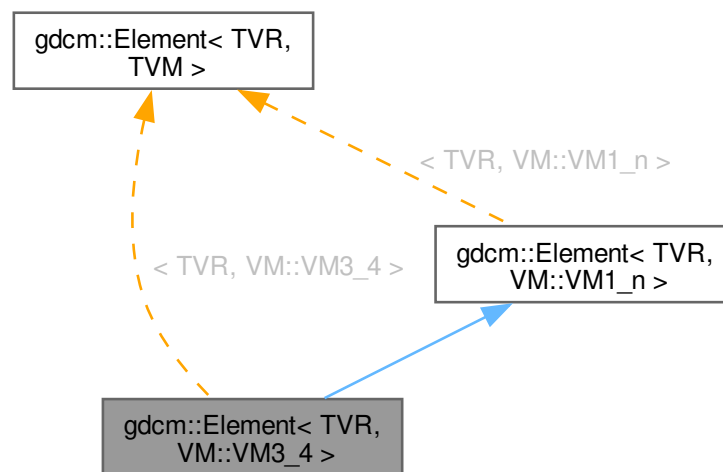
The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

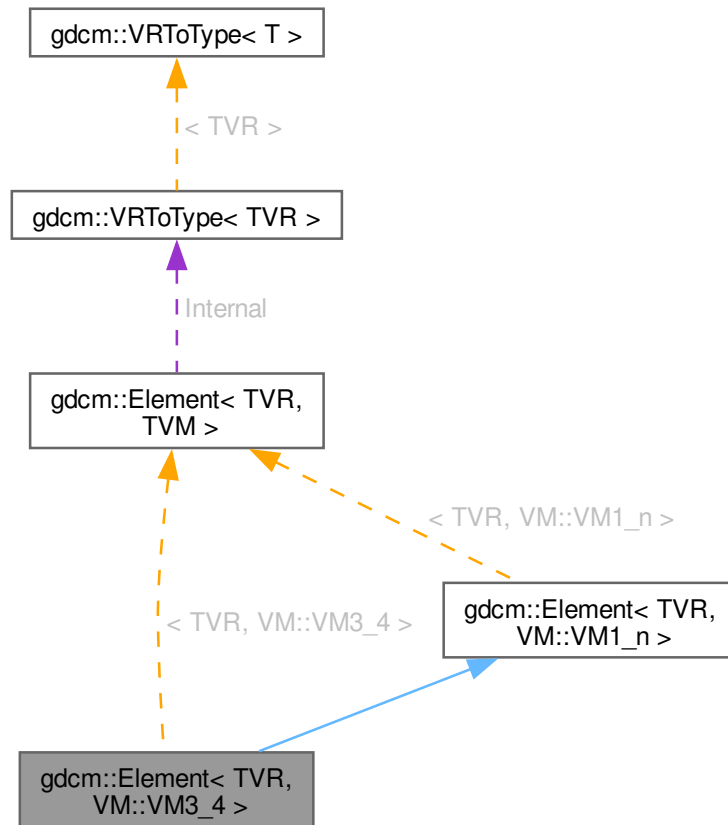
### 12.103 gdcm::Element< TVR, VM::VM3\_4 > Class Template Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< TVR, VM::VM3\_4 >:



Collaboration diagram for `gdcm::Element< TVR, VM::VM3_4 >`:



## Public Types

- typedef `Element< TVR, VM::VM1_n >` `Parent`
- typedef `VRTToType< TVR >::Type` `Type`

## Public Types inherited from `gdcm::Element< TVR, VM::VM1_n >`

- typedef `VRTToType< TVR >::Type` `Type`

## Public Member Functions

- `DataElement GetAsDataElement ()` const
- unsigned long `GetLength ()` const
- const `VRTToType< TVR >::Type & GetValue` (unsigned int idx=0) const



- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (int len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

### Public Member Functions inherited from [gdcm::Element](#)< TVR, VM::VM1\_n >

- [Element](#) ()
- [Element](#) (const Element &\_val)
- [~Element](#) ()
- DataElement [GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0)
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- Element & [operator=](#) (const Element &\_val)
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetArray](#) (const Type \*array, unsigned long len, bool save=false)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (unsigned long len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const
- void [WriteASCII](#) (std::ostream &os) const

### Static Public Member Functions

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Static Public Member Functions inherited from [gdcm::Element](#)< TVR, VM::VM1\_n >

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Public Attributes

- [VRToType](#)< TVR >::Type [Internal](#) [[VMToLength](#)< TVM >::Length]

**Protected Member Functions**

- void [SetNoSwap](#) ([Value](#) const &v)

**Protected Member Functions inherited from [gdcm::Element< TVR, VM::VM1\\_n >](#)**

- void [SetNoSwap](#) ([Value](#) const &v)

**12.103.1 Member Typedef Documentation****12.103.1.1 Parent**

```
template<long long TVR>
typedef Element<TVR, VM::VM1\_n> gdcm::Element< TVR, VM::VM3\_4 >::Parent
```

**12.103.1.2 Type**

```
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

**12.103.2 Member Function Documentation****12.103.2.1 GetAsDataElement()**

```
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement () const [inline]
```

**12.103.2.2 GetLength()**

```
unsigned long gdcm::Element< TVR, TVM >::GetLength () const [inline]
```

**12.103.2.3 GetValue()**

```
const VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

**12.103.2.4 GetValues()**

```
const VRToType< TVR >::Type * gdcm::Element< TVR, TVM >::GetValues () const [inline]
```

### 12.103.2.5 GetVM()

```
VM gdcm::Element< TVR, TVM >::GetVM () [inline], [static]
```

### 12.103.2.6 GetVR()

```
VR gdcm::Element< TVR, TVM >::GetVR () [inline], [static]
```

### 12.103.2.7 operator[]()

```
VRToType< TVR >::Type gdcm::Element< TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

### 12.103.2.8 Print()

```
void gdcm::Element< TVR, TVM >::Print (
    std::ostream & _os) const [inline]
```

### 12.103.2.9 Read()

```
void gdcm::Element< TVR, TVM >::Read (
    std::istream & _is) [inline]
```

### 12.103.2.10 Set()

```
void gdcm::Element< TVR, TVM >::Set (
    Value const & v) [inline]
```

### 12.103.2.11 SetFromDataElement()

```
void gdcm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< TVR, VM::VM3_4 > const & de) [inline]
```

### 12.103.2.12 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM3_4 >::SetLength (
    int len) [inline]
```

References [gdcm::Element< TVR, VM::VM1\\_n >::SetLength\(\)](#).

#### 12.103.2.13 SetNoSwap()

```
void gdcmm::Element< TVR, TVM >::SetNoSwap (
    Value const & v) [inline], [protected]
```

#### 12.103.2.14 SetValue()

```
void gdcmm::Element< TVR, TVM >::SetValue (
    typename VRToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

#### 12.103.2.15 Write()

```
void gdcmm::Element< TVR, TVM >::Write (
    std::ostream & _os) const [inline]
```

### 12.103.3 Member Data Documentation

#### 12.103.3.1 Internal

```
VRToType<TVR>::Type gdcmm::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

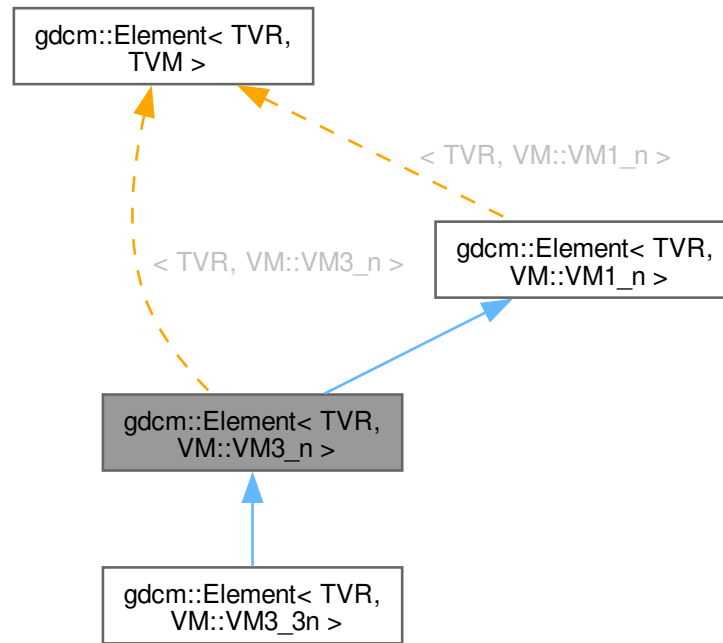
The documentation for this class was generated from the following file:

- [gdcmmElement.h](#)

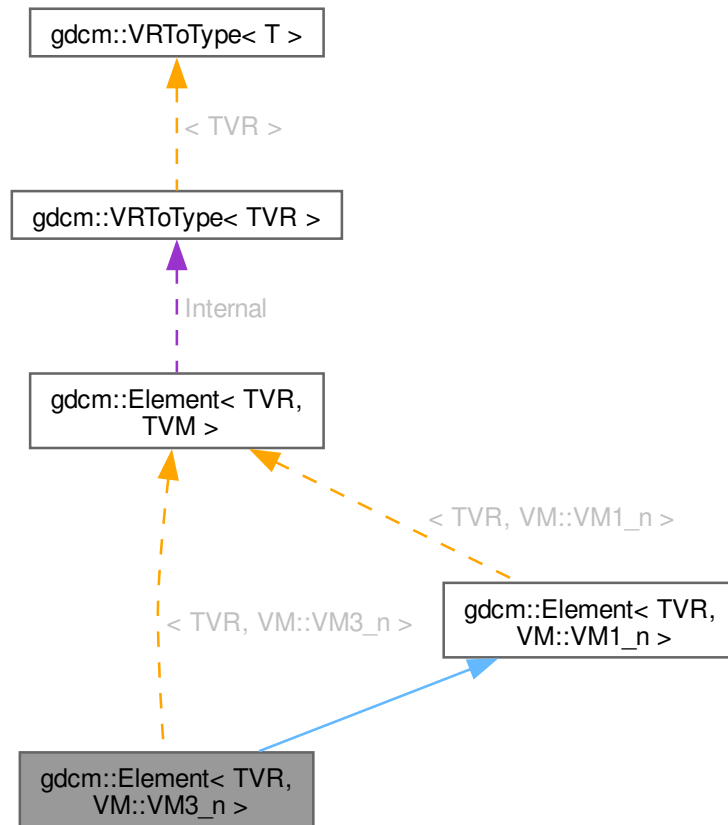
## 12.104 gdcmm::Element< TVR, VM::VM3\_n > Class Template Reference

```
#include <gdcmmElement.h>
```

Inheritance diagram for gdcm::Element< TVR, VM::VM3\_n >:



Collaboration diagram for `gdcm::Element< TVR, VM::VM3_n >`:



## Public Types

- typedef `Element< TVR, VM::VM1_n >` `Parent`
- typedef `VRTToType< TVR >::Type` `Type`

## Public Types inherited from `gdcm::Element< TVR, VM::VM1_n >`

- typedef `VRTToType< TVR >::Type` `Type`

## Public Member Functions

- `DataElement GetAsDataElement ()` const
- unsigned long `GetLength ()` const
- const `VRTToType< TVR >::Type & GetValue` (unsigned int idx=0) const

- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (int len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

### Public Member Functions inherited from [gdcm::Element](#)< TVR, VM::VM1\_n >

- [Element](#) ()
- [Element](#) (const Element &\_val)
- [~Element](#) ()
- DataElement [GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0)
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [Element](#) & [operator=](#) (const [Element](#) &\_val)
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) (Value const &v)
- void [SetArray](#) (const Type \*array, unsigned long len, bool save=false)
- void [SetFromDataElement](#) (DataElement const &de)
- void [SetLength](#) (unsigned long len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const
- void [WriteASCII](#) (std::ostream &os) const

### Static Public Member Functions

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Static Public Member Functions inherited from [gdcm::Element](#)< TVR, VM::VM1\_n >

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Public Attributes

- [VRToType](#)< TVR >::Type [Internal](#) [[VMToLength](#)< TVM >::Length]

**Protected Member Functions**

- void [SetNoSwap](#) ([Value](#) const &v)

**Protected Member Functions inherited from [gdcm::Element< TVR, VM::VM1\\_n >](#)**

- void [SetNoSwap](#) ([Value](#) const &v)

**12.104.1 Member Typedef Documentation****12.104.1.1 Parent**

```
template<long long TVR>
typedef Element<TVR, VM::VM1_n> gdcm::Element< TVR, VM::VM3_n >::Parent
```

**12.104.1.2 Type**

```
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

**12.104.2 Member Function Documentation****12.104.2.1 GetAsDataElement()**

```
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement () const [inline]
```

**12.104.2.2 GetLength()**

```
unsigned long gdcm::Element< TVR, TVM >::GetLength () const [inline]
```

**12.104.2.3 GetValue()**

```
const VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

**12.104.2.4 GetValues()**

```
const VRToType< TVR >::Type * gdcm::Element< TVR, TVM >::GetValues () const [inline]
```



#### 12.104.2.5 GetVM()

```
VM gdcm::Element< TVR, TVM >::GetVM () [inline], [static]
```

#### 12.104.2.6 GetVR()

```
VR gdcm::Element< TVR, TVM >::GetVR () [inline], [static]
```

#### 12.104.2.7 operator[]()

```
VRToType< TVR >::Type gdcm::Element< TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

#### 12.104.2.8 Print()

```
void gdcm::Element< TVR, TVM >::Print (
    std::ostream & _os) const [inline]
```

#### 12.104.2.9 Read()

```
void gdcm::Element< TVR, TVM >::Read (
    std::istream & _is) [inline]
```

#### 12.104.2.10 Set()

```
void gdcm::Element< TVR, TVM >::Set (
    Value const & v) [inline]
```

#### 12.104.2.11 SetFromDataElement()

```
void gdcm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< TVR, VM::VM3_n > const & de) [inline]
```

#### 12.104.2.12 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM3_n >::SetLength (
    int len) [inline]
```

References [gdcm::Element< TVR, VM::VM1\\_n >::SetLength\(\)](#).

Referenced by [gdcm::Element< TVR, VM::VM3\\_3n >::SetLength\(\)](#).

**12.104.2.13 SetNoSwap()**

```
void gdcM::Element< TVR, TVM >::SetNoSwap (
    Value const & v) [inline], [protected]
```

**12.104.2.14 SetValue()**

```
void gdcM::Element< TVR, TVM >::SetValue (
    typename VRToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

**12.104.2.15 Write()**

```
void gdcM::Element< TVR, TVM >::Write (
    std::ostream & _os) const [inline]
```

**12.104.3 Member Data Documentation****12.104.3.1 Internal**

```
VRToType<TVR>::Type gdcM::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

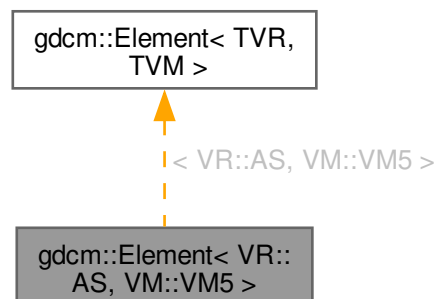
The documentation for this class was generated from the following file:

- [gdcMElement.h](#)

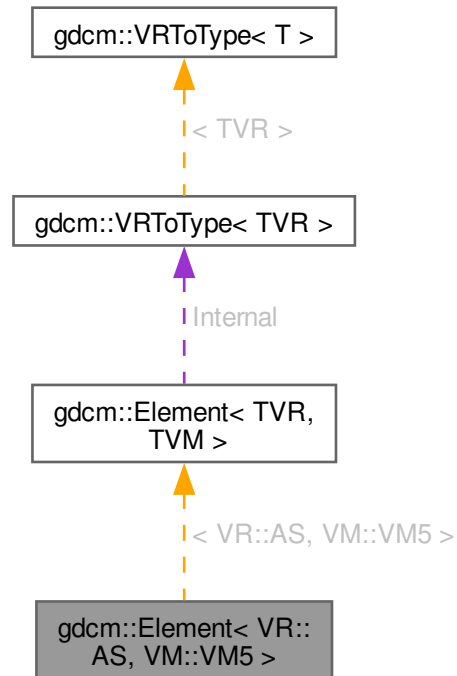
**12.105 gdcM::Element< VR::AS, VM::VM5 > Class Reference**

```
#include <gdcMElement.h>
```

Inheritance diagram for gdcM::Element< VR::AS, VM::VM5 >:



Collaboration diagram for gdcm::Element< VR::AS, VM::VM5 >:



## Public Types

- typedef `VRTToType< TVR >::Type` `Type`

## Public Member Functions

- `DataElement GetAsDataElement () const`
- `unsigned long GetLength () const`
- `const VRTToType< TVR >::Type & GetValue (unsigned int idx=0) const`
- `const VRTToType< TVR >::Type * GetValues () const`
- `VRTToType< TVR >::Type operator[] (unsigned int idx) const`
- `void Print (std::ostream &_os) const`
- `void Read (std::istream &_is)`
- `void Set (Value const &v)`
- `void SetFromDataElement (DataElement const &de)`
- `void SetValue (typename VRTToType< TVR >::Type v, unsigned int idx=0)`
- `void Write (std::ostream &_os) const`

### Static Public Member Functions

- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

### Public Attributes

- char [Internal](#) [[VMToLength](#)< [VM::VM5](#) >::Length \*sizeof([VRToType](#)< [VR::AS](#) >::Type)]

### Protected Member Functions

- void [SetNoSwap](#) ([Value](#) const &v)

## 12.105.1 Member Typedef Documentation

### 12.105.1.1 Type

```
typedef VRToType<TVR>::Type gdcmm::Element< TVR, TVM >::Type
```

## 12.105.2 Member Function Documentation

### 12.105.2.1 GetAsDataElement()

```
DataElement gdcmm::Element< TVR, TVM >::GetAsDataElement () const [inline]
```

### 12.105.2.2 GetLength()

```
unsigned long gdcmm::Element< VR::AS, VM::VM5 >::GetLength () const [inline]
```

### 12.105.2.3 GetValue()

```
const VRToType< TVR >::Type & gdcmm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

### 12.105.2.4 GetValues()

```
const VRToType< TVR >::Type * gdcmm::Element< TVR, TVM >::GetValues () const [inline]
```

### 12.105.2.5 GetVM()

```
VM gdcm::Element< TVR, TVM >::GetVM () [inline], [static]
```

### 12.105.2.6 GetVR()

```
VR gdcm::Element< TVR, TVM >::GetVR () [inline], [static]
```

### 12.105.2.7 operator[]()

```
VRToType< TVR >::Type gdcm::Element< TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

### 12.105.2.8 Print()

```
void gdcm::Element< VR::AS, VM::VM5 >::Print (
    std::ostream & _os) const [inline]
```

References [Internal](#).

### 12.105.2.9 Read()

```
void gdcm::Element< TVR, TVM >::Read (
    std::istream & _is) [inline]
```

### 12.105.2.10 Set()

```
void gdcm::Element< TVR, TVM >::Set (
    Value const & v) [inline]
```

### 12.105.2.11 SetFromDataElement()

```
void gdcm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< VR::AS, VM::VM5 > const & de) [inline]
```

### 12.105.2.12 SetNoSwap()

```
void gdcm::Element< TVR, TVM >::SetNoSwap (
    Value const & v) [inline], [protected]
```

### 12.105.2.13 SetValue()

```
void gdcm::Element< TVR, TVM >::SetValue (
    typename VRToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

### 12.105.2.14 Write()

```
void gdcm::Element< TVR, TVM >::Write (
    std::ostream & _os) const [inline]
```

## 12.105.3 Member Data Documentation

### 12.105.3.1 Internal

```
char gdcm::Element< VR::AS, VM::VM5 >::Internal[VMToLength< VM::VM5 >::Length *sizeof(VRToType<
VR::AS >::Type)]
```

Referenced by [Print\(\)](#).

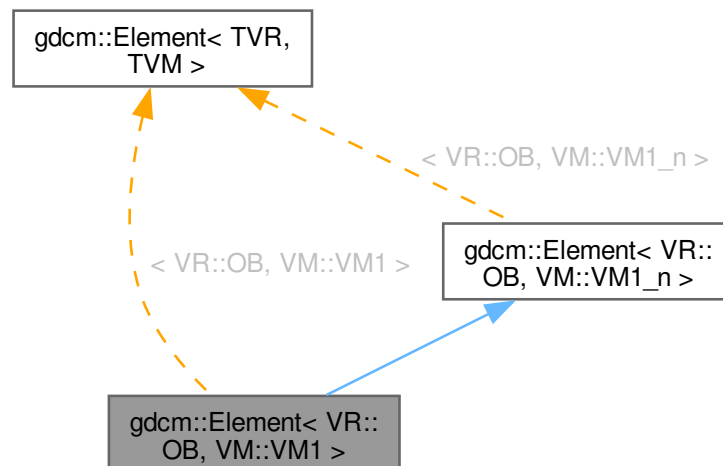
The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

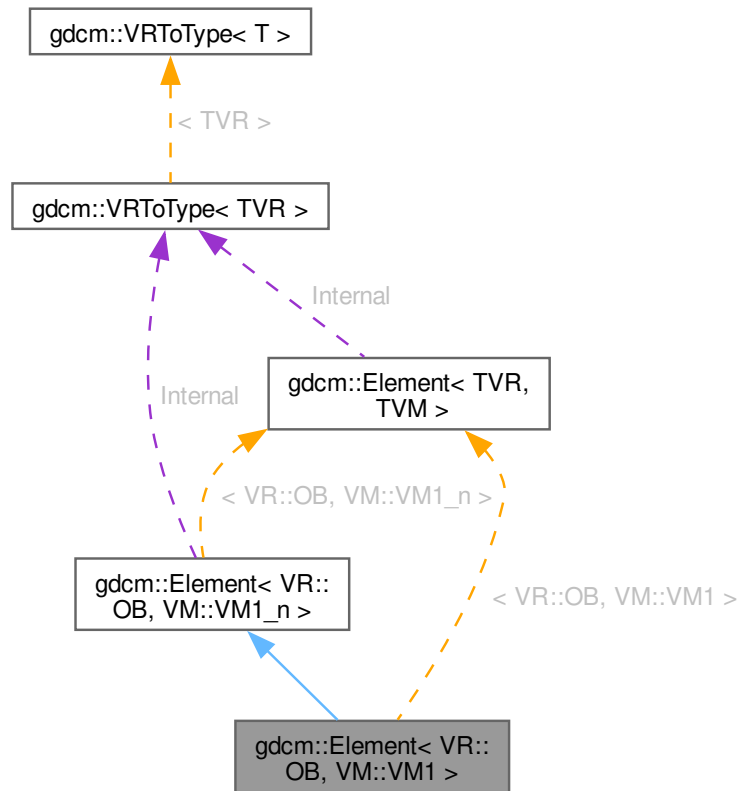
## 12.106 gdcm::Element< VR::OB, VM::VM1 > Class Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< VR::OB, VM::VM1 >:



Collaboration diagram for gdcm::Element< VR::OB, VM::VM1 >:



## Public Types

- typedef `VRTToType< TVR >::Type` `Type`

## Public Types inherited from `gdcm::Element< VR::OB, VM::VM1_n >`

- typedef `VRTToType< TVR >::Type` `Type`

## Public Member Functions

- `DataElement GetAsDataElement () const`
- `unsigned long GetLength () const`
- `const VRTToType< TVR >::Type & GetValue (unsigned int idx=0) const`
- `const VRTToType< TVR >::Type * GetValues () const`
- `VRTToType< TVR >::Type operator[] (unsigned int idx) const`

- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) ([Value](#) const &v)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

### Public Member Functions inherited from [gdcm::Element](#)< [VR::OB](#), [VM::VM1\\_n](#) >

- [DataElement](#) [GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) ([Value](#) const &v)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

### Static Public Member Functions

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Static Public Member Functions inherited from [gdcm::Element](#)< [VR::OB](#), [VM::VM1\\_n](#) >

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Public Attributes

- [VRToType](#)< TVR >::Type [Internal](#) [[VMToLength](#)< TVM >::Length]

### Public Attributes inherited from [gdcm::Element](#)< [VR::OB](#), [VM::VM1\\_n](#) >

- [VRToType](#)< TVR >::Type [Internal](#) [[VMToLength](#)< TVM >::Length]

### Protected Member Functions

- void [SetNoSwap](#) ([Value](#) const &v)



**Protected Member Functions inherited from [gdcm::Element< VR::OB, VM::VM1\\_n >](#)**

- void [SetNoSwap](#) (Value const &v)

**12.106.1 Member Typedef Documentation****12.106.1.1 Type**

```
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

**12.106.2 Member Function Documentation****12.106.2.1 GetAsDataElement()**

```
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement () const [inline]
```

**12.106.2.2 GetLength()**

```
unsigned long gdcm::Element< TVR, TVM >::GetLength () const [inline]
```

**12.106.2.3 GetValue()**

```
const VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

**12.106.2.4 GetValues()**

```
const VRToType< TVR >::Type * gdcm::Element< TVR, TVM >::GetValues () const [inline]
```

**12.106.2.5 GetVM()**

```
VM gdcm::Element< TVR, TVM >::GetVM () [inline], [static]
```

**12.106.2.6 GetVR()**

```
VR gdcm::Element< TVR, TVM >::GetVR () [inline], [static]
```

### 12.106.2.7 operator[]()

```
VRToType< TVR >::Type gdcmm::Element< TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

### 12.106.2.8 Print()

```
void gdcmm::Element< TVR, TVM >::Print (
    std::ostream & _os) const [inline]
```

### 12.106.2.9 Read()

```
void gdcmm::Element< TVR, TVM >::Read (
    std::istream & _is) [inline]
```

### 12.106.2.10 Set()

```
void gdcmm::Element< TVR, TVM >::Set (
    Value const & v) [inline]
```

### 12.106.2.11 SetFromDataElement()

```
void gdcmm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< VR::OB, VM::VM1 > const & de) [inline]
```

### 12.106.2.12 SetNoSwap()

```
void gdcmm::Element< TVR, TVM >::SetNoSwap (
    Value const & v) [inline], [protected]
```

### 12.106.2.13 SetValue()

```
void gdcmm::Element< TVR, TVM >::SetValue (
    typename VRTToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

### 12.106.2.14 Write()

```
void gdcmm::Element< TVR, TVM >::Write (
    std::ostream & _os) const [inline]
```

### 12.106.3 Member Data Documentation

#### 12.106.3.1 Internal

```
VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

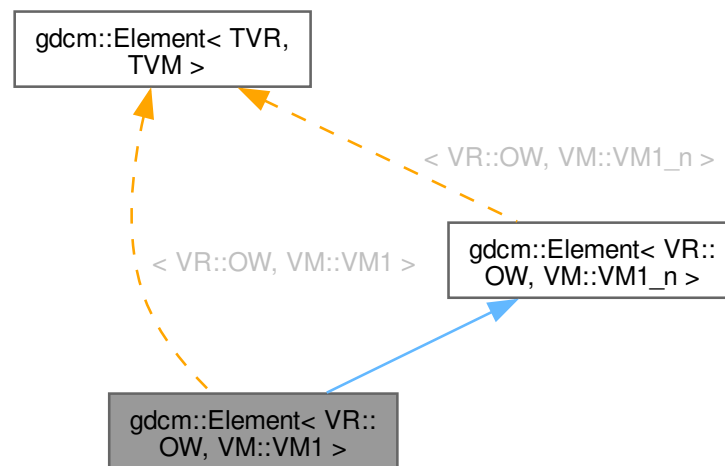
The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

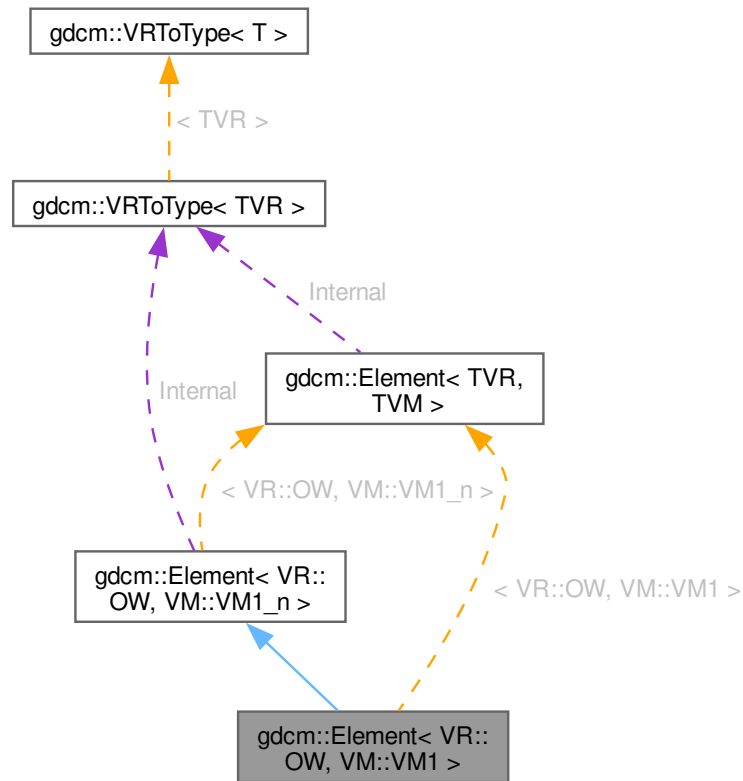
## 12.107 gdcm::Element< VR::OW, VM::VM1 > Class Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< VR::OW, VM::VM1 >:



Collaboration diagram for `gdcm::Element< VR::OW, VM::VM1 >`:



## Public Types

- typedef `VRTToType< TVR >::Type` `Type`

## Public Types inherited from `gdcm::Element< VR::OW, VM::VM1_n >`

- typedef `VRTToType< TVR >::Type` `Type`

## Public Member Functions

- `DataElement GetAsDataElement ()` const
- unsigned long `GetLength ()` const
- const `VRTToType< TVR >::Type` & `GetValue` (unsigned int idx=0) const
- const `VRTToType< TVR >::Type` \* `GetValues ()` const
- `VRTToType< TVR >::Type` `operator[]` (unsigned int idx) const
- void `Print` (std::ostream &\_os) const

- void [Read](#) (std::istream &\_is)
- void [Set](#) ([Value](#) const &v)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

### Public Member Functions inherited from [gdcm::Element< VR::OW, VM::VM1\\_n >](#)

- [DataElement](#) [GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) ([Value](#) const &v)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

### Static Public Member Functions

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Static Public Member Functions inherited from [gdcm::Element< VR::OW, VM::VM1\\_n >](#)

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

### Public Attributes

- [VRToType](#)< TVR >::Type [Internal](#) [[VMToLength](#)< TVM >::Length]

### Public Attributes inherited from [gdcm::Element< VR::OW, VM::VM1\\_n >](#)

- [VRToType](#)< TVR >::Type [Internal](#) [[VMToLength](#)< TVM >::Length]

### Protected Member Functions

- void [SetNoSwap](#) ([Value](#) const &v)

## Protected Member Functions inherited from [gdcm::Element< VR::OW, VM::VM1\\_n >](#)

- void [SetNoSwap](#) (Value const &v)

### 12.107.1 Member Typedef Documentation

#### 12.107.1.1 Type

```
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

### 12.107.2 Member Function Documentation

#### 12.107.2.1 GetAsDataElement()

```
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement () const [inline]
```

#### 12.107.2.2 GetLength()

```
unsigned long gdcm::Element< TVR, TVM >::GetLength () const [inline]
```

#### 12.107.2.3 GetValue()

```
const VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0) const [inline]
```

#### 12.107.2.4 GetValues()

```
const VRToType< TVR >::Type * gdcm::Element< TVR, TVM >::GetValues () const [inline]
```

#### 12.107.2.5 GetVM()

```
VM gdcm::Element< TVR, TVM >::GetVM () [inline], [static]
```

#### 12.107.2.6 GetVR()

```
VR gdcm::Element< TVR, TVM >::GetVR () [inline], [static]
```

### 12.107.2.7 operator[]()

```
VRToType< TVR >::Type gdcm::Element< TVR, TVM >::operator[] (
    unsigned int idx) const [inline]
```

### 12.107.2.8 Print()

```
void gdcm::Element< TVR, TVM >::Print (
    std::ostream & _os) const [inline]
```

### 12.107.2.9 Read()

```
void gdcm::Element< TVR, TVM >::Read (
    std::istream & _is) [inline]
```

### 12.107.2.10 Set()

```
void gdcm::Element< TVR, TVM >::Set (
    Value const & v) [inline]
```

### 12.107.2.11 SetFromDataElement()

```
void gdcm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< VR::OW, VM::VM1 > const & de) [inline]
```

### 12.107.2.12 SetNoSwap()

```
void gdcm::Element< TVR, TVM >::SetNoSwap (
    Value const & v) [inline], [protected]
```

### 12.107.2.13 SetValue()

```
void gdcm::Element< TVR, TVM >::SetValue (
    typename VRToType< TVR >::Type v,
    unsigned int idx = 0) [inline]
```

### 12.107.2.14 Write()

```
void gdcm::Element< TVR, TVM >::Write (
    std::ostream & _os) const [inline]
```

### 12.107.3 Member Data Documentation

#### 12.107.3.1 Internal

```
VRToType<TVR>::Type gdcmm::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

The documentation for this class was generated from the following file:

- [gdcmmElement.h](#)

## 12.108 gdcmm::ElementDisableCombinations< TVR, TVM > Class Template Reference

A class which is used to produce compile errors for an invalid combination of template parameters.

```
#include <gdcmmElement.h>
```

Inheritance diagram for gdcmm::ElementDisableCombinations< TVR, TVM >:



### 12.108.1 Detailed Description

```
template<long long TVR, int TVM>
class gdcmm::ElementDisableCombinations< TVR, TVM >
```

A class which is used to produce compile errors for an invalid combination of template parameters.

Invalid combinations have specialized declarations with no definition.

The documentation for this class was generated from the following file:

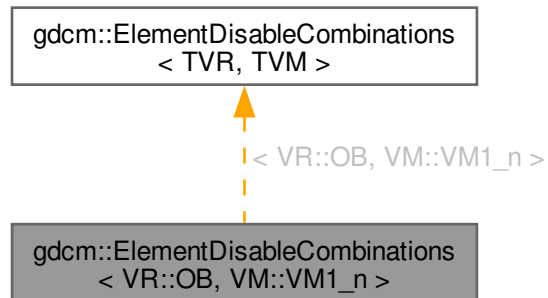
- [gdcmmElement.h](#)



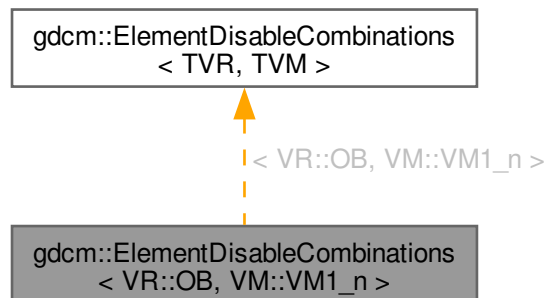
## 12.109 gdcm::ElementDisableCombinations< VR::OB, VM::VM1\_n > Class Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::ElementDisableCombinations< VR::OB, VM::VM1\_n >:



Collaboration diagram for gdcm::ElementDisableCombinations< VR::OB, VM::VM1\_n >:



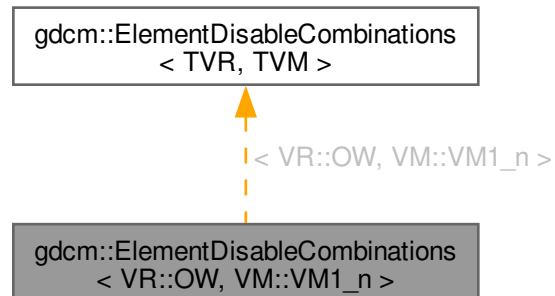
The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

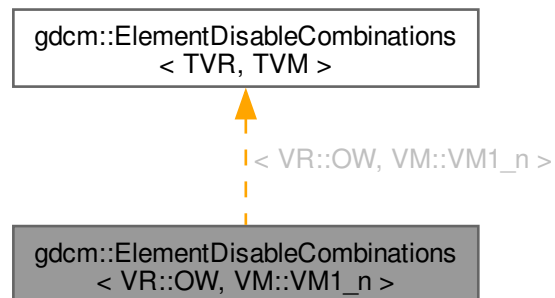
## 12.110 gdcmm::ElementDisableCombinations< VR::OW, VM::VM1\_n > Class Reference

```
#include <gdcmmElement.h>
```

Inheritance diagram for gdcmm::ElementDisableCombinations< VR::OW, VM::VM1\_n >:



Collaboration diagram for gdcmm::ElementDisableCombinations< VR::OW, VM::VM1\_n >:



The documentation for this class was generated from the following file:

- [gdcmmElement.h](#)

## 12.111 gdcm::EmptyMaskGenerator Class Reference

**EmptyMaskGenerator** Main class to generate a Empty Mask [Series](#) from an input [Series](#). This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM [Series](#) within the same input directory.

```
#include <gdcmEmptyMaskGenerator.h>
```

### Public Types

- enum [SOPClassUIDMode](#) {  
[UseOriginalSOPClassUID](#) = 0 ,  
[UseGrayscaleSecondaryImageStorage](#) }

### Public Member Functions

- [EmptyMaskGenerator](#) ()
- [~EmptyMaskGenerator](#) ()
- bool [Execute](#) ()  
*Main loop.*
- void [SetInputDirectory](#) (const char \*dirname)  
*Specify input directory.*
- void [SetOutputDirectory](#) (const char \*dirname)  
*Specify output directory.*
- void [SetSOPClassUIDMode](#) ([SOPClassUIDMode](#) mode)

### 12.111.1 Detailed Description

**EmptyMaskGenerator** Main class to generate a Empty Mask [Series](#) from an input [Series](#). This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM [Series](#) within the same input directory.

The class allow two mode of operations:

- [UseOriginalSOPClassUID](#)
- [UseGrayscaleSecondaryImageStorage](#)

[UseOriginalSOPClassUID](#) is the mode where original attributes are copied from the original DICOM instance.

[UseGrayscaleSecondaryImageStorage](#) is the mode where attributes are generated so as to create a MultiframeGrayscaleByteSecondaryCaptureImageStorage (MultiframeGrayscaleWordSecondaryCaptureImageStorage) instance.

In both mode:

- the [Study](#) references (StudyInstanceUID and StudyID) are preserved.
- the PatientID reference is preserved.
- the [Image Type](#) attribute will be setup so that the fourth element is set to 'MASK'.
- a new [Series](#) Instance UID is generated. It is thus required to run the process over all files using the same input [Series](#) Instance UID so that a proper mapping from the old [Series](#) UID is done to the new one. Since a new [Series](#) Instance UID is generated, there is no sense to preserve the original Frame of Reference UID, although it would have made sense here.

### Examples

[EmptyMask.cxx](#).

## 12.111.2 Member Enumeration Documentation

### 12.111.2.1 SOPClassUIDMode

enum [gdcm::EmptyMaskGenerator::SOPClassUIDMode](#)

#### Enumerator

UseOriginalSOPClassUID	
UseGrayscaleSecondaryImageStorage	

## 12.111.3 Constructor & Destructor Documentation

### 12.111.3.1 EmptyMaskGenerator()

[gdcm::EmptyMaskGenerator::EmptyMaskGenerator](#) ()

### 12.111.3.2 ~EmptyMaskGenerator()

[gdcm::EmptyMaskGenerator::~~EmptyMaskGenerator](#) ()

## 12.111.4 Member Function Documentation

### 12.111.4.1 Execute()

[bool gdcm::EmptyMaskGenerator::Execute](#) ()

Main loop.

#### Examples

[EmptyMask.cxx](#).

### 12.111.4.2 SetInputDirectory()

[void gdcm::EmptyMaskGenerator::SetInputDirectory](#) (  
    const char \* *dirname*)

Specify input directory.

#### Examples

[EmptyMask.cxx](#).

#### 12.111.4.3 SetOutputDirectory()

```
void gdcm::EmptyMaskGenerator::SetOutputDirectory (
    const char * dirname)
```

Specify output directory.

##### Examples

[EmptyMask.cxx](#).

#### 12.111.4.4 SetSOPClassUIDMode()

```
void gdcm::EmptyMaskGenerator::SetSOPClassUIDMode (
    SOPClassUIDMode mode)
```

Select generation of SOP Class UID method: Default is UseOriginalSOPClassUID

##### Examples

[EmptyMask.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmEmptyMaskGenerator.h](#)

## 12.112 gdcm::EncapsulatedDocument Class Reference

[EncapsulatedDocument](#).

```
#include <gdcmEncapsulatedDocument.h>
```

### Public Member Functions

- [EncapsulatedDocument](#) ()=default

#### 12.112.1 Detailed Description

[EncapsulatedDocument](#).

## 12.112.2 Constructor & Destructor Documentation

### 12.112.2.1 EncapsulatedDocument()

```
gdcm::EncapsulatedDocument::EncapsulatedDocument () [default]
```

The documentation for this class was generated from the following file:

- [gdcmEncapsulatedDocument.h](#)

## 12.113 gdcm::EncodingImplementation< T > Class Template Reference

[EncodingImplementation.](#)

Inheritance diagram for gdcm::EncodingImplementation< T >:



### 12.113.1 Detailed Description

```
template<long long T>
class gdcm::EncodingImplementation< T >
```

[EncodingImplementation.](#)

Note

TODO

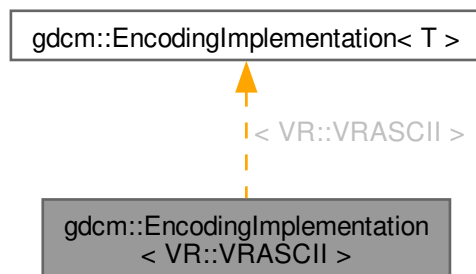
The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

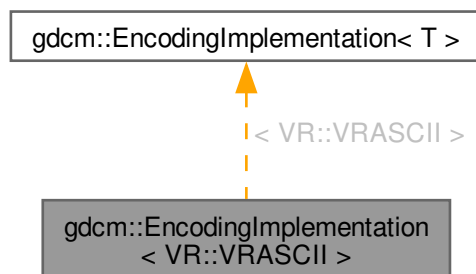
## 12.114 gdcm::EncodingImplementation< VR::VRASCII > Class Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::EncodingImplementation< VR::VRASCII >:



Collaboration diagram for gdcm::EncodingImplementation< VR::VRASCII >:



### Public Member Functions

- template<> void [Write](#) (const double \*data, unsigned long length, std::ostream &\_os)

## Static Public Member Functions

- `template<typename T>`  
`static void Read (T *data, unsigned long length, std::istream &_is)`
- `template<typename T>`  
`static void ReadComputeLength (T *data, unsigned int &length, std::istream &_is)`
- `template<typename T>`  
`static void ReadNoSwap (T *data, unsigned long length, std::istream &_is)`
- `template<typename T>`  
`static void Write (const T *data, unsigned long length, std::ostream &_os)`

## 12.114.1 Member Function Documentation

### 12.114.1.1 [Read\(\)](#)

```
template<typename T>
void gdcm::EncodingImplementation< VR::VRASCII >::Read (
    T * data,
    unsigned long length,
    std::istream & _is) [inline], [static]
```

Referenced by [ReadNoSwap\(\)](#).

### 12.114.1.2 [ReadComputeLength\(\)](#)

```
template<typename T>
void gdcm::EncodingImplementation< VR::VRASCII >::ReadComputeLength (
    T * data,
    unsigned int & length,
    std::istream & _is) [inline], [static]
```

References [gdcm::backslash\(\)](#).

### 12.114.1.3 [ReadNoSwap\(\)](#)

```
template<typename T>
void gdcm::EncodingImplementation< VR::VRASCII >::ReadNoSwap (
    T * data,
    unsigned long length,
    std::istream & _is) [inline], [static]
```

References [Read\(\)](#).



**12.114.1.4 Write() [1/2]**

```
template<>
void gdcm::EncodingImplementation< VR::VRASCII >::Write (
    const double * data,
    unsigned long length,
    std::ostream & _os) [inline]
```

References [gdcm::x16printf\(\)](#).

**12.114.1.5 Write() [2/2]**

```
template<typename T>
void gdcm::EncodingImplementation< VR::VRASCII >::Write (
    const T * data,
    unsigned long length,
    std::ostream & _os) [inline], [static]
```

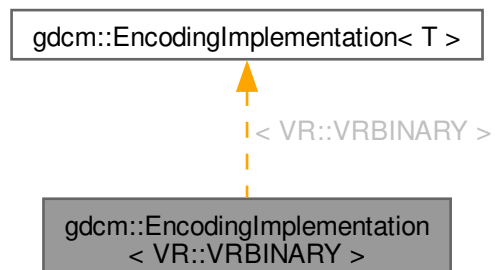
The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

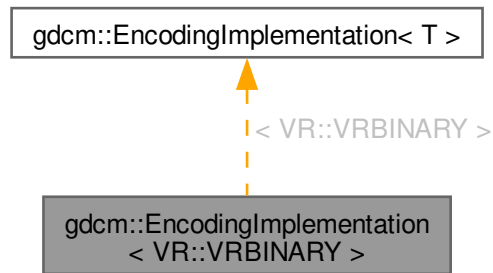
## 12.115 gdcm::EncodingImplementation< VR::VRBINARY > Class Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::EncodingImplementation< VR::VRBINARY >:



Collaboration diagram for `gdcm::EncodingImplementation< VR::VRBINARY >`:



### Static Public Member Functions

- `template<typename T>`  
static void [Read](#) (T \*data, unsigned long length, std::istream &\_is)
- `template<typename T>`  
static void [ReadComputeLength](#) (T \*data, unsigned int &length, std::istream &\_is)
- `template<typename T>`  
static void [ReadNoSwap](#) (T \*data, unsigned long length, std::istream &\_is)
- `template<typename T>`  
static void [Write](#) (const T \*data, unsigned long length, std::ostream &\_os)

## 12.115.1 Member Function Documentation

### 12.115.1.1 Read()

```

template<typename T>
void gdcm::EncodingImplementation< VR::VRBINARY >::Read (
    T * data,
    unsigned long length,
    std::istream & _is) [inline], [static]
  
```

References [gdcm::SwapperNoOp::SwapArray\(\)](#).

### 12.115.1.2 ReadComputeLength()

```

template<typename T>
void gdcm::EncodingImplementation< VR::VRBINARY >::ReadComputeLength (
    T * data,
    unsigned int & length,
    std::istream & _is) [inline], [static]
  
```

### 12.115.1.3 ReadNoSwap()

```
template<typename T>
void gdcm::EncodingImplementation< VR::VRBINARY >::ReadNoSwap (
    T * data,
    unsigned long length,
    std::istream & _is) [inline], [static]
```

### 12.115.1.4 Write()

```
template<typename T>
void gdcm::EncodingImplementation< VR::VRBINARY >::Write (
    const T * data,
    unsigned long length,
    std::ostream & _os) [inline], [static]
```

References [gdcm::SwapperNoOp::Swap\(\)](#).

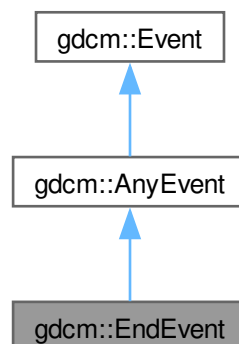
The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

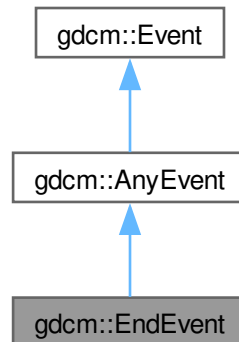
## 12.116 gdcm::EndEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::EndEvent:



Collaboration diagram for `gdcm::EndEvent`:



#### Additional Inherited Members

#### Public Member Functions inherited from `gdcm::Event`

- `Event ()`
- `Event (const Event &)`
- `virtual ~Event ()`
- `virtual bool CheckEvent (const Event *) const =0`
- `virtual const char * GetEventName () const =0`
- `virtual Event * MakeObject () const =0`
- `void operator= (const Event &)=delete`
- `virtual void Print (std::ostream &os) const`

The documentation for this class was generated from the following file:

- `gdcmEvent.h`

## 12.117 `gdcm::EnumeratedValues` Class Reference

**Element.** A Data `Element` with Enumerated Values that does not have a `Value` equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:

```
#include <gdcmEnumeratedValues.h>
```

#### Public Member Functions

- `EnumeratedValues ()=default`

### 12.117.1 Detailed Description

**Element.** A Data [Element](#) with Enumerated Values that does not have a [Value](#) equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:

1. [Patient](#) Sex (0010, 0040) is an example of a Data [Element](#) having Enumerated Values. It is defined to have a [Value](#) that is either "M", "F", or "O" (see PS 3.3). No other [Value](#) shall be given to this Data [Element](#).
2. Future modifications of this standard may add to the set of allowed values for Data Elements with Enumerated Values. Such additions by themselves may or may not require a change in SOP Class [UIDs](#), depending on the semantics of the Data [Element](#).

### 12.117.2 Constructor & Destructor Documentation

#### 12.117.2.1 EnumeratedValues()

```
gdcm::EnumeratedValues::EnumeratedValues () [default]
```

The documentation for this class was generated from the following file:

- [gdcmEnumeratedValues.h](#)

## 12.118 gdcm::EquipmentManufacturer Class Reference

```
#include <gdcmEquipmentManufacturer.h>
```

### Public Types

- enum [Type](#) {  
    [UNKNOWN](#) = 0 ,  
    [FUJI](#) ,  
    [GEMS](#) ,  
    [HITACHI](#) ,  
    [KODAK](#) ,  
    [MARCONI](#) ,  
    [PMS](#) ,  
    [SIEMENS](#) ,  
    [TOSHIBA](#) ,  
    [AGFA](#) ,  
    [SAMSUNG](#) ,  
    [UIH](#) }

### Static Public Member Functions

- static [Type](#) [Compute](#) ([DataSet](#) const &ds)
- static const char \* [TypeToString](#) ([Type](#) type)

### 12.118.1 Detailed Description

The intent is for private tags handling. This class is not meant to handle all possible vendors in the world, simply those well known where we intend to read private tags afterwards (typically SIEMENS+CSA, GEMS+PDB ...)

### 12.118.2 Member Enumeration Documentation

#### 12.118.2.1 Type

```
enum gdcM::EquipmentManufacturer::Type
```

##### Enumerator

UNKNOWN	
FUJI	
GEMS	
HITACHI	
KODAK	
MARCONI	
PMS	
SIEMENS	
TOSHIBA	
AGFA	
SAMSUNG	
UIH	

### 12.118.3 Member Function Documentation

#### 12.118.3.1 Compute()

```
Type gdcM::EquipmentManufacturer::Compute (  
    DataSet const & ds) [static]
```

#### 12.118.3.2 TypeToString()

```
const char * gdcM::EquipmentManufacturer::TypeToString (  
    Type type) [static]
```

The documentation for this class was generated from the following file:

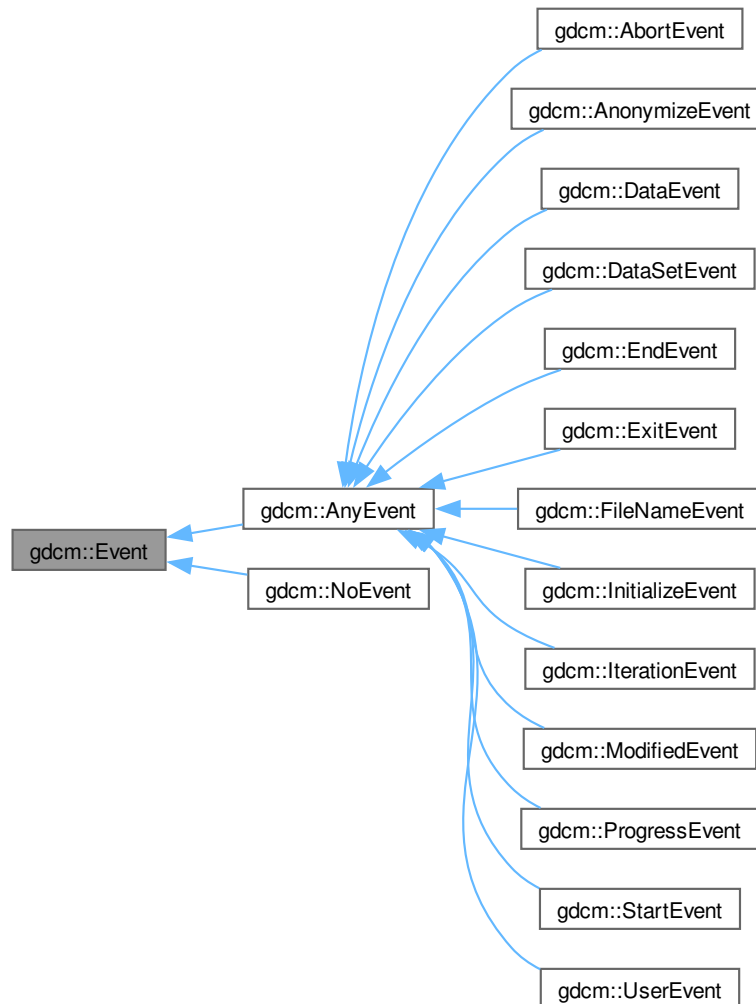
- [gdcMEquipmentManufacturer.h](#)

## 12.119 gdcm::Event Class Reference

superclass for callback/observer methods

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::Event:



### Public Member Functions

- [Event](#) ()
- [Event](#) (const Event &)
- virtual [~Event](#) ()

- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

### 12.119.1 Detailed Description

superclass for callback/observer methods

See also

[Command Subject](#)

Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

### 12.119.2 Constructor & Destructor Documentation

#### 12.119.2.1 Event() [1/2]

```
gdcmm::Event::Event ()
```

Referenced by [Event\(\)](#), [CheckEvent\(\)](#), [MakeObject\(\)](#), and [operator=\(\)](#).

#### 12.119.2.2 ~Event()

```
virtual gdcmm::Event::~~Event () [virtual]
```

#### 12.119.2.3 Event() [2/2]

```
gdcmm::Event::Event (
    const Event & )
```

References [Event\(\)](#).

### 12.119.3 Member Function Documentation

#### 12.119.3.1 CheckEvent()

```
virtual bool gdcmm::Event::CheckEvent (
    const Event * ) const [pure virtual]
```

Check if given event matches or derives from this event.

References [Event\(\)](#).



### 12.119.3.2 GetEventName()

```
virtual const char * gdcm::Event::GetEventName () const [pure virtual]
```

Return the StringName associated with the event.

Implemented in [gdcm::AnonymizeEvent](#), [gdcm::DataEvent](#), [gdcm::DataSetEvent](#), [gdcm::FileNameEvent](#), and [gdcm::ProgressEvent](#).

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), and [ScanDirectory.cs](#).

### 12.119.3.3 MakeObject()

```
virtual Event * gdcm::Event::MakeObject () const [pure virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implemented in [gdcm::AnonymizeEvent](#), [gdcm::DataEvent](#), [gdcm::DataSetEvent](#), [gdcm::FileNameEvent](#), and [gdcm::ProgressEvent](#).

References [Event\(\)](#).

### 12.119.3.4 operator=()

```
void gdcm::Event::operator= (
    const Event & ) [delete]
```

References [Event\(\)](#).

### 12.119.3.5 Print()

```
virtual void gdcm::Event::Print (
    std::ostream & os) const [virtual]
```

Print [Event](#) information. This method can be overridden by specific [Event](#) subtypes. The default is to print out the type of the event.

Referenced by [gdcm::operator<<\(\)](#).

The documentation for this class was generated from the following file:

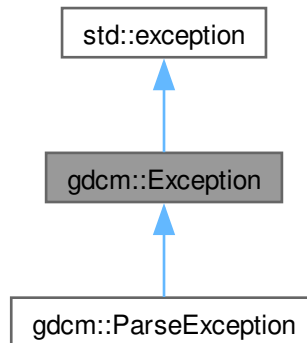
- [gdcmEvent.h](#)

## 12.120 gdcm::Exception Class Reference

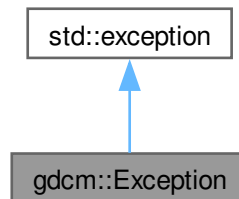
[Exception.](#)

```
#include <gdcmException.h>
```

Inheritance diagram for gdcm::Exception:



Collaboration diagram for gdcm::Exception:



### Public Member Functions

- [Exception](#) (const char \*desc="None", const char \*file=\_\_FILE\_\_, unsigned int lineNumber=\_\_LINE\_\_, const char \*func="")
- [~Exception](#) () override throw ()
- const char \* [GetDescription](#) () const  
*Return the Description.*
- const char \* [what](#) () const override throw ()  
*what implementation*

## 12.120.1 Detailed Description

[Exception](#).

Standard exception handling object.

### Note

Its copy-constructor and assignment operator are generated by the compiler.

### Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), [FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

## 12.120.2 Constructor & Destructor Documentation

### 12.120.2.1 Exception()

```
gdcmm::Exception::Exception (
    const char * desc = "None",
    const char * file = __FILE__,
    unsigned int lineNumber = __LINE__,
    const char * func = "") [inline], [explicit]
```

Explicit constructor, initializing the description and the text returned by [what\(\)](#).

### Note

The last parameter is ignored for the time being. It may be used to specify the function where the exception was thrown.

Referenced by [gdcmm::ParseException::ParseException\(\)](#).

### 12.120.2.2 ~Exception()

```
gdcmm::Exception::~~Exception () throw ( ) [inline], [override]
```

## 12.120.3 Member Function Documentation

### 12.120.3.1 GetDescription()

```
const char * gdcmm::Exception::GetDescription () const [inline]
```

Return the Description.

Referenced by [gdcmm::SequenceOfItems::Read\(\)](#).

### 12.120.3.2 what()

```
const char * gdcM::Exception::what () const throw ( )    [inline], [override]
```

what implementation

Referenced by [gdcM::SequenceOfFragments::ReadValue\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMException.h](#)

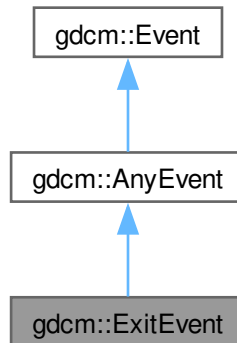
## 12.121 gdcM::ExitEvent Class Reference

```
#include <gdcMEvent.h>
```

Inheritance diagram for gdcM::ExitEvent:



Collaboration diagram for gdcm::ExitEvent:



#### Additional Inherited Members

#### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()
- [Event](#) (const Event &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

The documentation for this class was generated from the following file:

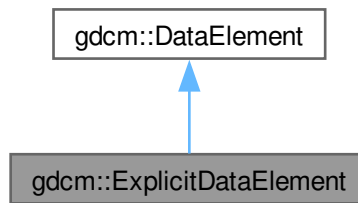
- [gdcmEvent.h](#)

## 12.122 gdcm::ExplicitDataElement Class Reference

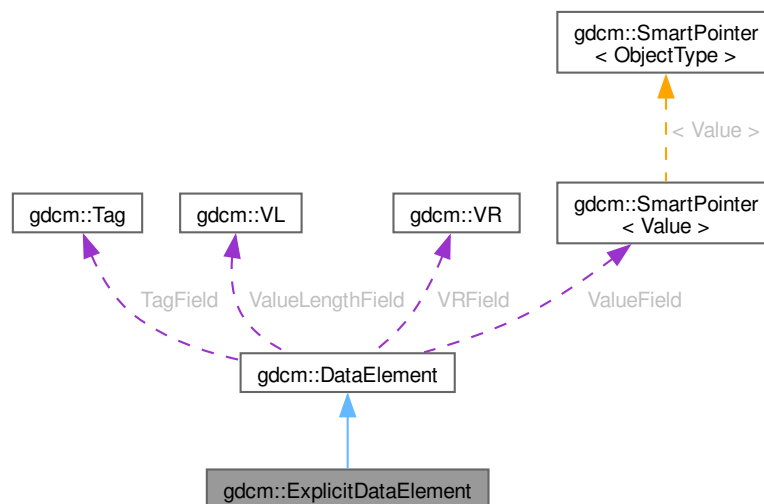
Class to read/write a [DataElement](#) as Explicit Data [Element](#).

```
#include <gdcmExplicitDataElement.h>
```

Inheritance diagram for `gdcm::ExplicitDataElement`:



Collaboration diagram for `gdcm::ExplicitDataElement`:



### Public Member Functions

- `VL GetLength () const`
- `template<typename TSwap> std::istream & Read (std::istream &is)`
- `template<typename TSwap> std::istream & ReadPreValue (std::istream &is)`
- `template<typename TSwap> std::istream & ReadValue (std::istream &is, bool readvalues=true)`
- `template<typename TSwap> std::istream & ReadWithLength (std::istream &is, VL &length)`
- `template<typename TSwap> const std::ostream & Write (std::ostream &os) const`

## Public Member Functions inherited from gdcm::DataElement

- [DataElement](#) (const DataElement &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()
  - Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()
  - Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE>
 [VL](#) [GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const
- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const
  - Get [Tag](#).*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const
  - Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const
  - Get [VL](#).*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const
  - Check if Data [Element](#) is empty.*
- bool [IsUndefinedLength](#) () const
  - return if [Value](#) Length if of undefined length*
- bool [operator<](#) (const [DataElement](#) &de) const
- [DataElement](#) & [operator=](#) (const [DataElement](#) &)=default
- bool [operator==](#) (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>
 std::istream & [Read](#) (std::istream &is)
- template<typename TDE, typename TSwap>
 std::istream & [ReadOrSkip](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
 std::istream & [ReadPreValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
 std::istream & [ReadValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
 std::istream & [ReadValueWithLength](#) (std::istream &is, [VL](#) &length, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
 std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)
- void [SetByteValue](#) (const char \*array, [VL](#) length)
- void [SetTag](#) (const [Tag](#) &t)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVL](#) (const [VL](#) &vl)
- void [SetVLToUndefined](#) ()
- void [SetVR](#) ([VR](#) const &vr)
- template<typename TDE, typename TSwap>
 const std::ostream & [Write](#) (std::ostream &os) const

### Additional Inherited Members

### Protected Types inherited from [gdcm::DataElement](#)

- typedef [SmartPointer](#)< [Value](#) > [ValuePtr](#)

### Protected Member Functions inherited from [gdcm::DataElement](#)

- void [SetValueFieldLength](#) ([VL](#) vl, bool readvalues)

### Protected Attributes inherited from [gdcm::DataElement](#)

- [Tag](#) [TagField](#)
- [ValuePtr](#) [ValueField](#)
- [VL](#) [ValueLengthField](#)
- [VR](#) [VRField](#)

## 12.122.1 Detailed Description

Class to read/write a [DataElement](#) as Explicit Data [Element](#).

#### Note

bla

#### Examples

[DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), and [ReadAndDumpDICOMDIR2.cxx](#).

## 12.122.2 Member Function Documentation

### 12.122.2.1 GetLength()

```
VL gdcm::ExplicitDataElement::GetLength () const
```

### 12.122.2.2 Read()

```
template<typename TSwap>
std::istream & gdcm::ExplicitDataElement::Read (
    std::istream & is)
```



### 12.122.2.3 ReadPreValue()

```
template<typename TSwap>
std::istream & gdcm::ExplicitDataElement::ReadPreValue (
    std::istream & is)
```

### 12.122.2.4 ReadValue()

```
template<typename TSwap>
std::istream & gdcm::ExplicitDataElement::ReadValue (
    std::istream & is,
    bool readvalues = true)
```

### 12.122.2.5 ReadWithLength()

```
template<typename TSwap>
std::istream & gdcm::ExplicitDataElement::ReadWithLength (
    std::istream & is,
    VL & length)
```

### 12.122.2.6 Write()

```
template<typename TSwap>
const std::ostream & gdcm::ExplicitDataElement::Write (
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

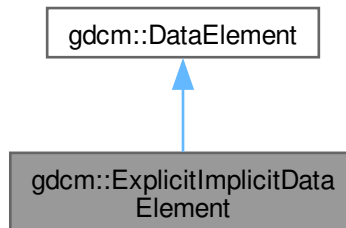
- [gdcmExplicitDataElement.h](#)

## 12.123 gdcm::ExplicitImplicitDataElement Class Reference

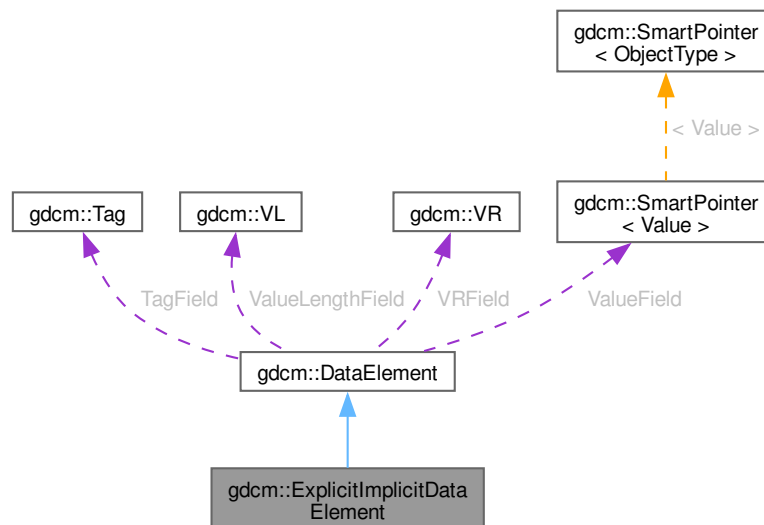
Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).

```
#include <gdcmExplicitImplicitDataElement.h>
```

Inheritance diagram for `gdc::ExplicitImplicitDataElement`:



Collaboration diagram for `gdc::ExplicitImplicitDataElement`:



### Public Member Functions

- `VL GetLength () const`
- `template<typename TSwap> std::istream & Read (std::istream &is)`
- `template<typename TSwap> std::istream & ReadPreValue (std::istream &is)`
- `template<typename TSwap> std::istream & ReadValue (std::istream &is, bool readvalues=true)`
- `template<typename TSwap> std::istream & ReadWithLength (std::istream &is, VL &length)`

## Public Member Functions inherited from gdcm::DataElement

- [DataElement](#) (const DataElement &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()
  - Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()
  - Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE>
  - [VL](#) [GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const
- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const
  - Get [Tag](#).*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const
  - Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const
  - Get [VL](#).*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const
  - Check if Data [Element](#) is empty.*
- bool [IsUndefinedLength](#) () const
  - return if [Value](#) Length if of undefined length*
- bool [operator](#)< (const [DataElement](#) &de) const
- [DataElement](#) & [operator](#)= (const [DataElement](#) &)=default
- bool [operator](#)== (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>
  - std::istream & [Read](#) (std::istream &is)
- template<typename TDE, typename TSwap>
  - std::istream & [ReadOrSkip](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
  - std::istream & [ReadPreValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
  - std::istream & [ReadValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
  - std::istream & [ReadValueWithLength](#) (std::istream &is, [VL](#) &length, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>
  - std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)
- void [SetByteValue](#) (const char \*array, [VL](#) length)
- void [SetTag](#) (const [Tag](#) &t)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVL](#) (const [VL](#) &vl)
- void [SetVLToUndefined](#) ()
- void [SetVR](#) ([VR](#) const &vr)
- template<typename TDE, typename TSwap>
  - const std::ostream & [Write](#) (std::ostream &os) const

## Additional Inherited Members

## Protected Types inherited from [gdcm::DataElement](#)

- typedef [SmartPointer](#)< [Value](#) > [ValuePtr](#)

## Protected Member Functions inherited from [gdcm::DataElement](#)

- void [SetValueFieldLength](#) ([VL](#) vl, bool readvalues)

## Protected Attributes inherited from [gdcm::DataElement](#)

- [Tag](#) [TagField](#)
- [ValuePtr](#) [ValueField](#)
- [VL](#) [ValueLengthField](#)
- [VR](#) [VRField](#)

### 12.123.1 Detailed Description

Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).

#### Note

This only happen for some Philips images Should I derive from [ExplicitDataElement](#) instead ? This is the class that is the closest the GDCM1.x parser. At each element we try first to read it as explicit, if this fails, then we try again as an implicit element.

### 12.123.2 Member Function Documentation

#### 12.123.2.1 GetLength()

```
VL gdcm::ExplicitImplicitDataElement::GetLength () const
```

#### 12.123.2.2 Read()

```
template<typename TSwap>
std::istream & gdcm::ExplicitImplicitDataElement::Read (
    std::istream & is)
```

Referenced by [ReadWithLength\(\)](#).

### 12.123.2.3 ReadPreValue()

```
template<typename TSwap>
std::istream & gdcm::ExplicitImplicitDataElement::ReadPreValue (
    std::istream & is)
```

### 12.123.2.4 ReadValue()

```
template<typename TSwap>
std::istream & gdcm::ExplicitImplicitDataElement::ReadValue (
    std::istream & is,
    bool readvalues = true)
```

### 12.123.2.5 ReadWithLength()

```
template<typename TSwap>
std::istream & gdcm::ExplicitImplicitDataElement::ReadWithLength (
    std::istream & is,
    VL & length) [inline]
```

References [Read\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmExplicitImplicitDataElement.h](#)

## 12.124 gdcm::Fiducials Class Reference

[Fiducials](#).

```
#include <gdcmFiducials.h>
```

### Public Member Functions

- [Fiducials](#) ()=default

### 12.124.1 Detailed Description

[Fiducials](#).

## 12.124.2 Constructor & Destructor Documentation

### 12.124.2.1 Fiducials()

```
gdcm::Fiducials::Fiducials () [default]
```

The documentation for this class was generated from the following file:

- [gdcmFiducials.h](#)

## 12.125 gdcm::File Class Reference

a DICOM [File](#)

```
#include <gdcmFile.h>
```

Inheritance diagram for gdcm::File:



Collaboration diagram for gdcm::File:



## Public Member Functions

- [File](#) ()
- [~File](#) () override
- [DataSet](#) & [GetDataSet](#) ()  
*Get Data Set.*
- const [DataSet](#) & [GetDataSet](#) () const  
*Get Data Set.*
- [FileMetaInformation](#) & [GetHeader](#) ()  
*Get File Meta Information.*
- const [FileMetaInformation](#) & [GetHeader](#) () const  
*Get File Meta Information.*
- std::istream & [Read](#) (std::istream &is)  
*Read.*
- void [SetDataSet](#) (const [DataSet](#) &ds)  
*Set Data Set.*
- void [SetHeader](#) (const [FileMetaInformation](#) &fmi)  
*Set File Meta Information.*
- std::ostream const & [Write](#) (std::ostream &os) const  
*Write.*

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [File](#) &val)

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## 12.125.1 Detailed Description

a DICOM [File](#)

See PS 3.10 [File](#): A [File](#) is an ordered string of zero or more bytes, where the first byte is at the beginning of the file and the last byte at the end of the [File](#). Files are identified by a unique [File](#) ID and may be written, read and/or deleted.

See also

[Reader Writer](#)

Examples

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CompressLossyJPEG.cs](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpCSA.cs](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [EncapsulateFileInRawData.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixBrokenJ2K.cxx](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [MpegVideoInfo.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadGEMSSDO.cxx](#), [SimplePrint.cs](#), [SimplePrintPatientName.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), and [iU22tomultisc.cxx](#).

## 12.125.2 Constructor & Destructor Documentation

### 12.125.2.1 File()

```
gdcm::File::File ()
```

Referenced by [gdcm::FileWithName::FileWithName\(\)](#), [~File\(\)](#), and [operator<<](#).

### 12.125.2.2 ~File()

```
gdcm::File::~File () [override]
```

References [File\(\)](#), and [operator<<](#).

## 12.125.3 Member Function Documentation

### 12.125.3.1 GetDataSet() [1/2]

```
DataSet & gdcm::File::GetDataSet () [inline]
```

Get Data Set.



**12.125.3.2 GetDataSet() [2/2]**

```
const DataSet & gdcm::File::GetDataSet () const [inline]
```

Get Data Set.

**Examples**

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CompressLossyJPEG.cs](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MergeTwoFiles.cxx](#), [MrProtocol.cxx](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [SimplePrint.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

**12.125.3.3 GetHeader() [1/2]**

```
FileMetaInformation & gdcm::File::GetHeader () [inline]
```

Get [File](#) Meta Information.

**12.125.3.4 GetHeader() [2/2]**

```
const FileMetaInformation & gdcm::File::GetHeader () const [inline]
```

Get [File](#) Meta Information.

**Examples**

[CreateJPIPDataSet.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GetJPEGSamplePrecision.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReformatFile.cs](#), [StandardizeFiles.cs](#), [StreamImageReaderTest.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [operator<<](#).

**12.125.3.5 Read()**

```
std::istream & gdcm::File::Read (
    std::istream & is)
```

Read.

### 12.125.3.6 SetDataSet()

```
void gdcM::File::SetDataSet (
    const DataSet & ds) [inline]
```

Set Data Set.

### 12.125.3.7 SetHeader()

```
void gdcM::File::SetHeader (
    const FileMetaInformation & fmi) [inline]
```

Set [File](#) Meta Information.

### 12.125.3.8 Write()

```
std::ostream const & gdcM::File::Write (
    std::ostream & os) const
```

Write.

## 12.125.4 Friends And Related Symbol Documentation

### 12.125.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const File & val) [friend]
```

References [File\(\)](#), [GetHeader\(\)](#), and [operator<<](#).

Referenced by [~File\(\)](#), and [operator<<](#).

The documentation for this class was generated from the following file:

- [gdcMFile.h](#)

## 12.126 gdcm::FileAnonymizer Class Reference

[FileAnonymizer](#).

```
#include <gdcmFileAnonymizer.h>
```

Inheritance diagram for gdcm::FileAnonymizer:



Collaboration diagram for gdcm::FileAnonymizer:



## Public Member Functions

- [FileAnonymizer](#) ()
- [~FileAnonymizer](#) () override
- void [Empty](#) ([Tag](#) const &t)
- void [Remove](#) ([Tag](#) const &t)  
*remove a tag (even a SQ can be removed)*
- void [Replace](#) ([Tag](#) const &t, const char \*value\_data, [VL](#) const &vl)
- void [Replace](#) ([Tag](#) const &t, const char \*value\_str)
- void [SetInputFileName](#) (const char \*filename\_native)  
*Set input filename.*
- void [SetOutputFileName](#) (const char \*filename\_native)  
*Set output filename.*
- bool [Write](#) ()  
*Write the output file.*

## Public Member Functions inherited from [gdcm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## 12.126.1 Detailed Description

[FileAnonymizer](#).

This [Anonymizer](#) is a file-based [Anonymizer](#). It requires a valid DICOM file and will use the [Value](#) Length to skip over any information.

It will not load the DICOM dataset taken from [SetInputFileName\(\)](#) into memory and should consume much less memory than [Anonymizer](#).

### Warning

: Each time you call [Replace\(\)](#) with a value. This value will copied, and stored in memory. The behavior is not ideal for extremely large data (larger than memory size). This class is really meant to take a large DICOM input file and then only changed some small attribute.

### caveats:

- This class will NOT work with unordered attributes in a DICOM [File](#),
- This class does neither recompute nor update the Group Length element,
- This class currently does not update the [File](#) Meta Information header.
- Only strict inplace Replace operation is supported when input and output file are the same.

### Examples

[FileAnonymize.cs](#), and [MakeTemplate.cxx](#).

## 12.126.2 Constructor & Destructor Documentation

### 12.126.2.1 FileAnonymizer()

```
gdcm::FileAnonymizer::FileAnonymizer ()
```

### 12.126.2.2 ~FileAnonymizer()

```
gdcm::FileAnonymizer::~~FileAnonymizer () [override]
```

## 12.126.3 Member Function Documentation

### 12.126.3.1 Empty()

```
void gdcm::FileAnonymizer::Empty (
    Tag const & t)
```

Make [Tag](#) t empty Warning: does not handle SQ element

### Examples

[FileAnonymize.cs](#), and [MakeTemplate.cxx](#).

### 12.126.3.2 Remove()

```
void gdcM::FileAnonymizer::Remove (
    Tag const & t)
```

remove a tag (even a SQ can be removed)

#### Examples

[FileAnonymize.cs](#).

### 12.126.3.3 Replace() [1/2]

```
void gdcM::FileAnonymizer::Replace (
    Tag const & t,
    const char * value_data,
    VL const & vl)
```

when the value contains \0, it is a good idea to specify the length. This function is required when dealing with VRBINARY tag

### 12.126.3.4 Replace() [2/2]

```
void gdcM::FileAnonymizer::Replace (
    Tag const & t,
    const char * value_str)
```

Replace tag with another value, if tag is not found it will be created: WARNING: this function can only execute if tag is a VRASCII WARNING: Do not ever try to write a value in a SQ Data [Element](#) !

#### Examples

[FileAnonymize.cs](#).

### 12.126.3.5 SetInputFileName()

```
void gdcM::FileAnonymizer::SetInputFileName (
    const char * filename_native)
```

Set input filename.

#### Examples

[FileAnonymize.cs](#), and [MakeTemplate.cxx](#).

### 12.126.3.6 SetOutputFileName()

```
void gdcm::FileAnonymizer::SetOutputFileName (  
    const char * filename_native)
```

Set output filename.

#### Examples

[FileAnonymize.cs](#), and [MakeTemplate.cxx](#).

### 12.126.3.7 Write()

```
bool gdcm::FileAnonymizer::Write ()
```

Write the output file.

#### Examples

[FileAnonymize.cs](#), and [MakeTemplate.cxx](#).

The documentation for this class was generated from the following file:

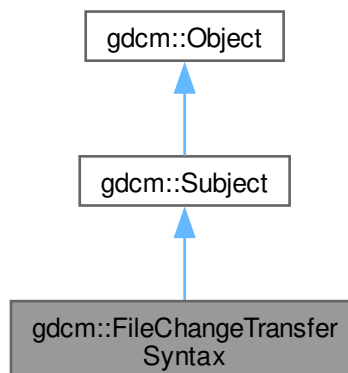
- [gdcmFileAnonymizer.h](#)

## 12.127 gdcm::FileChangeTransferSyntax Class Reference

[FileChangeTransferSyntax](#).

```
#include <gdcmFileChangeTransferSyntax.h>
```

Inheritance diagram for gdcm::FileChangeTransferSyntax:



Collaboration diagram for `gdcm::FileChangeTransferSyntax`:



### Public Member Functions

- [FileChangeTransferSyntax](#) ()
- [~FileChangeTransferSyntax](#) () override
- bool [Change](#) ()  
*Change the transfer syntax.*
- [ImageCodec](#) \* [GetCodec](#) ()
- void [SetInputFileName](#) (const char \*filename\_native)  
*Set input filename (raw DICOM).*
- void [SetOutputFileName](#) (const char \*filename\_native)  
*Set output filename (target compressed DICOM).*
- void [SetTransferSyntax](#) ([TransferSyntax](#) const &ts)  
*Specify the Target Transfer Syntax.*

### Public Member Functions inherited from [gdcm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)



## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Static Public Member Functions

- static [SmartPointer](#)< [FileChangeTransferSyntax](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### 12.127.1 Detailed Description

[FileChangeTransferSyntax](#).

This class is a file-based (limited) replacement of the in-memory [ImageChangeTransferSyntax](#).

This class provide a file-based compression-only mechanism. It will take in an uncompressed DICOM image file (Pixel Data element). Then produced as output a compressed DICOM file (Transfer Syntax will be updated).

Currently it supports the following transfer syntax:

- JPEGLosslessProcess14\_1

#### Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

### 12.127.2 Constructor & Destructor Documentation

#### 12.127.2.1 [FileChangeTransferSyntax](#)()

```
gdcm::FileChangeTransferSyntax::FileChangeTransferSyntax ()
```

Referenced by [New\(\)](#).

### 12.127.2.2 ~FileChangeTransferSyntax()

```
gdcm::FileChangeTransferSyntax::~~FileChangeTransferSyntax () [override]
```

## 12.127.3 Member Function Documentation

### 12.127.3.1 Change()

```
bool gdcm::FileChangeTransferSyntax::Change ()
```

Change the transfer syntax.

#### Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

### 12.127.3.2 GetCodec()

```
ImageCodec * gdcm::FileChangeTransferSyntax::GetCodec ()
```

Retrieve the actual codec (valid after calling SetTransferSyntax) Only advanced users should call this function.

#### Examples

[FileChangeTSLossy.cs](#).

### 12.127.3.3 New()

```
SmartPointer< FileChangeTransferSyntax > gdcm::FileChangeTransferSyntax::New () [inline], [static]
```

for wrapped language: instantiate a reference counted object

#### Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

References [FileChangeTransferSyntax\(\)](#).

### 12.127.3.4 SetInputFileName()

```
void gdcm::FileChangeTransferSyntax::SetInputFileName (  
    const char * filename_native)
```

Set input filename (raw DICOM).

#### Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

### 12.127.3.5 SetOutputFileName()

```
void gdcm::FileChangeTransferSyntax::SetOutputFileName (
    const char * filename_native)
```

Set output filename (target compressed DICOM).

#### Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

### 12.127.3.6 SetTransferSyntax()

```
void gdcm::FileChangeTransferSyntax::SetTransferSyntax (
    TransferSyntax const & ts)
```

Specify the Target Transfer Syntax.

#### Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

The documentation for this class was generated from the following file:

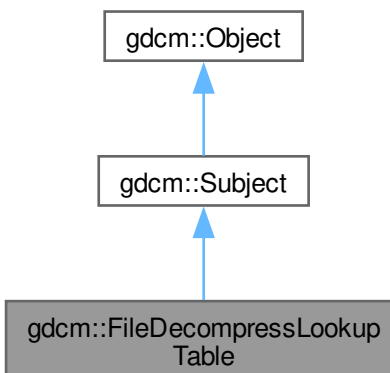
- [gdcmFileChangeTransferSyntax.h](#)

## 12.128 gdcm::FileDecompressLookupTable Class Reference

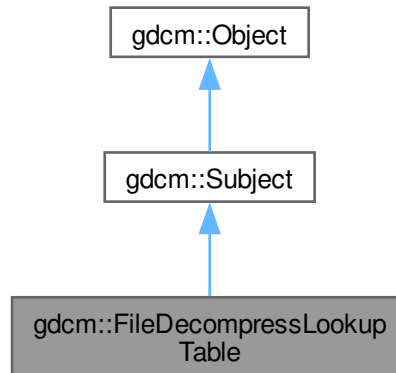
[FileDecompressLookupTable](#) class.

```
#include <gdcmFileDecompressLookupTable.h>
```

Inheritance diagram for gdcm::FileDecompressLookupTable:



Collaboration diagram for `gdcm::FileDecompressLookupTable`:



### Public Member Functions

- `FileDecompressLookupTable ()`=default
- `~FileDecompressLookupTable ()` override=default
- `bool Change ()`  
*Decompress.*
- `File & GetFile ()`
- `Pixmap & GetPixmap ()`
- `const Pixmap & GetPixmap () const`
- `void SetFile (const File &f)`  
*Set/Get File.*
- `void SetPixmap (Pixmap const &img)`

### Public Member Functions inherited from `gdcm::Subject`

- `Subject ()`
- `~Subject ()` override
- `unsigned long AddObserver (const Event &event, Command *)`
- `unsigned long AddObserver (const Event &event, Command *) const`
- `Command * GetCommand (unsigned long tag)`
- `bool HasObserver (const Event &event) const`
- `void InvokeEvent (const Event &)`
- `void InvokeEvent (const Event &) const`
- `void RemoveAllObservers ()`
- `void RemoveObserver (unsigned long tag)`

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const Object &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### 12.128.1 Detailed Description

[FileDecompressLookupTable](#) class.

It decompress the segmented LUT into linearized one (only PALETTE\_COLOR images) Output will be a [PhotometricInterpretation](#)=RGB image

### 12.128.2 Constructor & Destructor Documentation

#### 12.128.2.1 FileDecompressLookupTable()

```
gdcm::FileDecompressLookupTable::FileDecompressLookupTable () [default]
```

#### 12.128.2.2 ~FileDecompressLookupTable()

```
gdcm::FileDecompressLookupTable::~~FileDecompressLookupTable () [override], [default]
```

### 12.128.3 Member Function Documentation

#### 12.128.3.1 Change()

```
bool gdcm::FileDecompressLookupTable::Change ()
```

Decompress.

### 12.128.3.2 GetFile()

```
File & gdcm::FileDecompressLookupTable::GetFile () [inline]
```

### 12.128.3.3 GetPixmap() [1/2]

```
Pixmap & gdcm::FileDecompressLookupTable::GetPixmap () [inline]
```

### 12.128.3.4 GetPixmap() [2/2]

```
const Pixmap & gdcm::FileDecompressLookupTable::GetPixmap () const [inline]
```

### 12.128.3.5 SetFile()

```
void gdcm::FileDecompressLookupTable::SetFile (  
    const File & f) [inline]
```

Set/Get [File](#).

### 12.128.3.6 SetPixmap()

```
void gdcm::FileDecompressLookupTable::SetPixmap (  
    Pixmap const & img) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmFileDecompressLookupTable.h](#)

## 12.129 gdcm::FileDerivation Class Reference

[FileDerivation](#) class.

```
#include <gdcmFileDerivation.h>
```

**Public Member Functions**

- [FileDerivation](#) ()
- [~FileDerivation](#) ()
- bool [AddReference](#) (const char \*referencedsopclassuid, const char \*referencedsopinstanceuid)
- bool [Derive](#) ()  
*Change.*
- [File](#) & [GetFile](#) ()
- const [File](#) & [GetFile](#) () const
- void [SetAppendDerivationHistory](#) (bool b)
- void [SetDerivationCodeSequenceCodeValue](#) (unsigned int codevalue)  
*Specify the Derivation Code Sequence Code Value. Eg 113040.*
- void [SetDerivationDescription](#) (const char \*dd)  
*Specify the Derivation Description. Eg "lossy conversion".*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get File.*
- void [SetPurposeOfReferenceCodeSequenceCodeValue](#) (unsigned int codevalue)  
*Specify the Purpose Of Reference Code Value. Eg. 121320.*

**Protected Member Functions**

- bool [AddDerivationDescription](#) ()
- bool [AddPurposeOfReferenceCodeSequence](#) ([DataSet](#) &ds)
- bool [AddSourceImageSequence](#) ()

**12.129.1 Detailed Description**

[FileDerivation](#) class.

See PS 3.16 - 2008 For the list of Code [Value](#) that can be used for in Derivation Code Sequence

URL: [http://medical.nema.org/medical/dicom/2008/08\\_16pu.pdf](http://medical.nema.org/medical/dicom/2008/08_16pu.pdf)

DICOM Part 16 has two Context Groups CID 7202 and CID 7203 which contain a set of codes defining reason for a source image reference (ie. reason code for referenced image sequence) and a coded description of the deriation applied to the new image data from the original. Both these context groups are extensible.

[File](#) Derivation is compulsory when creating a lossy derived image.

**Examples**

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

**12.129.2 Constructor & Destructor Documentation****12.129.2.1 FileDerivation()**

```
gdcm::FileDerivation::FileDerivation ()
```

### 12.129.2.2 ~FileDerivation()

```
gdcm::FileDerivation::~~FileDerivation ()
```

## 12.129.3 Member Function Documentation

### 12.129.3.1 AddDerivationDescription()

```
bool gdcm::FileDerivation::AddDerivationDescription () [protected]
```

### 12.129.3.2 AddPurposeOfReferenceCodeSequence()

```
bool gdcm::FileDerivation::AddPurposeOfReferenceCodeSequence (  
    DataSet & ds) [protected]
```

### 12.129.3.3 AddReference()

```
bool gdcm::FileDerivation::AddReference (  
    const char * referencedsopclassuid,  
    const char * referencedsopinstanceuid)
```

Create the proper reference. Need to pass the original SOP Class UID and the original SOP Instance UID, so that those value can be used as Reference.

#### Warning

referencedsopclassuid and referencedsopinstanceuid needs to be \0 padded. This is not compatible with how ByteValue->GetPointer works.

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

### 12.129.3.4 AddSourceImageSequence()

```
bool gdcm::FileDerivation::AddSourceImageSequence () [protected]
```

### 12.129.3.5 Derive()

```
bool gdcm::FileDerivation::Derive ()
```

Change.

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).



### 12.129.3.6 GetFile() [1/2]

```
File & gdcmm::FileDerivation::GetFile () [inline]
```

#### Examples

[GenFakelImage.cxx](#), and [ReformatFile.cs](#).

### 12.129.3.7 GetFile() [2/2]

```
const File & gdcmm::FileDerivation::GetFile () const [inline]
```

### 12.129.3.8 SetAppendDerivationHistory()

```
void gdcmm::FileDerivation::SetAppendDerivationHistory (  
    bool b)
```

Specify if Derivation history should be appended (default false) When false, this is an error if input already has a derivation history When true, both Purpose of Reference Code [Value](#) and Derivation Code Sequence Code [Value](#) can have their history appended.

### 12.129.3.9 SetDerivationCodeSequenceCodeValue()

```
void gdcmm::FileDerivation::SetDerivationCodeSequenceCodeValue (  
    unsigned int codevalue)
```

Specify the Derivation Code Sequence Code [Value](#). Eg 113040.

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

### 12.129.3.10 SetDerivationDescription()

```
void gdcmm::FileDerivation::SetDerivationDescription (  
    const char * dd)
```

Specify the Derivation Description. Eg "lossy conversion".

### 12.129.3.11 SetFile()

```
void gdcM::FileDerivation::SetFile (
    const File & f) [inline]
```

Set/Get [File](#).

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

### 12.129.3.12 SetPurposeOfReferenceCodeSequenceCodeValue()

```
void gdcM::FileDerivation::SetPurposeOfReferenceCodeSequenceCodeValue (
    unsigned int codevalue)
```

Specify the Purpose Of Reference Code [Value](#). Eg. 121320.

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

The documentation for this class was generated from the following file:

- [gdcMFileDerivation.h](#)

## 12.130 gdcM::FileExplicitFilter Class Reference

[FileExplicitFilter](#) class.

```
#include <gdcMFileExplicitFilter.h>
```

### Public Member Functions

- [FileExplicitFilter](#) ()
- [~FileExplicitFilter](#) ()=default
- bool [Change](#) ()  
*Set FMI Transfer Syntax.*
- [File](#) & [GetFile](#) ()
- void [SetChangePrivateTags](#) (bool b)  
*Decide whether or not to [VR](#)ify private tags.*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get [File](#).*
- void [SetRecomputeItemLength](#) (bool b)  
*By default set Sequence & [Item](#) length to Undefined to avoid recomputing length:*
- void [SetRecomputeSequenceLength](#) (bool b)
- void [SetUseVRUN](#) (bool b)  
*When [VR](#)=16bits in explicit but Implicit has a 32bits length, use [VR](#)=UN.*

**Protected Member Functions**

- bool [ChangeFMI](#) ()
- bool [ProcessDataSet](#) ([DataSet](#) &ds, [Dicts](#) const &dicts)

**12.130.1 Detailed Description**

[FileExplicitFilter](#) class.

After changing a file from Implicit to Explicit representation (see [ImageChangeTransferSyntax](#)) one operation is to make sure the [VR](#) of each DICOM attribute are accurate and do match the one from PS 3.6. Indeed when a file is written in Implicit representation, the [VR](#) is not stored directly in the file.

**Warning**

changing an implicit dataset to an explicit dataset is NOT a trivial task of simply changing the [VR](#) to the dict one:

- One has to make sure SQ is properly set
- One has to recompute the explicit length SQ
- One has to make sure that [VR](#) is valid for the encoding
- One has to make sure that [VR](#) 16bits can store the original value length

**Examples**

[GenAllVR.cxx](#), and [LargeVRDSExplicit.cxx](#).

**12.130.2 Constructor & Destructor Documentation****12.130.2.1 FileExplicitFilter()**

```
gdcm::FileExplicitFilter::FileExplicitFilter () [inline]
```

**12.130.2.2 ~FileExplicitFilter()**

```
gdcm::FileExplicitFilter::~FileExplicitFilter () [default]
```

**12.130.3 Member Function Documentation****12.130.3.1 Change()**

```
bool gdcm::FileExplicitFilter::Change ()
```

Set FMI Transfer Syntax.

Change

**Examples**

[GenAllVR.cxx](#), and [LargeVRDSExplicit.cxx](#).

### 12.130.3.2 ChangeFMI()

```
bool gdcm::FileExplicitFilter::ChangeFMI () [protected]
```

### 12.130.3.3 GetFile()

```
File & gdcm::FileExplicitFilter::GetFile () [inline]
```

### 12.130.3.4 ProcessDataSet()

```
bool gdcm::FileExplicitFilter::ProcessDataSet (
    DataSet & ds,
    Dicts const & dicts) [protected]
```

### 12.130.3.5 SetChangePrivateTags()

```
void gdcm::FileExplicitFilter::SetChangePrivateTags (
    bool b) [inline]
```

Decide whether or not to [VR](#)ify private tags.

### 12.130.3.6 SetFile()

```
void gdcm::FileExplicitFilter::SetFile (
    const File & f) [inline]
```

Set/Get [File](#).

#### Examples

[GenAllVR.cxx](#), and [LargeVRDSExplicit.cxx](#).

### 12.130.3.7 SetRecomputeItemLength()

```
void gdcm::FileExplicitFilter::SetRecomputeItemLength (
    bool b)
```

By default set Sequence & [Item](#) length to Undefined to avoid recomputing length:

### 12.130.3.8 SetRecomputeSequenceLength()

```
void gdcm::FileExplicitFilter::SetRecomputeSequenceLength (
    bool b)
```

### 12.130.3.9 SetUseVRUN()

```
void gdcm::FileExplicitFilter::SetUseVRUN (
    bool b) [inline]
```

When VR=16bits in explicit but Implicit has a 32bits length, use VR=UN.

The documentation for this class was generated from the following file:

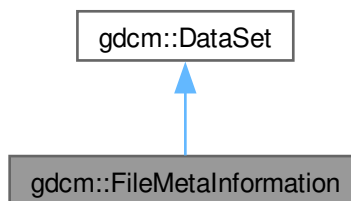
- [gdcmFileExplicitFilter.h](#)

## 12.131 gdcm::FileMetaInformation Class Reference

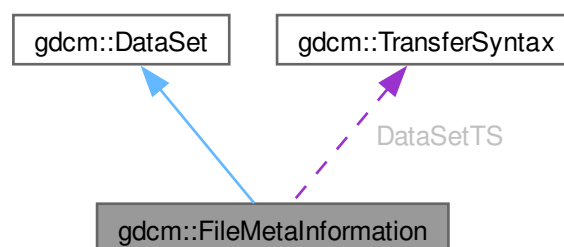
Class to represent a [File](#) Meta Information.

```
#include <gdcmFileMetaInformation.h>
```

Inheritance diagram for gdcm::FileMetaInformation:



Collaboration diagram for gdcm::FileMetaInformation:



## Public Member Functions

- [FileMetaInformation](#) ()
- [FileMetaInformation](#) ([FileMetaInformation](#) const &fmi)=default
- [~FileMetaInformation](#) ()
- void [FillFromDataSet](#) ([DataSet](#) const &ds)  
*Construct a [FileMetaInformation](#) from an already existing [DataSet](#):*
- const [TransferSyntax](#) & [GetDataSetTransferSyntax](#) () const
- [VL](#) [GetFullLength](#) () const
- [MediaStorage](#) [GetMediaStorage](#) () const
- std::string [GetMediaStorageAsString](#) () const
- [TransferSyntax::NegociatedType](#) [GetMetaInformationTS](#) () const
- [Preamble](#) & [GetPreamble](#) ()
- const [Preamble](#) & [GetPreamble](#) () const  
*Get [Preamble](#).*
- void [Insert](#) (const [DataElement](#) &de)
- bool [IsValid](#) () const
- [FileMetaInformation](#) & [operator=](#) (const [FileMetaInformation](#) &fmi)=default
- std::istream & [Read](#) (std::istream &is)  
*Read.*
- std::istream & [ReadCompat](#) (std::istream &is)
- void [Replace](#) (const [DataElement](#) &de)
- void [SetDataSetTransferSyntax](#) (const [TransferSyntax](#) &ts)
- void [SetPreamble](#) (const [Preamble](#) &p)
- std::ostream & [Write](#) (std::ostream &os) const  
*Write.*

## Public Member Functions inherited from [gdcm::DataSet](#)

- [Iterator](#) [Begin](#) ()
- [ConstIterator](#) [Begin](#) () const
- void [Clear](#) ()
- template<typename TDE>  
 unsigned int [ComputeGroupLength](#) ([Tag](#) const &tag) const
- [Iterator](#) [End](#) ()
- [ConstIterator](#) [End](#) () const
- bool [FindDataElement](#) (const [PrivateTag](#) &t) const  
*Look up if private tag 't' is present in the dataset:*
- bool [FindDataElement](#) (const [Tag](#) &t) const
- const [DataElement](#) & [FindNextDataElement](#) (const [Tag](#) &t) const
- const [DataElement](#) & [GetDataElement](#) (const [PrivateTag](#) &t) const  
*Return the dataelement.*
- const [DataElement](#) & [GetDataElement](#) (const [Tag](#) &t) const
- [DataElementSet](#) & [GetDES](#) ()
- const [DataElementSet](#) & [GetDES](#) () const
- template<typename TDE>  
[VL](#) [GetLength](#) () const
- [MediaStorage](#) [GetMediaStorage](#) () const
- std::string [GetPrivateCreator](#) (const [Tag](#) &t) const

- [PrivateTag GetPrivateTag](#) (const [Tag](#) &t) const  
*Return the private tag of the private tag 't', private creator will be set to empty if not found.*
- void [Insert](#) (const [DataElement](#) &de)
- bool [IsEmpty](#) () const  
*Returns if the dataset is empty.*
- const [DataElement](#) & [operator\(\)](#) (uint16\_t group, uint16\_t element) const
- [DataSet](#) & [operator=](#) ([DataSet](#) const &)=default
- const [DataElement](#) & [operator\[\]](#) (const [Tag](#) &t) const
- void [Print](#) (std::ostream &os, std::string const &indent="") const
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TDE, typename TSwap>  
std::istream & [ReadNested](#) (std::istream &is)
- template<typename TDE, typename TSwap>  
std::istream & [ReadSelectedPrivateTags](#) (std::istream &is, const std::set< [PrivateTag](#) > &tags, bool readvalues=true)
- template<typename TDE, typename TSwap>  
std::istream & [ReadSelectedPrivateTagsWithLength](#) (std::istream &is, const std::set< [PrivateTag](#) > &tags, [VL](#) &length, bool readvalues=true)
- template<typename TDE, typename TSwap>  
std::istream & [ReadSelectedTags](#) (std::istream &is, const std::set< [Tag](#) > &tags, bool readvalues=true)
- template<typename TDE, typename TSwap>  
std::istream & [ReadSelectedTagsWithLength](#) (std::istream &is, const std::set< [Tag](#) > &tags, [VL](#) &length, bool readvalues=true)
- template<typename TDE, typename TSwap>  
std::istream & [ReadUpToTag](#) (std::istream &is, const [Tag](#) &t, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadUpToTagWithLength](#) (std::istream &is, const [Tag](#) &t, std::set< [Tag](#) > const &skiptags, [VL](#) &length)
- template<typename TDE, typename TSwap>  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)
- [SizeType Remove](#) (const [Tag](#) &tag)  
*Completely remove a dataelement from the dataset.*
- void [Replace](#) (const [DataElement](#) &de)  
*Replace a dataelement with another one.*
- void [ReplaceEmpty](#) (const [DataElement](#) &de)  
*Only replace a DICOM attribute when it is missing or empty.*
- [SizeType Size](#) () const
- template<typename TDE, typename TSwap>  
std::ostream const & [Write](#) (std::ostream &os) const

### Static Public Member Functions

- static void [AppendImplementationClassUID](#) (const char \*imp)
- static const char \* [GetImplementationClassUID](#) ()
- static const char \* [GetImplementationVersionName](#) ()
- static const char \* [GetSourceApplicationEntityTitle](#) ()
- static void [SetImplementationClassUID](#) (const char \*imp)  
*Override the GDCM default values:*
- static void [SetImplementationVersionName](#) (const char \*version)
- static void [SetSourceApplicationEntityTitle](#) (const char \*title)

### Protected Member Functions

- void [ComputeDataSetMediaStorageSOPClass](#) ()
- void [ComputeDataSetTransferSyntax](#) ()
- void [Default](#) ()
- template<typename TSwap>  
std::istream & [ReadCompatInternal](#) (std::istream &is)

### Protected Member Functions inherited from [gdcm::DataSet](#)

- [Tag ComputeDataElement](#) (const [PrivateTag](#) &t) const
- const [DataElement](#) & [GetDEEnd](#) () const
- void [InsertDataElement](#) (const [DataElement](#) &de)

### Static Protected Member Functions

- static const char \* [GetFileMetaInformationVersion](#) ()
- static const char \* [GetGDCMImplementationClassUID](#) ()
- static const char \* [GetGDCMImplementationVersionName](#) ()
- static const char \* [GetGDCMSourceApplicationEntityTitle](#) ()

### Protected Attributes

- [MediaStorage::MSType](#) [DataSetMS](#)
- [TransferSyntax](#) [DataSetTS](#)
- [TransferSyntax::NegociatedType](#) [MetaInformationTS](#)

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [FileMetaInformation](#) &\_val)

### Additional Inherited Members

### Public Types inherited from [gdcm::DataSet](#)

- typedef [DataSet::const\\_iterator](#) [ConstIterator](#)
- typedef std::set< [DataElement](#) > [DataElementSet](#)
- typedef [DataSet::iterator](#) [Iterator](#)
- typedef [DataSet::size\\_type](#) [SizeType](#)



### 12.131.1 Detailed Description

Class to represent a [File](#) Meta Information.

[FileMetaInformation](#) is a Explicit Structured Set. Whenever the file contains an [ImplicitDataElement DataSet](#), a conversion will take place.

Definition: The [File](#) Meta Information includes identifying information on the encapsulated Data Set. This header consists of a 128 byte [File Preamble](#), followed by a 4 byte DICOM prefix, followed by the [File](#) Meta Elements shown in [Table 7.1-1](#). This header shall be present in every DICOM file.

See also

[Writer Reader](#)

Examples

[DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReformatFile.cs](#), and [StandardizeFiles.cs](#).

### 12.131.2 Constructor & Destructor Documentation

#### 12.131.2.1 FileMetaInformation() [1/2]

```
gdcm::FileMetaInformation::FileMetaInformation ()
```

Referenced by [FileMetaInformation\(\)](#), [~FileMetaInformation\(\)](#), [operator<<](#), and [operator=\(\)](#).

#### 12.131.2.2 ~FileMetaInformation()

```
gdcm::FileMetaInformation::~~FileMetaInformation ()
```

References [FileMetaInformation\(\)](#), and [operator<<](#).

#### 12.131.2.3 FileMetaInformation() [2/2]

```
gdcm::FileMetaInformation::FileMetaInformation (
    FileMetaInformation const & fmi) [default]
```

References [FileMetaInformation\(\)](#).

### 12.131.3 Member Function Documentation

#### 12.131.3.1 AppendImplementationClassUID()

```
void gdcm::FileMetaInformation::AppendImplementationClassUID (
    const char * imp) [static]
```

### 12.131.3.2 ComputeDataSetMediaStorageSOPClass()

```
void gdcM::FileMetaInformation::ComputeDataSetMediaStorageSOPClass () [protected]
```

### 12.131.3.3 ComputeDataSetTransferSyntax()

```
void gdcM::FileMetaInformation::ComputeDataSetTransferSyntax () [protected]
```

### 12.131.3.4 Default()

```
void gdcM::FileMetaInformation::Default () [protected]
```

### 12.131.3.5 FillFromDataSet()

```
void gdcM::FileMetaInformation::FillFromDataSet (  
    DataSet const & ds)
```

Construct a [FileMetaInformation](#) from an already existing [DataSet](#):

### 12.131.3.6 GetDataSetTransferSyntax()

```
const TransferSyntax & gdcM::FileMetaInformation::GetDataSetTransferSyntax () const [inline]
```

#### Examples

[GetJPEGSamplePrecision.cxx](#), and [MergeTwoFiles.cxx](#).

References [DataSetTS](#).

### 12.131.3.7 GetFileMetaInformationVersion()

```
const char * gdcM::FileMetaInformation::GetFileMetaInformationVersion () [static], [protected]
```

### 12.131.3.8 GetFullLength()

```
VL gdcM::FileMetaInformation::GetFullLength () const [inline]
```

References [gdcM::DataSet::GetLength\(\)](#), and [gdcM::VL::GetLength\(\)](#).

### 12.131.3.9 GetGDCMImplementationClassUID()

```
const char * gdcm::FileMetaInformation::GetGDCMImplementationClassUID () [static], [protected]
```

### 12.131.3.10 GetGDCMImplementationVersionName()

```
const char * gdcm::FileMetaInformation::GetGDCMImplementationVersionName () [static], [protected]
```

### 12.131.3.11 GetGDCMSourceApplicationEntityTitle()

```
const char * gdcm::FileMetaInformation::GetGDCMSourceApplicationEntityTitle () [static], [protected]
```

### 12.131.3.12 GetImplementationClassUID()

```
const char * gdcm::FileMetaInformation::GetImplementationClassUID () [static]
```

### 12.131.3.13 GetImplementationVersionName()

```
const char * gdcm::FileMetaInformation::GetImplementationVersionName () [static]
```

### 12.131.3.14 GetMediaStorage()

```
MediaStorage gdcm::FileMetaInformation::GetMediaStorage () const
```

### 12.131.3.15 GetMediaStorageAsString()

```
std::string gdcm::FileMetaInformation::GetMediaStorageAsString () const
```

### 12.131.3.16 GetMetaInformationTS()

```
TransferSyntax::NegociatedType gdcm::FileMetaInformation::GetMetaInformationTS () const [inline]
```

References [MetaInformationTS](#).

### 12.131.3.17 GetPreamble() [1/2]

```
Preamble & gdcm::FileMetaInformation::GetPreamble () [inline]
```

#### 12.131.3.18 GetPreamble() [2/2]

```
const Preamble & gdcM::FileMetaInformation::GetPreamble () const [inline]
```

Get [Preamble](#).

Referenced by [operator<<](#).

#### 12.131.3.19 GetSourceApplicationEntityTitle()

```
const char * gdcM::FileMetaInformation::GetSourceApplicationEntityTitle () [static]
```

#### 12.131.3.20 Insert()

```
void gdcM::FileMetaInformation::Insert (  
    const DataElement & de) [inline]
```

References [gdcMErrorMacro](#), [gdcM::Tag::GetGroup\(\)](#), [gdcM::DataElement::GetTag\(\)](#), and [gdcM::DataSet::InsertDataElement\(\)](#).

Referenced by [Replace\(\)](#).

#### 12.131.3.21 IsValid()

```
bool gdcM::FileMetaInformation::IsValid () const [inline]
```

#### 12.131.3.22 operator=()

```
FileMetaInformation & gdcM::FileMetaInformation::operator= (  
    const FileMetaInformation & fmi) [default]
```

References [FileMetaInformation\(\)](#).

#### 12.131.3.23 Read()

```
std::istream & gdcM::FileMetaInformation::Read (  
    std::istream & is)
```

Read.

#### 12.131.3.24 ReadCompat()

```
std::istream & gdcM::FileMetaInformation::ReadCompat (  
    std::istream & is)
```

### 12.131.3.25 ReadCompatInternal()

```
template<typename TSwap>
std::istream & gdcm::FileMetaInformation::ReadCompatInternal (
    std::istream & is) [protected]
```

### 12.131.3.26 Replace()

```
void gdcm::FileMetaInformation::Replace (
    const DataElement & de) [inline]
```

#### Examples

[LargeVRDSExplicit.cxx](#).

References [gdcm::DataElement::GetTag\(\)](#), [Insert\(\)](#), and [gdcm::DataSet::Remove\(\)](#).

### 12.131.3.27 SetDataSetTransferSyntax()

```
void gdcm::FileMetaInformation::SetDataSetTransferSyntax (
    const TransferSyntax & ts)
```

#### Examples

[CreateJPIPDataSet.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [MpegVideoInfo.cs](#), [QIDO-RS.cxx](#), [StreamImageReaderTest.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 12.131.3.28 SetImplementationClassUID()

```
void gdcm::FileMetaInformation::SetImplementationClassUID (
    const char * imp) [static]
```

Override the GDCM default values:

### 12.131.3.29 SetImplementationVersionName()

```
void gdcm::FileMetaInformation::SetImplementationVersionName (
    const char * version) [static]
```

### 12.131.3.30 SetPreamble()

```
void gdcm::FileMetaInformation::SetPreamble (
    const Preamble & p) [inline]
```

### 12.131.3.31 SetSourceApplicationEntityTitle()

```
void gdcM::FileMetaInformation::SetSourceApplicationEntityTitle (
    const char * title) [static]
```

#### Examples

[FixJAIBugJPEGLS.cxx](#), [GenerateDICOMDIR.cs](#), [ReformatFile.cs](#), and [StandardizeFiles.cs](#).

### 12.131.3.32 Write()

```
std::ostream & gdcM::FileMetaInformation::Write (
    std::ostream & os) const
```

Write.

## 12.131.4 Friends And Related Symbol Documentation

### 12.131.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const FileMetaInformation & _val) [friend]
```

References [FileMetaInformation\(\)](#), [GetPreamble\(\)](#), [operator<<](#), and [gdcM::DataSet::Print\(\)](#).

Referenced by [~FileMetaInformation\(\)](#), and [operator<<](#).

## 12.131.5 Member Data Documentation

### 12.131.5.1 DataSetMS

[MediaStorage::MSType](#) gdcM::FileMetaInformation::DataSetMS [protected]

### 12.131.5.2 DataSetTS

[TransferSyntax](#) gdcM::FileMetaInformation::DataSetTS [protected]

Referenced by [GetDataSetTransferSyntax\(\)](#).

### 12.131.5.3 MetaInformationTS

`TransferSyntax::NegociatedType` gdcm::FileMetaInformation::MetaInformationTS [protected]

Referenced by [GetMetaInformationTS\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmFileMetaInformation.h](#)

## 12.132 gdcm::Filename Class Reference

Class to manipulate file name's.

```
#include <gdcmFilename.h>
```

### Public Member Functions

- [Filename](#) (const char \*filename="")
- bool [EndWith](#) (const char ending[]) const  
*Does the filename ends with a particular string ?*
- const char \* [GetExtension](#) ()  
*return only the extension part of a filename*
- const char \* [GetFileName](#) () const  
*Return the full filename.*
- const char \* [GetName](#) ()  
*return only the name part of a filename*
- const char \* [GetPath](#) ()  
*Return only the path component of a filename.*
- bool [IsEmpty](#) () const  
*return whether the filename is empty*
- bool [IsIdentical](#) ([Filename](#) const &fn) const
- [operator const char \\*](#) () const
- const char \* [ToUnixSlashes](#) ()  
*Convert backslash (windows style) to UNIX style slash.*
- const char \* [ToWindowsSlashes](#) ()  
*Convert forward slash (UNIX style) to windows style slash.*

### Static Public Member Functions

- static const char \* [Join](#) (const char \*path, const char \*filename)

### 12.132.1 Detailed Description

Class to manipulate file name's.

#### Note

OS independent representation of a filename (to query path, name and extension from a filename)

### 12.132.2 Constructor & Destructor Documentation

#### 12.132.2.1 Filename()

```
gdcmm::Filename::Filename (
    const char * filename = "") [inline]
```

Referenced by [IsIdentical\(\)](#).

### 12.132.3 Member Function Documentation

#### 12.132.3.1 EndWith()

```
bool gdcmm::Filename::EndWith (
    const char ending[]) const
```

Does the filename ends with a particular string ?

#### 12.132.3.2 GetExtension()

```
const char * gdcmm::Filename::GetExtension ()
```

return only the extension part of a filename

#### 12.132.3.3 GetFileName()

```
const char * gdcmm::Filename::GetFileName () const [inline]
```

Return the full filename.

Referenced by [operator const char \\*\(\)](#).

#### 12.132.3.4 GetName()

```
const char * gdcmm::Filename::GetName ()
```

return only the name part of a filename



### 12.132.3.5 GetPath()

```
const char * gdcm::Filename::GetPath ()
```

Return only the path component of a filename.

#### Examples

[ClinicalTrialIdentificationWorkflow.cs](#).

### 12.132.3.6 IsEmpty()

```
bool gdcm::Filename::IsEmpty () const [inline]
```

return whether the filename is empty

### 12.132.3.7 IsIdentical()

```
bool gdcm::Filename::IsIdentical (  
    Filename const & fn) const
```

References [Filename\(\)](#).

### 12.132.3.8 Join()

```
const char * gdcm::Filename::Join (  
    const char * path,  
    const char * filename) [static]
```

Join two paths NOT THREAD SAFE

### 12.132.3.9 operator const char \*()

```
gdcm::Filename::operator const char * () const [inline]
```

Simple operator to allow [Filename](#) myfilename( "..."); const char \* s = myfilename;

References [GetFileName\(\)](#).

### 12.132.3.10 ToUnixSlashes()

```
const char * gdcm::Filename::ToUnixSlashes ()
```

Convert backslash (windows style) to UNIX style slash.

### 12.132.3.11 ToWindowsSlashes()

```
const char * gdcM::Filename::ToWindowsSlashes ()
```

Convert forward slash (UNIX style) to windows style slash.

The documentation for this class was generated from the following file:

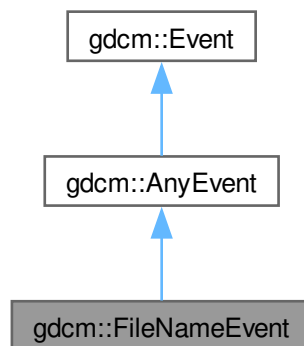
- [gdcMFilename.h](#)

## 12.133 gdcM::FileNameEvent Class Reference

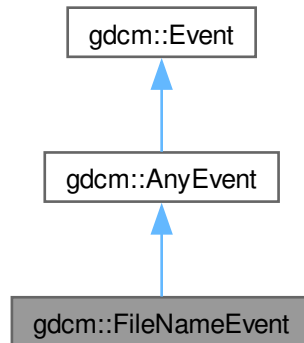
[FileNameEvent](#).

```
#include <gdcMFileNameEvent.h>
```

Inheritance diagram for gdcM::FileNameEvent:



Collaboration diagram for gdcm::FileNameEvent:



### Public Types

- typedef [FileNameEvent](#) `Self`
- typedef [AnyEvent](#) `Superclass`

### Public Member Functions

- [FileNameEvent](#) (const char \*s="")
- [FileNameEvent](#) (const [Self](#) &s)
- [~FileNameEvent](#) () override=default
- bool [CheckEvent](#) (const [::gdcm::Event](#) \*e) const override
- const char \* [GetEventName](#) () const override
- const char \* [GetFileName](#) () const
- [::gdcm::Event](#) \* [MakeObject](#) () const override
- void [operator=](#) (const [Self](#) &)=delete
- void [SetFileName](#) (const char \*f)

### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()
- [Event](#) (const [Event](#) &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

### 12.133.1 Detailed Description

[FileNameEvent](#).

Special type of event triggered during processing of [FileSet](#)

See also

[AnyEvent](#)

Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

### 12.133.2 Member Typedef Documentation

#### 12.133.2.1 Self

```
typedef FileNameEvent gdcm::FileNameEvent::Self
```

#### 12.133.2.2 Superclass

```
typedef AnyEvent gdcm::FileNameEvent::Superclass
```

### 12.133.3 Constructor & Destructor Documentation

#### 12.133.3.1 [FileNameEvent\(\)](#) [1/2]

```
gdcm::FileNameEvent::FileNameEvent (
    const char * s = "") [inline]
```

#### 12.133.3.2 [~FileNameEvent\(\)](#)

```
gdcm::FileNameEvent::~~FileNameEvent () [override], [default]
```

#### 12.133.3.3 [FileNameEvent\(\)](#) [2/2]

```
gdcm::FileNameEvent::FileNameEvent (
    const Self & s) [inline]
```

## 12.133.4 Member Function Documentation

### 12.133.4.1 CheckEvent()

```
bool gdcm::FileNameEvent::CheckEvent (
    const ::gdcm::Event * e) const [inline], [override]
```

### 12.133.4.2 GetEventName()

```
const char * gdcm::FileNameEvent::GetEventName () const [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements [gdcm::Event](#).

### 12.133.4.3 GetFileName()

```
const char * gdcm::FileNameEvent::GetFileName () const [inline]
```

#### Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

### 12.133.4.4 MakeObject()

```
::gdcm::Event * gdcm::FileNameEvent::MakeObject () const [inline], [override], [virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implements [gdcm::Event](#).

### 12.133.4.5 operator=()

```
void gdcm::FileNameEvent::operator= (
    const Self & ) [delete]
```

### 12.133.4.6 SetFileName()

```
void gdcm::FileNameEvent::SetFileName (
    const char * f) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmFileNameEvent.h](#)

## 12.134 gdcm::FilenameGenerator Class Reference

[FilenameGenerator](#).

```
#include <gdcmFilenameGenerator.h>
```

### Public Types

- typedef std::vector< [FilenameType](#) > [FilenamesType](#)
- typedef std::string [FilenameType](#)
- typedef [FilenamesType](#)::size\_type [SizeType](#)

### Public Member Functions

- [FilenameGenerator](#) ()
- [~FilenameGenerator](#) ()=default
- bool [Generate](#) ()  
*Generate (return success).*
- const char \* [GetFilename](#) ([SizeType](#) n) const  
*Get a particular filename (call after Generate).*
- [FilenamesType](#) const & [GetFilenames](#) () const  
*Return all filenames.*
- [SizeType](#) [GetNumberOfFilenames](#) () const
- const char \* [GetPattern](#) () const
- const char \* [GetPrefix](#) () const
- void [SetNumberOfFilenames](#) ([SizeType](#) nfiles)  
*Set/Get the number of filenames to generate.*
- void [SetPattern](#) (const char \*pattern)  
*Set/Get pattern.*
- void [SetPrefix](#) (const char \*prefix)  
*Set/Get prefix.*

### 12.134.1 Detailed Description

[FilenameGenerator](#).

class to generate filenames based on a pattern (C-style)

Output will be:

for i = 0, number of filenames: outfilename[i] = prefix + (pattern % i)

where pattern % i means C-style sprintf of Pattern using value 'i'

#### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

## 12.134.2 Member Typedef Documentation

### 12.134.2.1 FilenamesType

```
typedef std::vector<FilenameType> gdcm::FilenameGenerator::FilenamesType
```

### 12.134.2.2 FilenameType

```
typedef std::string gdcm::FilenameGenerator::FilenameType
```

### 12.134.2.3 SizeType

```
typedef FilenamesType::size_type gdcm::FilenameGenerator::SizeType
```

## 12.134.3 Constructor & Destructor Documentation

### 12.134.3.1 FilenameGenerator()

```
gdcm::FilenameGenerator::FilenameGenerator () [inline]
```

### 12.134.3.2 ~FilenameGenerator()

```
gdcm::FilenameGenerator::~~FilenameGenerator () [default]
```

## 12.134.4 Member Function Documentation

### 12.134.4.1 Generate()

```
bool gdcm::FilenameGenerator::Generate ()
```

Generate (return success).

#### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

#### 12.134.4.2 GetFilename()

```
const char * gdcm::FilenameGenerator::GetFilename (
    SizeType n) const
```

Get a particular filename (call after Generate).

##### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

#### 12.134.4.3 GetFileNames()

```
FileNamesType const & gdcm::FilenameGenerator::GetFileNames () const [inline]
```

Return all filenames.

#### 12.134.4.4 GetNumberOfFileNames()

```
SizeType gdcm::FilenameGenerator::GetNumberOfFileNames () const
```

##### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

#### 12.134.4.5 GetPattern()

```
const char * gdcm::FilenameGenerator::GetPattern () const [inline]
```

#### 12.134.4.6 GetPrefix()

```
const char * gdcm::FilenameGenerator::GetPrefix () const [inline]
```

#### 12.134.4.7 SetNumberOfFileNames()

```
void gdcm::FilenameGenerator::SetNumberOfFileNames (
    SizeType nfiles)
```

Set/Get the number of filenames to generate.

##### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).



#### 12.134.4.8 SetPattern()

```
void gdcm::FilenameGenerator::SetPattern (
    const char * pattern) [inline]
```

Set/Get pattern.

#### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

#### 12.134.4.9 SetPrefix()

```
void gdcm::FilenameGenerator::SetPrefix (
    const char * prefix) [inline]
```

Set/Get prefix.

The documentation for this class was generated from the following file:

- [gdcmFilenameGenerator.h](#)

## 12.135 gdcm::FileSet Class Reference

```
#include <gdcmFileSet.h>
```

### Public Types

- typedef std::vector< [FileType](#) > [FilesType](#)
- typedef std::string [FileType](#)

### Public Member Functions

- [FileSet](#) ()
- bool [AddFile](#) (const char \*filename)
- void [AddFile](#) ([File](#) const &)
- [FilesType](#) const & [GetFiles](#) () const
- void [SetFiles](#) ([FilesType](#) const &files)

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [FileSet](#) &d)

### 12.135.1 Detailed Description

File-set: A File-set is a collection of DICOM Files (and possibly non-DICOM Files) that share a common naming space within which [File](#) IDs are unique.

### 12.135.2 Member Typedef Documentation

#### 12.135.2.1 FileType

```
typedef std::vector<FileType> gdcm::FileSet::FileType
```

#### 12.135.2.2 FileType

```
typedef std::string gdcm::FileSet::FileType
```

### 12.135.3 Constructor & Destructor Documentation

#### 12.135.3.1 FileSet()

```
gdcm::FileSet::FileSet () [inline]
```

Referenced by [operator<<](#).

### 12.135.4 Member Function Documentation

#### 12.135.4.1 AddFile() [1/2]

```
bool gdcm::FileSet::AddFile (  
    const char * filename)
```

Add a file 'filename' to the list of files. Return true on success, false in case filename could not be found on system.

#### 12.135.4.2 AddFile() [2/2]

```
void gdcm::FileSet::AddFile (  
    File const & ) [inline]
```

**Deprecated** . Does nothing

#### 12.135.4.3 GetFiles()

```
FileType const & gdcm::FileSet::GetFiles () const [inline]
```

#### 12.135.4.4 SetFiles()

```
void gdcm::FileSet::SetFiles (  
    FileType const & files)
```

### 12.135.5 Friends And Related Symbol Documentation

#### 12.135.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const FileSet & d) [friend]
```

References [FileSet\(\)](#).

The documentation for this class was generated from the following file:

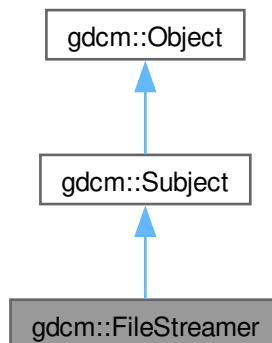
- [gdcmFileSet.h](#)

## 12.136 gdcm::FileStreamer Class Reference

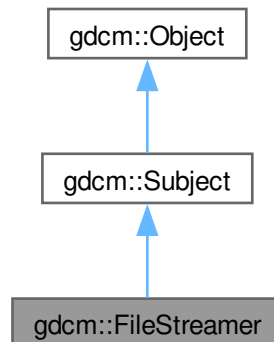
[FileStreamer](#).

```
#include <gdcmFileStreamer.h>
```

Inheritance diagram for gdcm::FileStreamer:



Collaboration diagram for `gdcm::FileStreamer`:



## Public Member Functions

- [FileStreamer](#) ()
- [~FileStreamer](#) () override
- bool [AppendToDataElement](#) (const [Tag](#) &t, const char \*array, size\_t len)  
*Append to previously started [Tag](#) t.*
- bool [AppendToGroupDataElement](#) (const [PrivateTag](#) &pt, const char \*array, size\_t len)  
*Append to previously started private creator.*
- bool [CheckDataElement](#) (const [Tag](#) &t)
- void [CheckTemplateFileName](#) (bool check)
- bool [ReserveDataElement](#) (size\_t len)
- bool [ReserveGroupDataElement](#) (unsigned short ndataelement)
- void [SetOutputFileName](#) (const char \*filename\_native)  
*Set output filename (target file).*
- void [SetTemplateFileName](#) (const char \*filename\_native)  
*Set input DICOM template filename.*
- bool [StartDataElement](#) (const [Tag](#) &t)
- bool [StartGroupDataElement](#) (const [PrivateTag](#) &pt, size\_t maxsize=0, uint8\_t startoffset=0)
- bool [StopDataElement](#) (const [Tag](#) &t)  
*Stop appending to tag t. This will compute the proper attribute length.*
- bool [StopGroupDataElement](#) (const [PrivateTag](#) &pt)  
*Stop appending to private creator.*

## Public Member Functions inherited from [gdcm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)

- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Static Public Member Functions

- static [SmartPointer](#)< [FileStreamer](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### 12.136.1 Detailed Description

[FileStreamer](#).

This class let a user create a massive DICOM [DataSet](#) from a template DICOM file, by appending chunks of data.

This class support two mode of operation:

1. Creating a single [DataElement](#) by appending chunk after chunk of data.
2. Creating a set of [DataElement](#) within the same group, using a private creator for start. New [DataElement](#) are added any time the user defined maximum size for data element is reached.

#### Warning

any existing [DataElement](#) is removed, pick carefully which [DataElement](#) to add.

#### Examples

[FileStreaming.cs](#).

## 12.136.2 Constructor & Destructor Documentation

### 12.136.2.1 FileStreamer()

```
gdcm::FileStreamer::FileStreamer ()
```

Referenced by [New\(\)](#).

### 12.136.2.2 ~FileStreamer()

```
gdcm::FileStreamer::~~FileStreamer () [override]
```

## 12.136.3 Member Function Documentation

### 12.136.3.1 AppendToDataElement()

```
bool gdcm::FileStreamer::AppendToDataElement (
    const Tag & t,
    const char * array,
    size_t len)
```

Append to previously started [Tag](#) t.

### 12.136.3.2 AppendToGroupDataElement()

```
bool gdcm::FileStreamer::AppendToGroupDataElement (
    const PrivateTag & pt,
    const char * array,
    size_t len)
```

Append to previously started private creator.

#### Examples

[FileStreaming.cs](#).

### 12.136.3.3 CheckDataElement()

```
bool gdcm::FileStreamer::CheckDataElement (
    const Tag & t)
```

Decide to check the Data [Element](#) to be written (default: off) The implementation has default strategy for checking validity of [DataElement](#). Currently it only support checking for the following tags:

- (7fe0,0010) Pixel Data

#### 12.136.3.4 CheckTemplateFileName()

```
void gdcm::FileStreamer::CheckTemplateFileName (
    bool check)
```

Instead of simply blindly copying the input DICOM Template file, GDCM will be used to check the input file, and correct any issues recognized within the file. Only use if you do not have control over the input template file.

#### 12.136.3.5 New()

```
SmartPointer< FileStreamer > gdcm::FileStreamer::New () [inline], [static]
```

for wrapped language: instantiate a reference counted object

References [FileStreamer\(\)](#).

#### 12.136.3.6 ReserveDataElement()

```
bool gdcm::FileStreamer::ReserveDataElement (
    size_t len)
```

Add a hint on the final size of the dataelement. When optimally chosen, this reduce the number of file in-place copying. Should be called before StartDataElement

#### 12.136.3.7 ReserveGroupDataElement()

```
bool gdcm::FileStreamer::ReserveGroupDataElement (
    unsigned short ndataelement)
```

Optimisation: pre-allocate the number of dataelement within the private group (ndataelement <= 256). Should be called before StartGroupDataElement

#### 12.136.3.8 SetOutputFileName()

```
void gdcm::FileStreamer::SetOutputFileName (
    const char * filename_native)
```

Set output filename (target file).

#### Examples

[FileStreaming.cs](#).

### 12.136.3.9 SetTemplateFileName()

```
void gdcmm::FileStreamer::SetTemplateFileName (
    const char * filename_native)
```

Set input DICOM template filename.

#### Examples

[FileStreaming.cs](#).

### 12.136.3.10 StartDataElement()

```
bool gdcmm::FileStreamer::StartDataElement (
    const Tag & t)
```

Start Single Data [Element](#) Operation This will delete any existing [Tag](#) t. Need to call it only once.

### 12.136.3.11 StartGroupDataElement()

```
bool gdcmm::FileStreamer::StartGroupDataElement (
    const PrivateTag & pt,
    size_t maxsize = 0,
    uint8_t startoffset = 0)
```

Start Private Group (multiple [DataElement](#)) Operation. Each newly added [DataElement](#) will have a length lower than

#### Parameters

<i>maxsize</i>	. When not specified, maxsize is set to maximum size allowed by DICOM ( $= 2^{32}$ ). startoffset can be used to specify the very first element you want to start with (instead of the first possible). <a href="#">Value</a> should be in [0x0, 0xff] This will find the first available private creator.
----------------	--

**Bug** maxsize should be a value lower than the actual total size of the buffer to be copied

#### Examples

[FileStreaming.cs](#).

### 12.136.3.12 StopDataElement()

```
bool gdcmm::FileStreamer::StopDataElement (
    const Tag & t)
```

Stop appending to tag t. This will compute the proper attribute length.



### 12.136.3.13 StopGroupDataElement()

```
bool gdcm::FileStreamer::StopGroupDataElement (
    const PrivateTag & pt)
```

Stop appending to private creator.

#### Examples

[FileStreaming.cs](#).

The documentation for this class was generated from the following file:

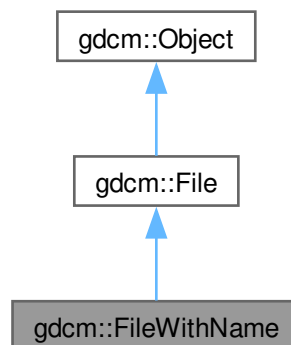
- [gdcmFileStreamer.h](#)

## 12.137 gdcm::FileWithName Class Reference

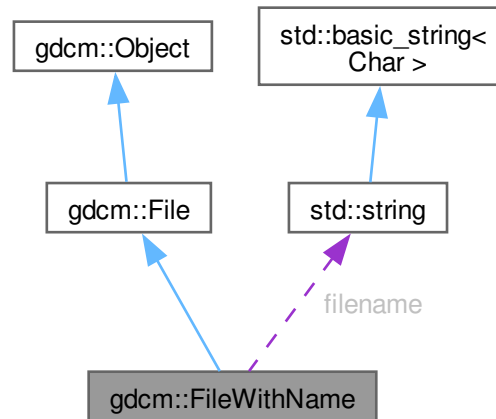
[FileWithName](#).

```
#include <gdcmSerieHelper.h>
```

Inheritance diagram for gdcm::FileWithName:



Collaboration diagram for `gdcm::FileWithName`:



### Public Member Functions

- [FileWithName](#) ([File](#) &f)

### Public Member Functions inherited from [gdcm::File](#)

- [File](#) ()
- [~File](#) () override
- [DataSet](#) & [GetDataSet](#) ()  
*Get Data Set.*
- const [DataSet](#) & [GetDataSet](#) () const  
*Get Data Set.*
- [FileMetaInformation](#) & [GetHeader](#) ()  
*Get [File](#) Meta Information.*
- const [FileMetaInformation](#) & [GetHeader](#) () const  
*Get [File](#) Meta Information.*
- `std::istream` & [Read](#) (`std::istream` &is)  
*Read.*
- void [SetDataSet](#) (const [DataSet](#) &ds)  
*Set Data Set.*
- void [SetHeader](#) (const [FileMetaInformation](#) &fmi)  
*Set [File](#) Meta Information.*
- `std::ostream` const & [Write](#) (`std::ostream` &os) const  
*Write.*

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Public Attributes

- std::string [filename](#)

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### 12.137.1 Detailed Description

[FileWithName](#).

Backward only class do not use in newer code

### 12.137.2 Constructor & Destructor Documentation

#### 12.137.2.1 FileWithName()

```
gdcm::FileWithName::FileWithName (  
    File & f) [inline]
```

References [gdcm::File::File\(\)](#), and [filename](#).

### 12.137.3 Member Data Documentation

#### 12.137.3.1 filename

```
std::string gdcm::FileWithName::filename
```

Referenced by [FileWithName\(\)](#).

The documentation for this class was generated from the following file:

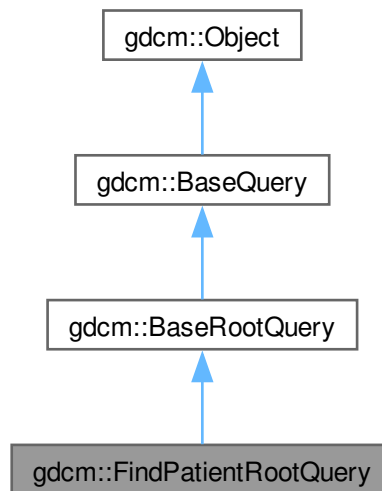
- [gdcmSerieHelper.h](#)

## 12.138 gdcm::FindPatientRootQuery Class Reference

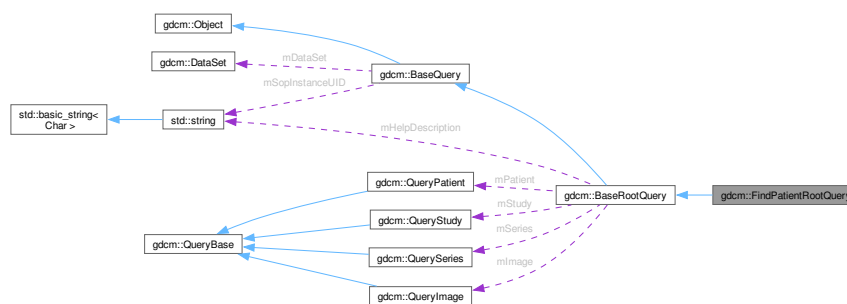
PatientRootQuery.

```
#include <gdcmFindPatientRootQuery.h>
```

Inheritance diagram for gdcm::FindPatientRootQuery:



Collaboration diagram for gdcm::FindPatientRootQuery:



### Public Member Functions

- `FindPatientRootQuery ()`
- `UIDs::TSName GetAbstractSyntaxUID ()` const override
- `std::vector< Tag > GetTagListByLevel (const EQueryLevel &inQueryLevel)` override
- `void InitializeDataSet (const EQueryLevel &inQueryLevel)` override
- `bool ValidateQuery (bool inStrict=true)` const override

## Public Member Functions inherited from [gdcm::BaseRootQuery](#)

- [~BaseRootQuery](#) () override=default
- [EQueryLevel](#) [GetQueryLevelFromQueryRoot](#) ([ERootType](#) roottype)

## Public Member Functions inherited from [gdcm::BaseQuery](#)

- [~BaseQuery](#) () override
  - void [AddQueryDataSet](#) (const [DataSet](#) &ds)
  - [DataSet](#) & [GetQueryDataSet](#) ()
  - [DataSet](#) const & [GetQueryDataSet](#) () const
- Set/Get the internal representation of the query as a [DataSet](#).*
- std::string [GetSOPInstanceUID](#) () const
  - void [Print](#) (std::ostream &os) const override
  - void [SetSearchParameter](#) (const std::string &inKeyword, const std::string &inValue)
  - void [SetSearchParameter](#) (const [Tag](#) &inTag, const std::string &inValue)
  - void [SetSOPInstanceUID](#) (const std::string &iSopInstanceUID)
  - const std::ostream & [WriteHelpFile](#) (std::ostream &os)
  - bool [WriteQuery](#) (const std::string &inFileName)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
  - [Object](#) (const [Object](#) &)
- Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
  - void [operator=](#) (const [Object](#) &)

## Friends

- class [QueryFactory](#)

## Additional Inherited Members

## Static Public Member Functions inherited from [gdcm::BaseRootQuery](#)

- static [QueryBase](#) \* [Construct](#) ([ERootType](#) inRootType, [EQueryLevel](#) qllevel)
- static int [GetQueryLevelFromString](#) (const char \*str)
- static const char \* [GetQueryLevelString](#) ([EQueryLevel](#) ql)

## Protected Member Functions inherited from [gdcm::BaseRootQuery](#)

- [BaseRootQuery](#) ()

### Protected Member Functions inherited from [gdcm::BaseQuery](#)

- [BaseQuery](#) ()
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [DictEntry](#) &inDictEntry, const std::string &inValue)
- bool [ValidDataSet](#) (const [DataSet](#) &dataSetToValid, const [DataSet](#) &dataSetReference) const

### Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### Protected Attributes inherited from [gdcm::BaseRootQuery](#)

- std::string [mHelpDescription](#)
- [QueryImage](#) [mImage](#)
- [QueryPatient](#) [mPatient](#)
- [ERootType](#) [mRootType](#)
- [QuerySeries](#) [mSeries](#)
- [QueryStudy](#) [mStudy](#)

### Protected Attributes inherited from [gdcm::BaseQuery](#)

- [DataSet](#) [mDataSet](#)
- std::string [mSopInstanceUID](#)

## 12.138.1 Detailed Description

PatientRootQuery.

contains: the class which will produce a dataset for c-find with patient root

## 12.138.2 Constructor & Destructor Documentation

### 12.138.2.1 FindPatientRootQuery()

```
gdcm::FindPatientRootQuery::FindPatientRootQuery ()
```

## 12.138.3 Member Function Documentation

### 12.138.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::FindPatientRootQuery::GetAbstractSyntaxUID () const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

### 12.138.3.2 GetTagListByLevel()

```
std::vector< Tag > gdcm::FindPatientRootQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel) [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements [gdcm::BaseRootQuery](#).

### 12.138.3.3 InitializeDataSet()

```
void gdcm::FindPatientRootQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel) [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmTk

Implements [gdcm::BaseRootQuery](#).

### 12.138.3.4 ValidateQuery()

```
bool gdcm::FindPatientRootQuery::ValidateQuery (
    bool inStrict = true) const [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements [gdcm::BaseRootQuery](#).

## 12.138.4 Friends And Related Symbol Documentation

### 12.138.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

References [QueryFactory](#).

Referenced by [QueryFactory](#).

The documentation for this class was generated from the following file:

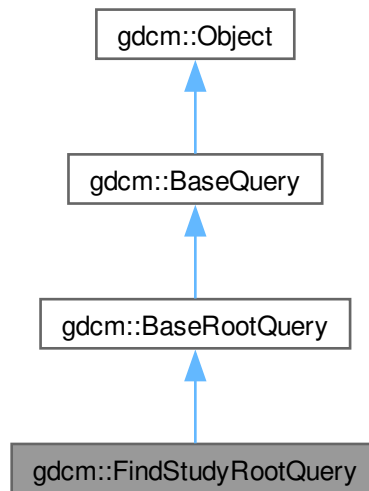
- [gdcmFindPatientRootQuery.h](#)

## 12.139 gdcm::FindStudyRootQuery Class Reference

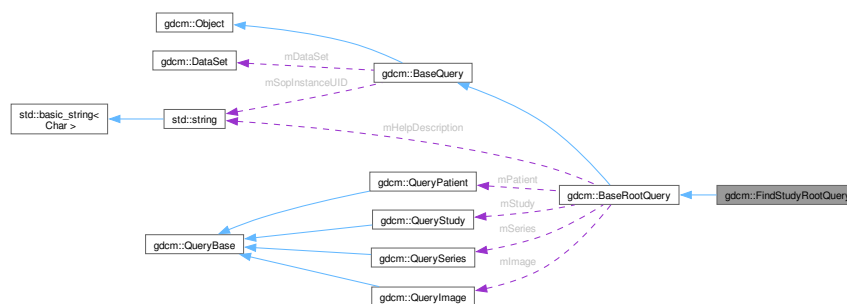
[FindStudyRootQuery](#).

```
#include <gdcmFindStudyRootQuery.h>
```

Inheritance diagram for gdcm::FindStudyRootQuery:



Collaboration diagram for gdcm::FindStudyRootQuery:



### Public Member Functions

- [FindStudyRootQuery](#) ()
- `UIDs::TSName GetAbstractSyntaxUID` () const override
- `std::vector< Tag > GetTagListByLevel` (const [EQueryLevel](#) &inQueryLevel) override
- void [InitializeDataSet](#) (const [EQueryLevel](#) &inQueryLevel) override
- bool [ValidateQuery](#) (bool inStrict=true) const override



## Public Member Functions inherited from [gdcm::BaseRootQuery](#)

- [~BaseRootQuery](#) () override=default
- [EQueryLevel](#) [GetQueryLevelFromQueryRoot](#) ([ERootType](#) roottype)

## Public Member Functions inherited from [gdcm::BaseQuery](#)

- [~BaseQuery](#) () override
  - void [AddQueryDataSet](#) (const [DataSet](#) &ds)
  - [DataSet](#) & [GetQueryDataSet](#) ()
  - [DataSet](#) const & [GetQueryDataSet](#) () const
- Set/Get the internal representation of the query as a [DataSet](#).*
- std::string [GetSOPInstanceUID](#) () const
  - void [Print](#) (std::ostream &os) const override
  - void [SetSearchParameter](#) (const std::string &inKeyword, const std::string &inValue)
  - void [SetSearchParameter](#) (const [Tag](#) &inTag, const std::string &inValue)
  - void [SetSOPInstanceUID](#) (const std::string &iSopInstanceUID)
  - const std::ostream & [WriteHelpFile](#) (std::ostream &os)
  - bool [WriteQuery](#) (const std::string &inFileName)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
  - [Object](#) (const [Object](#) &)
- Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
  - void [operator=](#) (const [Object](#) &)

## Friends

- class [QueryFactory](#)

## Additional Inherited Members

## Static Public Member Functions inherited from [gdcm::BaseRootQuery](#)

- static [QueryBase](#) \* [Construct](#) ([ERootType](#) inRootType, [EQueryLevel](#) qllevel)
- static int [GetQueryLevelFromString](#) (const char \*str)
- static const char \* [GetQueryLevelString](#) ([EQueryLevel](#) ql)

## Protected Member Functions inherited from [gdcm::BaseRootQuery](#)

- [BaseRootQuery](#) ()

### Protected Member Functions inherited from [gdcm::BaseQuery](#)

- [BaseQuery](#) ()
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [DictEntry](#) &inDictEntry, const std::string &inValue)
- bool [ValidDataSet](#) (const [DataSet](#) &dataSetToValid, const [DataSet](#) &dataSetReference) const

### Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### Protected Attributes inherited from [gdcm::BaseRootQuery](#)

- std::string [mHelpDescription](#)
- [QueryImage](#) [mImage](#)
- [QueryPatient](#) [mPatient](#)
- [ERootType](#) [mRootType](#)
- [QuerySeries](#) [mSeries](#)
- [QueryStudy](#) [mStudy](#)

### Protected Attributes inherited from [gdcm::BaseQuery](#)

- [DataSet](#) [mDataSet](#)
- std::string [mSopInstanceUID](#)

## 12.139.1 Detailed Description

[FindStudyRootQuery](#).

contains: the class which will produce a dataset for C-FIND with study root

## 12.139.2 Constructor & Destructor Documentation

### 12.139.2.1 [FindStudyRootQuery](#)()

```
gdcm::FindStudyRootQuery::FindStudyRootQuery ()
```

## 12.139.3 Member Function Documentation

### 12.139.3.1 [GetAbstractSyntaxUID](#)()

```
UIDs::TSName gdcm::FindStudyRootQuery::GetAbstractSyntaxUID () const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

### 12.139.3.2 GetTagListByLevel()

```
std::vector< Tag > gdcm::FindStudyRootQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel) [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements [gdcm::BaseRootQuery](#).

### 12.139.3.3 InitializeDataSet()

```
void gdcm::FindStudyRootQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel) [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmTk

Implements [gdcm::BaseRootQuery](#).

### 12.139.3.4 ValidateQuery()

```
bool gdcm::FindStudyRootQuery::ValidateQuery (
    bool inStrict = true) const [override], [virtual]
```

have to be able to ensure that (0008,0052) is set that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional)

Implements [gdcm::BaseRootQuery](#).

## 12.139.4 Friends And Related Symbol Documentation

### 12.139.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

References [QueryFactory](#).

Referenced by [QueryFactory](#).

The documentation for this class was generated from the following file:

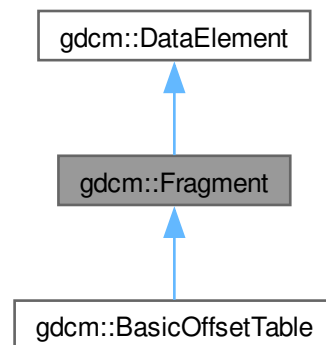
- [gdcmFindStudyRootQuery.h](#)

## 12.140 gdcm::Fragment Class Reference

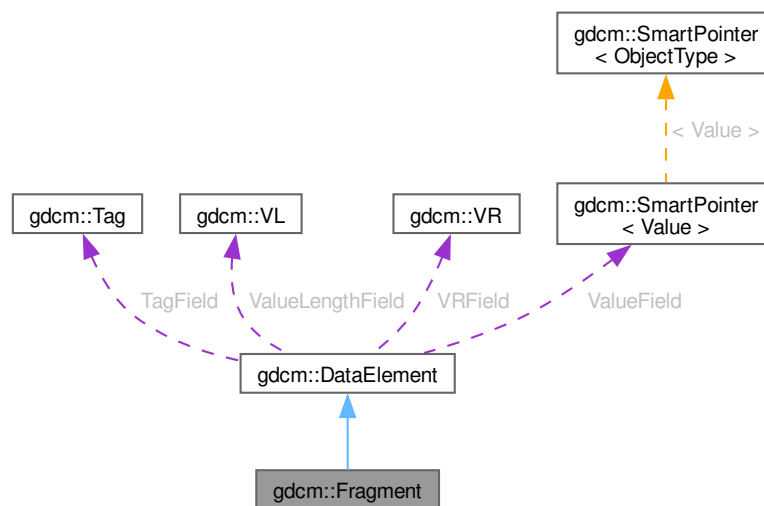
Class to represent a [Fragment](#).

```
#include <gdcmFragment.h>
```

Inheritance diagram for gdcm::Fragment:



Collaboration diagram for gdcm::Fragment:



## Public Member Functions

- [Fragment](#) ()
- [VL ComputeLength](#) () const
- [VL GetLength](#) () const
- template<typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadBacktrack](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is)
- template<typename TSwap>  
std::ostream & [Write](#) (std::ostream &os) const

## Public Member Functions inherited from [gdcm::DataElement](#)

- [DataElement](#) (const DataElement &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()  
*Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()  
*Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE>  
[VL GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const
- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const  
*Get [Tag](#).*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const  
*Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const  
*Get [VL](#).*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const  
*Check if Data [Element](#) is empty.*
- bool [IsUndefinedLength](#) () const  
*return if [Value](#) Length if of undefined length*
- bool [operator](#)< (const [DataElement](#) &de) const
- [DataElement](#) & [operator](#)= (const [DataElement](#) &)=default
- bool [operator](#)== (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is)

- `template<typename TDE, typename TSwap>`  
`std::istream & ReadOrSkip (std::istream &is, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadPreValue (std::istream &is, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadValue (std::istream &is, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadValueWithLength (std::istream &is, VL &length, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadWithLength (std::istream &is, VL &length)`
- `void SetByteValue (const char *array, VL length)`
- `void SetTag (const Tag &t)`
- `void SetValue (Value const &vl)`
- `void SetVL (const VL &vl)`
- `void SetVLToUndefined ()`
- `void SetVR (VR const &vr)`
- `template<typename TDE, typename TSwap>`  
`const std::ostream & Write (std::ostream &os) const`

## Friends

- `std::ostream & operator<< (std::ostream &os, const Fragment &val)`

## Additional Inherited Members

## Protected Types inherited from `gdcm::DataElement`

- `typedef SmartPointer< Value > ValuePtr`

## Protected Member Functions inherited from `gdcm::DataElement`

- `void SetValueFieldLength (VL vl, bool readvalues)`

## Protected Attributes inherited from `gdcm::DataElement`

- `Tag TagField`
- `ValuePtr ValueField`
- `VL ValueLengthField`
- `VR VRField`

## 12.140.1 Detailed Description

Class to represent a `Fragment`.

### Examples

`DecompressImageMultiframe.cs`, `DecompressJPEGFile.cs`, `FixBrokenJ2K.cxx`, `FixJAIBugJPEGLS.cxx`, and `MpegVideoInfo.cs`.

## 12.140.2 Constructor & Destructor Documentation

### 12.140.2.1 Fragment()

```
gdcm::Fragment::Fragment () [inline]
```

References [gdcm::DataElement::DataElement\(\)](#).

Referenced by [gdcm::BasicOffsetTable::BasicOffsetTable\(\)](#), and [operator<<](#).

## 12.140.3 Member Function Documentation

### 12.140.3.1 ComputeLength()

```
VL gdcm::Fragment::ComputeLength () const
```

### 12.140.3.2 GetLength()

```
VL gdcm::Fragment::GetLength () const
```

### 12.140.3.3 Read()

```
template<typename TSwap>
std::istream & gdcm::Fragment::Read (
    std::istream & is) [inline]
```

References [ReadPreValue\(\)](#), and [ReadValue\(\)](#).

Referenced by [gdcm::SequenceOfFragments::ReadValue\(\)](#).

### 12.140.3.4 ReadBacktrack()

```
template<typename TSwap>
std::istream & gdcm::Fragment::ReadBacktrack (
    std::istream & is) [inline]
```

References [gdcmErrorMacro](#), [gdcmWarningMacro](#), [gdcm::ParseException::SetLastElement\(\)](#), [gdcm::DataElement::TagField](#), [gdcm::DataElement::ValueField](#), and [gdcm::DataElement::ValueLengthField](#).

Referenced by [gdcm::SequenceOfFragments::ReadValue\(\)](#).

### 12.140.3.5 ReadPreValue()

```
template<typename TSwap>
std::istream & gdcM::Fragment::ReadPreValue (
    std::istream & is) [inline]
```

References [gdcM::DataElement::TagField](#), and [gdcM::DataElement::ValueLengthField](#).

Referenced by [Read\(\)](#).

### 12.140.3.6 ReadValue()

```
template<typename TSwap>
std::istream & gdcM::Fragment::ReadValue (
    std::istream & is) [inline]
```

References [gdcMWarningMacro](#), [gdcM::ParseException::SetLastElement\(\)](#), [gdcM::DataElement::ValueField](#), and [gdcM::DataElement::ValueLengthField](#).

Referenced by [Read\(\)](#).

### 12.140.3.7 Write()

```
template<typename TSwap>
std::ostream & gdcM::Fragment::Write (
    std::ostream & os) const [inline]
```

References [gdcM::ByteValue::ComputeLength\(\)](#), [gdcM::DataElement::GetByteValue\(\)](#), [gdcM::ByteValue::GetLength\(\)](#), [gdcM::DataElement::IsEmpty\(\)](#), [gdcM::DataElement::TagField](#), [gdcM::DataElement::ValueLengthField](#), [gdcM::ByteValue::Write\(\)](#), and [gdcM::VL::Write\(\)](#).

## 12.140.4 Friends And Related Symbol Documentation

### 12.140.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const Fragment & val) [friend]
```

References [Fragment\(\)](#), [operator<<](#), [gdcM::DataElement::TagField](#), [gdcM::DataElement::ValueField](#), and [gdcM::DataElement::ValueLengthField](#).

Referenced by [operator<<](#).

The documentation for this class was generated from the following file:

- [gdcMFragment.h](#)



## 12.141 gdcm::Global Class Reference

[Global](#).

```
#include <gdcmGlobal.h>
```

### Public Member Functions

- [Global](#) ()
- [Global](#) (const [Global](#) &\_val)=delete
- [~Global](#) ()
- bool [Append](#) (const char \*path)
- [Defs](#) const & [GetDefs](#) () const
- [Dicts](#) & [GetDicts](#) ()
- [Dicts](#) const & [GetDicts](#) () const
- bool [LoadResourcesFiles](#) ()
- [Global](#) & [operator=](#) (const [Global](#) &\_val)=delete
- bool [Prepend](#) (const char \*path)

### Static Public Member Functions

- static [Global](#) & [GetInstance](#) ()  
*return the singleton instance*

### Protected Member Functions

- const char \* [Locate](#) (const char \*resfile) const  
*Locate a resource file.*

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Global](#) &g)

### 12.141.1 Detailed Description

[Global](#).

#### Note

[Global](#) should be included in any translation unit that will use [Dict](#) or that implements the singleton pattern. It makes sure that the [Dict](#) singleton is created before and destroyed after all other singletons in GDCM.

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenerateStandardSOPClasses.cxx](#), [PublicDict.cxx](#), [ReadAndPrintAttributes.cxx](#), and [TraverseModules.cxx](#).

## 12.141.2 Constructor & Destructor Documentation

### 12.141.2.1 Global() [1/2]

```
gdcmm::Global::Global ()
```

Referenced by [Global\(\)](#), [GetInstance\(\)](#), [operator<<](#), and [operator=\(\)](#).

### 12.141.2.2 ~Global()

```
gdcmm::Global::~~Global ()
```

### 12.141.2.3 Global() [2/2]

```
gdcmm::Global::Global (  
    const Global & _val) [delete]
```

References [Global\(\)](#).

## 12.141.3 Member Function Documentation

### 12.141.3.1 Append()

```
bool gdcmm::Global::Append (  
    const char * path)
```

Append path at the end of the path list

#### Warning

not thread safe !

### 12.141.3.2 GetDefs()

```
Defs const & gdcmm::Global::GetDefs () const
```

retrieve the default/internal (Part 3) You need to explicitly call LoadResourcesFiles before

#### Examples

[GenerateStandardSOPClasses.cxx](#), and [TraverseModules.cxx](#).

### 12.141.3.3 GetDicts() [1/2]

```
Dicts & gdcmm::Global::GetDicts ()
```

### 12.141.3.4 GetDicts() [2/2]

```
Dicts const & gdcmm::Global::GetDicts () const
```

retrieve the default/internal dicts (Part 6) This dict is filled up at load time

#### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [MrProtocol.cxx](#), [PublicDict.cxx](#), [ReadAndPrintAttributes.cxx](#), and [TraverseModules.cxx](#).

### 12.141.3.5 GetInstance()

```
Global & gdcmm::Global::GetInstance () [static]
```

return the singleton instance

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenerateStandardSOPClasses.cxx](#), [MrProtocol.cxx](#), [PublicDict.cxx](#), [ReadAndPrintAttributes.cxx](#), and [TraverseModules.cxx](#).

References [Global\(\)](#).

### 12.141.3.6 LoadResourcesFiles()

```
bool gdcmm::Global::LoadResourcesFiles ()
```

Load all internal XML files, resource path need to have been set before calling this member function (see [Append/↔](#) Prepend members func)

#### Warning

not thread safe !

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [GenerateStandardSOPClasses.cxx](#), and [TraverseModules.cxx](#).

### 12.141.3.7 Locate()

```
const char * gdcM::Global::Locate (  
    const char * resfile) const [protected]
```

Locate a resource file.

### 12.141.3.8 operator=()

```
Global & gdcM::Global::operator= (  
    const Global & _val) [delete]
```

References [Global\(\)](#).

### 12.141.3.9 Prepend()

```
bool gdcM::Global::Prepend (  
    const char * path)
```

Prepend path at the beginning of the path list

#### Warning

not thread safe !

## 12.141.4 Friends And Related Symbol Documentation

### 12.141.4.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const Global & g) [friend]
```

References [Global\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMGlobal.h](#)

## 12.142 gdcM::GroupDict Class Reference

Class to represent the mapping from group number to its abbreviation and name.

```
#include <gdcMGroupDict.h>
```

## Public Types

- typedef std::vector< std::string > [GroupStringVector](#)

## Public Member Functions

- [GroupDict](#) ()
- [~GroupDict](#) ()=default
- std::string const & [GetAbbreviation](#) (uint16\_t num) const
- std::string const & [GetName](#) (uint16\_t num) const
- size\_t [Size](#) () const

## Protected Member Functions

- void [Add](#) (std::string const &abbreviation, std::string const &name)
- void [Insert](#) (uint16\_t num, std::string const &abbreviation, std::string const &name)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [GroupDict](#) &\_val)

## 12.142.1 Detailed Description

Class to represent the mapping from group number to its abbreviation and name.

### Note

Should I rewrite this class to use a std::map instead of std::vector for problem of memory consumption ?

## 12.142.2 Member Typedef Documentation

### 12.142.2.1 GroupStringVector

```
typedef std::vector<std::string> gdcmm::GroupDict::GroupStringVector
```

## 12.142.3 Constructor & Destructor Documentation

### 12.142.3.1 GroupDict()

```
gdcmm::GroupDict::GroupDict () [inline]
```

Referenced by [~GroupDict\(\)](#), [Insert\(\)](#), and [operator<<](#).

### 12.142.3.2 ~GroupDict()

```
gdcmm::GroupDict::~~GroupDict () [default]
```

References [GroupDict\(\)](#), and [operator<<](#).

## 12.142.4 Member Function Documentation

### 12.142.4.1 Add()

```
void gdcmm::GroupDict::Add (  
    std::string const & abbreviation,  
    std::string const & name) [protected]
```

### 12.142.4.2 GetAbbreviation()

```
std::string const & gdcmm::GroupDict::GetAbbreviation (  
    uint16_t num) const
```

Referenced by [operator<<](#).

### 12.142.4.3 GetName()

```
std::string const & gdcmm::GroupDict::GetName (  
    uint16_t num) const
```

Referenced by [operator<<](#).

### 12.142.4.4 Insert()

```
void gdcmm::GroupDict::Insert (  
    uint16_t num,  
    std::string const & abbreviation,  
    std::string const & name) [protected]
```

References [GroupDict\(\)](#).

### 12.142.4.5 Size()

```
size_t gdcmm::GroupDict::Size () const [inline]
```

Referenced by [operator<<](#).

## 12.142.5 Friends And Related Symbol Documentation

### 12.142.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const GroupDict & _val) [friend]
```

References [GroupDict\(\)](#), [GetAbbreviation\(\)](#), [GetName\(\)](#), and [Size\(\)](#).

Referenced by [~GroupDict\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmGroupDict.h](#)

## 12.143 gdcm::IconImageFilter Class Reference

[IconImageFilter](#).

```
#include <gdcmIconImageFilter.h>
```

### Public Member Functions

- [IconImageFilter](#) ()
- [~IconImageFilter](#) ()
- bool [Extract](#) ()  
*Extract all Icon found in [File](#).*
- [File](#) & [GetFile](#) ()
- const [File](#) & [GetFile](#) () const
- [IconImage](#) & [GetIconImage](#) (unsigned int i) const
- unsigned int [GetNumberOfIconImages](#) () const  
*Retrieve extract [IconImage](#) (need to call [Extract](#) first).*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get [File](#).*

### Protected Member Functions

- void [ExtractIconImages](#) ()
- void [ExtractVeprolIconImages](#) ()

### 12.143.1 Detailed Description

#### [IconImageFilter](#).

This filter will extract icons from a [File](#) This filter will loop over all known sequence (public and private) that may contains an [IconImage](#) and retrieve them. The filter will fails with a value of false if no icon can be found Since it handle both public and private icon type, one should not assume the icon is in uncompress form, some private vendor store private icon in JPEG8/JPEG12

Implementation details: This filter supports the following Icons:

- (0088,0200) Icon [Image](#) Sequence
- (0009,10,GEIIS) GE IIS Thumbnail Sequence
- (6003,10,GEMS\_Ultrasound\_ImageGroup\_001) GEMS [Image](#) Thumbnail Sequence
- (0055,30,VEPRO VIF 3.0 DATA) Icon Data
- (0055,30,VEPRO VIM 5.0 DATA) ICONDATA2

#### Warning

the icon stored in those private attribute do not conform to definition of Icon [Image](#) Sequence (do not simply copy/paste). For example some private icon can be expressed as 12bits pixel, while the DICOM standard only allow 8bits icons.

#### See also

[ImageReader](#)

#### Examples

[ExtractIconFromFile.cxx](#).

### 12.143.2 Constructor & Destructor Documentation

#### 12.143.2.1 [IconImageFilter](#)()

```
gdcm::IconImageFilter::IconImageFilter ()
```

#### 12.143.2.2 [~IconImageFilter](#)()

```
gdcm::IconImageFilter::~~IconImageFilter ()
```



## 12.143.3 Member Function Documentation

### 12.143.3.1 Extract()

```
bool gdcm::IconImageFilter::Extract ()
```

Extract all Icon found in [File](#).

#### Examples

[ExtractIconFromFile.cxx](#).

### 12.143.3.2 ExtractIconImages()

```
void gdcm::IconImageFilter::ExtractIconImages () [protected]
```

### 12.143.3.3 ExtractVeprolIconImages()

```
void gdcm::IconImageFilter::ExtractVeproIconImages () [protected]
```

### 12.143.3.4 GetFile() [1/2]

```
File & gdcm::IconImageFilter::GetFile () [inline]
```

### 12.143.3.5 GetFile() [2/2]

```
const File & gdcm::IconImageFilter::GetFile () const [inline]
```

### 12.143.3.6 GetIconImage()

```
IconImage & gdcm::IconImageFilter::GetIconImage (  
    unsigned int i) const
```

#### Examples

[ExtractIconFromFile.cxx](#).

### 12.143.3.7 GetNumberOfIconImages()

```
unsigned int gdcmm::IconImageFilter::GetNumberOfIconImages () const
```

Retrieve extract [IconImage](#) (need to call Extract first).

#### Examples

[ExtractIconFromFile.cxx](#).

### 12.143.3.8 SetFile()

```
void gdcmm::IconImageFilter::SetFile (
    const File & f) [inline]
```

Set/Get [File](#).

#### Examples

[ExtractIconFromFile.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmmIconImageFilter.h](#)

## 12.144 gdcmm::IconImageGenerator Class Reference

[IconImageGenerator](#).

```
#include <gdcmmIconImageGenerator.h>
```

### Public Member Functions

- [IconImageGenerator](#) ()
- [~IconImageGenerator](#) ()
- void [AutoPixelMinMax](#) (bool b)
- void [ConvertRGBToPaletteColor](#) (bool b)
- bool [Generate](#) ()  
*Generate Icon.*
- const [IconImage](#) & [GetIconImage](#) () const  
*Retrieve generated Icon.*
- [Pixmap](#) & [GetPixmap](#) ()
- const [Pixmap](#) & [GetPixmap](#) () const
- void [SetOutputDimensions](#) (const unsigned int dims[2])  
*Set Target dimension of output Icon.*
- void [SetOutsideValuePixel](#) (double v)
- void [SetPixelMinMax](#) (double min, double max)
- void [SetPixmap](#) (const [Pixmap](#) &p)  
*Set/Get File.*

### 12.144.1 Detailed Description

[IconImageGenerator](#).

This filter will generate a valid Icon from the Pixel Data element (an instance of [Pixmap](#)). To generate a valid Icon, one is only allowed the following Photometric Interpretation:

- MONOCHROME1
- MONOCHROME2
- PALETTE\_COLOR

The Pixel Bits Allocated is restricted to 8bits, therefore 16 bits image needs to be rescaled. By default the filter will use the full scalar range of 16bits image to rescale to unsigned 8bits. This may not be ideal for some situation, in which case the API `SetPixelMinMax` can be used to overwrite the default min,max interval used.

See also

[ImageReader](#)

Examples

[ExtractIconFromFile.cxx](#).

### 12.144.2 Constructor & Destructor Documentation

#### 12.144.2.1 IconImageGenerator()

```
gdcm::IconImageGenerator::IconImageGenerator ()
```

#### 12.144.2.2 ~IconImageGenerator()

```
gdcm::IconImageGenerator::~~IconImageGenerator ()
```

### 12.144.3 Member Function Documentation

#### 12.144.3.1 AutoPixelMinMax()

```
void gdcm::IconImageGenerator::AutoPixelMinMax (  
    bool b)
```

Instead of explicitly specifying the min/max value for the rescale operation, let the internal mechanism compute the min/max of icon and rescale to best appropriate.

Examples

[ExtractIconFromFile.cxx](#).

### 12.144.3.2 ConvertRGBToPaletteColor()

```
void gdcm::IconImageGenerator::ConvertRGBToPaletteColor (
    bool b)
```

Converting from RGB to PALETTE\_COLOR can be a slow operation. However DICOM standard requires that color icon be described as palette. Set this boolean to false only if you understand the consequences. default value is true, false generates invalid Icon [Image](#) Sequence

### 12.144.3.3 Generate()

```
bool gdcm::IconImageGenerator::Generate ()
```

Generate Icon.

#### Examples

[ExtractIconFromFile.cxx](#).

### 12.144.3.4 GetIconImage()

```
const IconImage & gdcm::IconImageGenerator::GetIconImage () const [inline]
```

Retrieve generated Icon.

#### Examples

[ExtractIconFromFile.cxx](#).

### 12.144.3.5 GetPixmap() [1/2]

```
Pixmap & gdcm::IconImageGenerator::GetPixmap () [inline]
```

### 12.144.3.6 GetPixmap() [2/2]

```
const Pixmap & gdcm::IconImageGenerator::GetPixmap () const [inline]
```

### 12.144.3.7 SetOutputDimensions()

```
void gdcm::IconImageGenerator::SetOutputDimensions (
    const unsigned int dims[2])
```

Set Target dimension of output Icon.

#### Examples

[ExtractIconFromFile.cxx](#).

### 12.144.3.8 SetOutsideValuePixel()

```
void gdcm::IconImageGenerator::SetOutsideValuePixel (
    double v)
```

Set a pixel value that should be discarded. This happen typically for CT image, where a pixel has been used to pad outside the image (see Pixel Padding [Value](#)). Requires `AutoPixelMinMax(true)`

### 12.144.3.9 SetPixelMinMax()

```
void gdcm::IconImageGenerator::SetPixelMinMax (
    double min,
    double max)
```

Override default min/max to compute best rescale for 16bits -> 8bits downscale. Typically those value can be read from the `SmallestImagePixelValue` `LargestImagePixelValue` DICOM attribute.

### 12.144.3.10 SetPixmap()

```
void gdcm::IconImageGenerator::SetPixmap (
    const Pixmap & p) [inline]
```

Set/Get [File](#).

#### Examples

[ExtractIconFromFile.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmIconImageGenerator.h](#)

## 12.145 gdcm::ignore\_char Struct Reference

```
#include <gdcmElement.h>
```

#### Public Member Functions

- [ignore\\_char](#) (char c)

#### Public Attributes

- char [m\\_char](#)

## 12.145.1 Constructor & Destructor Documentation

### 12.145.1.1 ignore\_char()

```
gdcm::ignore_char::ignore_char (  
    char c) [inline]
```

References [m\\_char](#).

## 12.145.2 Member Data Documentation

### 12.145.2.1 m\_char

```
char gdcm::ignore_char::m_char
```

Referenced by [ignore\\_char\(\)](#), and [gdcm::operator>>\(\)](#).

The documentation for this struct was generated from the following file:

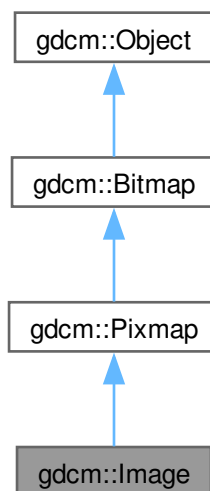
- [gdcmElement.h](#)

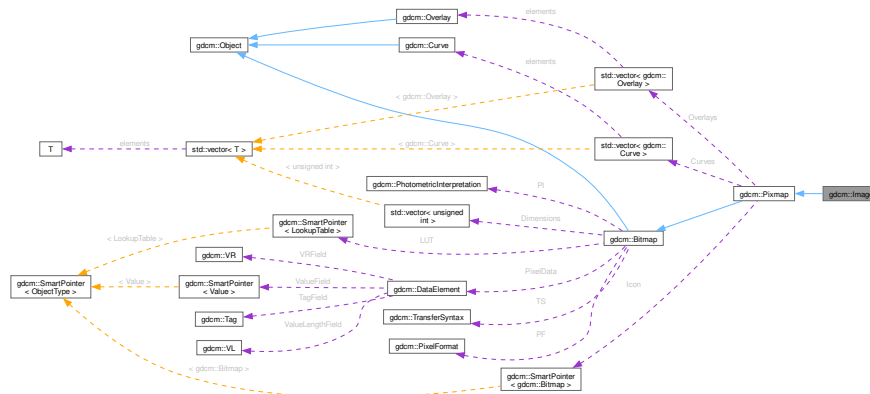
## 12.146 gdcm::Image Class Reference

[Image](#).

```
#include <gdcmImage.h>
```

Inheritance diagram for gdcm::Image:





- `Image ()`
- `~Image ()` override=default
- `const double * GetDirectionCosines ()` const
- `double GetDirectionCosines (unsigned int idx)` const
- `double GetIntercept ()` const
- `const double * GetOrigin ()` const
- `double GetOrigin (unsigned int idx)` const
- `double GetSlope ()` const
- `const double * GetSpacing ()` const
- `double GetSpacing (unsigned int idx)` const
- `void Print (std::ostream &os)` const override

*print*

- `void SetDirectionCosines (const double dircos[6])`
- `void SetDirectionCosines (const float dircos[6])`
- `void SetDirectionCosines (unsigned int idx, double dircos)`
- `void SetIntercept (double intercept)`

*intercept*

- `void SetOrigin (const double origin[3])`
- `void SetOrigin (const float origin[3])`
- `void SetOrigin (unsigned int idx, double ori)`
- `void SetSlope (double slope)`

*slope*

- `void SetSpacing (const double spacing[3])`
- `void SetSpacing (unsigned int idx, double spacing)`

## Public Member Functions inherited from `gdcm::Pixmap`

- `Pixmap ()`
- `~Pixmap ()` override
- `bool AreOverlaysInPixelData ()` const override  
*returns if Overlays are stored in the unused bit of the pixel data:*
- `Curve & GetCurve (size_t i=0)`  
*Curve: group 50xx.*
- `const Curve & GetCurve (size_t i=0)` const
- `IconImage & GetIconImage ()`
- `const IconImage & GetIconImage ()` const  
*Set/Get Icon Image.*
- `size_t GetNumberOfCurves ()` const
- `size_t GetNumberOfOverlays ()` const
- `Overlay & GetOverlay (size_t i=0)`  
*Overlay: group 60xx.*
- `const Overlay & GetOverlay (size_t i=0)` const
- `void Print (std::ostream &) const` override
- `void RemoveOverlay (size_t i)`
- `void SetIconImage (IconImage const &ii)`
- `void SetNumberOfCurves (size_t n)`
- `void SetNumberOfOverlays (size_t n)`
- `bool UnusedBitsPresentInPixelData ()` const override  
*returns if there are unused bits in the pixel data*

## Public Member Functions inherited from `gdcm::Bitmap`

- `Bitmap ()`
- `~Bitmap ()` override
- `void Clear ()`
- `bool GetBuffer (char *buffer) const`  
*Access the raw data.*
- `unsigned long GetBufferLength ()` const
- `unsigned int GetColumns ()` const
- `DataElement & GetDataElement ()`
- `const DataElement & GetDataElement ()` const
- `unsigned int GetDimension (unsigned int idx) const`
- `const unsigned int * GetDimensions ()` const  
*Return the dimension of the pixel data, first dimension (x), then 2nd (y), then 3rd (z)...*
- `LookupTable & GetLUT ()`
- `const LookupTable & GetLUT ()` const
- `bool GetNeedByteSwap ()` const  
*INTERNAL do not use.*
- `unsigned int GetNumberOfDimensions ()` const  
*Return the number of dimension of the pixel data bytes; for example 2 for a 2D matrices of values.*
- `const PhotometricInterpretation & GetPhotometricInterpretation ()` const  
*return the photometric interpretation*
- `PixelFormat & GetPixelFormat ()`



- const [PixelFormat](#) & [GetPixelFormat](#) () const  
*Get/Set [PixelFormat](#).*
- unsigned int [GetPlanarConfiguration](#) () const  
*return the planar configuration*
- unsigned int [GetRows](#) () const
- const [TransferSyntax](#) & [GetTransferSyntax](#) () const
- bool [IsEmpty](#) () const
- bool [IsLossy](#) () const  
*Return whether or not the image was compressed using a lossy compressor or not.*
- bool [IsTransferSyntaxCompatible](#) ([TransferSyntax](#) const &ts) const
- void [SetColumns](#) (unsigned int col)
- void [SetDataElement](#) ([DataElement](#) const &de)
- void [SetDimension](#) (unsigned int idx, unsigned int dim)
- void [SetDimensions](#) (const unsigned int dims[3])
- void [SetLossyFlag](#) (bool f)  
*Specifically set that the image was compressed using a lossy compression mechanism.*
- void [SetLUT](#) ([LookupTable](#) const &lut)  
*Set/Get LUT.*
- void [SetNeedByteSwap](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)
- void [SetRows](#) (unsigned int rows)
- void [SetTransferSyntax](#) ([TransferSyntax](#) const &ts)  
*Transfer syntax.*

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

## Additional Inherited Members

## Protected Types inherited from [gdcm::Bitmap](#)

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

### Protected Member Functions inherited from [gdcm::Bitmap](#)

- bool [ComputeLossyFlag](#) ()
- bool [GetBuffer2](#) (std::ostream &os) const
- bool [TryJPEG2000Codec](#) (char \*buffer, bool &lossyflag) const
- bool [TryJPEG2000Codec2](#) (std::ostream &os) const
- bool [TryJPEGCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryJPEGCodec2](#) (std::ostream &os) const
- bool [TryJPEGLSCCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryKAKADUCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryPVRGCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryRAWCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryRLECodec](#) (char \*buffer, bool &lossyflag) const

### Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### Protected Attributes inherited from [gdcm::Pixmap](#)

- std::vector< [Curve](#) > [Curves](#)
- [SmartPointer](#)< [IconImage](#) > [Icon](#)
- std::vector< [Overlay](#) > [Overlays](#)

### Protected Attributes inherited from [gdcm::Bitmap](#)

- std::vector< unsigned int > [Dimensions](#)
- bool [LossyFlag](#)
- [LUTPtr](#) [LUT](#)
- bool [NeedByteSwap](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) [PF](#)
- [PhotometricInterpretation](#) [PI](#)
- [DataElement](#) [PixelData](#)
- unsigned int [PlanarConfiguration](#)
- [TransferSyntax](#) [TS](#)

## 12.146.1 Detailed Description

[Image](#).

This is the container for an [Image](#) in the general sense. From this container you should be able to request information like:

- Origin
- Dimension
- [PixelFormat](#) ... But also to retrieve the image as a raw buffer (char \*) Since we have to deal with both RAW data and JPEG stream (which internally encode all the above information) this API might seems redundant. One way to solve that would be to subclass [Image](#) with [JPEGImage](#) which would from the stream extract the header info and fill it to please [Image](#)...well except origin for instance

Basically you can see it as a storage for the Pixel Data element (7fe0,0010).

### Warning

This class does some heuristics to guess the [Spacing](#) but is not compatible with DICOM CP-586. In case of doubt use [PixmapReader](#) instead

### See also

[ImageReader](#) [PixmapReader](#)

### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [ConvertToQImage.cxx](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [ExtractIconFromFile.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenFakeImage.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [MpegVideoInfo.cs](#), [PatchFile.cxx](#), [PrintLUT.cxx](#), [ReadMultiTimesException.cxx](#), [RescaleImage.cs](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), [iU22tomultisc.cxx](#), and [threadgdcm.cxx](#).

## 12.146.2 Constructor & Destructor Documentation

### 12.146.2.1 Image()

```
gdcm::Image::Image () [inline]
```

### 12.146.2.2 ~Image()

```
gdcm::Image::~Image () [override], [default]
```

## 12.146.3 Member Function Documentation

### 12.146.3.1 GetDirectionCosines() [1/2]

```
const double * gdcm::Image::GetDirectionCosines () const
```

Return a 6-tuples specifying the direction cosines A default value of (1,0,0,0,1,0) will be return when the direction cosines was not specified.

### 12.146.3.2 GetDirectionCosines() [2/2]

```
double gdcm::Image::GetDirectionCosines (
    unsigned int idx) const
```

### 12.146.3.3 GetIntercept()

```
double gdcm::Image::GetIntercept () const [inline]
```

### 12.146.3.4 GetOrigin() [1/2]

```
const double * gdcm::Image::GetOrigin () const
```

Return a 3-tuples specifying the origin Will return (0,0,0) if the origin was not specified.

#### Examples

[HelloVizWorld.cxx](#).

### 12.146.3.5 GetOrigin() [2/2]

```
double gdcm::Image::GetOrigin (
    unsigned int idx) const
```

### 12.146.3.6 GetSlope()

```
double gdcm::Image::GetSlope () const [inline]
```

### 12.146.3.7 GetSpacing() [1/2]

```
const double * gdcm::Image::GetSpacing () const
```

Return a 3-tuples specifying the spacing NOTE: 3rd value can be an arbitrary 1 value when the spacing was not specified (ex. 2D image). WARNING: when the spacing is not specifier, a default value of 1 will be returned

### 12.146.3.8 GetSpacing() [2/2]

```
double gdcmm::Image::GetSpacing (
    unsigned int idx) const
```

### 12.146.3.9 Print()

```
void gdcmm::Image::Print (
    std::ostream & os) const [override], [virtual]
```

print

Reimplemented from [gdcmm::Bitmap](#).

#### Examples

[CompressImage.cxx](#), and [PatchFile.cxx](#).

### 12.146.3.10 SetDirectionCosines() [1/3]

```
void gdcmm::Image::SetDirectionCosines (
    const double dircos[6])
```

### 12.146.3.11 SetDirectionCosines() [2/3]

```
void gdcmm::Image::SetDirectionCosines (
    const float dircos[6])
```

### 12.146.3.12 SetDirectionCosines() [3/3]

```
void gdcmm::Image::SetDirectionCosines (
    unsigned int idx,
    double dircos)
```

### 12.146.3.13 SetIntercept()

```
void gdcmm::Image::SetIntercept (
    double intercept) [inline]
```

intercept

#### Examples

[TemplateEmptyImage.cxx](#).

**12.146.3.14 SetOrigin() [1/3]**

```
void gdcM::Image::SetOrigin (  
    const double origin[3])
```

**12.146.3.15 SetOrigin() [2/3]**

```
void gdcM::Image::SetOrigin (  
    const float origin[3])
```

**12.146.3.16 SetOrigin() [3/3]**

```
void gdcM::Image::SetOrigin (  
    unsigned int idx,  
    double ori)
```

**12.146.3.17 SetSlope()**

```
void gdcM::Image::SetSlope (  
    double slope) [inline]
```

*slope*

**Examples**

[TemplateEmptyImage.cxx](#).

**12.146.3.18 SetSpacing() [1/2]**

```
void gdcM::Image::SetSpacing (  
    const double spacing[3])
```

**Examples**

[csa2img.cxx](#), and [iU22tomultisc.cxx](#).

**12.146.3.19 SetSpacing() [2/2]**

```
void gdcM::Image::SetSpacing (  
    unsigned int idx,  
    double spacing)
```

The documentation for this class was generated from the following file:

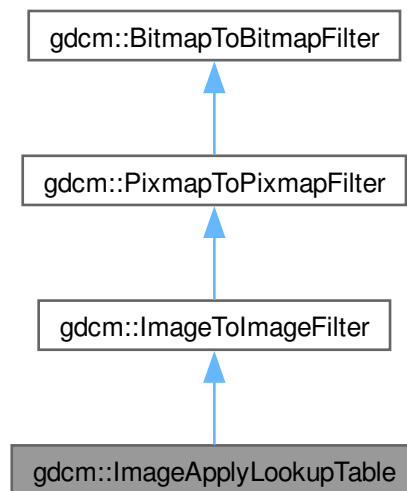
- [gdcMImage.h](#)

## 12.147 gdcm::ImageApplyLookupTable Class Reference

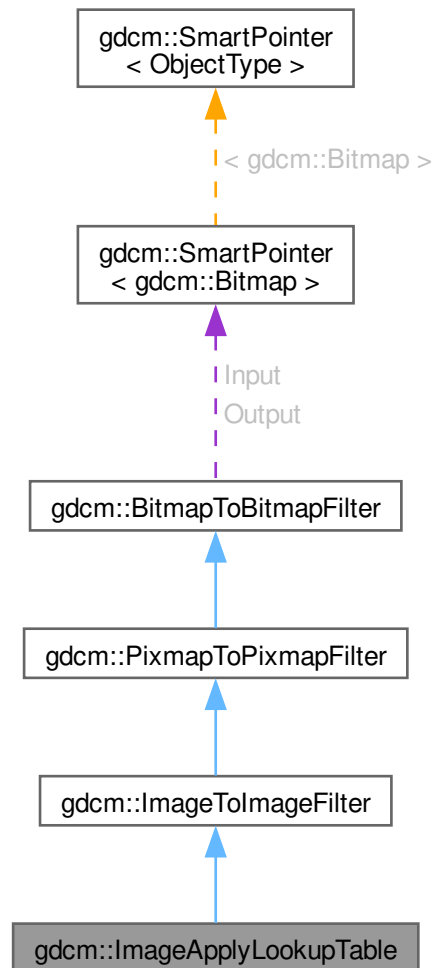
[ImageApplyLookupTable](#) class.

```
#include <gdcmImageApplyLookupTable.h>
```

Inheritance diagram for gdcm::ImageApplyLookupTable:



Collaboration diagram for `gdcm::ImageApplyLookupTable`:



### Public Member Functions

- [ImageApplyLookupTable](#) ()
- [~ImageApplyLookupTable](#) ()
- bool [Apply](#) ()
  - Apply.*
- void [SetRGB8](#) (bool b)
  - RGB8 ?*



**Public Member Functions inherited from [gdcm::ImageToImageFilter](#)**

- [ImageToImageFilter](#) ()
- [~ImageToImageFilter](#) ()=default
- [Image](#) & [GetInput](#) ()
- const [Image](#) & [GetOutput](#) () const

*Get Output image.*

**Public Member Functions inherited from [gdcm::PixmapToPixmapFilter](#)**

- [PixmapToPixmapFilter](#) ()
- [~PixmapToPixmapFilter](#) ()=default
- [Pixmap](#) & [GetInput](#) ()
- const [Pixmap](#) & [GetOutput](#) () const
- const [Pixmap](#) & [GetOutputAsPixmap](#) () const

*Get Output image.*

**Public Member Functions inherited from [gdcm::BitmapToBitmapFilter](#)**

- [BitmapToBitmapFilter](#) ()
- [~BitmapToBitmapFilter](#) ()=default
- const [Bitmap](#) & [GetOutput](#) () const
- const [Bitmap](#) & [GetOutputAsBitmap](#) () const
- void [SetInput](#) (const [Bitmap](#) &image)

*Get Output image.*

*Set input image.*

**Additional Inherited Members****Protected Attributes inherited from [gdcm::BitmapToBitmapFilter](#)**

- [SmartPointer](#)< [Bitmap](#) > [Input](#)
- [SmartPointer](#)< [Bitmap](#) > [Output](#)

**12.147.1 Detailed Description**

[ImageApplyLookupTable](#) class.

It applies the LUT the PixelData (only PALETTE\_COLOR images) Output will be a [PhotometricInterpretation](#)=RGB image

**12.147.2 Constructor & Destructor Documentation****12.147.2.1 ImageApplyLookupTable()**

```
gdcm::ImageApplyLookupTable::ImageApplyLookupTable ()
```

### 12.147.2.2 ~ImageApplyLookupTable()

```
gdcm::ImageApplyLookupTable::~ImageApplyLookupTable ()
```

## 12.147.3 Member Function Documentation

### 12.147.3.1 Apply()

```
bool gdcm::ImageApplyLookupTable::Apply ()
```

Apply.

### 12.147.3.2 SetRGB8()

```
void gdcm::ImageApplyLookupTable::SetRGB8 (  
    bool b)
```

RGB8 ?

The documentation for this class was generated from the following file:

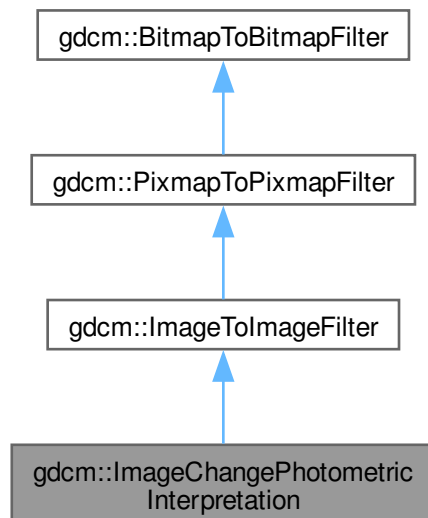
- [gdcmImageApplyLookupTable.h](#)

## 12.148 gdcm::ImageChangePhotometricInterpretation Class Reference

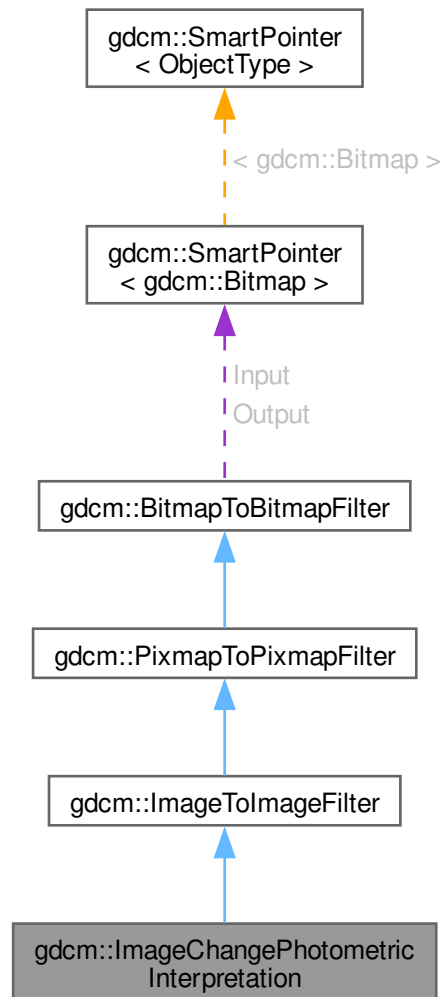
[ImageChangePhotometricInterpretation](#) class.

```
#include <gdcmImageChangePhotometricInterpretation.h>
```

Inheritance diagram for gdcm::ImageChangePhotometricInterpretation:



Collaboration diagram for gdcm::ImageChangePhotometricInterpretation:



### Public Member Functions

- [ImageChangePhotometricInterpretation \(\)](#)
- [~ImageChangePhotometricInterpretation \(\)=default](#)
- [bool Change \(\)](#)  
*Change.*
- [const PhotometricInterpretation & GetPhotometricInterpretation \(\) const](#)
- [void SetPhotometricInterpretation \(PhotometricInterpretation const &pi\)](#)  
*Set/Get requested PhotometricInterpretation.*

### Public Member Functions inherited from [gdcm::ImageToImageFilter](#)

- [ImageToImageFilter](#) ()
- [~ImageToImageFilter](#) ()=default
- [Image](#) & [GetInput](#) ()
- const [Image](#) & [GetOutput](#) () const

*Get Output image.*

### Public Member Functions inherited from [gdcm::PixmapToPixmapFilter](#)

- [PixmapToPixmapFilter](#) ()
- [~PixmapToPixmapFilter](#) ()=default
- [Pixmap](#) & [GetInput](#) ()
- const [Pixmap](#) & [GetOutput](#) () const
- const [Pixmap](#) & [GetOutputAsPixmap](#) () const

*Get Output image.*

### Public Member Functions inherited from [gdcm::BitmapToBitmapFilter](#)

- [BitmapToBitmapFilter](#) ()
- [~BitmapToBitmapFilter](#) ()=default
- const [Bitmap](#) & [GetOutput](#) () const
- const [Bitmap](#) & [GetOutputAsBitmap](#) () const
- void [SetInput](#) (const [Bitmap](#) &image)

*Get Output image.*

*Set input image.*

### Static Public Member Functions

- template<typename T>  
static void [RGB2YBR](#) (T ybr[3], const T rgb[3], unsigned short storedbits=8)
- template<typename T>  
static void [YBR2RGB](#) (T rgb[3], const T ybr[3], unsigned short storedbits=8)

### Protected Member Functions

- bool [ChangeMonochrome](#) ()
- bool [ChangeRGB2YBR](#) ()
- bool [ChangeYBR2RGB](#) ()

### Additional Inherited Members

### Protected Attributes inherited from [gdcm::BitmapToBitmapFilter](#)

- [SmartPointer](#)< [Bitmap](#) > [Input](#)
- [SmartPointer](#)< [Bitmap](#) > [Output](#)

## 12.148.1 Detailed Description

[ImageChangePhotometricInterpretation](#) class.

Class to change the Photometric Interpretation of an input DICOM

## 12.148.2 Constructor & Destructor Documentation

### 12.148.2.1 ImageChangePhotometricInterpretation()

```
gdcm::ImageChangePhotometricInterpretation::ImageChangePhotometricInterpretation () [inline]
```

### 12.148.2.2 ~ImageChangePhotometricInterpretation()

```
gdcm::ImageChangePhotometricInterpretation::~~ImageChangePhotometricInterpretation () [default]
```

## 12.148.3 Member Function Documentation

### 12.148.3.1 Change()

```
bool gdcm::ImageChangePhotometricInterpretation::Change ()
```

Change.

References [RGB2YBR\(\)](#), and [YBR2RGB\(\)](#).

### 12.148.3.2 ChangeMonochrome()

```
bool gdcm::ImageChangePhotometricInterpretation::ChangeMonochrome () [protected]
```

### 12.148.3.3 ChangeRGB2YBR()

```
bool gdcm::ImageChangePhotometricInterpretation::ChangeRGB2YBR () [protected]
```

### 12.148.3.4 ChangeYBR2RGB()

```
bool gdcm::ImageChangePhotometricInterpretation::ChangeYBR2RGB () [protected]
```

### 12.148.3.5 GetPhotometricInterpretation()

```
const PhotometricInterpretation & gdcM::ImageChangePhotometricInterpretation::GetPhotometricInterpretation () const [inline]
```

### 12.148.3.6 RGB2YBR()

```
template<typename T>
void gdcM::ImageChangePhotometricInterpretation::RGB2YBR (
    T ybr[3],
    const T rgb[3],
    unsigned short storedbits = 8) [static]
```

colorspace conversion (based on CCIR Recommendation 601-2) -> T.871

References [gdcM::Clamp\(\)](#), and [gdcM::Round\(\)](#).

Referenced by [Change\(\)](#).

### 12.148.3.7 SetPhotometricInterpretation()

```
void gdcM::ImageChangePhotometricInterpretation::SetPhotometricInterpretation (
    PhotometricInterpretation const & pi) [inline]
```

Set/Get requested [PhotometricInterpretation](#).

### 12.148.3.8 YBR2RGB()

```
template<typename T>
void gdcM::ImageChangePhotometricInterpretation::YBR2RGB (
    T rgb[3],
    const T ybr[3],
    unsigned short storedbits = 8) [static]
```

References [gdcM::Clamp\(\)](#), and [gdcM::Round\(\)](#).

Referenced by [Change\(\)](#).

The documentation for this class was generated from the following file:

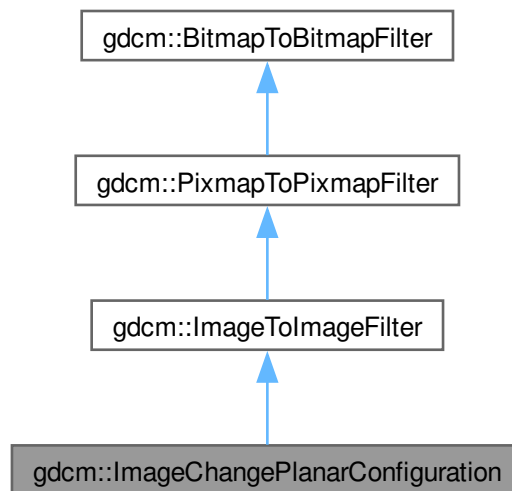
- [gdcMImageChangePhotometricInterpretation.h](#)

## 12.149 gdcm::ImageChangePlanarConfiguration Class Reference

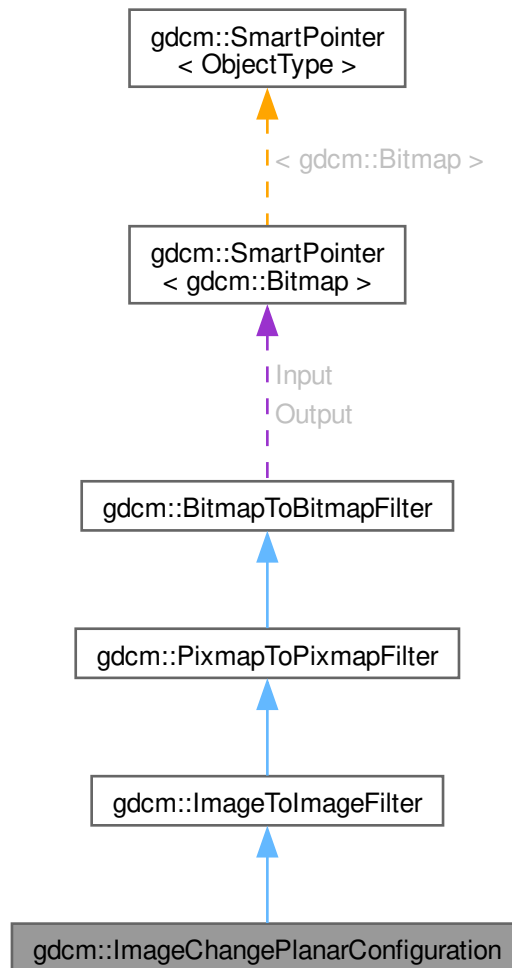
[ImageChangePlanarConfiguration](#) class.

```
#include <gdcmImageChangePlanarConfiguration.h>
```

Inheritance diagram for gdcm::ImageChangePlanarConfiguration:



Collaboration diagram for `gdcM::ImageChangePlanarConfiguration`:



### Public Member Functions

- `ImageChangePlanarConfiguration ()`
- `~ImageChangePlanarConfiguration ()=default`
- `bool Change ()`  
*Change.*
- `unsigned int GetPlanarConfiguration () const`
- `void SetPlanarConfiguration (unsigned int pc)`  
*Set/Get requested PlanarConfiguration.*



**Public Member Functions inherited from [gdcm::ImageToImageFilter](#)**

- [ImageToImageFilter](#) ()
- [~ImageToImageFilter](#) ()=default
- [Image](#) & [GetInput](#) ()
- const [Image](#) & [GetOutput](#) () const

*Get Output image.*

**Public Member Functions inherited from [gdcm::PixmapToPixmapFilter](#)**

- [PixmapToPixmapFilter](#) ()
  - [~PixmapToPixmapFilter](#) ()=default
  - [Pixmap](#) & [GetInput](#) ()
  - const [Pixmap](#) & [GetOutput](#) () const
- Get Output image.*
- const [Pixmap](#) & [GetOutputAsPixmap](#) () const

**Public Member Functions inherited from [gdcm::BitmapToBitmapFilter](#)**

- [BitmapToBitmapFilter](#) ()
  - [~BitmapToBitmapFilter](#) ()=default
  - const [Bitmap](#) & [GetOutput](#) () const
- Get Output image.*
- const [Bitmap](#) & [GetOutputAsBitmap](#) () const
  - void [SetInput](#) (const [Bitmap](#) &image)
- Set input image.*

**Static Public Member Functions**

- template<typename T>  
static size\_t [RGBPixelsToRGBPlanes](#) (T \*r, T \*g, T \*b, const T \*rgb, size\_t s)
- template<typename T>  
static size\_t [RGBPlanesToRGBPixels](#) (T \*out, const T \*r, const T \*g, const T \*b, size\_t s)

**Additional Inherited Members****Protected Attributes inherited from [gdcm::BitmapToBitmapFilter](#)**

- [SmartPointer](#)< [Bitmap](#) > [Input](#)
- [SmartPointer](#)< [Bitmap](#) > [Output](#)

**12.149.1 Detailed Description**

[ImageChangePlanarConfiguration](#) class.

Class to change the Planar configuration of an input DICOM By default it will change into the more usual representation: PlanarConfiguration = 0

## 12.149.2 Constructor & Destructor Documentation

### 12.149.2.1 ImageChangePlanarConfiguration()

```
gdcm::ImageChangePlanarConfiguration::ImageChangePlanarConfiguration () [inline]
```

### 12.149.2.2 ~ImageChangePlanarConfiguration()

```
gdcm::ImageChangePlanarConfiguration::~~ImageChangePlanarConfiguration () [default]
```

## 12.149.3 Member Function Documentation

### 12.149.3.1 Change()

```
bool gdcm::ImageChangePlanarConfiguration::Change ()
```

Change.

### 12.149.3.2 GetPlanarConfiguration()

```
unsigned int gdcm::ImageChangePlanarConfiguration::GetPlanarConfiguration () const [inline]
```

### 12.149.3.3 RGBPixelsToRGBPlanes()

```
template<typename T>
size_t gdcm::ImageChangePlanarConfiguration::RGBPixelsToRGBPlanes (
    T * r,
    T * g,
    T * b,
    const T * rgb,
    size_t s) [static]
```

Convert a regular RGB pixel image (R,G,B,R,G,B...) into a planar R,G,B image (R,R...,G,G...,B,B)

#### Warning

this works on a frame basis, you need to loop over all frames in multiple frames image to apply this function

### 12.149.3.4 RGBPlanesToRGBPixels()

```
template<typename T>
size_t gdcm::ImageChangePlanarConfiguration::RGBPlanesToRGBPixels (
    T * out,
    const T * r,
    const T * g,
    const T * b,
    size_t s) [static]
```

s is the size of one plane (r,g or b). Thus the output buffer needs to be at least 3\*s bytes long s can be seen as the number of RGB pixels in the output

### 12.149.3.5 SetPlanarConfiguration()

```
void gdcm::ImageChangePlanarConfiguration::SetPlanarConfiguration (
    unsigned int pc) [inline]
```

Set/Get requested PlanarConfiguration.

The documentation for this class was generated from the following file:

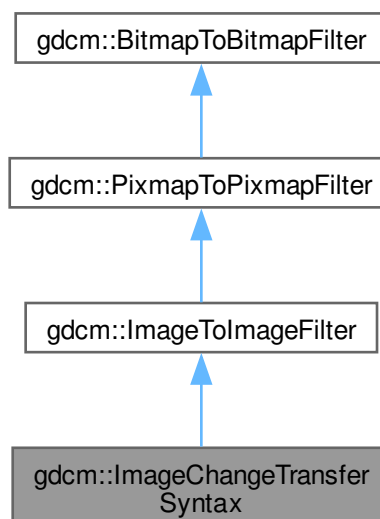
- [gdcmImageChangePlanarConfiguration.h](#)

## 12.150 gdcm::ImageChangeTransferSyntax Class Reference

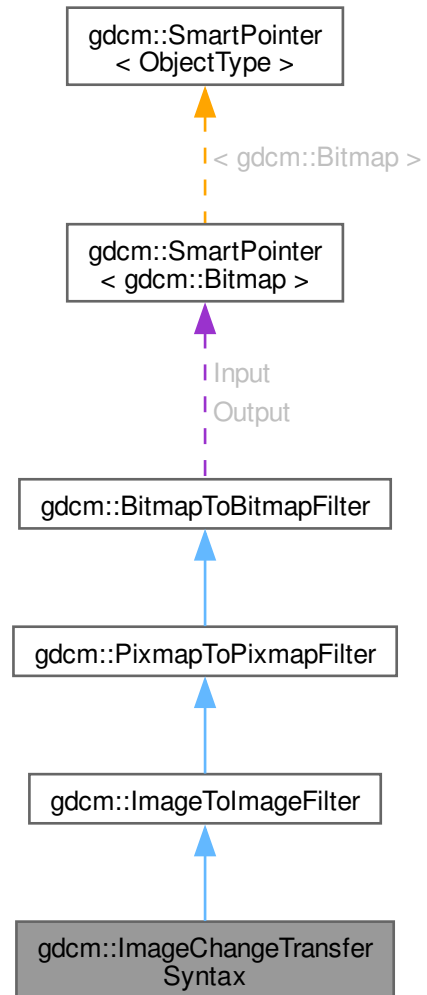
[ImageChangeTransferSyntax](#) class.

```
#include <gdcmImageChangeTransferSyntax.h>
```

Inheritance diagram for gdcm::ImageChangeTransferSyntax:



Collaboration diagram for `gdcm::ImageChangeTransferSyntax`:



### Public Member Functions

- `ImageChangeTransferSyntax ()`
- `~ImageChangeTransferSyntax ()=default`
- `bool Change ()`  
*Change.*
- `const TransferSyntax & GetTransferSyntax () const`  
*Get Transfer Syntax.*
- `void SetCompressIconImage (bool b)`
- `void SetForce (bool f)`

- void [SetTransferSyntax](#) (const [TransferSyntax](#) &ts)  
*Set target Transfer Syntax.*
- void [SetUserCodec](#) ([ImageCodec](#) \*ic)

### Public Member Functions inherited from [gdcm::ImageToImageFilter](#)

- [ImageToImageFilter](#) ()
- [~ImageToImageFilter](#) ()=default
- [Image](#) & [GetInput](#) ()
- const [Image](#) & [GetOutput](#) () const  
*Get Output image.*

### Public Member Functions inherited from [gdcm::PixmapToPixmapFilter](#)

- [PixmapToPixmapFilter](#) ()
- [~PixmapToPixmapFilter](#) ()=default
- [Pixmap](#) & [GetInput](#) ()
- const [Pixmap](#) & [GetOutput](#) () const  
*Get Output image.*
- const [Pixmap](#) & [GetOutputAsPixmap](#) () const

### Public Member Functions inherited from [gdcm::BitmapToBitmapFilter](#)

- [BitmapToBitmapFilter](#) ()
- [~BitmapToBitmapFilter](#) ()=default
- const [Bitmap](#) & [GetOutput](#) () const  
*Get Output image.*
- const [Bitmap](#) & [GetOutputAsBitmap](#) () const
- void [SetInput](#) (const [Bitmap](#) &image)  
*Set input image.*

### Protected Member Functions

- bool [TryJPEG2000Codec](#) (const [DataElement](#) &pixelde, [Bitmap](#) const &input, [Bitmap](#) &output)
- bool [TryJPEGCodec](#) (const [DataElement](#) &pixelde, [Bitmap](#) const &input, [Bitmap](#) &output)
- bool [TryJPEGLSCCodec](#) (const [DataElement](#) &pixelde, [Bitmap](#) const &input, [Bitmap](#) &output)
- bool [TryRAWCodec](#) (const [DataElement](#) &pixelde, [Bitmap](#) const &input, [Bitmap](#) &output)
- bool [TryRLECodec](#) (const [DataElement](#) &pixelde, [Bitmap](#) const &input, [Bitmap](#) &output)

### Additional Inherited Members

### Protected Attributes inherited from [gdcm::BitmapToBitmapFilter](#)

- [SmartPointer](#)< [Bitmap](#) > [Input](#)
- [SmartPointer](#)< [Bitmap](#) > [Output](#)

### 12.150.1 Detailed Description

[ImageChangeTransferSyntax](#) class.

Class to change the transfer syntax of an input DICOM

If only Force param is set but no input [TransferSyntax](#) is set, it is assumed that user only wants to inspect encapsulated stream (advanced dev. option).

When using UserCodec it is very important that the [TransferSyntax](#) (as set in SetTransferSyntax) is actually understood by UserCodec (ie. UserCodec->CanCode( TransferSyntax ) ). Otherwise the behavior is to use a default codec.

See also

[JPEGCodec](#) [JPEGLSCodec](#) [JPEG2000Codec](#)

Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), and [StandardizeFiles.cs](#).

### 12.150.2 Constructor & Destructor Documentation

#### 12.150.2.1 ImageChangeTransferSyntax()

```
gdcm::ImageChangeTransferSyntax::ImageChangeTransferSyntax () [inline]
```

#### 12.150.2.2 ~ImageChangeTransferSyntax()

```
gdcm::ImageChangeTransferSyntax::~~ImageChangeTransferSyntax () [default]
```

### 12.150.3 Member Function Documentation

#### 12.150.3.1 Change()

```
bool gdcm::ImageChangeTransferSyntax::Change ()
```

Change.

Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), and [StandardizeFiles.cs](#).

### 12.150.3.2 GetTransferSyntax()

```
const TransferSyntax & gdcm::ImageChangeTransferSyntax::GetTransferSyntax () const [inline]
```

Get Transfer Syntax.

### 12.150.3.3 SetCompressIconImage()

```
void gdcm::ImageChangeTransferSyntax::SetCompressIconImage (  
    bool b) [inline]
```

Decide whether or not to also compress the Icon [Image](#) using the same Transfer Syntax. Default is to simply decompress icon image

#### Examples

[StandardizeFiles.cs](#).

### 12.150.3.4 SetForce()

```
void gdcm::ImageChangeTransferSyntax::SetForce (  
    bool f) [inline]
```

When target Transfer Syntax is identical to input target syntax, no operation is actually done. This is an issue when someone wants to re-compress using GDCM internal implementation a JPEG (for example) image

#### Examples

[StandardizeFiles.cs](#).

### 12.150.3.5 SetTransferSyntax()

```
void gdcm::ImageChangeTransferSyntax::SetTransferSyntax (  
    const TransferSyntax & ts) [inline]
```

Set target Transfer Syntax.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), and [StandardizeFiles.cs](#).

### 12.150.3.6 SetUserCodec()

```
void gdcm::ImageChangeTransferSyntax::SetUserCodec (
    ImageCodec * ic) [inline]
```

Allow user to specify exactly which codec to use. this is needed to specify special qualities or compression option.

#### Warning

if the codec 'ic' is not compatible with the [TransferSyntax](#) requested, it will not be used. It is the user responsibility to check that `UserCodec->CanCode( TransferSyntax )`

#### Examples

[CompressLossyJPEG.cs](#).

### 12.150.3.7 TryJPEG2000Codec()

```
bool gdcm::ImageChangeTransferSyntax::TryJPEG2000Codec (
    const DataElement & pixelde,
    Bitmap const & input,
    Bitmap & output) [protected]
```

### 12.150.3.8 TryJPEGCodec()

```
bool gdcm::ImageChangeTransferSyntax::TryJPEGCodec (
    const DataElement & pixelde,
    Bitmap const & input,
    Bitmap & output) [protected]
```

### 12.150.3.9 TryJPEGLSCodec()

```
bool gdcm::ImageChangeTransferSyntax::TryJPEGLSCodec (
    const DataElement & pixelde,
    Bitmap const & input,
    Bitmap & output) [protected]
```

### 12.150.3.10 TryRAWCodec()

```
bool gdcm::ImageChangeTransferSyntax::TryRAWCodec (
    const DataElement & pixelde,
    Bitmap const & input,
    Bitmap & output) [protected]
```



## 12.150.3.11 TryRLECodec()

```
bool gdcm::ImageChangeTransferSyntax::TryRLECodec (
    const DataElement & pixelde,
    Bitmap const & input,
    Bitmap & output) [protected]
```

The documentation for this class was generated from the following file:

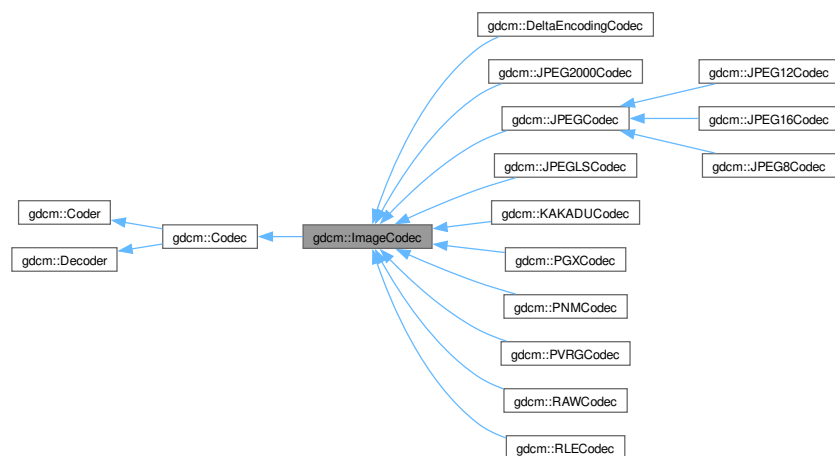
- [gdcmImageChangeTransferSyntax.h](#)

## 12.151 gdcm::ImageCodec Class Reference

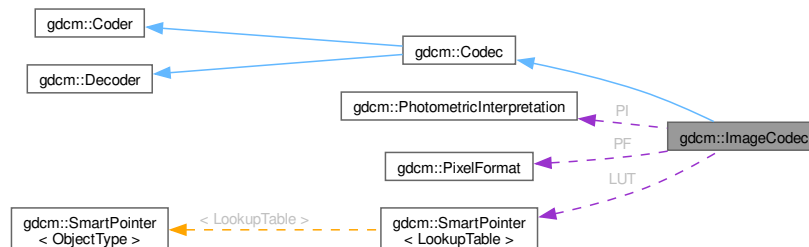
[ImageCodec](#).

```
#include <gdcmImageCodec.h>
```

Inheritance diagram for gdcm::ImageCodec:



Collaboration diagram for gdcm::ImageCodec:



## Public Member Functions

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- virtual [ImageCodec](#) \* [Clone](#) () const =0
- bool [Decode](#) ([DataElement](#) const &is\_, [DataElement](#) &os) override  
*Decode.*
- const unsigned int \* [GetDimensions](#) () const
- virtual bool [GetHeaderInfo](#) (std::istream &is\_, [TransferSyntax](#) &ts)
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

## Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default
- virtual bool [Code](#) ([DataElement](#) const &in\_, [DataElement](#) &out\_)  
*Code.*

## Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

## Protected Types

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

### Protected Member Functions

- virtual bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- virtual bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- bool [DecodeByStreams](#) (std::istream &is\_, std::ostream &os) override
- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsFrameEncoder](#) ()
- virtual bool [IsRowEncoder](#) ()
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)
- virtual bool [StartEncode](#) (std::ostream &os)
- virtual bool [StopEncode](#) (std::ostream &os)

### Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

### Protected Attributes

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) LUT
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) PF
- [PhotometricInterpretation](#) PI
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

### Friends

- class [FileChangeTransferSyntax](#)
- class [ImageChangePhotometricInterpretation](#)

### 12.151.1 Detailed Description

[ImageCodec](#).

#### Note

Main codec, this is a central place for all implementation

#### Examples

[FileChangeTSLossy.cs](#).

### 12.151.2 Member Typedef Documentation

#### 12.151.2.1 LUTPtr

```
typedef SmartPointer<LookupTable> gdcm::ImageCodec::LUTPtr [protected]
```

### 12.151.3 Constructor & Destructor Documentation

#### 12.151.3.1 ImageCodec()

```
gdcm::ImageCodec::ImageCodec ()
```

Referenced by [Clone\(\)](#), [gdcm::JPEG2000Codec::Clone\(\)](#), [gdcm::JPEGCodec::Clone\(\)](#), [gdcm::JPEGLSCodec::Clone\(\)](#), [gdcm::KAKADUCodec::Clone\(\)](#), [gdcm::PGXCodec::Clone\(\)](#), [gdcm::PNMCodec::Clone\(\)](#), [gdcm::PVRGCodec::Clone\(\)](#), [gdcm::RAWCodec::Clone\(\)](#), and [gdcm::RLECodec::Clone\(\)](#).

#### 12.151.3.2 ~ImageCodec()

```
gdcm::ImageCodec::~~ImageCodec () [override]
```

### 12.151.4 Member Function Documentation

#### 12.151.4.1 AppendFrameEncode()

```
virtual bool gdcm::ImageCodec::AppendFrameEncode (  
    std::ostream & out,  
    const char * data,  
    size_t datalen) [protected], [virtual]
```

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), and [gdcm::RLECodec](#).

#### 12.151.4.2 AppendRowEncode()

```
virtual bool gdcmm::ImageCodec::AppendRowEncode (
    std::ostream & out,
    const char * data,
    size_t datalen) [protected], [virtual]
```

Reimplemented in [gdcmm::JPEG2000Codec](#), [gdcmm::JPEGCodec](#), [gdcmm::JPEGLSCodec](#), and [gdcmm::RLECodec](#).

#### 12.151.4.3 CanCode()

```
bool gdcmm::ImageCodec::CanCode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Implements [gdcmm::Coder](#).

Reimplemented in [gdcmm::JPEG2000Codec](#), [gdcmm::JPEGCodec](#), [gdcmm::JPEGLSCodec](#), [gdcmm::KAKADUCodec](#), [gdcmm::PGXCodec](#), [gdcmm::PNMCodec](#), [gdcmm::PVRGCodec](#), [gdcmm::RAWCodec](#), and [gdcmm::RLECodec](#).

#### 12.151.4.4 CanDecode()

```
bool gdcmm::ImageCodec::CanDecode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Implements [gdcmm::Decoder](#).

Reimplemented in [gdcmm::JPEG2000Codec](#), [gdcmm::JPEGCodec](#), [gdcmm::JPEGLSCodec](#), [gdcmm::KAKADUCodec](#), [gdcmm::PGXCodec](#), [gdcmm::PNMCodec](#), [gdcmm::PVRGCodec](#), [gdcmm::RAWCodec](#), and [gdcmm::RLECodec](#).

#### 12.151.4.5 CleanupUnusedBits()

```
bool gdcmm::ImageCodec::CleanupUnusedBits (
    char * data,
    size_t datalen)
```

#### 12.151.4.6 Clone()

```
virtual ImageCodec * gdcmm::ImageCodec::Clone () const [pure virtual]
```

Implemented in [gdcmm::JPEG2000Codec](#), [gdcmm::JPEGCodec](#), [gdcmm::JPEGLSCodec](#), [gdcmm::KAKADUCodec](#), [gdcmm::PGXCodec](#), [gdcmm::PNMCodec](#), [gdcmm::PVRGCodec](#), [gdcmm::RAWCodec](#), and [gdcmm::RLECodec](#).

References [ImageCodec\(\)](#).

#### 12.151.4.7 Decode()

```
bool gdcM::ImageCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcM::Decoder](#).

Reimplemented in [gdcM::JPEG2000Codec](#), [gdcM::JPEGCodec](#), [gdcM::JPEGLSCodec](#), [gdcM::KAKADUCodec](#), [gdcM::PVRGCodec](#), [gdcM::RAWCodec](#), and [gdcM::RLECodec](#).

#### 12.151.4.8 DecodeByStreams()

```
bool gdcM::ImageCodec::DecodeByStreams (
    std::istream & is_,
    std::ostream & os) [override], [protected], [virtual]
```

Reimplemented from [gdcM::Decoder](#).

Reimplemented in [gdcM::JPEG12Codec](#), [gdcM::JPEG16Codec](#), [gdcM::JPEG2000Codec](#), [gdcM::JPEG8Codec](#), [gdcM::JPEGCodec](#), [gdcM::RAWCodec](#), and [gdcM::RLECodec](#).

#### 12.151.4.9 DoByteSwap()

```
bool gdcM::ImageCodec::DoByteSwap (
    std::istream & is_,
    std::ostream & os) [protected]
```

#### 12.151.4.10 DoInvertMonochrome()

```
bool gdcM::ImageCodec::DoInvertMonochrome (
    std::istream & is_,
    std::ostream & os) [protected]
```

#### 12.151.4.11 DoOverlayCleanup()

```
bool gdcM::ImageCodec::DoOverlayCleanup (
    std::istream & is_,
    std::ostream & os) [protected]
```

#### 12.151.4.12 DoPaddedCompositePixelCode()

```
bool gdcM::ImageCodec::DoPaddedCompositePixelCode (
    std::istream & is_,
    std::ostream & os) [protected]
```

#### 12.151.4.13 DoPlanarConfiguration()

```
bool gdcmm::ImageCodec::DoPlanarConfiguration (
    std::istream & is_,
    std::ostream & os) [protected]
```

#### 12.151.4.14 DoSimpleCopy()

```
bool gdcmm::ImageCodec::DoSimpleCopy (
    std::istream & is_,
    std::ostream & os) [protected]
```

#### 12.151.4.15 DoYBR()

```
bool gdcmm::ImageCodec::DoYBR (
    std::istream & is_,
    std::ostream & os) [protected]
```

#### 12.151.4.16 DoYBRFull422()

```
bool gdcmm::ImageCodec::DoYBRFull422 (
    std::istream & is_,
    std::ostream & os) [protected]
```

#### 12.151.4.17 GetDimensions()

```
const unsigned int * gdcmm::ImageCodec::GetDimensions () const [inline]
```

References [Dimensions](#).

#### 12.151.4.18 GetHeaderInfo()

```
virtual bool gdcmm::ImageCodec::GetHeaderInfo (
    std::istream & is_,
    TransferSyntax & ts) [virtual]
```

Reimplemented in [gdcmm::JPEG12Codec](#), [gdcmm::JPEG16Codec](#), [gdcmm::JPEG2000Codec](#), [gdcmm::JPEG8Codec](#), [gdcmm::JPEGCodec](#), [gdcmm::JPEGLSCCodec](#), [gdcmm::PGXCodec](#), [gdcmm::PNMCodec](#), [gdcmm::RAWCodec](#), and [gdcmm::RLECodec](#).

#### 12.151.4.19 GetLossyFlag()

```
bool gdcmm::ImageCodec::GetLossyFlag () const
```

#### 12.151.4.20 GetLUT()

```
const LookupTable & gdcm::ImageCodec::GetLUT () const [inline]
```

References [LUT](#).

#### 12.151.4.21 GetNeedByteSwap()

```
bool gdcm::ImageCodec::GetNeedByteSwap () const [inline]
```

References [NeedByteSwap](#).

#### 12.151.4.22 GetNumberOfDimensions()

```
unsigned int gdcm::ImageCodec::GetNumberOfDimensions () const
```

#### 12.151.4.23 GetPhotometricInterpretation()

```
const PhotometricInterpretation & gdcm::ImageCodec::GetPhotometricInterpretation () const
```

#### 12.151.4.24 GetPixelFormat() [1/2]

```
PixelFormat & gdcm::ImageCodec::GetPixelFormat () [inline]
```

##### Examples

[GetJPEGSamplePrecision.cxx](#).

References [PF](#).

#### 12.151.4.25 GetPixelFormat() [2/2]

```
const PixelFormat & gdcm::ImageCodec::GetPixelFormat () const [inline]
```

References [PF](#).

#### 12.151.4.26 GetPlanarConfiguration()

```
unsigned int gdcm::ImageCodec::GetPlanarConfiguration () const [inline]
```

References [PlanarConfiguration](#).



#### 12.151.4.27 IsFrameEncoder()

```
virtual bool gdcm::ImageCodec::IsFrameEncoder () [protected], [virtual]
```

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), and [gdcm::RLECodec](#).

#### 12.151.4.28 IsLossy()

```
bool gdcm::ImageCodec::IsLossy () const
```

#### 12.151.4.29 IsRowEncoder()

```
virtual bool gdcm::ImageCodec::IsRowEncoder () [protected], [virtual]
```

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), and [gdcm::RLECodec](#).

#### 12.151.4.30 IsValid()

```
virtual bool gdcm::ImageCodec::IsValid (
    PhotometricInterpretation const & pi) [protected], [virtual]
```

Reimplemented in [gdcm::JPEGCodec](#).

#### 12.151.4.31 SetDimensions() [1/2]

```
void gdcm::ImageCodec::SetDimensions (
    const std::vector< unsigned int > & d)
```

#### 12.151.4.32 SetDimensions() [2/2]

```
void gdcm::ImageCodec::SetDimensions (
    const unsigned int d[3])
```

#### Examples

[ExtractIconFromFile.cxx](#).

#### 12.151.4.33 SetLossyFlag()

```
void gdcm::ImageCodec::SetLossyFlag (
    bool l)
```

#### 12.151.4.34 SetLUT()

```
void gdcm::ImageCodec::SetLUT (
    LookupTable const & lut) [inline]
```

##### Examples

[ExtractIconFromFile.cxx](#).

References [LUT](#).

#### 12.151.4.35 SetNeedByteSwap()

```
void gdcm::ImageCodec::SetNeedByteSwap (
    bool b) [inline]
```

References [NeedByteSwap](#).

#### 12.151.4.36 SetNeedOverlayCleanup()

```
void gdcm::ImageCodec::SetNeedOverlayCleanup (
    bool b) [inline]
```

References [NeedOverlayCleanup](#).

#### 12.151.4.37 SetNumberOfDimensions()

```
void gdcm::ImageCodec::SetNumberOfDimensions (
    unsigned int dim)
```

#### 12.151.4.38 SetPhotometricInterpretation()

```
void gdcm::ImageCodec::SetPhotometricInterpretation (
    PhotometricInterpretation const & pi)
```

##### Examples

[ExtractIconFromFile.cxx](#).

#### 12.151.4.39 SetPixelFormat()

```
virtual void gdcm::ImageCodec::SetPixelFormat (
    PixelFormat const & pf) [inline], [virtual]
```

Reimplemented in [gdcm::JPEGCodec](#).

##### Examples

[ExtractIconFromFile.cxx](#).

References [PF](#).

#### 12.151.4.40 SetPlanarConfiguration()

```
void gdcm::ImageCodec::SetPlanarConfiguration (
    unsigned int pc) [inline]
```

References [PlanarConfiguration](#).

#### 12.151.4.41 StartEncode()

```
virtual bool gdcm::ImageCodec::StartEncode (
    std::ostream & os) [protected], [virtual]
```

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), and [gdcm::RLECodec](#).

#### 12.151.4.42 StopEncode()

```
virtual bool gdcm::ImageCodec::StopEncode (
    std::ostream & os) [protected], [virtual]
```

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), and [gdcm::RLECodec](#).

### 12.151.5 Friends And Related Symbol Documentation

#### 12.151.5.1 FileChangeTransferSyntax

```
friend class FileChangeTransferSyntax [friend]
```

This is a high level API to encode in a streaming fashion. Each plugin will handle differently the caching mechanism so that a limited memory is used when compressing dataset. [Codec](#) will fall into two categories:

- Full row encoder: only a single scanline (row) of data is needed to be loaded at a time;
- Full frame encoder (default): a complete frame (row x col) is needed to be loaded at a time

References [FileChangeTransferSyntax](#).

Referenced by [FileChangeTransferSyntax](#).

### 12.151.5.2 ImageChangePhotometricInterpretation

```
friend class ImageChangePhotometricInterpretation [friend]
```

References [ImageChangePhotometricInterpretation](#).

Referenced by [ImageChangePhotometricInterpretation](#).

## 12.151.6 Member Data Documentation

### 12.151.6.1 Dimensions

```
unsigned int gdcm::ImageCodec::Dimensions[3] [protected]
```

Referenced by [GetDimensions\(\)](#).

### 12.151.6.2 LossyFlag

```
bool gdcm::ImageCodec::LossyFlag [protected]
```

### 12.151.6.3 LUT

```
LUTPtr gdcm::ImageCodec::LUT [protected]
```

Referenced by [GetLUT\(\)](#), and [SetLUT\(\)](#).

### 12.151.6.4 NeedByteSwap

```
bool gdcm::ImageCodec::NeedByteSwap [protected]
```

Referenced by [GetNeedByteSwap\(\)](#), and [SetNeedByteSwap\(\)](#).

### 12.151.6.5 NeedOverlayCleanup

```
bool gdcm::ImageCodec::NeedOverlayCleanup [protected]
```

Referenced by [SetNeedOverlayCleanup\(\)](#).

### 12.151.6.6 NumberOfDimensions

```
unsigned int gdcm::ImageCodec::NumberOfDimensions [protected]
```

### 12.151.6.7 PF

`PixelFormat` `gdcm::ImageCodec::PF` [protected]

Referenced by [GetPixelFormat\(\)](#), [GetPixelFormat\(\)](#), and [SetPixelFormat\(\)](#).

### 12.151.6.8 PI

`PhotometricInterpretation` `gdcm::ImageCodec::PI` [protected]

### 12.151.6.9 PlanarConfiguration

`unsigned int` `gdcm::ImageCodec::PlanarConfiguration` [protected]

Referenced by [GetPlanarConfiguration\(\)](#), and [SetPlanarConfiguration\(\)](#).

### 12.151.6.10 RequestPaddedCompositePixelCode

`bool` `gdcm::ImageCodec::RequestPaddedCompositePixelCode` [protected]

### 12.151.6.11 RequestPlanarConfiguration

`bool` `gdcm::ImageCodec::RequestPlanarConfiguration` [protected]

The documentation for this class was generated from the following file:

- [gdcmImageCodec.h](#)

## 12.152 gdcm::ImageConverter Class Reference

[Image](#) Converter.

```
#include <gdcmImageConverter.h>
```

### Public Member Functions

- [ImageConverter](#) ()
- [~ImageConverter](#) ()
- void [Convert](#) ()
- const [Image](#) & [GetOutput](#) () const
- void [SetInput](#) ([Image](#) const &input)

### 12.152.1 Detailed Description

[Image](#) Converter.

#### Note

This is the class used to convert from on [Image](#) to another This is typically used to convert let say YBR JPEG compressed [Image](#) to a RAW RGB [Image](#). So that the buffer can be directly pass to third party application. This filter is application level and not integrated directly in GDCM

### 12.152.2 Constructor & Destructor Documentation

#### 12.152.2.1 ImageConverter()

```
gdcm::ImageConverter::ImageConverter ()
```

#### 12.152.2.2 ~ImageConverter()

```
gdcm::ImageConverter::~~ImageConverter ()
```

### 12.152.3 Member Function Documentation

#### 12.152.3.1 Convert()

```
void gdcm::ImageConverter::Convert ()
```

#### 12.152.3.2 GetOutput()

```
const Image & gdcm::ImageConverter::GetOutput () const
```

#### 12.152.3.3 SetInput()

```
void gdcm::ImageConverter::SetInput (  
    Image const & input)
```

The documentation for this class was generated from the following file:

- [gdcmImageConverter.h](#)

## 12.153 gdcm::ImageFragmentSplitter Class Reference

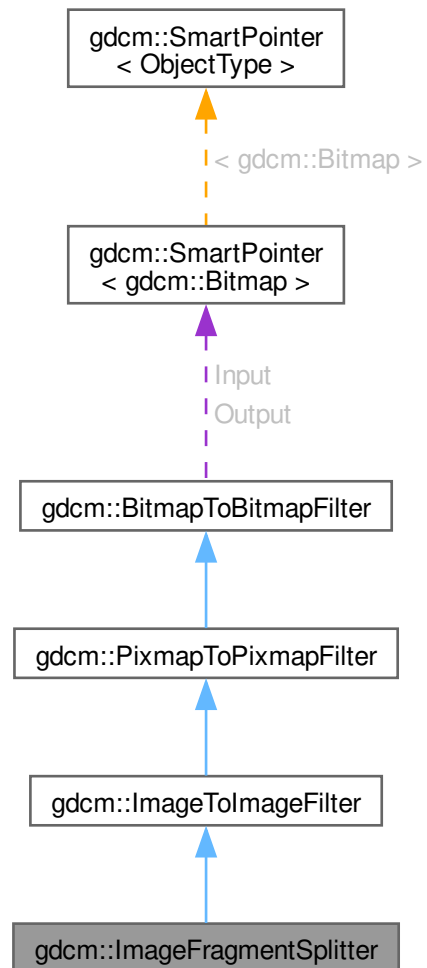
[ImageFragmentSplitter](#) class.

```
#include <gdcmImageFragmentSplitter.h>
```

Inheritance diagram for gdcm::ImageFragmentSplitter:



Collaboration diagram for `gdcm::ImageFragmentSplitter`:



### Public Member Functions

- [ImageFragmentSplitter](#) ()
- [~ImageFragmentSplitter](#) ()=default
- unsigned int [GetFragmentSizeMax](#) () const
- void [SetForce](#) (bool f)
- void [SetFragmentSizeMax](#) (unsigned int fragsize)  
*FragmentSizeMax needs to be an even number.*
- bool [Split](#) ()  
*Split.*



**Public Member Functions inherited from [gdcm::ImageToImageFilter](#)**

- [ImageToImageFilter](#) ()
- [~ImageToImageFilter](#) ()=default
- [Image](#) & [GetInput](#) ()
- const [Image](#) & [GetOutput](#) () const

*Get Output image.*

**Public Member Functions inherited from [gdcm::PixmapToPixmapFilter](#)**

- [PixmapToPixmapFilter](#) ()
- [~PixmapToPixmapFilter](#) ()=default
- [Pixmap](#) & [GetInput](#) ()
- const [Pixmap](#) & [GetOutput](#) () const
- const [Pixmap](#) & [GetOutputAsPixmap](#) () const

*Get Output image.*

**Public Member Functions inherited from [gdcm::BitmapToBitmapFilter](#)**

- [BitmapToBitmapFilter](#) ()
- [~BitmapToBitmapFilter](#) ()=default
- const [Bitmap](#) & [GetOutput](#) () const
- const [Bitmap](#) & [GetOutputAsBitmap](#) () const
- void [SetInput](#) (const [Bitmap](#) &image)

*Get Output image.*

*Set input image.*

**Additional Inherited Members****Protected Attributes inherited from [gdcm::BitmapToBitmapFilter](#)**

- [SmartPointer](#)< [Bitmap](#) > [Input](#)
- [SmartPointer](#)< [Bitmap](#) > [Output](#)

**12.153.1 Detailed Description**

[ImageFragmentSplitter](#) class.

For single frame image, DICOM standard allow splitting the frame into multiple fragments

**12.153.2 Constructor & Destructor Documentation****12.153.2.1 [ImageFragmentSplitter](#)()**

```
gdcm::ImageFragmentSplitter::ImageFragmentSplitter () [inline]
```

### 12.153.2.2 ~ImageFragmentSplitter()

```
gdcmm::ImageFragmentSplitter::~~ImageFragmentSplitter () [default]
```

## 12.153.3 Member Function Documentation

### 12.153.3.1 GetFragmentSizeMax()

```
unsigned int gdcmm::ImageFragmentSplitter::GetFragmentSizeMax () const [inline]
```

### 12.153.3.2 SetForce()

```
void gdcmm::ImageFragmentSplitter::SetForce (  
    bool f) [inline]
```

When file already has all it's segment < FragmentSizeMax there is not need to run the filter. Unless the user explicitly say 'force' recomputation !

### 12.153.3.3 SetFragmentSizeMax()

```
void gdcmm::ImageFragmentSplitter::SetFragmentSizeMax (  
    unsigned int fragsize)
```

FragmentSizeMax needs to be an even number.

### 12.153.3.4 Split()

```
bool gdcmm::ImageFragmentSplitter::Split ()
```

Split.

The documentation for this class was generated from the following file:

- [gdcmmImageFragmentSplitter.h](#)

## 12.154 gdcmm::ImageHelper Class Reference

[ImageHelper](#) (internal class, not intended for user level).

```
#include <gdcmmImageHelper.h>
```

## Static Public Member Functions

- static [MediaStorage](#) [ComputeMediaStorageFromModality](#) (const char \*modality, unsigned int dimension=2, [PixelFormat](#) const &pf=[PixelFormat](#)(), [PhotometricInterpretation](#) const &pi=[PhotometricInterpretation](#)(), double rescaleintercept=0, double rescaleslope=1)

*Moved from [MediaStorage](#) here, since we need extra info stored in [PixelFormat](#) & [PhotometricInterpretation](#).*

- static bool [ComputeSpacingFromImagePositionPatient](#) (const std::vector< double > &imageposition, std::vector< double > &spacing)

*DO NOT USE.*

- static std::vector< unsigned int > [GetDimensionsValue](#) (const [File](#) &f)
- static bool [GetDirectionCosinesFromDataSet](#) ([DataSet](#) const &ds, std::vector< double > &dircos)
- static std::vector< double > [GetDirectionCosinesValue](#) ([File](#) const &f)
- static bool [GetForcePixelSpacing](#) ()
- static bool [GetForceRescaleInterceptSlope](#) ()
- static [SmartPointer< LookupTable >](#) [GetLUT](#) ([File](#) const &f)

*returns the lookup table of an image file*

- static std::vector< double > [GetOriginValue](#) ([File](#) const &f)

*Set/Get Origin (IPP) from/to a file.*

- static [PhotometricInterpretation](#) [GetPhotometricInterpretationValue](#) ([File](#) const &f)
- static [PixelFormat](#) [GetPixelFormatValue](#) (const [File](#) &f)
- static unsigned int [GetPlanarConfigurationValue](#) (const [File](#) &f)
- static bool [GetPMSRescaleInterceptSlope](#) ()
- static const [ByteValue](#) \* [GetPointerFromElement](#) ([Tag](#) const &tag, [File](#) const &f)
- static bool [GetRealWorldValueMappingContent](#) ([File](#) const &f, [RealWorldValueMappingContent](#) &rwvmc)
- static std::vector< double > [GetRescaleInterceptSlopeValue](#) ([File](#) const &f)
- static bool [GetSecondaryCaptureImagePlaneModule](#) ()
- static std::vector< double > [GetSpacingValue](#) ([File](#) const &f)

*Set/Get [Spacing](#) from/to a [File](#).*

- static void [SetDimensionsValue](#) ([File](#) &f, const [Pixmap](#) &img)
- static void [SetDirectionCosinesValue](#) ([DataSet](#) &ds, const std::vector< double > &dircos)
- static void [SetForcePixelSpacing](#) (bool)
- static void [SetForceRescaleInterceptSlope](#) (bool)
- static void [SetOriginValue](#) ([DataSet](#) &ds, const [Image](#) &img)
- static void [SetPMSRescaleInterceptSlope](#) (bool)
- static void [SetRescaleInterceptSlopeValue](#) ([File](#) &f, const [Image](#) &img)
- static void [SetSecondaryCaptureImagePlaneModule](#) (bool)
- static void [SetSpacingValue](#) ([DataSet](#) &ds, const std::vector< double > &spacing)

## Static Protected Member Functions

- static [Tag](#) [GetSpacingTagFromMediaStorage](#) ([MediaStorage](#) const &ms)
- static [Tag](#) [GetZSpacingTagFromMediaStorage](#) ([MediaStorage](#) const &ms)

### 12.154.1 Detailed Description

[ImageHelper](#) (internal class, not intended for user level).

Helper for writing World images in DICOM. DICOM has a 'template' approach to image where MR [Image](#) Storage are distinct object from Enhanced MR [Image](#) Storage. For example the Pixel [Spacing](#) in one object is not at the same position (ie [Tag](#)) as in the other this class is the central (read: fragile) place where all the dispatching is done from a unified view of a world image (typically VTK or ITK point of view) down to the low level DICOM point of view.

#### Warning

: do not expect the API of this class to be maintained at any point, since as Modalities are added the API might have to be augmented or behavior changed to cope with new modalities.

#### Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), and [ExtractOneFrame.cs](#).

### 12.154.2 Member Function Documentation

#### 12.154.2.1 ComputeMediaStorageFromModality()

```
MediaStorage gdcm::ImageHelper::ComputeMediaStorageFromModality (
    const char * modality,
    unsigned int dimension = 2,
    PixelFormat const & pf = PixelFormat(),
    PhotometricInterpretation const & pi = PhotometricInterpretation(),
    double rescaleintercept = 0,
    double rescaleslope = 1) [static]
```

Moved from [MediaStorage](#) here, since we need extra info stored in [PixelFormat](#) & [PhotometricInterpretation](#).

#### 12.154.2.2 ComputeSpacingFromImagePositionPatient()

```
bool gdcm::ImageHelper::ComputeSpacingFromImagePositionPatient (
    const std::vector< double > & imageposition,
    std::vector< double > & spacing) [static]
```

DO NOT USE.

#### 12.154.2.3 GetDimensionsValue()

```
std::vector< unsigned int > gdcm::ImageHelper::GetDimensionsValue (
    const File & f) [static]
```

This function checks tags (0x0028, 0x0010) and (0x0028, 0x0011) for the rows and columns of the image in pixels (as opposed to actual distances). The output is {col , row}

#### Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

#### 12.154.2.4 GetDirectionCosinesFromDataSet()

```
bool gdcm::ImageHelper::GetDirectionCosinesFromDataSet (
    DataSet const & ds,
    std::vector< double > & dircos) [static]
```

#### 12.154.2.5 GetDirectionCosinesValue()

```
std::vector< double > gdcm::ImageHelper::GetDirectionCosinesValue (
    File const & f) [static]
```

Get Direction Cosines (IOP) from/to a file Requires a file because mediastorage must be known

#### 12.154.2.6 GetForcePixelSpacing()

```
bool gdcm::ImageHelper::GetForcePixelSpacing () [static]
```

#### 12.154.2.7 GetForceRescaleInterceptSlope()

```
bool gdcm::ImageHelper::GetForceRescaleInterceptSlope () [static]
```

#### 12.154.2.8 GetLUT()

```
SmartPointer< LookupTable > gdcm::ImageHelper::GetLUT (
    File const & f) [static]
```

returns the lookup table of an image file

#### 12.154.2.9 GetOriginValue()

```
std::vector< double > gdcm::ImageHelper::GetOriginValue (
    File const & f) [static]
```

Set/Get Origin (IPP) from/to a file.

#### 12.154.2.10 GetPhotometricInterpretationValue()

```
PhotometricInterpretation gdcm::ImageHelper::GetPhotometricInterpretationValue (
    File const & f) [static]
```

#### Examples

[ExtractImageRegion.cs](#).

**12.154.2.11 GetPixelFormatValue()**

```
PixelFormat gdcM::ImageHelper::GetPixelFormatValue (
    const File & f) [static]
```

This function returns pixel information about an image from its dataset That includes samples per pixel and bit depth (in that order)

**Examples**

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), and [ExtractOneFrame.cs](#).

**12.154.2.12 GetPlanarConfigurationValue()**

```
unsigned int gdcM::ImageHelper::GetPlanarConfigurationValue (
    const File & f) [static]
```

**12.154.2.13 GetPMSRescaleInterceptSlope()**

```
bool gdcM::ImageHelper::GetPMSRescaleInterceptSlope () [static]
```

**12.154.2.14 GetPointerFromElement()**

```
const ByteValue * gdcM::ImageHelper::GetPointerFromElement (
    Tag const & tag,
    File const & f) [static]
```

**12.154.2.15 GetRealWorldValueMappingContent()**

```
bool gdcM::ImageHelper::GetRealWorldValueMappingContent (
    File const & f,
    RealWorldValueMappingContent & rwvmc) [static]
```

**12.154.2.16 GetRescaleInterceptSlopeValue()**

```
std::vector< double > gdcM::ImageHelper::GetRescaleInterceptSlopeValue (
    File const & f) [static]
```

Set/Get shift/scale from/to a file

**Warning**

this function reads/sets the Slope/Intercept in appropriate class storage, but also Grid Scaling in RT Dose Storage  
Can't take a dataset because the mediastorage of the file must be known

### 12.154.2.17 GetSecondaryCaptureImagePlaneModule()

```
bool gdcm::ImageHelper::GetSecondaryCaptureImagePlaneModule () [static]
```

### 12.154.2.18 GetSpacingTagFromMediaStorage()

```
Tag gdcm::ImageHelper::GetSpacingTagFromMediaStorage (
    MediaStorage const & ms) [static], [protected]
```

### 12.154.2.19 GetSpacingValue()

```
std::vector< double > gdcm::ImageHelper::GetSpacingValue (
    File const & f) [static]
```

Set/Get [Spacing](#) from/to a [File](#).

### 12.154.2.20 GetZSpacingTagFromMediaStorage()

```
Tag gdcm::ImageHelper::GetZSpacingTagFromMediaStorage (
    MediaStorage const & ms) [static], [protected]
```

### 12.154.2.21 SetDimensionsValue()

```
void gdcm::ImageHelper::SetDimensionsValue (
    File & f,
    const Pixmap & img) [static]
```

### 12.154.2.22 SetDirectionCosinesValue()

```
void gdcm::ImageHelper::SetDirectionCosinesValue (
    DataSet & ds,
    const std::vector< double > & dircos) [static]
```

Set Direction Cosines (IOP) from/to a file When [IOD](#) does not defines what is IOP (eg. typically Secondary Capture [Image](#) Storage) this call will simply remove the IOP attribute. Else in case of MR/CT image storage, this call will properly lookup the correct attribute to store the IOP.

### 12.154.2.23 SetForcePixelSpacing()

```
void gdcm::ImageHelper::SetForcePixelSpacing (
    bool ) [static]
```

GDCM 1.x compatibility issue: When using ReWrite an MR [Image](#) Storage would be rewritten as Secondary Capture [Object](#) while still having a Pixel [Spacing](#) tag (0028,0030). If you have deal with those files, use this very special flag to handle them Unless explicitly set elsewhere by the standard, it will use value from 0028,0030 / 0018,0088 for the Pixel [Spacing](#) of the [Image](#)

#### 12.154.2.24 SetForceRescaleInterceptSlope()

```
void gdcmm::ImageHelper::SetForceRescaleInterceptSlope (
    bool ) [static]
```

GDCM 1.x compatibility issue: Do not use anymore. This hack was used for some MR [Image](#) Storage generated by Philips Modality. When "Combine MR Rescaling" is set to TRUE, rescaling is removed. But when set to FALSE, the Modality LUT was exported. Internally GDCM now handles this gracefully.

#### 12.154.2.25 SetOriginValue()

```
void gdcmm::ImageHelper::SetOriginValue (
    DataSet & ds,
    const Image & img) [static]
```

#### 12.154.2.26 SetPMSRescaleInterceptSlope()

```
void gdcmm::ImageHelper::SetPMSRescaleInterceptSlope (
    bool ) [static]
```

Since GDCM 2.6.1 Philips Medical [System](#) are read using the Private Field For Rescale Slope/Intercept by default. This mechanism can be deactivated using the following API: This option has no effect when ForceRescaleInterceptSlope is set to true GDCM will only read those private attribute but never write them out.

#### 12.154.2.27 SetRescaleInterceptSlopeValue()

```
void gdcmm::ImageHelper::SetRescaleInterceptSlopeValue (
    File & f,
    const Image & img) [static]
```

#### 12.154.2.28 SetSecondaryCaptureImagePlaneModule()

```
void gdcmm::ImageHelper::SetSecondaryCaptureImagePlaneModule (
    bool ) [static]
```

Opt into [Image Plane Module](#) for Secondary Capture [Image](#) Storage Enable reading [Image](#) Position [Patient](#) (IPP), [Image Orientation Patient](#) (IOP) and Pixel [Spacing](#) (0028,0030) This is a custom extension for some existing dataset (academic)



### 12.154.2.29 SetSpacingValue()

```
void gdcm::ImageHelper::SetSpacingValue (
    DataSet & ds,
    const std::vector< double > & spacing) [static]
```

#### Warning

You need to call SetSpacingValue after SetOriginValue / SetDirectionCosinesValue

The documentation for this class was generated from the following file:

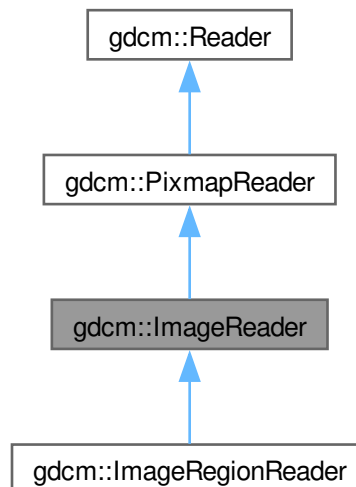
- [gdcmImageHelper.h](#)

## 12.155 gdcm::ImageReader Class Reference

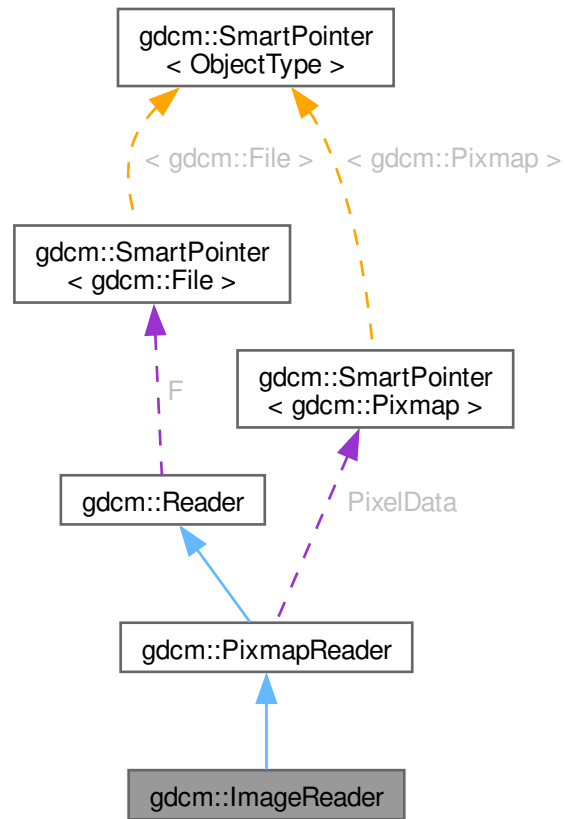
[ImageReader](#).

```
#include <gdcmImageReader.h>
```

Inheritance diagram for gdcm::ImageReader:



Collaboration diagram for `gdcm::ImageReader`:



### Public Member Functions

- `ImageReader ()`
- `~ImageReader ()` override
- `Image & GetImage ()`
- `const Image & GetImage () const`  
*Return the read image.*
- `bool Read ()` override

### Public Member Functions inherited from `gdcm::PixmapReader`

- `PixmapReader ()`
- `~PixmapReader ()` override
- `Pixmap & GetPixmap ()`
- `const Pixmap & GetPixmap () const`  
*Return the read image (need to call `Read()` first).*
- `bool Read ()` override

## Public Member Functions inherited from [gdcm::Reader](#)

- [Reader](#) ()
- virtual [~Reader](#) ()
- bool [CanRead](#) () const
- [File](#) & [GetFile](#) ()  
*Set/Get File.*
- const [File](#) & [GetFile](#) () const  
*Set/Get File.*
- size\_t [GetStreamCurrentPosition](#) () const
- bool [ReadSelectedPrivateTags](#) (std::set< [PrivateTag](#) > const &ptags, bool readvalues=true)  
*Will only read the specified selected private tags.*
- bool [ReadSelectedTags](#) (std::set< [Tag](#) > const &tags, bool readvalues=true)  
*Will only read the specified selected tags.*
- bool [ReadUpToTag](#) (const [Tag](#) &tag, std::set< [Tag](#) > const &skiptags=std::set< [Tag](#) >())
- void [SetFile](#) ([File](#) &file)  
*Set/Get File.*
- void [SetFileName](#) (const char \*filename\_native)
- void [SetStream](#) (std::istream &input\_stream)  
*Set the open-ed stream directly.*

## Protected Member Functions

- bool [ReadACRNEMAImage](#) () override
- bool [ReadImage](#) ([MediaStorage](#) const &ms) override

## Protected Member Functions inherited from [gdcm::PixmapReader](#)

- bool [ReadImageInternal](#) ([MediaStorage](#) const &ms, bool handlepixeldata=true)

## Protected Member Functions inherited from [gdcm::Reader](#)

- std::istream \* [GetStreamPtr](#) () const
- bool [ReadDataSet](#) ()
- bool [ReadMetaInformation](#) ()
- bool [ReadPreamble](#) ()

## Additional Inherited Members

## Protected Attributes inherited from [gdcm::PixmapReader](#)

- [SmartPointer](#)< [Pixmap](#) > [PixelData](#)

## Protected Attributes inherited from [gdcm::Reader](#)

- [SmartPointer](#) < [File](#) > [F](#)

### 12.155.1 Detailed Description

[ImageReader](#).

#### Note

its role is to convert the DICOM [DataSet](#) into a [Image](#) representation [Image](#) is different from [Pixmap](#) has it has a position and a direction in Space.

#### See also

[Image](#)

#### Examples

[BasicImageAnonymizer.cs](#), [CheckBigEndianBug.cxx](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [ConvertToQImage.cxx](#), [DecompressImage.cs](#), [ExtractIconFromFile.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [MrProtocol.cxx](#), [PatchFile.cxx](#), [PrintLUT.cxx](#), [ReadMultiTimesException.cxx](#), [RescaleImage.cs](#), and [threadgdcm.cxx](#).

### 12.155.2 Constructor & Destructor Documentation

#### 12.155.2.1 [ImageReader\(\)](#)

```
gdcm::ImageReader::ImageReader ()
```

#### 12.155.2.2 [~ImageReader\(\)](#)

```
gdcm::ImageReader::~~ImageReader () [override]
```

### 12.155.3 Member Function Documentation

#### 12.155.3.1 [GetImage\(\)](#) [1/2]

```
Image & gdcm::ImageReader::GetImage ()
```

### 12.155.3.2 GetImage() [2/2]

```
const Image & gdcm::ImageReader::GetImage () const
```

Return the read image.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [ConvertToQImage.cxx](#), [DecompressImage.cs](#), [ExtractIconFromFile.cxx](#), [ExtractImageRegionWithLUT.cs](#), [FixJAIBugJPEGLS.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [PatchFile.cxx](#), [PrintLUT.cxx](#), [ReadMultiTimesException.cxx](#), [RescaleImage.cs](#), [TemplateEmptyImage.cxx](#), and [threadgdcm.cxx](#).

### 12.155.3.3 Read()

```
bool gdcm::ImageReader::Read () [override], [virtual]
```

Read the DICOM image. There are two reason for failure:

1. The input filename is not DICOM
2. The input DICOM file does not contains an [Image](#).

Reimplemented from [gdcm::Reader](#).

Reimplemented in [gdcm::ImageRegionReader](#).

#### Examples

[BasicImageAnonymizer.cs](#), [CheckBigEndianBug.cxx](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [ConvertToQImage.cxx](#), [DecompressImage.cs](#), [ExtractIconFromFile.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MrProtocol.cxx](#), [PatchFile.cxx](#), [PrintLUT.cxx](#), [ReadMultiTimesException.cxx](#), [RescaleImage.cs](#), and [threadgdcm.cxx](#).

### 12.155.3.4 ReadACRNEMAIImage()

```
bool gdcm::ImageReader::ReadACRNEMAIImage () [override], [protected], [virtual]
```

Reimplemented from [gdcm::PixmapReader](#).

### 12.155.3.5 ReadImage()

```
bool gdcm::ImageReader::ReadImage (  
    MediaStorage const & ms) [override], [protected], [virtual]
```

Reimplemented from [gdcm::PixmapReader](#).

The documentation for this class was generated from the following file:

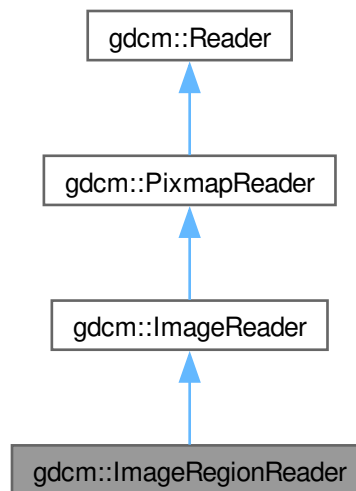
- [gdcmImageReader.h](#)

## 12.156 gdcm::ImageRegionReader Class Reference

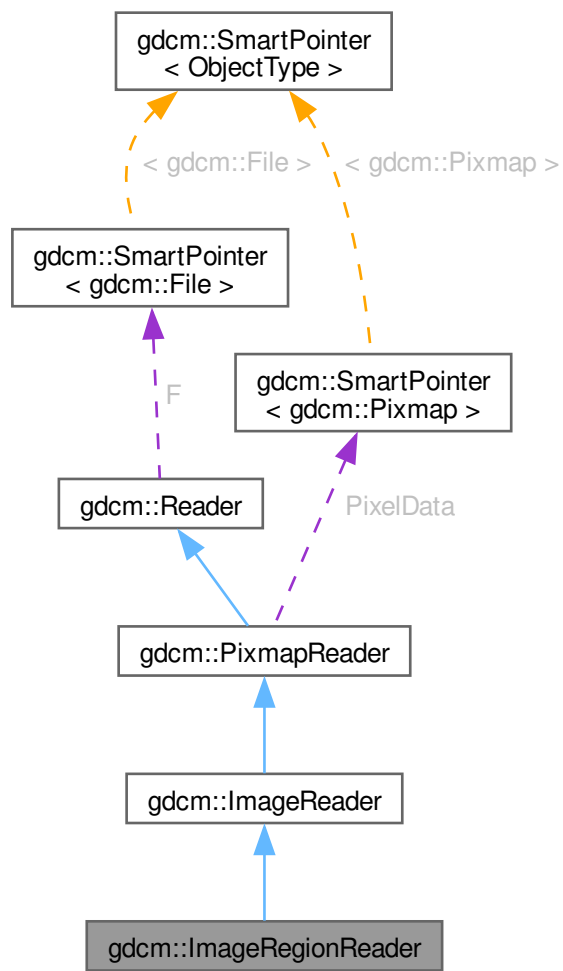
[ImageRegionReader](#).

```
#include <gdcmImageRegionReader.h>
```

Inheritance diagram for gdcm::ImageRegionReader:



Collaboration diagram for gdcm::ImageRegionReader:



### Public Member Functions

- [ImageRegionReader](#) ()
- [~ImageRegionReader](#) () override
- [size\\_t ComputeBufferLength](#) () const
- [Region](#) const & [GetRegion](#) () const
- bool [ReadInformation](#) ()
- bool [ReadIntoBuffer](#) (char \*inreadbuffer, size\_t buflen)
- void [SetRegion](#) ([Region](#) const &region)

*Set/Get [Region](#) to be read.*

## Public Member Functions inherited from [gdcm::ImageReader](#)

- [ImageReader](#) ()
- [~ImageReader](#) () override
- [Image](#) & [GetImage](#) ()
- const [Image](#) & [GetImage](#) () const

*Return the read image.*

## Public Member Functions inherited from [gdcm::PixmapReader](#)

- [PixmapReader](#) ()
- [~PixmapReader](#) () override
- [Pixmap](#) & [GetPixmap](#) ()
- const [Pixmap](#) & [GetPixmap](#) () const

*Return the read image (need to call [Read\(\)](#) first).*

- bool [Read](#) () override

## Public Member Functions inherited from [gdcm::Reader](#)

- [Reader](#) ()
  - virtual [~Reader](#) ()
  - bool [CanRead](#) () const
  - [File](#) & [GetFile](#) ()
- Set/Get File.*
- const [File](#) & [GetFile](#) () const
- Set/Get File.*
- size\_t [GetStreamCurrentPosition](#) () const
  - bool [ReadSelectedPrivateTags](#) (std::set< [PrivateTag](#) > const &ptags, bool readvalues=true)
- Will only read the specified selected private tags.*
- bool [ReadSelectedTags](#) (std::set< [Tag](#) > const &tags, bool readvalues=true)
- Will only read the specified selected tags.*
- bool [ReadUpToTag](#) (const [Tag](#) &tag, std::set< [Tag](#) > const &skiptags=std::set< [Tag](#) >())
  - void [SetFile](#) ([File](#) &file)
- Set/Get File.*
- void [SetFileName](#) (const char \*filename\_native)
  - void [SetStream](#) (std::istream &input\_stream)

*Set the open-ed stream directly.*

## Protected Member Functions

- bool [Read](#) () override
- To prevent user from calling super class [Read\(\)](#) function.*

## Protected Member Functions inherited from [gdcm::ImageReader](#)

- bool [ReadACRNEMAIImage](#) () override
- bool [ReadImage](#) ([MediaStorage](#) const &ms) override



**Protected Member Functions inherited from [gdcm::PixmapReader](#)**

- bool [ReadImageInternal](#) ([MediaStorage](#) const &ms, bool handlepixeldata=true)

**Protected Member Functions inherited from [gdcm::Reader](#)**

- std::istream \* [GetStreamPtr](#) () const
- bool [ReadDataSet](#) ()
- bool [ReadMetaInformation](#) ()
- bool [ReadPreamble](#) ()

**Additional Inherited Members****Protected Attributes inherited from [gdcm::PixmapReader](#)**

- [SmartPointer](#)< [Pixmap](#) > [PixelData](#)

**Protected Attributes inherited from [gdcm::Reader](#)**

- [SmartPointer](#)< [File](#) > [F](#)

**12.156.1 Detailed Description**

[ImageRegionReader](#).

This class is able to read a region from a DICOM file containing an image. This implementation requires that the information stored in the DICOM header are consistent with what is in the encapsulated Pixel Data. This is technically not required by DICOM standard, which makes this implementation illegal with regards to the famous JPEG note: [http://dicom.nema.org/medical/dicom/current/output/chtml/part05/sect\\_8.2.↵html#para\\_4bcb841e-c6bf-4e26-82a5-3fad3c942da0](http://dicom.nema.org/medical/dicom/current/output/chtml/part05/sect_8.2.↵html#para_4bcb841e-c6bf-4e26-82a5-3fad3c942da0)

See also

[ImageReader](#)

Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), and [TemplateEmptyImage.cxx](#).

**12.156.2 Constructor & Destructor Documentation****12.156.2.1 [ImageRegionReader](#)()**

```
gdcm::ImageRegionReader::ImageRegionReader ()
```

### 12.156.2.2 ~ImageRegionReader()

```
gdcm::ImageRegionReader::~~ImageRegionReader () [override]
```

## 12.156.3 Member Function Documentation

### 12.156.3.1 ComputeBufferLength()

```
size_t gdcm::ImageRegionReader::ComputeBufferLength () const
```

Explicit call which will compute the minimal buffer length that can hold the whole uncompressed image as defined by [Region](#) region.

#### Returns

0 upon error

### 12.156.3.2 GetRegion()

```
Region const & gdcm::ImageRegionReader::GetRegion () const
```

### 12.156.3.3 Read()

```
bool gdcm::ImageRegionReader::Read () [override], [protected], [virtual]
```

To prevent user from calling super class [Read\(\)](#) function.

Reimplemented from [gdcm::ImageReader](#).

### 12.156.3.4 ReadInformation()

```
bool gdcm::ImageRegionReader::ReadInformation ()
```

Read meta information (not Pixel Data) from the DICOM file.

#### Returns

false upon error

#### Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), and [TemplateEmptyImage.cxx](#).

### 12.156.3.5 ReadIntoBuffer()

```
bool gdcm::ImageRegionReader::ReadIntoBuffer (
    char * inreadbuffer,
    size_t buflen)
```

Read into buffer: For Python, the `buflen` param is deduced directly from the input bytearray passed as parameter (function only takes one param).

#### Returns

false upon error

#### Examples

[ExtractImageRegion.cs](#), and [ExtractImageRegionWithLUT.cs](#).

### 12.156.3.6 SetRegion()

```
void gdcm::ImageRegionReader::SetRegion (
    Region const & region)
```

Set/Get [Region](#) to be read.

#### Examples

[ExtractImageRegion.cs](#), and [ExtractImageRegionWithLUT.cs](#).

The documentation for this class was generated from the following file:

- [gdcmImageRegionReader.h](#)

## 12.157 gdcm::ImageToImageFilter Class Reference

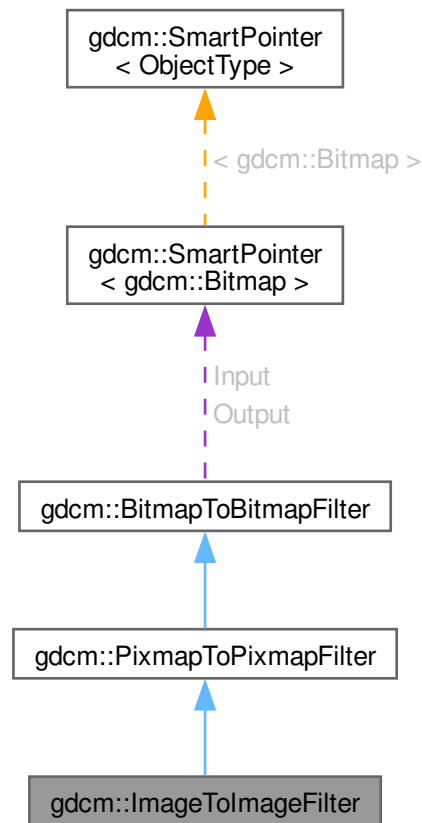
[ImageToImageFilter](#) class.

```
#include <gdcmImageToImageFilter.h>
```

Inheritance diagram for `gdcm::ImageToImageFilter`:



Collaboration diagram for `gdcm::ImageToImageFilter`:



### Public Member Functions

- [ImageToImageFilter \(\)](#)
- [~ImageToImageFilter \(\)](#)=default
- [Image & GetInput \(\)](#)
- [const Image & GetOutput \(\)](#) const  
*Get Output image.*

### Public Member Functions inherited from [gdcm::PixmapToPixmapFilter](#)

- [PixmapToPixmapFilter \(\)](#)
- [~PixmapToPixmapFilter \(\)](#)=default
- [Pixmap & GetInput \(\)](#)
- [const Pixmap & GetOutput \(\)](#) const  
*Get Output image.*
- [const Pixmap & GetOutputAsPixmap \(\)](#) const

**Public Member Functions inherited from [gdcm::BitmapToBitmapFilter](#)**

- [BitmapToBitmapFilter](#) ()
- [~BitmapToBitmapFilter](#) ()=default
- const [Bitmap](#) & [GetOutput](#) () const  
*Get Output image.*
- const [Bitmap](#) & [GetOutputAsBitmap](#) () const
- void [SetInput](#) (const [Bitmap](#) &image)  
*Set input image.*

**Additional Inherited Members****Protected Attributes inherited from [gdcm::BitmapToBitmapFilter](#)**

- [SmartPointer](#)< [Bitmap](#) > [Input](#)
- [SmartPointer](#)< [Bitmap](#) > [Output](#)

**12.157.1 Detailed Description**

[ImageToImageFilter](#) class.

Super class for all filter taking an image and producing an output image

**12.157.2 Constructor & Destructor Documentation****12.157.2.1 [ImageToImageFilter](#)()**

```
gdcm::ImageToImageFilter::ImageToImageFilter ()
```

**12.157.2.2 [~ImageToImageFilter](#)()**

```
gdcm::ImageToImageFilter::~ImageToImageFilter () [default]
```

**12.157.3 Member Function Documentation****12.157.3.1 [GetInput](#)()**

```
Image & gdcm::ImageToImageFilter::GetInput ()
```

### 12.157.3.2 GetOutput()

```
const Image & gdcM::ImageToImageFilter::GetOutput () const
```

Get Output image.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), and [CompressLossyJPEG.cs](#).

The documentation for this class was generated from the following file:

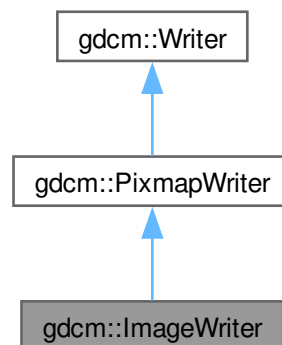
- [gdcMImageToImageFilter.h](#)

## 12.158 gdcM::ImageWriter Class Reference

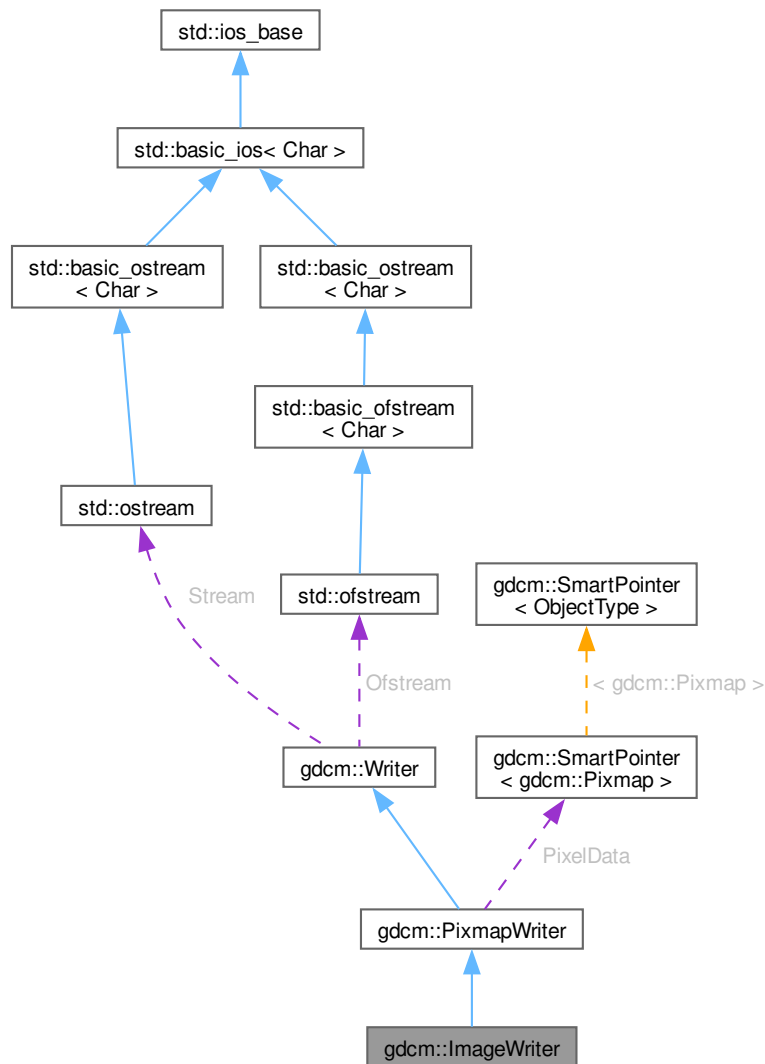
[ImageWriter](#).

```
#include <gdcMImageWriter.h>
```

Inheritance diagram for gdcM::ImageWriter:



Collaboration diagram for gdcm::ImageWriter:



## Public Member Functions

- [ImageWriter](#) ()
- [~ImageWriter](#) () override
- [MediaStorage ComputeTargetMediaStorage](#) ()
- const [Image](#) & [GetImage](#) () const override
- [Image](#) & [GetImage](#) () override
- bool [Write](#) () override

*Write.*

## Public Member Functions inherited from [gdcm::PixmapWriter](#)

- [PixmapWriter](#) ()
- [~PixmapWriter](#) () override
- [Pixmap](#) & [GetPixmap](#) ()
- const [Pixmap](#) & [GetPixmap](#) () const
- virtual void [SetImage](#) ([Pixmap](#) const &img)
- void [SetPixmap](#) ([Pixmap](#) const &img)
- bool [Write](#) () override

*Write.*

## Public Member Functions inherited from [gdcm::Writer](#)

- [Writer](#) ()
  - virtual [~Writer](#) ()
  - void [CheckFileMetaInformationOff](#) ()
  - void [CheckFileMetaInformationOn](#) ()
  - [File](#) & [GetFile](#) ()
  - void [SetCheckFileMetaInformation](#) (bool b)
- Undocumented function, do not use (= leave default).*
- void [SetFile](#) (const [File](#) &f)
- Set/Get the DICOM file ([DataSet](#) + Header).*
- void [SetFileName](#) (const char \*filename\_native)
- Set the filename of DICOM file to write:*
- void [SetStream](#) (std::ostream &output\_stream)

*Set user ostream buffer.*

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::PixmapWriter](#)

- void [DolconImage](#) ([DataSet](#) &ds, [Pixmap](#) const &image)
- bool [PrepareWrite](#) ([MediaStorage](#) const &refms)

## Protected Member Functions inherited from [gdcm::Writer](#)

- bool [GetCheckFileMetaInformation](#) () const
- std::ostream \* [GetStreamPtr](#) () const
- void [SetWriteDataSetOnly](#) (bool b)

## Protected Attributes inherited from [gdcm::PixmapWriter](#)

- [SmartPointer](#)< [Pixmap](#) > [PixelData](#)



## Protected Attributes inherited from [gdcm::Writer](#)

- `std::ofstream` \* [Ofstream](#)
- `std::ostream` \* [Stream](#)

### 12.158.1 Detailed Description

[ImageWriter](#).

This is an extended version of the [PixmapWriter](#). Pay attention that:

1. It will populate missing attribute for Secondary Capture [Image](#) Storage instances,
2. It may also change an input MR [Image](#) Storage instance into a pseudo Enhanced MR [Image](#) Storage instance whenever Modality LUT is required.
3. Some [DataElement](#) related to [gdcm::Image](#) may be slightly altered.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [GenFakelImage.cxx](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

### 12.158.2 Constructor & Destructor Documentation

#### 12.158.2.1 ImageWriter()

```
gdcm::ImageWriter::ImageWriter ()
```

#### 12.158.2.2 ~ImageWriter()

```
gdcm::ImageWriter::~ImageWriter () [override]
```

### 12.158.3 Member Function Documentation

#### 12.158.3.1 ComputeTargetMediaStorage()

```
MediaStorage gdcm::ImageWriter::ComputeTargetMediaStorage ()
```

internal function used to compute a target [MediaStorage](#) the most appropriate User may want to call this function ahead of time (before Write)

#### Examples

[TemplateEmptyImage.cxx](#).

**12.158.3.2 GetImage() [1/2]**

```
const Image & gdcm::ImageWriter::GetImage () const [inline], [override], [virtual]
```

Set/Get [Image](#) to be written It will overwrite anything [Image](#) infos found in [DataSet](#) (see parent class to see how to pass dataset)

Reimplemented from [gdcm::PixmapWriter](#).

**Examples**

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

**12.158.3.3 GetImage() [2/2]**

```
Image & gdcm::ImageWriter::GetImage () [inline], [override], [virtual]
```

Reimplemented from [gdcm::PixmapWriter](#).

**12.158.3.4 Write()**

```
bool gdcm::ImageWriter::Write () [override], [virtual]
```

Write.

Reimplemented from [gdcm::Writer](#).

**Examples**

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmImageWriter.h](#)

**12.159 gdcm::network::ImplementationClassUIDSub Class Reference**

[ImplementationClassUIDSub](#).

```
#include <gdcmImplementationClassUIDSub.h>
```

## Public Member Functions

- [ImplementationClassUIDSub](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

## 12.159.1 Detailed Description

[ImplementationClassUIDSub](#).

PS 3.7 [Table D.3-1](#) IMPLEMENTATION CLASS UID SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

## 12.159.2 Constructor & Destructor Documentation

### 12.159.2.1 ImplementationClassUIDSub()

```
gdcmm::network::ImplementationClassUIDSub::ImplementationClassUIDSub ()
```

## 12.159.3 Member Function Documentation

### 12.159.3.1 Print()

```
void gdcmm::network::ImplementationClassUIDSub::Print (  
    std::ostream & os) const
```

### 12.159.3.2 Read()

```
std::istream & gdcmm::network::ImplementationClassUIDSub::Read (  
    std::istream & is)
```

### 12.159.3.3 Size()

```
size_t gdcmm::network::ImplementationClassUIDSub::Size () const
```

### 12.159.3.4 Write()

```
const std::ostream & gdcmm::network::ImplementationClassUIDSub::Write (  
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

- [gdcmmImplementationClassUIDSub.h](#)

## 12.160 gdcm::network::ImplementationUIDSub Class Reference

[ImplementationUIDSub.](#)

```
#include <gdcmImplementationUIDSub.h>
```

### Public Member Functions

- [ImplementationUIDSub](#) ()
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.160.1 Detailed Description

[ImplementationUIDSub.](#)

[Table](#) D.3-2 IMPLEMENTATION UID SUB-ITEM FIELDS (A-ASSOCIATE-AC)

### 12.160.2 Constructor & Destructor Documentation

#### 12.160.2.1 ImplementationUIDSub()

```
gdcm::network::ImplementationUIDSub::ImplementationUIDSub ()
```

### 12.160.3 Member Function Documentation

#### 12.160.3.1 Write()

```
const std::ostream & gdcm::network::ImplementationUIDSub::Write (  
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

- [gdcmImplementationUIDSub.h](#)

## 12.161 gdcm::network::ImplementationVersionNameSub Class Reference

[ImplementationVersionNameSub.](#)

```
#include <gdcmImplementationVersionNameSub.h>
```

## Public Member Functions

- [ImplementationVersionNameSub](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.161.1 Detailed Description

[ImplementationVersionNameSub](#).

[Table](#) D.3-3 IMPLEMENTATION VERSION NAME SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

### 12.161.2 Constructor & Destructor Documentation

#### 12.161.2.1 ImplementationVersionNameSub()

```
gdcm::network::ImplementationVersionNameSub::ImplementationVersionNameSub ()
```

### 12.161.3 Member Function Documentation

#### 12.161.3.1 Print()

```
void gdcm::network::ImplementationVersionNameSub::Print (  
    std::ostream & os) const
```

#### 12.161.3.2 Read()

```
std::istream & gdcm::network::ImplementationVersionNameSub::Read (  
    std::istream & is)
```

#### 12.161.3.3 Size()

```
size_t gdcm::network::ImplementationVersionNameSub::Size () const
```

#### 12.161.3.4 Write()

```
const std::ostream & gdcm::network::ImplementationVersionNameSub::Write (  
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

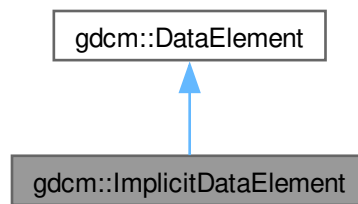
- [gdcmImplementationVersionNameSub.h](#)

## 12.162 gdcm::ImplicitDataElement Class Reference

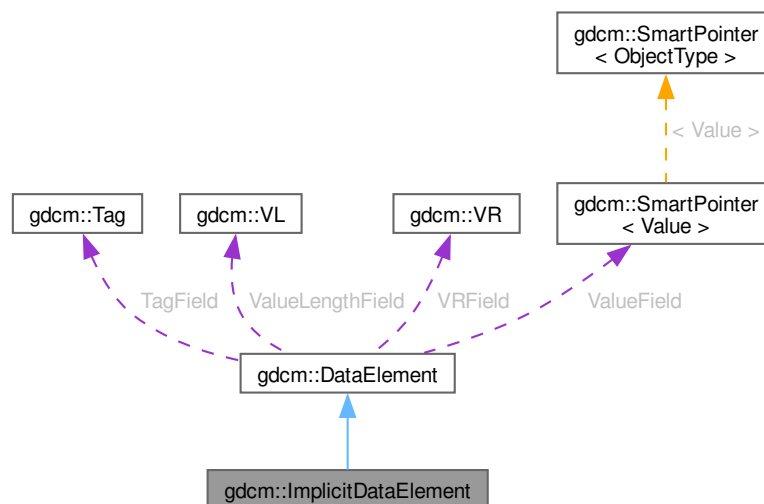
Class to represent an *Implicit VR Data Element*.

```
#include <gdcmImplicitDataElement.h>
```

Inheritance diagram for gdcm::ImplicitDataElement:



Collaboration diagram for gdcm::ImplicitDataElement:



### Public Member Functions

- [VL GetLength](#) () const

- template<typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap>  
std::istream & [ReadValueWithLength](#) (std::istream &is, [VL](#) &length, bool readvalues=true)
- template<typename TSwap>  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length, bool readvalues=true)
- template<typename TSwap>  
const std::ostream & [Write](#) (std::ostream &os) const

## Public Member Functions inherited from [gdcm::DataElement](#)

- [DataElement](#) (const DataElement &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()  
*Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()  
*Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE>  
[VL](#) [GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const
- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const  
*Get [Tag](#).*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const  
*Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const  
*Get [VL](#).*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const  
*Check if Data [Element](#) is empty.*
- bool [IsUndefinedLength](#) () const  
*return if [Value](#) Length if of undefined length*
- bool [operator<](#) (const [DataElement](#) &de) const
- [DataElement](#) & [operator=](#) (const [DataElement](#) &)=default
- bool [operator==](#) (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TDE, typename TSwap>  
std::istream & [ReadOrSkip](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)

- `template<typename TDE, typename TSwap>`  
`std::istream & ReadPreValue (std::istream &is, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadValue (std::istream &is, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadValueWithLength (std::istream &is, VL &length, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadWithLength (std::istream &is, VL &length)`
- `void SetByteValue (const char *array, VL length)`
- `void SetTag (const Tag &t)`
- `void SetValue (Value const &vl)`
- `void SetVL (const VL &vl)`
- `void SetVLToUndefined ()`
- `void SetVR (VR const &vr)`
- `template<typename TDE, typename TSwap>`  
`const std::ostream & Write (std::ostream &os) const`

### Additional Inherited Members

### Protected Types inherited from [gdcm::DataElement](#)

- `typedef SmartPointer< Value > ValuePtr`

### Protected Member Functions inherited from [gdcm::DataElement](#)

- `void SetValueFieldLength (VL vl, bool readvalues)`

### Protected Attributes inherited from [gdcm::DataElement](#)

- [Tag](#) [TagField](#)
- [ValuePtr](#) [ValueField](#)
- [VL](#) [ValueLengthField](#)
- [VR](#) [VRField](#)

## 12.162.1 Detailed Description

Class to represent an *Implicit* [VR](#) Data [Element](#).

#### Note

bla

#### Examples

[ReadExplicitLengthSQIVR.cxx](#).



## 12.162.2 Member Function Documentation

### 12.162.2.1 GetLength()

```
VL gdcm::ImplicitDataElement::GetLength () const
```

### 12.162.2.2 Read()

```
template<typename TSwap>
std::istream & gdcm::ImplicitDataElement::Read (
    std::istream & is)
```

### 12.162.2.3 ReadPreValue()

```
template<typename TSwap>
std::istream & gdcm::ImplicitDataElement::ReadPreValue (
    std::istream & is)
```

### 12.162.2.4 ReadValue()

```
template<typename TSwap>
std::istream & gdcm::ImplicitDataElement::ReadValue (
    std::istream & is,
    bool readvalues = true)
```

### 12.162.2.5 ReadValueWithLength()

```
template<typename TSwap>
std::istream & gdcm::ImplicitDataElement::ReadValueWithLength (
    std::istream & is,
    VL & length,
    bool readvalues = true)
```

### 12.162.2.6 ReadWithLength()

```
template<typename TSwap>
std::istream & gdcm::ImplicitDataElement::ReadWithLength (
    std::istream & is,
    VL & length,
    bool readvalues = true)
```

### 12.162.2.7 Write()

```
template<typename TSwap>
const std::ostream & gdcM::ImplicitDataElement::Write (
    std::ostream & os) const
```

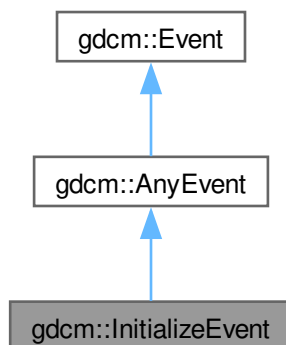
The documentation for this class was generated from the following file:

- [gdcMImplicitDataElement.h](#)

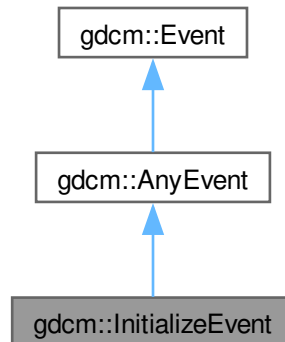
## 12.163 gdcM::InitializeEvent Class Reference

```
#include <gdcMEvent.h>
```

Inheritance diagram for gdcM::InitializeEvent:



Collaboration diagram for gdcm::InitializeEvent:



#### Additional Inherited Members

#### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()
- [Event](#) (const Event &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 12.164 gdcm::IOD Class Reference

Class for representing a [IOD](#).

```
#include <gdcmIOD.h>
```

#### Public Types

- typedef std::vector< [IODEntry](#) > [MapIODEntry](#)
- typedef MapIODEntry::size\_type [SizeType](#)

### Public Member Functions

- [IOD](#) ()=default
- void [AddIODEntry](#) (const [IODEntry](#) &iode)
- void [Clear](#) ()
- const [IODEntry](#) & [GetIODEntry](#) ([SizeType](#) idx) const
- [SizeType](#) [GetNumberOfIODs](#) () const
- [Type](#) [GetTypeFromTag](#) (const [Defs](#) &defs, const [Tag](#) &tag) const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [IOD](#) &\_val)

## 12.164.1 Detailed Description

Class for representing a [IOD](#).

#### Note

bla

#### See also

[Dict](#)

#### Examples

[TraverseModules.cxx](#).

## 12.164.2 Member Typedef Documentation

### 12.164.2.1 MapIODEntry

```
typedef std::vector<IODEntry> gdcm::IOD::MapIODEntry
```

### 12.164.2.2 SizeType

```
typedef MapIODEntry::size\_type gdcm::IOD::SizeType
```

### 12.164.3 Constructor & Destructor Documentation

#### 12.164.3.1 IOD()

`gdcm::IOD::IOD () [default]`

References [IOD\(\)](#), and [operator<<](#).

Referenced by [IOD\(\)](#), and [operator<<](#).

### 12.164.4 Member Function Documentation

#### 12.164.4.1 AddIODEntry()

```
void gdcm::IOD::AddIODEntry (  
    const IODEntry & iode) [inline]
```

#### 12.164.4.2 Clear()

```
void gdcm::IOD::Clear () [inline]
```

#### 12.164.4.3 GetIODEntry()

```
const IODEntry & gdcm::IOD::GetIODEntry (  
    SizeType idx) const [inline]
```

##### Examples

[TraverseModules.cxx](#).

#### 12.164.4.4 GetNumberOfIODs()

```
SizeType gdcm::IOD::GetNumberOfIODs () const [inline]
```

##### Examples

[TraverseModules.cxx](#).

#### 12.164.4.5 GetTypeFromTag()

```
Type gdcm::IOD::GetTypeFromTag (  
    const Defs & defs,  
    const Tag & tag) const
```

## 12.164.5 Friends And Related Symbol Documentation

### 12.164.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const IOD & _val) [friend]
```

References [IOD\(\)](#).

Referenced by [IOD\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmIOD.h](#)

## 12.165 gdcm::IODEntry Class Reference

Class for representing a [IODEntry](#).

```
#include <gdcmIODEntry.h>
```

### Public Member Functions

- [IODEntry](#) (const char \*name="", const char \*ref="", const char \*inUsage="")
- const char \* [GetIE](#) () const
- const char \* [GetName](#) () const
- const char \* [GetRef](#) () const
- const char \* [GetUsage](#) () const
- [Usage::UsageType](#) [GetUsageType](#) () const
- void [SetIE](#) (const char \*ie)
- void [SetName](#) (const char \*name)
- void [SetRef](#) (const char \*ref)
- void [SetUsage](#) (const char \*inUsage)

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [IODEntry](#) &\_val)

## 12.165.1 Detailed Description

Class for representing a [IODEntry](#).

### Note

A.1.3 [IOD Module Table](#) and Functional Group [Macro Table](#) This Section of each [IOD](#) defines in a tabular form the [Modules](#) comprising the [IOD](#). The following information must be specified for each [Module](#) in the table:

- The name of the [Module](#) or Functional Group
- A reference to the Section in Annex C which defines the [Module](#) or Functional Group
- The usage of the [Module](#) or Functional Group; whether it is:
  - Mandatory (see A.1.3.1) , abbreviated M
  - Conditional (see A.1.3.2) , abbreviated C
  - User Option (see A.1.3.3) , abbreviated U
- The [Modules](#) referenced are defined in Annex C. A.1.3.1 MANDATORY MODULES For each [IOD](#), Mandatory [Modules](#) shall be supported per the definitions, semantics and requirements defined in Annex C. PS 3.3 - 2008 Page 96
- Standard - A.1.3.2 CONDITIONAL MODULES Conditional [Modules](#) are Mandatory [Modules](#) if specific conditions are met. If the specified conditions are not met, this [Module](#) shall not be supported; that is, no information defined in that [Module](#) shall be sent. A.1.3.3 USER OPTION MODULES User Option [Modules](#) may or may not be supported. If an optional [Module](#) is supported, the [Attribute](#) Types specified in the [Modules](#) in Annex C shall be supported.

See also

[DictEntry](#)

Examples

[TraverseModules.cxx](#).

## 12.165.2 Constructor & Destructor Documentation

### 12.165.2.1 IODEntry()

```
gdcm::IODEntry::IODEntry (
    const char * name = "",
    const char * ref = "",
    const char * inUsage = "") [inline]
```

Referenced by [operator<<](#).

## 12.165.3 Member Function Documentation

### 12.165.3.1 GetIE()

```
const char * gdcm::IODEntry::GetIE () const [inline]
```

### 12.165.3.2 GetName()

```
const char * gdcm::IODEntry::GetName () const [inline]
```

### 12.165.3.3 GetRef()

```
const char * gdcm::IODEntry::GetRef () const [inline]
```

#### Examples

[TraverseModules.cxx](#).

### 12.165.3.4 GetUsage()

```
const char * gdcm::IODEntry::GetUsage () const [inline]
```

### 12.165.3.5 GetUsageType()

```
Usage::UsageType gdcm::IODEntry::GetUsageType () const
```

### 12.165.3.6 SetIE()

```
void gdcm::IODEntry::SetIE (  
    const char * ie) [inline]
```

### 12.165.3.7 SetName()

```
void gdcm::IODEntry::SetName (  
    const char * name) [inline]
```

### 12.165.3.8 SetRef()

```
void gdcm::IODEntry::SetRef (  
    const char * ref) [inline]
```

### 12.165.3.9 SetUsage()

```
void gdcm::IODEntry::SetUsage (  
    const char * inUsage) [inline]
```



## 12.165.4 Friends And Related Symbol Documentation

### 12.165.4.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const IODEntry & _val) [friend]
```

References [IODEntry\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmIODEntry.h](#)

## 12.166 gdcm::IODs Class Reference

Class for representing a [IODs](#).

```
#include <gdcmIODs.h>
```

### Public Types

- typedef std::map< [IODName](#), [IOD](#) > [IODMapType](#)
- typedef IODMapType::const\_iterator [IODMapTypeConstIterator](#)
- typedef std::string [IODName](#)

### Public Member Functions

- [IODs](#) ()=default
- void [AddIOD](#) (const char \*name, const [IOD](#) &module)
- [IODMapTypeConstIterator](#) [Begin](#) () const
- void [Clear](#) ()
- [IODMapTypeConstIterator](#) [End](#) () const
- const [IOD](#) & [GetIOD](#) (const char \*name) const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [IODs](#) &\_val)

### 12.166.1 Detailed Description

Class for representing a [IODs](#).

#### Note

bla

#### See also

[IOD](#)

#### Examples

[TraverseModules.cxx](#).

### 12.166.2 Member Typedef Documentation

#### 12.166.2.1 IODMapType

```
typedef std::map<IODName, IOD> gdcm::IODs::IODMapType
```

#### 12.166.2.2 IODMapTypeConstIterator

```
typedef IODMapType::const_iterator gdcm::IODs::IODMapTypeConstIterator
```

#### Examples

[TraverseModules.cxx](#).

#### 12.166.2.3 IODName

```
typedef std::string gdcm::IODs::IODName
```

#### Examples

[TraverseModules.cxx](#).

### 12.166.3 Constructor & Destructor Documentation

#### 12.166.3.1 IODs()

```
gdcm::IODs::IODs () [default]
```

References [IODs\(\)](#), and [operator<<](#).

Referenced by [IODs\(\)](#), and [operator<<](#).

## 12.166.4 Member Function Documentation

### 12.166.4.1 AddIOD()

```
void gdcm::IODs::AddIOD (
    const char * name,
    const IOD & module) [inline]
```

### 12.166.4.2 Begin()

```
IODMapTypeConstIterator gdcm::IODs::Begin () const [inline]
```

#### Examples

[TraverseModules.cxx](#).

### 12.166.4.3 Clear()

```
void gdcm::IODs::Clear () [inline]
```

### 12.166.4.4 End()

```
IODMapTypeConstIterator gdcm::IODs::End () const [inline]
```

#### Examples

[TraverseModules.cxx](#).

### 12.166.4.5 GetIOD()

```
const IOD & gdcm::IODs::GetIOD (
    const char * name) const [inline]
```

## 12.166.5 Friends And Related Symbol Documentation

### 12.166.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const IODs & _val) [friend]
```

References [IODs\(\)](#).

Referenced by [IODs\(\)](#).

The documentation for this class was generated from the following file:

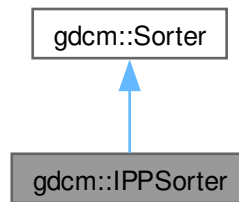
- [gdcmIODs.h](#)

## 12.167 gdcm::IPPSorter Class Reference

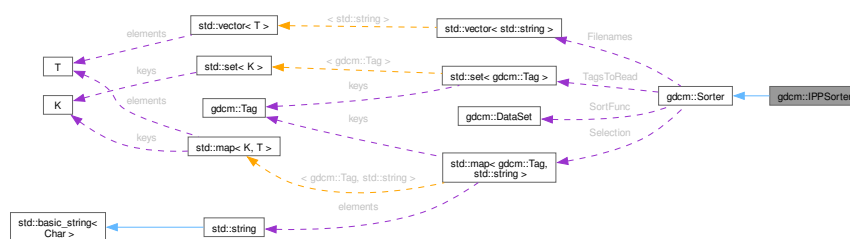
[IPPSorter](#).

```
#include <gdcmIPPSorter.h>
```

Inheritance diagram for gdcm::IPPSorter:



Collaboration diagram for gdcm::IPPSorter:



### Public Member Functions

- [IPPSorter](#) ()
- double [GetDirectionCosinesTolerance](#) () const
- double [GetZSpacing](#) () const
- double [GetZSpacingTolerance](#) () const
- void [SetComputeZSpacing](#) (bool b)
- void [SetDirectionCosinesTolerance](#) (double tol)
- void [SetDropDuplicatePositions](#) (bool b)
- void [SetZSpacingTolerance](#) (double tol)
- bool [Sort](#) (std::vector< std::string > const &filenames) override

## Public Member Functions inherited from [gdcm::Sorter](#)

- [Sorter](#) ()
- virtual [~Sorter](#) ()
- bool [AddSelect](#) ([Tag](#) const &tag, const char \*value)  
*UNSUPPORTED FOR NOW.*
- const std::vector< std::string > & [GetFileNames](#) () const
- void [Print](#) (std::ostream &os) const  
*Print.*
- void [SetSortFunction](#) ([SortFunction](#) f)
- void [SetTagsToRead](#) (std::set< [Tag](#) > const &tags)
- virtual bool [StableSort](#) (std::vector< std::string > const &filenames)

## Protected Attributes

- bool [ComputeZSpacing](#)
- double [DirCosTolerance](#)
- bool [DropDuplicatePositions](#)
- double [ZSpacing](#)
- double [ZTolerance](#)

## Protected Attributes inherited from [gdcm::Sorter](#)

- std::vector< std::string > [FileNames](#)
- std::map< [Tag](#), std::string > [Selection](#)
- [SortFunction](#) [SortFunc](#)
- std::set< [Tag](#) > [TagsToRead](#)

## Additional Inherited Members

## Public Types inherited from [gdcm::Sorter](#)

- typedef bool(\* [SortFunction](#)) ([DataSet](#) const &, [DataSet](#) const &)  
*Set the sort function which compares one dataset to the other.*

## Protected Types inherited from [gdcm::Sorter](#)

- typedef std::map< [Tag](#), std::string > [SelectionMap](#)

### 12.167.1 Detailed Description

[IPPSorter](#).

Implement a simple [Image](#) Position ([Patient](#)) sorter, along the [Image Orientation](#) ([Patient](#)) direction. This algorithm does NOT support duplicate and will FAIL in case of duplicate IPP.

#### Warning

See special note for `SetZSpacingTolerance` when computing the ZSpacing from the IPP of each DICOM files (default tolerance for consistent spacing is: 1e-6mm)

For more information on [Spacing](#), and how it is defined in DICOM, advanced users may refers to:

[http://gdcm.sourceforge.net/wiki/index.php/Imager\\_Pixel\\_Spacing](http://gdcm.sourceforge.net/wiki/index.php/Imager_Pixel_Spacing)

**Bug** There are currently a couple of bugs in this implementation:

- Gantry Tilt is not considered (always an error)
- Application programmer should only sort valid [DataSet](#) (eg. `MRImageStorage`, `CTImageStorage`, `PETImageStorage`)

#### Examples

[Compute3DSpacing.cxx](#), [VolumeSorter.cxx](#), and [gdcmorthoplanes.cxx](#).

### 12.167.2 Constructor & Destructor Documentation

#### 12.167.2.1 IPPSorter()

```
gdcm::IPPSorter::IPPSorter ()
```

### 12.167.3 Member Function Documentation

#### 12.167.3.1 GetDirectionCosinesTolerance()

```
double gdcm::IPPSorter::GetDirectionCosinesTolerance () const [inline]
```

References [DirCosTolerance](#).

### 12.167.3.2 GetZSpacing()

```
double gdcm::IPPSorter::GetZSpacing () const [inline]
```

Read-only function to provide access to the computed value for the Z-Spacing The ComputeZSpacing must have been set to true before execution of sort algorithm. Call this function *after* calling [Sort\(\)](#); Z-Spacing will be 0 on 2 occasions:

- Sorting simply failed, potentially duplicate IPP => ZSpacing = 0
- ZSpacing could not be computed (Z-Spacing is not constant, or ZTolerance is too low)

#### Examples

[Compute3DSpacing.cxx](#), [gdcmorthoplanes.cxx](#), and [reslicesphere.cxx](#).

References [ZSpacing](#).

### 12.167.3.3 GetZSpacingTolerance()

```
double gdcm::IPPSorter::GetZSpacingTolerance () const [inline]
```

References [ZTolerance](#).

### 12.167.3.4 SetComputeZSpacing()

```
void gdcm::IPPSorter::SetComputeZSpacing (  
    bool b) [inline]
```

Functions related to Z-Spacing computation Set to true when sort algorithm should also perform a regular Z-Spacing computation using the [Image](#) Position ([Patient](#)) Potential reason for failure:

1. ALL slices are taken into account, if one slice is missing then ZSpacing will be set to 0 since the spacing will not be found to be regular along the [Series](#)

#### Examples

[Compute3DSpacing.cxx](#), [VolumeSorter.cxx](#), [gdcmorthoplanes.cxx](#), and [reslicesphere.cxx](#).

References [ComputeZSpacing](#).

### 12.167.3.5 SetDirectionCosinesTolerance()

```
void gdcM::IPPSorter::SetDirectionCosinesTolerance (
    double tol) [inline]
```

Sometimes IOP along a series is slightly changing for example: "0.999081\\0.0426953\\0.00369272\\-0.0419025\\0.955059\\0.293439", "0.999081\\0.0426953\\0.00369275\\-0.0419025\\0.955059\\0.293439", "0.999081\\0.0426952\\0.00369272\\-0.0419025\\0.955059\\0.293439", We need an API to define the tolerance which is allowed. Internally the cross vector of each direction cosines is computed. The tolerance then define the distance in between 1.0 to the dot product of those cross vectors. In a perfect world this dot product is of course 1.0 which imply a [DirectionCosines](#) tolerance of exactly 0.0 (default).

References [DirCosTolerance](#).

### 12.167.3.6 SetDropDuplicatePositions()

```
void gdcM::IPPSorter::SetDropDuplicatePositions (
    bool b) [inline]
```

Makes the [IPPSorter](#) ignore multiple images located at the same position. Only the first occurrence will be kept. [DropDuplicatePositions](#) defaults to false.

References [DropDuplicatePositions](#).

### 12.167.3.7 SetZSpacingTolerance()

```
void gdcM::IPPSorter::SetZSpacingTolerance (
    double tol) [inline]
```

1. Another reason for failure is that that Z-Spacing is only slightly changing (eg 1e-3) along the series, a human can determine that this is ok and change the tolerance from its default value: 1e-6

#### Examples

[Compute3DSpacing.cxx](#), [gdcMorthoplanes.cxx](#), and [reslicesphere.cxx](#).

References [ZTolerance](#).

### 12.167.3.8 Sort()

```
bool gdcM::IPPSorter::Sort (
    std::vector< std::string > const & filenames) [override], [virtual]
```

Main entry point to the sorter. It will execute the filter, option should be set before running this function ([SetZSpacingTolerance](#), ...) Return value indicate if sorting could be achieved,. Warning this does *NOT* imply that spacing is consistent, it only means the file are sorted according to IPP You should check if ZSpacing is 0 or not to deduce if file are actually a 3D volume

Reimplemented from [gdcM::Sorter](#).

#### Examples

[Compute3DSpacing.cxx](#), [VolumeSorter.cxx](#), [gdcMorthoplanes.cxx](#), and [reslicesphere.cxx](#).



## 12.167.4 Member Data Documentation

### 12.167.4.1 ComputeZSpacing

`bool gdcm::IPPSorter::ComputeZSpacing` [protected]

Referenced by [SetComputeZSpacing\(\)](#).

### 12.167.4.2 DirCosTolerance

`double gdcm::IPPSorter::DirCosTolerance` [protected]

Referenced by [GetDirectionCosinesTolerance\(\)](#), and [SetDirectionCosinesTolerance\(\)](#).

### 12.167.4.3 DropDuplicatePositions

`bool gdcm::IPPSorter::DropDuplicatePositions` [protected]

Referenced by [SetDropDuplicatePositions\(\)](#).

### 12.167.4.4 ZSpacing

`double gdcm::IPPSorter::ZSpacing` [protected]

Referenced by [GetZSpacing\(\)](#).

### 12.167.4.5 ZTolerance

`double gdcm::IPPSorter::ZTolerance` [protected]

Referenced by [GetZSpacingTolerance\(\)](#), and [SetZSpacingTolerance\(\)](#).

The documentation for this class was generated from the following file:

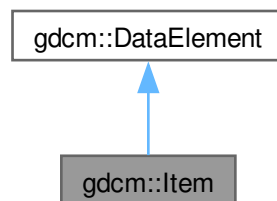
- [gdcmIPPSorter.h](#)

## 12.168 gdcm::Item Class Reference

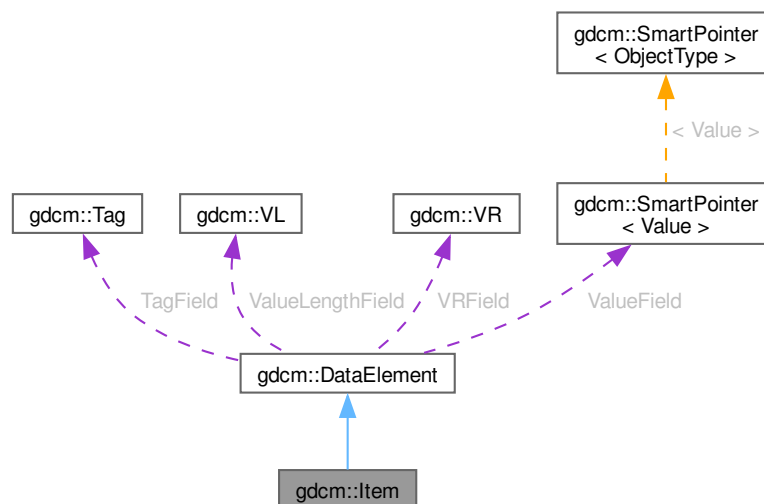
Class to represent an [Item](#).

```
#include <gdcmItem.h>
```

Inheritance diagram for gdcm::Item:



Collaboration diagram for gdcm::Item:



### Public Member Functions

- [Item](#) ()

- [Item](#) (Item const &val)
- void [Clear](#) ()
- bool [FindDataElement](#) (const [Tag](#) &t) const
- const [DataElement](#) & [GetDataElement](#) (const [Tag](#) &t) const
- template<typename TDE>  
[VL](#) [GetLength](#) () const
- [DataSet](#) & [GetNestedDataSet](#) ()
- const [DataSet](#) & [GetNestedDataSet](#) () const
- void [InsertDataElement](#) (const [DataElement](#) &de)
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- void [SetNestedDataSet](#) (const [DataSet](#) &nested)
- template<typename TDE, typename TSwap>  
const std::ostream & [Write](#) (std::ostream &os) const

## Public Member Functions inherited from [gdcm::DataElement](#)

- [DataElement](#) (const [DataElement](#) &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()  
*Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()  
*Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE>  
[VL](#) [GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const
- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const  
*Get [Tag](#).*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const  
*Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const  
*Get [VL](#).*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const  
*Check if Data [Element](#) is empty.*
- bool [IsUndefinedLength](#) () const  
*return if [Value](#) Length if of undefined length*
- bool [operator](#)< (const [DataElement](#) &de) const
- [DataElement](#) & [operator](#)= (const [DataElement](#) &)=default
- bool [operator](#)== (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is)

- `template<typename TDE, typename TSwap>`  
`std::istream & ReadOrSkip (std::istream &is, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadPreValue (std::istream &is, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadValue (std::istream &is, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadValueWithLength (std::istream &is, VL &length, std::set< Tag > const &skiptags)`
- `template<typename TDE, typename TSwap>`  
`std::istream & ReadWithLength (std::istream &is, VL &length)`
- `void SetByteValue (const char *array, VL length)`
- `void SetTag (const Tag &t)`
- `void SetValue (Value const &vl)`
- `void SetVL (const VL &vl)`
- `void SetVLToUndefined ()`
- `void SetVR (VR const &vr)`
- `template<typename TDE, typename TSwap>`  
`const std::ostream & Write (std::ostream &os) const`

## Friends

- `std::ostream & operator<< (std::ostream &os, const Item &val)`

## Additional Inherited Members

## Protected Types inherited from `gdcm::DataElement`

- `typedef SmartPointer< Value > ValuePtr`

## Protected Member Functions inherited from `gdcm::DataElement`

- `void SetValueFieldLength (VL vl, bool readvalues)`

## Protected Attributes inherited from `gdcm::DataElement`

- `Tag TagField`
- `ValuePtr ValueField`
- `VL ValueLengthField`
- `VR VRField`

## 12.168.1 Detailed Description

Class to represent an [Item](#).

A component of the value of a Data [Element](#) that is of [Value](#) Representation Sequence of Items. An [Item](#) contains a Data Set . See PS 3.5 7.5.1 [Item](#) Encoding Rules Each [Item](#) of a Data [Element](#) of [VR](#) SQ shall be encoded as a DICOM Standard Data [Element](#) with a specific Data [Element](#) Tag of [Value](#) (FFFE,E000). The [Item](#) Tag is followed by a 4 byte [Item](#) Length field encoded in one of the following two ways Explicit/ Implicit

### Note

ITEM: A component of the [Value](#) of a Data [Element](#) that is of [Value](#) Representation Sequence of Items. An [Item](#) contains a Data Set.

### Examples

[ChangeSequenceUltrasound.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [NewSequence.cs](#), [SimplePrint.cs](#), [gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

## 12.168.2 Constructor & Destructor Documentation

### 12.168.2.1 Item() [1/2]

```
gdcm::Item::Item () [inline]
```

References [gdcm::DataElement::DataElement\(\)](#).

Referenced by [Item\(\)](#), and [operator<<](#).

### 12.168.2.2 Item() [2/2]

```
gdcm::Item::Item (
    Item const & val) [inline]
```

References [gdcm::DataElement::DataElement\(\)](#), and [Item\(\)](#).

## 12.168.3 Member Function Documentation

### 12.168.3.1 Clear()

```
void gdcm::Item::Clear () [inline]
```

References [gdcm::DataElement::Clear\(\)](#).

Referenced by [gdcm::SequenceOfItems::Read\(\)](#).

### 12.168.3.2 FindDataElement()

```
bool gdcM::Item::FindDataElement (
    const Tag & t) const [inline]
```

### 12.168.3.3 GetDataElement()

```
const DataElement & gdcM::Item::GetDataElement (
    const Tag & t) const [inline]
```

References [gdcM::DataElement::DataElement\(\)](#).

### 12.168.3.4 GetLength()

```
template<typename TDE>
VL gdcM::Item::GetLength () const
```

### 12.168.3.5 GetNestedDataSet() [1/2]

```
DataSet & gdcM::Item::GetNestedDataSet () [inline]
```

### 12.168.3.6 GetNestedDataSet() [2/2]

```
const DataSet & gdcM::Item::GetNestedDataSet () const [inline]
```

#### Examples

[ChangeSequenceUltrasound.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenSeqs.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [NewSequence.cs](#), [SimplePrint.cs](#), [gdcMrtionplan.cxx](#), and [gdcMrtplan.cxx](#).

Referenced by [gdcM::SequenceOfItems::Read\(\)](#).

### 12.168.3.7 InsertDataElement()

```
void gdcM::Item::InsertDataElement (
    const DataElement & de) [inline]
```

References [gdcM::DataElement::DataElement\(\)](#), and [gdcM::DataElement::IsUndefinedLength\(\)](#).

### 12.168.3.8 Read()

```
template<typename TDE, typename TSwap>
std::istream & gdcm::Item::Read (
    std::istream & is) [inline]
```

References [gdcm::ByteSwapFilter::ByteSwap\(\)](#), [gdcm::DataSet::Clear\(\)](#), [gdcmDebugMacro](#), [gdcmErrorMacro](#), [gdcmWarningMacro](#), [gdcm::DataSet::IsEmpty\(\)](#), [gdcm::DataElement::ReadWithLength\(\)](#), [gdcm::ByteSwapFilter::SetByteSwapTag\(\)](#), [gdcm::SwapperDoOp::Swap\(\)](#), [gdcm::DataElement::TagField](#), and [gdcm::DataElement::ValueLengthField](#).

Referenced by [gdcm::SequenceOfItems::Read\(\)](#).

### 12.168.3.9 SetNestedDataSet()

```
void gdcm::Item::SetNestedDataSet (
    const DataSet & nested) [inline]
```

### 12.168.3.10 Write()

```
template<typename TDE, typename TSwap>
const std::ostream & gdcm::Item::Write (
    std::ostream & os) const [inline]
```

References [gdcmWarningMacro](#), [gdcm::VL::GetLength\(\)](#), [gdcm::DataElement::TagField](#), [gdcm::DataElement::ValueLengthField](#), [gdcm::Tag::Write\(\)](#), and [gdcm::VL::Write\(\)](#).

## 12.168.4 Friends And Related Symbol Documentation

### 12.168.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const Item & val) [friend]
```

References [Item\(\)](#), [operator<<](#), [gdcm::DataSet::Print\(\)](#), [gdcm::DataElement::TagField](#), and [gdcm::DataElement::ValueLengthField](#).

Referenced by [operator<<](#).

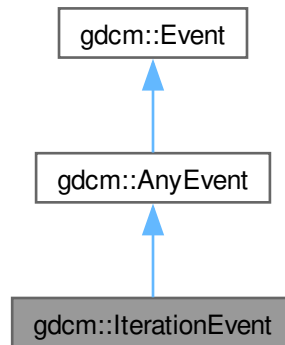
The documentation for this class was generated from the following file:

- [gdcmItem.h](#)

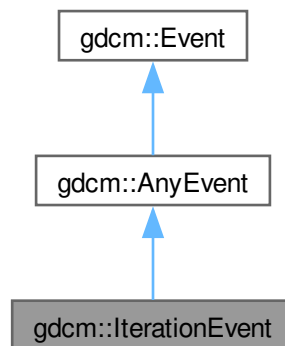
## 12.169 gdcm::IterationEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::IterationEvent:



Collaboration diagram for gdcm::IterationEvent:



### Additional Inherited Members

### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()



- [Event](#) (const Event &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 12.170 gdcm::JPEG12Codec Class Reference

Class to do JPEG 12bits (lossy & lossless).

```
#include <gdcmJPEG12Codec.h>
```

Inheritance diagram for gdcm::JPEG12Codec:





**Public Member Functions inherited from [gdcm::ImageCodec](#)**

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- const unsigned int \* [GetDimensions](#) () const
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- void [SetPlanarConfiguration](#) (unsigned int pc)

**Public Member Functions inherited from [gdcm::Coder](#)**

- virtual [~Coder](#) ()=default

**Public Member Functions inherited from [gdcm::Decoder](#)**

- virtual [~Decoder](#) ()=default

**Protected Member Functions**

- bool [EncodeBuffer](#) (std::ostream &os, const char \*data, size\_t datalen) override
- bool [IsStateSuspension](#) () const override

**Protected Member Functions inherited from [gdcm::JPEGCodec](#)**

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- bool [IsValid](#) ([PhotometricInterpretation](#) const &pi) override
- void [SetBitSample](#) (int bit)
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override

### Protected Member Functions inherited from [gdcm::ImageCodec](#)

- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)

### Additional Inherited Members

### Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

### Protected Attributes inherited from [gdcm::JPEGCodec](#)

- int [BitSample](#)
- int [Quality](#)

### Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) [LUT](#)
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) [PF](#)
- [PhotometricInterpretation](#) [PI](#)
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

## 12.170.1 Detailed Description

Class to do JPEG 12bits (lossy & lossless).

#### Note

internal class

## 12.170.2 Constructor & Destructor Documentation

### 12.170.2.1 JPEG12Codec()

```
gdcm::JPEG12Codec::JPEG12Codec ()
```

### 12.170.2.2 ~JPEG12Codec()

```
gdcm::JPEG12Codec::~~JPEG12Codec () [override]
```

## 12.170.3 Member Function Documentation

### 12.170.3.1 DecodeByStreams()

```
bool gdcm::JPEG12Codec::DecodeByStreams (
    std::istream & is,
    std::ostream & os) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.170.3.2 EncodeBuffer()

```
bool gdcm::JPEG12Codec::EncodeBuffer (
    std::ostream & os,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcm::JPEGCodec](#).

### 12.170.3.3 GetHeaderInfo()

```
bool gdcm::JPEG12Codec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.170.3.4 InternalCode()

```
bool gdcm::JPEG12Codec::InternalCode (
    const char * input,
    unsigned long len,
    std::ostream & os) [override], [virtual]
```

Reimplemented from [gdcm::Coder](#).

### 12.170.3.5 IsStateSuspension()

```
bool gdcM::JPEG12Codec::IsStateSuspension () const [override], [protected], [virtual]
```

Reimplemented from [gdcM::JPEGCodec](#).

The documentation for this class was generated from the following file:

- [gdcMJPEG12Codec.h](#)

## 12.171 gdcM::JPEG16Codec Class Reference

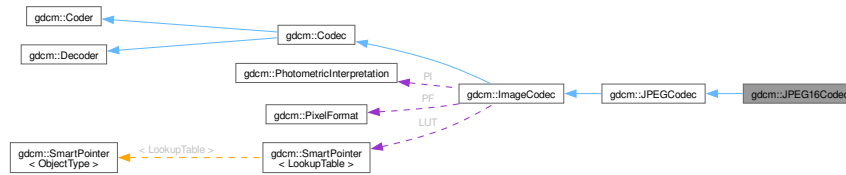
Class to do JPEG 16bits (lossless).

```
#include <gdcMJPEG16Codec.h>
```

Inheritance diagram for gdcM::JPEG16Codec:



Collaboration diagram for gdcm::JPEG16Codec:



## Public Member Functions

- [JPEG16Codec](#) ()
- [~JPEG16Codec](#) () override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [InternalCode](#) (const char \*input, unsigned long len, std::ostream &os) override

## Public Member Functions inherited from [gdcm::JPEGCodec](#)

- [JPEGCodec](#) ()
- [~JPEGCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Compress into JPEG.*
- void [ComputeOffsetTable](#) (bool b)  
*Compute the offset table:*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [GetLossless](#) () const
- double [GetQuality](#) () const
- void [SetLossless](#) (bool l)
- void [SetPixelFormat](#) ([PixelFormat](#) const &pf) override
- void [SetQuality](#) (double q)

### Public Member Functions inherited from [gdcm::ImageCodec](#)

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- const unsigned int \* [GetDimensions](#) () const
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- void [SetPlanarConfiguration](#) (unsigned int pc)

### Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default

### Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

### Protected Member Functions

- bool [EncodeBuffer](#) (std::ostream &os, const char \*data, size\_t datalen) override
- bool [IsStateSuspension](#) () const override

### Protected Member Functions inherited from [gdcm::JPEGCodec](#)

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- bool [IsValid](#) ([PhotometricInterpretation](#) const &pi) override
- void [SetBitSample](#) (int bit)
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override



## Protected Member Functions inherited from [gdcm::ImageCodec](#)

- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)

## Additional Inherited Members

## Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

## Protected Attributes inherited from [gdcm::JPEGCodec](#)

- int [BitSample](#)
- int [Quality](#)

## Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) [LUT](#)
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) [PF](#)
- [PhotometricInterpretation](#) [PI](#)
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

### 12.171.1 Detailed Description

Class to do JPEG 16bits (lossless).

#### Note

internal class

## 12.171.2 Constructor & Destructor Documentation

### 12.171.2.1 JPEG16Codec()

```
gdcm::JPEG16Codec::JPEG16Codec ()
```

### 12.171.2.2 ~JPEG16Codec()

```
gdcm::JPEG16Codec::~~JPEG16Codec () [override]
```

## 12.171.3 Member Function Documentation

### 12.171.3.1 DecodeByStreams()

```
bool gdcm::JPEG16Codec::DecodeByStreams (
    std::istream & is,
    std::ostream & os) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.171.3.2 EncodeBuffer()

```
bool gdcm::JPEG16Codec::EncodeBuffer (
    std::ostream & os,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcm::JPEGCodec](#).

### 12.171.3.3 GetHeaderInfo()

```
bool gdcm::JPEG16Codec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.171.3.4 InternalCode()

```
bool gdcm::JPEG16Codec::InternalCode (
    const char * input,
    unsigned long len,
    std::ostream & os) [override], [virtual]
```

Reimplemented from [gdcm::Coder](#).

### 12.171.3.5 IsStateSuspension()

```
bool gdcm::JPEG16Codec::IsStateSuspension () const [override], [protected], [virtual]
```

Reimplemented from [gdcm::JPEGCodec](#).

The documentation for this class was generated from the following file:

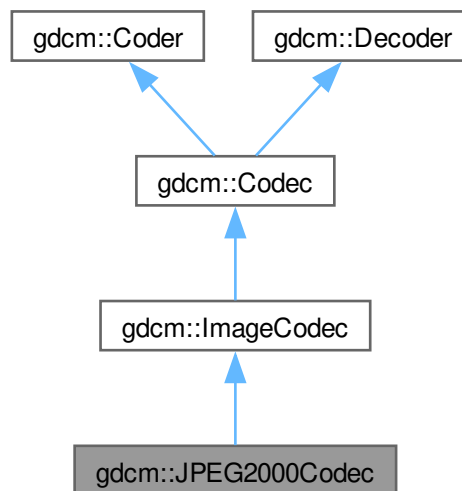
- [gdcmJPEG16Codec.h](#)

## 12.172 gdcm::JPEG2000Codec Class Reference

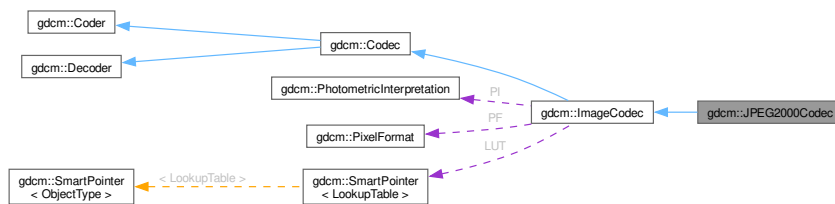
Class to do JPEG 2000.

```
#include <gdcmJPEG2000Codec.h>
```

Inheritance diagram for gdcm::JPEG2000Codec:



Collaboration diagram for gdcm::JPEG2000Codec:



## Public Member Functions

- [JPEG2000Codec](#) ()
- [~JPEG2000Codec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Code.*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- double [GetQuality](#) (unsigned int idx=0) const
- double [GetRate](#) (unsigned int idx=0) const
- void [SetMCT](#) (unsigned int mct)
- void [SetNumberOfResolutions](#) (unsigned int nres)
- void [SetNumberOfThreadsForDecompression](#) (int nThreads)
- void [SetQuality](#) (unsigned int idx, double q)
- void [SetRate](#) (unsigned int idx, double rate)
- void [SetReversible](#) (bool res)
- void [SetTileSize](#) (unsigned int tx, unsigned int ty)

## Public Member Functions inherited from [gdcm::ImageCodec](#)

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- const unsigned int \* [GetDimensions](#) () const
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

## Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default

## Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

## Protected Member Functions

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override

## Protected Member Functions inherited from [gdcm::ImageCodec](#)

- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)

## Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

## Friends

- class [Bitmap](#)
- class [ImageRegionReader](#)

## Additional Inherited Members

## Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

## Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) LUT
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) PF
- [PhotometricInterpretation](#) PI
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

### 12.172.1 Detailed Description

Class to do JPEG 2000.

#### Note

the class will produce JPC (JPEG 2000 codestream), since some private implementor are using full jp2 file the decoder tolerate jp2 input this is an implementation of an [ImageCodec](#)

### 12.172.2 Constructor & Destructor Documentation

#### 12.172.2.1 JPEG2000Codec()

```
gdcm::JPEG2000Codec::JPEG2000Codec ()
```

#### 12.172.2.2 ~JPEG2000Codec()

```
gdcm::JPEG2000Codec::~~JPEG2000Codec () [override]
```

### 12.172.3 Member Function Documentation

#### 12.172.3.1 AppendFrameEncode()

```
bool gdcm::JPEG2000Codec::AppendFrameEncode (
    std::ostream & out,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.172.3.2 AppendRowEncode()

```
bool gdcm::JPEG2000Codec::AppendRowEncode (
    std::ostream & out,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.172.3.3 CanCode()

```
bool gdcm::JPEG2000Codec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.172.3.4 CanDecode()

```
bool gdcm::JPEG2000Codec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.172.3.5 Clone()

```
ImageCodec * gdcm::JPEG2000Codec::Clone () const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

References [gdcm::ImageCodec::ImageCodec\(\)](#).

### 12.172.3.6 Code()

```
bool gdcm::JPEG2000Codec::Code (
    DataElement const & in_,
    DataElement & out_) [override], [virtual]
```

Code.

Reimplemented from [gdcm::Coder](#).

### 12.172.3.7 Decode()

```
bool gdcM::JPEG2000Codec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcM::ImageCodec](#).

### 12.172.3.8 DecodeByStreams()

```
bool gdcM::JPEG2000Codec::DecodeByStreams (
    std::istream & is,
    std::ostream & os) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

### 12.172.3.9 DecodeExtent()

```
bool gdcM::JPEG2000Codec::DecodeExtent (
    char * buffer,
    unsigned int xmin,
    unsigned int xmax,
    unsigned int ymin,
    unsigned int ymax,
    unsigned int zmin,
    unsigned int zmax,
    std::istream & is) [protected]
```

### 12.172.3.10 GetHeaderInfo()

```
bool gdcM::JPEG2000Codec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts) [override], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

Referenced by [StopEncode\(\)](#).

### 12.172.3.11 GetQuality()

```
double gdcM::JPEG2000Codec::GetQuality (
    unsigned int idx = 0) const
```



**12.172.3.12 GetRate()**

```
double gdcm::JPEG2000Codec::GetRate (
    unsigned int idx = 0) const
```

**12.172.3.13 IsFrameEncoder()**

```
bool gdcm::JPEG2000Codec::IsFrameEncoder () [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

**12.172.3.14 IsRowEncoder()**

```
bool gdcm::JPEG2000Codec::IsRowEncoder () [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

**12.172.3.15 SetMCT()**

```
void gdcm::JPEG2000Codec::SetMCT (
    unsigned int mct)
```

**12.172.3.16 SetNumberOfResolutions()**

```
void gdcm::JPEG2000Codec::SetNumberOfResolutions (
    unsigned int nres)
```

**12.172.3.17 SetNumberOfThreadsForDecompression()**

```
void gdcm::JPEG2000Codec::SetNumberOfThreadsForDecompression (
    int nThreads)
```

Set Number of threads

**Parameters**

<i>nThreads</i>	: number of threads for decompression codec, if 0 or 1 decompression is done in current thread, if negative value is set determine how many virtual threads are available
-----------------	---

**12.172.3.18 SetQuality()**

```
void gdcM::JPEG2000Codec::SetQuality (
    unsigned int idx,
    double q)
```

**12.172.3.19 SetRate()**

```
void gdcM::JPEG2000Codec::SetRate (
    unsigned int idx,
    double rate)
```

**12.172.3.20 SetReversible()**

```
void gdcM::JPEG2000Codec::SetReversible (
    bool res)
```

**12.172.3.21 SetTileSize()**

```
void gdcM::JPEG2000Codec::SetTileSize (
    unsigned int tx,
    unsigned int ty)
```

**12.172.3.22 StartEncode()**

```
bool gdcM::JPEG2000Codec::StartEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

**12.172.3.23 StopEncode()**

```
bool gdcM::JPEG2000Codec::StopEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

References [GetHeaderInfo\(\)](#).

## 12.172.4 Friends And Related Symbol Documentation

### 12.172.4.1 Bitmap

`friend class Bitmap [friend]`

References [Bitmap](#).

Referenced by [Bitmap](#).

### 12.172.4.2 ImageRegionReader

`friend class ImageRegionReader [friend]`

References [ImageRegionReader](#).

Referenced by [ImageRegionReader](#).

The documentation for this class was generated from the following file:

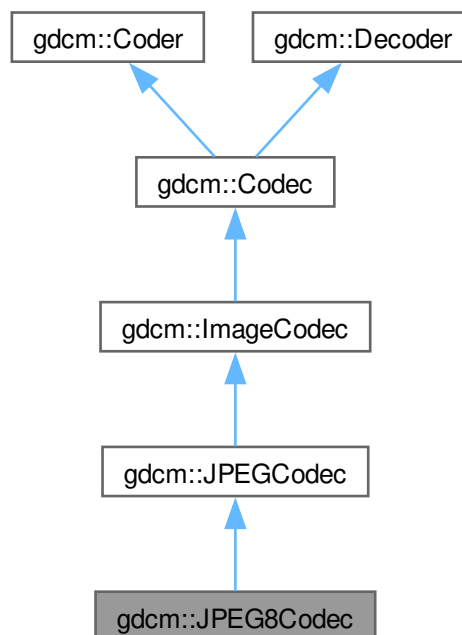
- [gdcmJPEG2000Codec.h](#)

## 12.173 gdcm::JPEG8Codec Class Reference

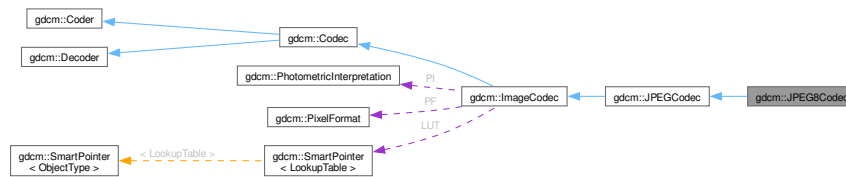
Class to do JPEG 8bits (lossy & lossless).

```
#include <gdcmJPEG8Codec.h>
```

Inheritance diagram for gdcm::JPEG8Codec:



Collaboration diagram for `gdcm::JPEG8Codec`:



## Public Member Functions

- `JPEG8Codec` ()
- `~JPEG8Codec` () override
- `bool DecodeByStreams` (std::istream &is, std::ostream &os) override
- `bool GetHeaderInfo` (std::istream &is, `TransferSyntax` &ts) override
- `bool InternalCode` (const char \*input, unsigned long len, std::ostream &os) override

## Public Member Functions inherited from `gdcm::JPGCodec`

- `JPGCodec` ()
- `~JPGCodec` () override
- `bool CanCode` (`TransferSyntax` const &ts) const override  
*Return whether this coder support this transfer syntax (can code it).*
- `bool CanDecode` (`TransferSyntax` const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- `ImageCodec * Clone` () const override
- `bool Code` (`DataElement` const &in, `DataElement` &out) override  
*Compress into JPEG.*
- `void ComputeOffsetTable` (bool b)  
*Compute the offset table:*
- `bool Decode` (`DataElement` const &is, `DataElement` &os) override  
*Decode.*
- `bool GetHeaderInfo` (std::istream &is, `TransferSyntax` &ts) override
- `bool GetLossless` () const
- `double GetQuality` () const
- `void SetLossless` (bool l)
- `void SetPixelFormat` (`PixelFormat` const &pf) override
- `void SetQuality` (double q)

**Public Member Functions inherited from [gdcm::ImageCodec](#)**

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- const unsigned int \* [GetDimensions](#) () const
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- void [SetPlanarConfiguration](#) (unsigned int pc)

**Public Member Functions inherited from [gdcm::Coder](#)**

- virtual [~Coder](#) ()=default

**Public Member Functions inherited from [gdcm::Decoder](#)**

- virtual [~Decoder](#) ()=default

**Protected Member Functions**

- bool [EncodeBuffer](#) (std::ostream &os, const char \*data, size\_t datalen) override
- bool [IsStateSuspension](#) () const override

**Protected Member Functions inherited from [gdcm::JPEGCodec](#)**

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- bool [IsValid](#) ([PhotometricInterpretation](#) const &pi) override
- void [SetBitSample](#) (int bit)
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override

### Protected Member Functions inherited from [gdcm::ImageCodec](#)

- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)

### Additional Inherited Members

### Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

### Protected Attributes inherited from [gdcm::JPEGCodec](#)

- int [BitSample](#)
- int [Quality](#)

### Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) [LUT](#)
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) [PF](#)
- [PhotometricInterpretation](#) [PI](#)
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

## 12.173.1 Detailed Description

Class to do JPEG 8bits (lossy & lossless).

#### Note

internal class

## 12.173.2 Constructor & Destructor Documentation

### 12.173.2.1 JPEG8Codec()

```
gdcm::JPEG8Codec::JPEG8Codec ()
```

### 12.173.2.2 ~JPEG8Codec()

```
gdcm::JPEG8Codec::~~JPEG8Codec () [override]
```

## 12.173.3 Member Function Documentation

### 12.173.3.1 DecodeByStreams()

```
bool gdcm::JPEG8Codec::DecodeByStreams (
    std::istream & is,
    std::ostream & os) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.173.3.2 EncodeBuffer()

```
bool gdcm::JPEG8Codec::EncodeBuffer (
    std::ostream & os,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcm::JPEGCodec](#).

### 12.173.3.3 GetHeaderInfo()

```
bool gdcm::JPEG8Codec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.173.3.4 InternalCode()

```
bool gdcm::JPEG8Codec::InternalCode (
    const char * input,
    unsigned long len,
    std::ostream & os) [override], [virtual]
```

Reimplemented from [gdcm::Coder](#).

### 12.173.3.5 IsStateSuspension()

```
bool gdcM::JPEG8Codec::IsStateSuspension () const [override], [protected], [virtual]
```

Reimplemented from [gdcM::JPEGCodec](#).

The documentation for this class was generated from the following file:

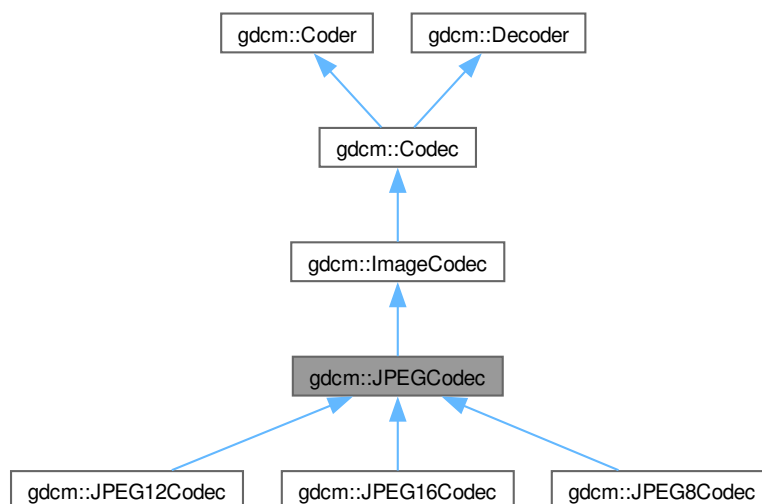
- [gdcMJPEG8Codec.h](#)

## 12.174 gdcM::JPEGCodec Class Reference

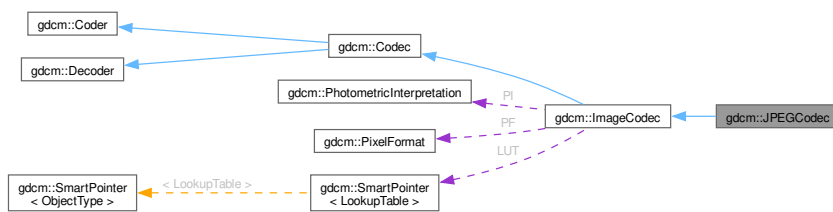
JPEG codec.

```
#include <gdcMJPEGCodec.h>
```

Inheritance diagram for gdcM::JPEGCodec:



Collaboration diagram for gdcM::JPEGCodec:





**Public Member Functions**

- [JPEGCodec](#) ()
- [~JPEGCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Compress into JPEG.*
- void [ComputeOffsetTable](#) (bool b)  
*Compute the offset table:*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- virtual bool [EncodeBuffer](#) (std::ostream &out, const char \*inbuffer, size\_t inlen)
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [GetLossless](#) () const
- double [GetQuality](#) () const
- void [SetLossless](#) (bool l)
- void [SetPixelFormat](#) ([PixelFormat](#) const &pf) override
- void [SetQuality](#) (double q)

**Public Member Functions inherited from [gdcm::ImageCodec](#)**

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- const unsigned int \* [GetDimensions](#) () const
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- void [SetPlanarConfiguration](#) (unsigned int pc)

## Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default

## Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

## Protected Member Functions

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- virtual bool [IsStateSuspension](#) () const
- bool [IsValid](#) ([PhotometricInterpretation](#) const &pi) override
- void [SetBitSample](#) (int bit)
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override

## Protected Member Functions inherited from [gdcm::ImageCodec](#)

- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)

## Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

## Protected Attributes

- int [BitSample](#)
- int [Quality](#)

## Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) LUT
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) PF
- [PhotometricInterpretation](#) PI
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

## Friends

- class [ImageRegionReader](#)

## Additional Inherited Members

## Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

### 12.174.1 Detailed Description

JPEG codec.

Class to do JPEG (8bits, 12bits, 16bits lossy & lossless). It redispach in between the different codec implementation: [JPEG8Codec](#), [JPEG12Codec](#) & [JPEG16Codec](#) It also support inconsistency in between DICOM header and JPEG compressed stream [ImageCodec](#) implementation for the JPEG case

#### Note

Things you should know if you ever want to dive into DICOM/JPEG world (among other):

- [http://groups.google.com/group/comp.protocols.dicom/browse\\_thread/thread/625e46919f208](http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/625e46919f208)
- [http://groups.google.com/group/comp.protocols.dicom/browse\\_thread/thread/75fdfccc65a62](http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/75fdfccc65a62)
- [http://groups.google.com/group/comp.protocols.dicom/browse\\_thread/thread/2d525ef6a2f09](http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/2d525ef6a2f09)
- [http://groups.google.com/group/comp.protocols.dicom/browse\\_thread/thread/6b93af410f8c9](http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/6b93af410f8c9)

#### Examples

[CompressLossyJPEG.cs](#), [FileChangeTSLossy.cs](#), and [GetJPEGSamplePrecision.cxx](#).

## 12.174.2 Constructor & Destructor Documentation

### 12.174.2.1 JPEGCodec()

```
gdcM::JPEGCodec::JPEGCodec ()
```

### 12.174.2.2 ~JPEGCodec()

```
gdcM::JPEGCodec::~~JPEGCodec () [override]
```

## 12.174.3 Member Function Documentation

### 12.174.3.1 AppendFrameEncode()

```
bool gdcM::JPEGCodec::AppendFrameEncode (
    std::ostream & out,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

### 12.174.3.2 AppendRowEncode()

```
bool gdcM::JPEGCodec::AppendRowEncode (
    std::ostream & out,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

### 12.174.3.3 CanCode()

```
bool gdcM::JPEGCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Reimplemented from [gdcM::ImageCodec](#).

### Examples

[CompressLossyJPEG.cs](#).

#### 12.174.3.4 CanDecode()

```
bool gdcmm::JPEGCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Reimplemented from [gdcmm::ImageCodec](#).

#### 12.174.3.5 Clone()

```
ImageCodec * gdcmm::JPEGCodec::Clone () const [override], [virtual]
```

Implements [gdcmm::ImageCodec](#).

References [gdcmm::ImageCodec::ImageCodec\(\)](#).

#### 12.174.3.6 Code()

```
bool gdcmm::JPEGCodec::Code (
    DataElement const & in,
    DataElement & out) [override], [virtual]
```

Compress into JPEG.

Reimplemented from [gdcmm::Coder](#).

#### 12.174.3.7 ComputeOffsetTable()

```
void gdcmm::JPEGCodec::ComputeOffsetTable (
    bool b)
```

Compute the offset table:

#### 12.174.3.8 Decode()

```
bool gdcmm::JPEGCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcmm::ImageCodec](#).

### 12.174.3.9 DecodeByStreams()

```
bool gdcm::JPEGCodec::DecodeByStreams (
    std::istream & is,
    std::ostream & os) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.174.3.10 DecodeExtent()

```
bool gdcm::JPEGCodec::DecodeExtent (
    char * buffer,
    unsigned int xmin,
    unsigned int xmax,
    unsigned int ymin,
    unsigned int ymax,
    unsigned int zmin,
    unsigned int zmax,
    std::istream & is) [protected]
```

### 12.174.3.11 EncodeBuffer()

```
virtual bool gdcm::JPEGCodec::EncodeBuffer (
    std::ostream & out,
    const char * inbuffer,
    size_t inlen) [virtual]
```

Reimplemented in [gdcm::JPEG12Codec](#), [gdcm::JPEG16Codec](#), and [gdcm::JPEG8Codec](#).

### 12.174.3.12 GetHeaderInfo()

```
bool gdcm::JPEGCodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### Examples

[GetJPEGSamplePrecision.cxx](#).

### 12.174.3.13 GetLossless()

```
bool gdcm::JPEGCodec::GetLossless () const
```

#### 12.174.3.14 GetQuality()

```
double gdcm::JPEGCodec::GetQuality () const
```

#### 12.174.3.15 IsFrameEncoder()

```
bool gdcm::JPEGCodec::IsFrameEncoder () [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### 12.174.3.16 IsRowEncoder()

```
bool gdcm::JPEGCodec::IsRowEncoder () [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### 12.174.3.17 IsStateSuspension()

```
virtual bool gdcm::JPEGCodec::IsStateSuspension () const [protected], [virtual]
```

Reimplemented in [gdcm::JPEG12Codec](#), [gdcm::JPEG16Codec](#), and [gdcm::JPEG8Codec](#).

#### 12.174.3.18 IsValid()

```
bool gdcm::JPEGCodec::IsValid (  
    PhotometricInterpretation const & pi) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### 12.174.3.19 SetBitSample()

```
void gdcm::JPEGCodec::SetBitSample (  
    int bit) [protected]
```

#### 12.174.3.20 SetLossless()

```
void gdcm::JPEGCodec::SetLossless (  
    bool l)
```

#### Examples

[CompressLossyJPEG.cs](#), and [FileChangeTSLossy.cs](#).

### 12.174.3.21 SetPixelFormat()

```
void gdcm::JPEGCodec::SetPixelFormat (
    PixelFormat const & pf) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### Examples

[GetJPEGSamplePrecision.cxx](#).

### 12.174.3.22 SetQuality()

```
void gdcm::JPEGCodec::SetQuality (
    double q)
```

#### Examples

[CompressLossyJPEG.cs](#), and [FileChangeTSLossy.cs](#).

### 12.174.3.23 StartEncode()

```
bool gdcm::JPEGCodec::StartEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.174.3.24 StopEncode()

```
bool gdcm::JPEGCodec::StopEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

## 12.174.4 Friends And Related Symbol Documentation

### 12.174.4.1 ImageRegionReader

```
friend class ImageRegionReader [friend]
```

References [ImageRegionReader](#).

Referenced by [ImageRegionReader](#).



## 12.174.5 Member Data Documentation

### 12.174.5.1 BitSample

```
int gdcm::JPEGCodec::BitSample [protected]
```

### 12.174.5.2 Quality

```
int gdcm::JPEGCodec::Quality [protected]
```

The documentation for this class was generated from the following file:

- [gdcmJPEGCodec.h](#)

## 12.175 gdcm::JPEGLSCodec Class Reference

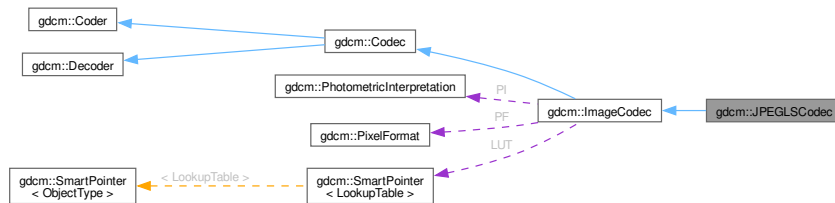
JPEG-LS.

```
#include <gdcmJPEGLSCodec.h>
```

Inheritance diagram for gdcm::JPEGLSCodec:



Collaboration diagram for `gdcm::JPEGLSCodec`:



## Public Member Functions

- `JPEGLSCodec ()`
- `~JPEGLSCodec ()` override
- `bool CanCode (TransferSyntax const &ts) const` override  
*Return whether this coder support this transfer syntax (can code it).*
- `bool CanDecode (TransferSyntax const &ts) const` override  
*Return whether this decoder support this transfer syntax (can decode it).*
- `ImageCodec * Clone ()` const override
- `bool Code (DataElement const &in, DataElement &out)` override  
*Code.*
- `bool Decode (DataElement const &in, char *outBuffer, size_t inBufferLength, uint32_t inXMin, uint32_t inXMax, uint32_t inYMin, uint32_t inYMax, uint32_t inZMin, uint32_t inZMax)`
- `bool Decode (DataElement const &is, DataElement &os)` override  
*Decode.*
- `unsigned long GetBufferLength ()` const
- `bool GetHeaderInfo (std::istream &is, TransferSyntax &ts)` override
- `bool GetLossless ()` const
- `void SetBufferLength (unsigned long l)`
- `void SetLossless (bool l)`
- `void SetLossyError (int error)`  
*[0-3] generally*

## Public Member Functions inherited from `gdcm::ImageCodec`

- `ImageCodec ()`
- `~ImageCodec ()` override
- `bool CleanupUnusedBits (char *data, size_t datalen)`
- `const unsigned int * GetDimensions ()` const
- `bool GetLossyFlag ()` const
- `const LookupTable & GetLUT ()` const
- `bool GetNeedByteSwap ()` const
- `unsigned int GetNumberOfDimensions ()` const
- `const PhotometricInterpretation & GetPhotometricInterpretation ()` const
- `PixelFormat & GetPixelFormat ()`
- `const PixelFormat & GetPixelFormat ()` const

- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

### Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default

### Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

### Protected Member Functions

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override

### Protected Member Functions inherited from [gdcm::ImageCodec](#)

- bool [DecodeByStreams](#) (std::istream &is\_, std::ostream &os) override
- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)

### Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

### Friends

- class [ImageRegionReader](#)

### Additional Inherited Members

### Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > LUTPtr

### Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) LUT
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) PF
- [PhotometricInterpretation](#) PI
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

## 12.175.1 Detailed Description

JPEG-LS.

#### Note

codec that implement the JPEG-LS compression this is an implementation of [ImageCodec](#) for JPEG-LS

It uses the CharLS JPEG-LS implementation <https://github.com/team-charls/charls>

## 12.175.2 Constructor & Destructor Documentation

### 12.175.2.1 JPEGLSCodec()

```
gdcm::JPEGLSCodec::JPEGLSCodec ()
```

### 12.175.2.2 ~JPEGLSCodec()

```
gdcm::JPEGLSCodec::~~JPEGLSCodec () [override]
```

## 12.175.3 Member Function Documentation

### 12.175.3.1 AppendFrameEncode()

```
bool gdcm::JPEGLSCodec::AppendFrameEncode (
    std::ostream & out,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.175.3.2 AppendRowEncode()

```
bool gdcm::JPEGLSCodec::AppendRowEncode (
    std::ostream & out,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.175.3.3 CanCode()

```
bool gdcm::JPEGLSCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.175.3.4 CanDecode()

```
bool gdcm::JPEGLSCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.175.3.5 Clone()

```
ImageCodec * gdcm::JPEGLSCodec::Clone () const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

References [gdcm::ImageCodec::ImageCodec\(\)](#).

### 12.175.3.6 Code()

```
bool gdcm::JPEGLSCodec::Code (
    DataElement const & in_,
    DataElement & out_) [override], [virtual]
```

Code.

Reimplemented from [gdcm::Coder](#).

### 12.175.3.7 Decode() [1/2]

```
bool gdcm::JPEGLSCodec::Decode (
    DataElement const & in,
    char * outBuffer,
    size_t inBufferLength,
    uint32_t inXMin,
    uint32_t inXMax,
    uint32_t inYMin,
    uint32_t inYMax,
    uint32_t inZMin,
    uint32_t inZMax)
```

### 12.175.3.8 Decode() [2/2]

```
bool gdcm::JPEGLSCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

### 12.175.3.9 DecodeExtent()

```
bool gdcm::JPEGLSCodec::DecodeExtent (
    char * buffer,
    unsigned int xmin,
    unsigned int xmax,
    unsigned int ymin,
    unsigned int ymax,
    unsigned int zmin,
    unsigned int zmax,
    std::istream & is) [protected]
```

### 12.175.3.10 GetBufferLength()

```
unsigned long gdcm::JPEGLSCodec::GetBufferLength () const [inline]
```

### 12.175.3.11 GetHeaderInfo()

```
bool gdcm::JPEGLSCodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.175.3.12 GetLossless()

```
bool gdcm::JPEGLSCodec::GetLossless () const
```

### 12.175.3.13 IsFrameEncoder()

```
bool gdcm::JPEGLSCodec::IsFrameEncoder () [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.175.3.14 IsRowEncoder()

```
bool gdcm::JPEGLSCodec::IsRowEncoder () [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.175.3.15 SetBufferLength()

```
void gdcm::JPEGLSCodec::SetBufferLength (
    unsigned long l) [inline]
```

### 12.175.3.16 SetLossless()

```
void gdcm::JPEGLSCodec::SetLossless (
    bool l)
```

### 12.175.3.17 SetLossyError()

```
void gdcm::JPEGLSCodec::SetLossyError (
    int error)
```

[0-3] generally

### 12.175.3.18 StartEncode()

```
bool gdcmm::JPEGLSCodec::StartEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcmm::ImageCodec](#).

### 12.175.3.19 StopEncode()

```
bool gdcmm::JPEGLSCodec::StopEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcmm::ImageCodec](#).

## 12.175.4 Friends And Related Symbol Documentation

### 12.175.4.1 ImageRegionReader

```
friend class ImageRegionReader [friend]
```

References [ImageRegionReader](#).

Referenced by [ImageRegionReader](#).

The documentation for this class was generated from the following file:

- [gdcmmJPEGLSCodec.h](#)

## 12.176 gdcmm::JSON Class Reference

```
#include <gdcmmJSON.h>
```

### Public Member Functions

- [JSON](#) ()
- [~JSON](#) ()
- bool [Code](#) ([DataSet](#) const &in, std::ostream &os)
- bool [Decode](#) (std::istream &is, [DataSet](#) &out)
- bool [GetPrettyPrint](#) () const
- void [PrettyPrintOff](#) ()
- void [PrettyPrintOn](#) ()
- void [SetPrettyPrint](#) (bool onoff)



## 12.176.1 Detailed Description

### Examples

[QIDO-RS.cxx](#).

## 12.176.2 Constructor & Destructor Documentation

### 12.176.2.1 JSON()

```
gdcm::JSON::JSON ()
```

### 12.176.2.2 ~JSON()

```
gdcm::JSON::~~JSON ()
```

## 12.176.3 Member Function Documentation

### 12.176.3.1 Code()

```
bool gdcm::JSON::Code (
    DataSet const & in,
    std::ostream & os)
```

### Examples

[QIDO-RS.cxx](#).

### 12.176.3.2 Decode()

```
bool gdcm::JSON::Decode (
    std::istream & is,
    DataSet & out)
```

### Examples

[QIDO-RS.cxx](#).

### 12.176.3.3 GetPrettyPrint()

```
bool gdcm::JSON::GetPrettyPrint () const
```

#### 12.176.3.4 PrettyPrintOff()

```
void gdcm::JSON::PrettyPrintOff ()
```

#### 12.176.3.5 PrettyPrintOn()

```
void gdcm::JSON::PrettyPrintOn ()
```

#### Examples

[QIDO-RS.cxx](#).

#### 12.176.3.6 SetPrettyPrint()

```
void gdcm::JSON::SetPrettyPrint (  
    bool onoff)
```

The documentation for this class was generated from the following file:

- [gdcmJSON.h](#)

## 12.177 gdcm::KAKADUCodec Class Reference

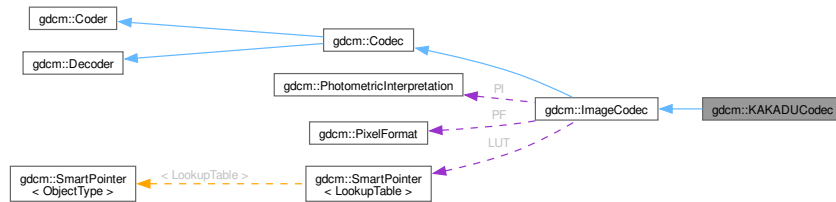
[KAKADUCodec](#).

```
#include <gdcmKAKADUCodec.h>
```

Inheritance diagram for gdcm::KAKADUCodec:



Collaboration diagram for gdcm::KAKADUCodec:



## Public Member Functions

- [KAKADUCodec](#) ()
- [~KAKADUCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Code.*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*

## Public Member Functions inherited from [gdcm::ImageCodec](#)

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- const unsigned int \* [GetDimensions](#) () const
- virtual bool [GetHeaderInfo](#) (std::istream &is\_, [TransferSyntax](#) &ts)
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

## Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default

## Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

## Additional Inherited Members

## Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > LUTPtr

## Protected Member Functions inherited from [gdcm::ImageCodec](#)

- virtual bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- virtual bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- bool [DecodeByStreams](#) (std::istream &is\_, std::ostream &os) override
- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsFrameEncoder](#) ()
- virtual bool [IsRowEncoder](#) ()
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)
- virtual bool [StartEncode](#) (std::ostream &os)
- virtual bool [StopEncode](#) (std::ostream &os)

## Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

## Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) LUT
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) PF
- [PhotometricInterpretation](#) PI
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

## 12.177.1 Detailed Description

[KAKADUCodec](#).

## 12.177.2 Constructor & Destructor Documentation

### 12.177.2.1 KAKADUCodec()

```
gdcm::KAKADUCodec::KAKADUCodec ()
```

### 12.177.2.2 ~KAKADUCodec()

```
gdcm::KAKADUCodec::~~KAKADUCodec () [override]
```

## 12.177.3 Member Function Documentation

### 12.177.3.1 CanCode()

```
bool gdcm::KAKADUCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.177.3.2 CanDecode()

```
bool gdcm::KAKADUCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.177.3.3 Clone()

```
ImageCodec * gdcm::KAKADUCodec::Clone () const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

References [gdcm::ImageCodec::ImageCodec\(\)](#).

#### 12.177.3.4 Code()

```
bool gdcm::KAKADUCodec::Code (
    DataElement const & in_,
    DataElement & out_) [override], [virtual]
```

Code.

Reimplemented from [gdcm::Coder](#).

#### 12.177.3.5 Decode()

```
bool gdcm::KAKADUCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

The documentation for this class was generated from the following file:

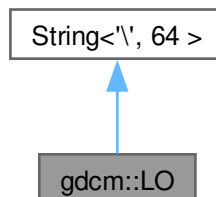
- [gdcmKAKADUCodec.h](#)

### 12.178 gdcm::LO Class Reference

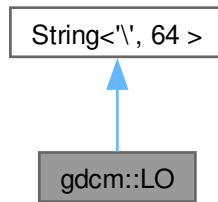
[LO](#).

```
#include <gdcmLO.h>
```

Inheritance diagram for gdcm::LO:



Collaboration diagram for gdcm::LO:



### Public Types

- typedef `Superclass::const_iterator` `const_iterator`
- typedef `Superclass::const_reference` `const_reference`
- typedef `Superclass::const_reverse_iterator` `const_reverse_iterator`
- typedef `Superclass::difference_type` `difference_type`
- typedef `Superclass::iterator` `iterator`
- typedef `Superclass::pointer` `pointer`
- typedef `Superclass::reference` `reference`
- typedef `Superclass::reverse_iterator` `reverse_iterator`
- typedef `Superclass::size_type` `size_type`
- typedef `String<'\\', 64 > Superclass`
- typedef `Superclass::value_type` `value_type`

### Public Member Functions

- `LO ()`
- `LO (const Superclass &s, size_type pos=0, size_type n=npos)`
- `LO (const value_type *s)`
- `LO (const value_type *s, size_type n)`
- `bool isValid () const`

## 12.178.1 Detailed Description

`LO`.

Note

TODO

## 12.178.2 Member Typedef Documentation

### 12.178.2.1 `const_iterator`

```
typedef Superclass::const_iterator gdc::LO::const_iterator
```

### 12.178.2.2 `const_reference`

```
typedef Superclass::const_reference gdc::LO::const_reference
```

### 12.178.2.3 `const_reverse_iterator`

```
typedef Superclass::const_reverse_iterator gdc::LO::const_reverse_iterator
```

### 12.178.2.4 `difference_type`

```
typedef Superclass::difference_type gdc::LO::difference_type
```

### 12.178.2.5 `iterator`

```
typedef Superclass::iterator gdc::LO::iterator
```

### 12.178.2.6 `pointer`

```
typedef Superclass::pointer gdc::LO::pointer
```

### 12.178.2.7 `reference`

```
typedef Superclass::reference gdc::LO::reference
```

### 12.178.2.8 `reverse_iterator`

```
typedef Superclass::reverse_iterator gdc::LO::reverse_iterator
```

### 12.178.2.9 `size_type`

```
typedef Superclass::size_type gdc::LO::size_type
```



### 12.178.2.10 Superclass

```
typedef String<'\\', 64> gdcmm::LO::Superclass
```

### 12.178.2.11 value\_type

```
typedef Superclass::value\_type gdcmm::LO::value\_type
```

## 12.178.3 Constructor & Destructor Documentation

### 12.178.3.1 LO() [1/4]

```
gdcmm::LO::LO () [inline]
```

### 12.178.3.2 LO() [2/4]

```
gdcmm::LO::LO (  
    const value\_type * s) [inline]
```

### 12.178.3.3 LO() [3/4]

```
gdcmm::LO::LO (  
    const value\_type * s,  
    size\_type n) [inline]
```

### 12.178.3.4 LO() [4/4]

```
gdcmm::LO::LO (  
    const Superclass & s,  
    size\_type pos = 0,  
    size\_type n = npos) [inline]
```

## 12.178.4 Member Function Documentation

### 12.178.4.1 IsValid()

```
bool gdcmm::LO::IsValid () const [inline]
```

References [gdcmm::String](#)<'\\', 64 >::IsValid().

The documentation for this class was generated from the following file:

- [gdcmmLO.h](#)

## 12.179 gdcm::LookupTable Class Reference

[LookupTable](#) class.

```
#include <gdcmLookupTable.h>
```

Inheritance diagram for gdcm::LookupTable:



Collaboration diagram for gdcm::LookupTable:



### Public Types

- enum [LookupTableType](#) {  
    [RED](#) = 0 ,  
    [GREEN](#) ,  
    [BLUE](#) ,  
    [GRAY](#) ,  
    [UNKNOWN](#) }

**Public Member Functions**

- [LookupTable](#) ()
- [LookupTable](#) (LookupTable const &lut)
- [~LookupTable](#) () override
- void [Allocate](#) (unsigned short bitsample=8)  
*Allocate the LUT.*
- void [Clear](#) ()  
*Clear the LUT.*
- bool [Decode](#) (char \*outputbuffer, size\_t outlen, const char \*inputbuffer, size\_t inlen) const
- void [Decode](#) (std::istream &is, std::ostream &os) const  
*Decode the LUT.*
- bool [Decode8](#) (char \*outputbuffer, size\_t outlen, const char \*inputbuffer, size\_t inlen) const  
*Decode into RGB 8 bits space.*
- unsigned short [GetBitSample](#) () const  
*return the bit sample*
- bool [GetBufferAsRGBA](#) (unsigned char \*rgba) const  
*return the LUT as RGBA buffer*
- void [GetLUT](#) (LookupTableType type, unsigned char \*array, unsigned int &length) const
- void [GetLUTDescriptor](#) (LookupTableType type, unsigned short &length, unsigned short &subscript, unsigned short &bitsize) const
- unsigned int [GetLUTLength](#) (LookupTableType type) const
- const unsigned char \* [GetPointer](#) () const  
*return a raw pointer to the LUT*
- void [InitializeBlueLUT](#) (unsigned short length, unsigned short subscript, unsigned short bitsize)
- bool [Initialized](#) () const  
*return whether the LUT has been initialized*
- void [InitializeGreenLUT](#) (unsigned short length, unsigned short subscript, unsigned short bitsize)
- void [InitializeLUT](#) (LookupTableType type, unsigned short length, unsigned short subscript, unsigned short bitsize)  
*Generic interface:*
- void [InitializeRedLUT](#) (unsigned short length, unsigned short subscript, unsigned short bitsize)  
*RED / GREEN / BLUE specific:*
- bool [IsRGB8](#) () const  
*Return whether 16 bits LUT is in RGB 8 bits space.*
- void [Print](#) (std::ostream &) const override
- void [SetBlueLUT](#) (const unsigned char \*blue, unsigned int length)
- void [SetGreenLUT](#) (const unsigned char \*green, unsigned int length)
- virtual void [SetLUT](#) (LookupTableType type, const unsigned char \*array, unsigned int length)
- void [SetRedLUT](#) (const unsigned char \*red, unsigned int length)
- bool [WriteBufferAsRGBA](#) (const unsigned char \*rgba)  
*Write the LUT as RGBA.*

**Public Member Functions inherited from [gdcm::Object](#)**

- [Object](#) ()
- [Object](#) (const Object &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

**Protected Attributes**

- unsigned short [BitSample](#)
- bool [IncompleteLUT](#):1
- LookupTableInternal \* [Internal](#)

**Additional Inherited Members****Protected Member Functions inherited from [gdcm::Object](#)**

- void [Register](#) ()
- void [UnRegister](#) ()

**12.179.1 Detailed Description**

[LookupTable](#) class.

**Examples**

[ExtractImageRegionWithLUT.cs](#), and [PrintLUT.cxx](#).

**12.179.2 Member Enumeration Documentation****12.179.2.1 LookupTableType**

```
enum gdcm::LookupTable::LookupTableType
```

**Enumerator**

RED	
GREEN	
BLUE	
GRAY	
UNKNOWN	

**12.179.3 Constructor & Destructor Documentation****12.179.3.1 LookupTable() [1/2]**

```
gdcm::LookupTable::LookupTable ()
```

Referenced by [LookupTable\(\)](#).

### 12.179.3.2 ~LookupTable()

```
gdcmm::LookupTable::~~LookupTable () [override]
```

### 12.179.3.3 LookupTable() [2/2]

```
gdcmm::LookupTable::LookupTable (  
    LookupTable const & lut) [inline]
```

References [LookupTable\(\)](#), and [gdcmm::Object::Object\(\)](#).

## 12.179.4 Member Function Documentation

### 12.179.4.1 Allocate()

```
void gdcmm::LookupTable::Allocate (  
    unsigned short bitsample = 8)
```

Allocate the LUT.

### 12.179.4.2 Clear()

```
void gdcmm::LookupTable::Clear ()
```

Clear the LUT.

### 12.179.4.3 Decode() [1/2]

```
bool gdcmm::LookupTable::Decode (  
    char * outputbuffer,  
    size_t outlen,  
    const char * inputbuffer,  
    size_t inlen) const
```

Decode the LUT outputbuffer will contains the RGB decoded PALETTE COLOR input image of size inlen the outputbuffer should be at least 3 times the size of inlen

### 12.179.4.4 Decode() [2/2]

```
void gdcmm::LookupTable::Decode (  
    std::istream & is,  
    std::ostream & os) const
```

Decode the LUT.

### Examples

[ExtractImageRegionWithLUT.cs](#).

#### 12.179.4.5 Decode8()

```
bool gdc::LookupTable::Decode8 (
    char * outputbuffer,
    size_t outlen,
    const char * inputbuffer,
    size_t inlen) const
```

Decode into RGB 8 bits space.

#### 12.179.4.6 GetBitSample()

```
unsigned short gdc::LookupTable::GetBitSample () const [inline]
```

return the bit sample

References [BitSample](#).

#### 12.179.4.7 GetBufferAsRGBA()

```
bool gdc::LookupTable::GetBufferAsRGBA (
    unsigned char * rgba) const
```

return the LUT as RGBA buffer

#### 12.179.4.8 GetLUT()

```
void gdc::LookupTable::GetLUT (
    LookupTableType type,
    unsigned char * array,
    unsigned int & length) const
```

#### 12.179.4.9 GetLUTDescriptor()

```
void gdc::LookupTable::GetLUTDescriptor (
    LookupTableType type,
    unsigned short & length,
    unsigned short & subscript,
    unsigned short & bitsize) const
```

#### 12.179.4.10 GetLUTLength()

```
unsigned int gdc::LookupTable::GetLUTLength (
    LookupTableType type) const
```

#### 12.179.4.11 GetPointer()

```
const unsigned char * gdcm::LookupTable::GetPointer () const
```

return a raw pointer to the LUT

#### 12.179.4.12 InitializeBlueLUT()

```
void gdcm::LookupTable::InitializeBlueLUT (
    unsigned short length,
    unsigned short subscript,
    unsigned short bitsize)
```

#### 12.179.4.13 Initialized()

```
bool gdcm::LookupTable::Initialized () const
```

return whether the LUT has been initialized

#### 12.179.4.14 InitializeGreenLUT()

```
void gdcm::LookupTable::InitializeGreenLUT (
    unsigned short length,
    unsigned short subscript,
    unsigned short bitsize)
```

#### 12.179.4.15 InitializeLUT()

```
void gdcm::LookupTable::InitializeLUT (
    LookupTableType type,
    unsigned short length,
    unsigned short subscript,
    unsigned short bitsize)
```

Generic interface:

#### 12.179.4.16 InitializeRedLUT()

```
void gdcm::LookupTable::InitializeRedLUT (
    unsigned short length,
    unsigned short subscript,
    unsigned short bitsize)
```

RED / GREEN / BLUE specific:

#### 12.179.4.17 IsRGB8()

```
bool gdcm::LookupTable::IsRGB8 () const
```

Return whether 16 bits LUT is in RGB 8 bits space.

#### 12.179.4.18 Print()

```
void gdcm::LookupTable::Print (
    std::ostream & ) const [override], [virtual]
```

Reimplemented from [gdcm::Object](#).

Reimplemented in [gdcm::SegmentedPaletteColorLookupTable](#).

#### Examples

[PrintLUT.cxx](#).

#### 12.179.4.19 SetBlueLUT()

```
void gdcm::LookupTable::SetBlueLUT (
    const unsigned char * blue,
    unsigned int length)
```

#### 12.179.4.20 SetGreenLUT()

```
void gdcm::LookupTable::SetGreenLUT (
    const unsigned char * green,
    unsigned int length)
```

#### 12.179.4.21 SetLUT()

```
virtual void gdcm::LookupTable::SetLUT (
    LookupTableType type,
    const unsigned char * array,
    unsigned int length) [virtual]
```

Reimplemented in [gdcm::SegmentedPaletteColorLookupTable](#).

#### 12.179.4.22 SetRedLUT()

```
void gdcm::LookupTable::SetRedLUT (
    const unsigned char * red,
    unsigned int length)
```



#### 12.179.4.23 WriteBufferAsRGBA()

```
bool gdcm::LookupTable::WriteBufferAsRGBA (
    const unsigned char * rgba)
```

Write the LUT as RGBA.

### 12.179.5 Member Data Documentation

#### 12.179.5.1 BitSample

```
unsigned short gdcm::LookupTable::BitSample [protected]
```

Referenced by [GetBitSample\(\)](#).

#### 12.179.5.2 IncompleteLUT

```
bool gdcm::LookupTable::IncompleteLUT [protected]
```

#### 12.179.5.3 Internal

```
LookupTableInternal* gdcm::LookupTable::Internal [protected]
```

The documentation for this class was generated from the following file:

- [gdcmLookupTable.h](#)

## 12.180 gdcm::Scanner2::Itstr Struct Reference

```
#include <gdcmScanner2.h>
```

### Public Member Functions

- bool [operator\(\)](#) (const char \*s1, const char \*s2) const

## 12.180.1 Member Function Documentation

### 12.180.1.1 operator>()()

```
bool gdcM::Scanner2::ltstr::operator() (
    const char * s1,
    const char * s2) const [inline]
```

The documentation for this struct was generated from the following file:

- [gdcMScanner2.h](#)

## 12.181 gdcM::Scanner::ltstr Struct Reference

```
#include <gdcMScanner.h>
```

### Public Member Functions

- bool [operator\(\)](#) (const char \*s1, const char \*s2) const

### 12.181.1 Member Function Documentation

#### 12.181.1.1 operator>()()

```
bool gdcM::Scanner::ltstr::operator() (
    const char * s1,
    const char * s2) const [inline]
```

The documentation for this struct was generated from the following file:

- [gdcMScanner.h](#)

## 12.182 gdcM::StrictScanner2::ltstr Struct Reference

```
#include <gdcMStrictScanner2.h>
```

### Public Member Functions

- bool [operator\(\)](#) (const char \*s1, const char \*s2) const

## 12.182.1 Member Function Documentation

### 12.182.1.1 operator>()

```
bool gdcm::StrictScanner2::ltstr::operator() (
    const char * s1,
    const char * s2) const [inline]
```

The documentation for this struct was generated from the following file:

- [gdcmStrictScanner2.h](#)

## 12.183 gdcm::StrictScanner::ltstr Struct Reference

```
#include <gdcmStrictScanner.h>
```

### Public Member Functions

- bool [operator\(\)](#) (const char \*s1, const char \*s2) const

## 12.183.1 Member Function Documentation

### 12.183.1.1 operator>()

```
bool gdcm::StrictScanner::ltstr::operator() (
    const char * s1,
    const char * s2) const [inline]
```

The documentation for this struct was generated from the following file:

- [gdcmStrictScanner.h](#)

## 12.184 gdcm::Macro Class Reference

Class for representing a [Macro](#).

```
#include <gdcmMacro.h>
```

### Public Types

- typedef std::vector< std::string > [ArrayIncludeMacrosType](#)
- typedef std::map< [Tag](#), [MacroEntry](#) > [MapModuleEntry](#)

## Public Member Functions

- [Macro](#) ()=default
- void [AddMacroEntry](#) (const [Tag](#) &tag, const [MacroEntry](#) &module)  
*Will add a [ModuleEntry](#) directly at root-level. See [Macro](#) for nested-included level.*
- void [Clear](#) ()
- bool [FindMacroEntry](#) (const [Tag](#) &tag) const
- const [MacroEntry](#) & [GetMacroEntry](#) (const [Tag](#) &tag) const
- const char \* [GetName](#) () const
- void [SetName](#) (const char \*name)
- bool [Verify](#) (const [DataSet](#) &ds, [Usage](#) const &usage) const

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Macro](#) &\_val)

## 12.184.1 Detailed Description

Class for representing a [Macro](#).

### Note

[Attribute Macro](#): a set of Attributes that are described in a single table that is referenced by multiple [Module](#) or other tables.

### See also

[Module](#)

## 12.184.2 Member Typedef Documentation

### 12.184.2.1 ArrayIncludeMacroType

```
typedef std::vector<std::string> gdcmm::Macro::ArrayIncludeMacroType
```

### 12.184.2.2 MapModuleEntry

```
typedef std::map<Tag, MacroEntry> gdcmm::Macro::MapModuleEntry
```

## 12.184.3 Constructor & Destructor Documentation

### 12.184.3.1 Macro()

```
gdcmmacro::Macro::Macro () [default]
```

References [Macro\(\)](#), and [operator<<](#).

Referenced by [Macro\(\)](#), and [operator<<](#).

## 12.184.4 Member Function Documentation

### 12.184.4.1 AddMacroEntry()

```
void gdcmmacro::Macro::AddMacroEntry (  
    const Tag & tag,  
    const MacroEntry & module) [inline]
```

Will add a [ModuleEntry](#) directly at root-level. See [Macro](#) for nested-included level.

### 12.184.4.2 Clear()

```
void gdcmmacro::Macro::Clear () [inline]
```

### 12.184.4.3 FindMacroEntry()

```
bool gdcmmacro::Macro::FindMacroEntry (  
    const Tag & tag) const
```

Find or Get a [ModuleEntry](#). [ModuleEntry](#) are either search are root-level or within nested-macro included in module.

### 12.184.4.4 GetMacroEntry()

```
const MacroEntry & gdcmmacro::Macro::GetMacroEntry (  
    const Tag & tag) const
```

### 12.184.4.5 GetName()

```
const char * gdcmmacro::Macro::GetName () const [inline]
```

#### 12.184.4.6 SetName()

```
void gdcmmacro::Macro::SetName (
    const char * name) [inline]
```

#### 12.184.4.7 Verify()

```
bool gdcmmacro::Macro::Verify (
    const DataSet & ds,
    Usage const & usage) const
```

### 12.184.5 Friends And Related Symbol Documentation

#### 12.184.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Macro & _val) [friend]
```

References [Macro\(\)](#).

Referenced by [Macro\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmmacro.h](#)

## 12.185 gdcmmacro::Macros Class Reference

Class for representing a [Modules](#).

```
#include <gdcmmacros.h>
```

### Public Types

- typedef std::map< std::string, [Macro](#) > [ModuleMapType](#)

### Public Member Functions

- [Macros](#) ()=default
- void [AddMacro](#) (const char \*ref, const [Macro](#) &module)
- void [Clear](#) ()
- const [Macro](#) & [GetMacro](#) (const char \*name) const
- bool [IsEmpty](#) () const

## Friends

- `std::ostream & operator<< (std::ostream &_os, const Macros &_val)`

## 12.185.1 Detailed Description

Class for representing a [Modules](#).

### Note

bla

### See also

[Module](#)

### Examples

[TraverseModules.cxx](#).

## 12.185.2 Member Typedef Documentation

### 12.185.2.1 ModuleMapType

```
typedef std::map<std::string, Macro> gdcmmacros::ModuleMapType
```

## 12.185.3 Constructor & Destructor Documentation

### 12.185.3.1 Macros()

```
gdcmmacros::Macros::Macros () [default]
```

References [Macros\(\)](#), and [operator<<](#).

Referenced by [Macros\(\)](#), and [operator<<](#).

## 12.185.4 Member Function Documentation

### 12.185.4.1 AddMacro()

```
void gdcmmacros::AddMacro (
    const char * ref,
    const Macro & module) [inline]
```

#### 12.185.4.2 Clear()

```
void gdcM::Macros::Clear () [inline]
```

#### 12.185.4.3 GetMacro()

```
const Macro & gdcM::Macros::GetMacro (
    const char * name) const [inline]
```

#### 12.185.4.4 IsEmpty()

```
bool gdcM::Macros::IsEmpty () const [inline]
```

### 12.185.5 Friends And Related Symbol Documentation

#### 12.185.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Macros & _val) [friend]
```

References [Macros\(\)](#).

Referenced by [Macros\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMMacros.h](#)

## 12.186 gdcM::network::MaximumLengthSub Class Reference

[MaximumLengthSub](#).

```
#include <gdcMMaximumLengthSub.h>
```

#### Public Member Functions

- [MaximumLengthSub](#) ()
- uint32\_t [GetMaximumLength](#) () const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetMaximumLength](#) (uint32\_t maximumlength)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const



## 12.186.1 Detailed Description

[MaximumLengthSub](#).

Annex D [Table D.1-1](#) MAXIMUM LENGTH SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

or

[Table D.1-2](#) Maximum length sub-item fields (A-ASSOCIATE-AC)

## 12.186.2 Constructor & Destructor Documentation

### 12.186.2.1 MaximumLengthSub()

```
gdcmm::network::MaximumLengthSub::MaximumLengthSub ()
```

## 12.186.3 Member Function Documentation

### 12.186.3.1 GetMaximumLength()

```
uint32_t gdcmm::network::MaximumLengthSub::GetMaximumLength () const [inline]
```

### 12.186.3.2 Print()

```
void gdcmm::network::MaximumLengthSub::Print (  
    std::ostream & os) const
```

### 12.186.3.3 Read()

```
std::istream & gdcmm::network::MaximumLengthSub::Read (  
    std::istream & is)
```

### 12.186.3.4 SetMaximumLength()

```
void gdcmm::network::MaximumLengthSub::SetMaximumLength (  
    uint32_t maximumlength)
```

### 12.186.3.5 Size()

```
size_t gdcmm::network::MaximumLengthSub::Size () const
```

### 12.186.3.6 Write()

```
const std::ostream & gdcM::network::MaximumLengthSub::Write (
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

- [gdcMMaximumLengthSub.h](#)

## 12.187 gdcM::MD5 Class Reference

Class for [MD5](#).

```
#include <gdcMMD5.h>
```

### Static Public Member Functions

- static bool [Compute](#) (const char \*buffer, size\_t buf\_len, char digest\_str[33])
- static bool [ComputeFile](#) (const char \*filename, char digest\_str[33])  
*Compute md5 from a file filename.*

### 12.187.1 Detailed Description

Class for [MD5](#).

#### Warning

this class is able to pick from two implementations:

1. a lightweight md5 implementation (when GDCM\_BUILD\_TESTING is turned ON)
2. the one from OpenSSL (when GDCM\_USE\_SYSTEM\_OPENSSL is turned ON)

In all other cases it will return an error

### 12.187.2 Member Function Documentation

#### 12.187.2.1 Compute()

```
bool gdcM::MD5::Compute (
    const char * buffer,
    size_t buf_len,
    char digest_str[33]) [static]
```

### 12.187.2.2 ComputeFile()

```
bool gdcm::MD5::ComputeFile (
    const char * filename,
    char digest_str[33]) [static]
```

Compute md5 from a file `filename`.

The documentation for this class was generated from the following file:

- [gdcmMD5.h](#)

## 12.188 gdcm::MEC\_MR3 Class Reference

Class for [MEC\\_MR3](#).

```
#include <gdcmMEC_MR3.h>
```

### Static Public Member Functions

- static const [PrivateTag](#) & [GetCanonMECMR3Tag](#) ()
- static const [PrivateTag](#) & [GetPMTFInformationDataTag](#) ()
- static const [PrivateTag](#) & [GetToshibaMECMR3Tag](#) ()
- static bool [Print](#) (const char \*src, size\_t srclen)

### 12.188.1 Detailed Description

Class for [MEC\\_MR3](#).

### 12.188.2 Member Function Documentation

#### 12.188.2.1 GetCanonMECMR3Tag()

```
const PrivateTag & gdcm::MEC_MR3::GetCanonMECMR3Tag () [static]
```

Return the private tag used by CANON to store the [MEC\\_MR3](#) data This is: [PrivateTag](#)(0x0029,0x90,"CANON\_MEC←\_MR3");

#### 12.188.2.2 GetPMTFInformationDataTag()

```
const PrivateTag & gdcm::MEC_MR3::GetPMTFInformationDataTag () [static]
```

Return the private tag used by PMTF to store the [MEC\\_MR3](#) data This is: [PrivateTag](#)(0x0029,0x90,"PMTF INFORMATION DATA");

### 12.188.2.3 GetToshibaMECMR3Tag()

```
const PrivateTag & gdcmm::MEC_MR3::GetToshibaMECMR3Tag () [static]
```

Return the private tag used by TOSHIBA to store the MEC\_MR3 data This is: PrivateTag(0x0029,0x90,"TOSHIBA\_MEC\_MR3");

### 12.188.2.4 Print()

```
bool gdcmm::MEC_MR3::Print (
    const char * src,
    size_t srclen) [static]
```

The documentation for this class was generated from the following file:

- [gdcmmMEC\\_MR3.h](#)

## 12.189 gdcmm::MediaStorage Class Reference

[MediaStorage](#).

```
#include <gdcmmMediaStorage.h>
```

### Public Types

- enum [MSType](#) {
 [MediaStorageDirectoryStorage](#) = 0 ,
 [ComputedRadiographyImageStorage](#) ,
 [DigitalXRayImageStorageForPresentation](#) ,
 [DigitalXRayImageStorageForProcessing](#) ,
 [DigitalMammographyImageStorageForPresentation](#) ,
 [DigitalMammographyImageStorageForProcessing](#) ,
 [DigitalIntraoralXrayImageStorageForPresentation](#) ,
 [DigitalIntraoralXrayImageStorageForProcessing](#) ,
 [CTImageStorage](#) ,
 [EnhancedCTImageStorage](#) ,
 [UltrasoundImageStorageRetired](#) ,
 [UltrasoundImageStorage](#) ,
 [UltrasoundMultiFrameImageStorageRetired](#) ,
 [UltrasoundMultiFrameImageStorage](#) ,
 [MRIImageStorage](#) ,
 [EnhancedMRIImageStorage](#) ,
 [MRSpectroscopyStorage](#) ,
 [NuclearMedicineImageStorageRetired](#) ,
 [SecondaryCaptureImageStorage](#) ,
 [MultiframeSingleBitSecondaryCaptureImageStorage](#) ,
 [MultiframeGrayscaleByteSecondaryCaptureImageStorage](#) ,
 [MultiframeGrayscaleWordSecondaryCaptureImageStorage](#) ,
 }

[MultiframeTrueColorSecondaryCaptureImageStorage](#) ,  
[StandaloneOverlayStorage](#) ,  
[StandaloneCurveStorage](#) ,  
[LeadECGWaveformStorage](#) ,  
[GeneralECGWaveformStorage](#) ,  
[AmbulatoryECGWaveformStorage](#) ,  
[HemodynamicWaveformStorage](#) ,  
[CardiacElectrophysiologyWaveformStorage](#) ,  
[BasicVoiceAudioWaveformStorage](#) ,  
[StandaloneModalityLUTStorage](#) ,  
[StandaloneVOILUTStorage](#) ,  
[GrayscaleSoftcopyPresentationStateStorageSOPClass](#) ,  
[XRayAngiographicImageStorage](#) ,  
[XRayRadiofluoroscopicImageStorage](#) ,  
[XRayAngiographicBiPlaneImageStorageRetired](#) ,  
[NuclearMedicineImageStorage](#) ,  
[RawDataStorage](#) ,  
[SpacialRegistrationStorage](#) ,  
[SpacialFiducialsStorage](#) ,  
[PETImageStorage](#) ,  
[RTImageStorage](#) ,  
[RTDoseStorage](#) ,  
[RTStructureSetStorage](#) ,  
[RTPlanStorage](#) ,  
[CSANonImageStorage](#) ,  
[Philips3D](#) ,  
[EnhancedSR](#) ,  
[BasicTextSR](#) ,  
[HardcopyGrayscaleImageStorage](#) ,  
[ComprehensiveSR](#) ,  
[DetachedStudyManagementSOPClass](#) ,  
[EncapsulatedPDFStorage](#) ,  
[EncapsulatedCDASStorage](#) ,  
[StudyComponentManagementSOPClass](#) ,  
[DetachedVisitManagementSOPClass](#) ,  
[DetachedPatientManagementSOPClass](#) ,  
[VideoEndoscopicImageStorage](#) ,  
[GeneralElectricMagneticResonanceImageStorage](#) ,  
[GEPrivate3DModelStorage](#) ,  
[ToshibaPrivateDataStorage](#) ,  
[MammographyCADSR](#) ,  
[KeyObjectSelectionDocument](#) ,  
[HangingProtocolStorage](#) ,  
[ModalityPerformedProcedureStepSOPClass](#) ,  
[PhilipsPrivateMRSyntheticImageStorage](#) ,  
[VLPhotographicImageStorage](#) ,  
[SegmentationStorage](#) ,  
[RTIonPlanStorage](#) ,  
[XRay3DAngiographicImageStorage](#) ,  
[EnhancedXAImageStorage](#) ,  
[RTIonBeamsTreatmentRecordStorage](#) ,  
[SurfaceSegmentationStorage](#) ,  
[VLWholeSlideMicroscopyImageStorage](#) ,  
[RTTreatmentSummaryRecordStorage](#) ,

```

    EnhancedUSVolumeStorage ,
    XRayRadiationDoseSR ,
    VLEndoscopicImageStorage ,
    BreastTomosynthesisImageStorage ,
    FujiPrivateCRImageStorage ,
    OphthalmicPhotography8BitImageStorage ,
    OphthalmicTomographyImageStorage ,
    VLMicroscopicImageStorage ,
    EnhancedPETImageStorage ,
    VideoPhotographicImageStorage ,
    XRay3DCraniofacialImageStorage ,
    IVOCTForPresentation ,
    IVOCTForProcessing ,
    LegacyConvertedEnhancedCTImageStorage ,
    LegacyConvertedEnhancedMRIImageStorage ,
    LegacyConvertedEnhancedPETImageStorage ,
    BreastProjectionXRayImageStorageForPresentation ,
    BreastProjectionXRayImageStorageForProcessing ,
    HardcopyColorImageStorage ,
    EnhancedMRColorImageStorage ,
    FujiPrivateMammoCRImageStorage ,
    OphthalmicPhotography16BitImageStorage ,
    VideoMicroscopicImageStorage ,
    MS_END }
• enum ObjectType {
    NoObject = 0 ,
    Video ,
    Waveform ,
    Audio ,
    PDF ,
    URI ,
    Segmentation ,
    ObjectEnd }

```

## Public Member Functions

- [MediaStorage](#) (MSType type=MS\_END)
- const char \* [GetModality](#) () const
- unsigned int [GetModalityDimension](#) () const
- const char \* [GetString](#) () const
 

*Return the Media [String](#) of the object.*
- void [GuessFromModality](#) (const char \*modality, unsigned int dimension=2)
- bool [IsUndefined](#) () const
- [operator MSType](#) () const
- bool [SetFromDataSet](#) ([DataSet](#) const &ds)
- bool [SetFromFile](#) ([File](#) const &file)
- bool [SetFromHeader](#) ([FileMetaInformation](#) const &fmi)
- bool [SetFromModality](#) ([DataSet](#) const &ds)

### Static Public Member Functions

- static const char \* [GetMSString](#) ([MSType](#) ts)  
*Return the Media [String](#) associated. Will return NULL for MS\_END.*
- static [MSType](#) [GetMSType](#) (const char \*str)
- static unsigned int [GetNumberOfModality](#) ()
- static unsigned int [GetNumberOfMSString](#) ()
- static unsigned int [GetNumberOfMSType](#) ()
- static bool [IsImage](#) ([MSType](#) ts)

### Protected Member Functions

- void [SetFromSourceImageSequence](#) ([DataSet](#) const &ds)

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [MediaStorage](#) &ms)

## 12.189.1 Detailed Description

[MediaStorage](#).

#### Note

FIXME There should not be any notion of [Image](#) and/or PDF at that point Only the codec can answer yes I support this Media Storage or not... For instance an [ImageCodec](#) will answer yes to most of them while a [PDFCodec](#) will answer only for the Encapsulated PDF

#### See also

[UIDs](#)

#### Examples

[CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenerateStandardSOPClasses.cxx](#), [GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), [TestReader.cxx](#), [gdcmmrtionplan.cxx](#), [gdcmmrtplan.cxx](#), and [iU22tomultisc.cxx](#).

## 12.189.2 Member Enumeration Documentation

### 12.189.2.1 MStype

enum `gdcm::MediaStorage::MStype`

#### Enumerator

MediaStorageDirectoryStorage	
ComputedRadiographyImageStorage	
DigitalXRayImageStorageForPresentation	
DigitalXRayImageStorageForProcessing	
DigitalMammographyImageStorageForPresentation	
DigitalMammographyImageStorageForProcessing	
DigitalIntraoralXrayImageStorageForPresentation	
DigitalIntraoralXRayImageStorageForProcessing	
CTImageStorage	
EnhancedCTImageStorage	
UltrasoundImageStorageRetired	
UltrasoundImageStorage	
UltrasoundMultiFrameImageStorageRetired	
UltrasoundMultiFrameImageStorage	
MRImageStorage	
EnhancedMRImageStorage	
MRSpectroscopyStorage	
NuclearMedicineImageStorageRetired	
SecondaryCaptureImageStorage	
MultiframeSingleBitSecondaryCaptureImageStorage	
MultiframeGrayscaleByteSecondaryCaptureImageStorage	
MultiframeGrayscaleWordSecondaryCaptureImageStorage	
MultiframeTrueColorSecondaryCaptureImageStorage	
StandaloneOverlayStorage	
StandaloneCurveStorage	
LeadECGWaveformStorage	
GeneralECGWaveformStorage	
AmbulatoryECGWaveformStorage	
HemodynamicWaveformStorage	
CardiacElectrophysiologyWaveformStorage	
BasicVoiceAudioWaveformStorage	
StandaloneModalityLUTStorage	
StandaloneVOILUTStorage	



GrayscaleSoftcopyPresentationStateStorageSOPClass	
XRayAngiographicImageStorage	
XRayRadiofluoroscopicImageStorage	
XRayAngiographicBiPlaneImageStorageRetired	
NuclearMedicineImageStorage	
RawDataStorage	
SpacialRegistrationStorage	
SpacialFiducialsStorage	
PETImageStorage	
RTImageStorage	
RTDoseStorage	
RTStructureSetStorage	
RTPlanStorage	
CSANonImageStorage	
Philips3D	
EnhancedSR	
BasicTextSR	
HardcopyGrayscaleImageStorage	
ComprehensiveSR	
DetachedStudyManagementSOPClass	
EncapsulatedPDFStorage	
EncapsulatedCDASStorage	
StudyComponentManagementSOPClass	
DetachedVisitManagementSOPClass	
DetachedPatientManagementSOPClass	
VideoEndoscopicImageStorage	
GeneralElectricMagneticResonanceImageStorage	
GEPrivate3DModelStorage	
ToshibaPrivateDataStorage	
MammographyCADSR	
KeyObjectSelectionDocument	
HangingProtocolStorage	
ModalityPerformedProcedureStepSOPClass	
PhilipsPrivateMRSyntheticImageStorage	
VLPhotographicImageStorage	
SegmentationStorage	
RTIonPlanStorage	
XRay3DAngiographicImageStorage	
EnhancedXAImageStorage	

RTIonBeamsTreatmentRecordStorage	
SurfaceSegmentationStorage	
VLWholeSlideMicroscopyImageStorage	
RTTreatmentSummaryRecordStorage	
EnhancedUSVolumeStorage	
XRayRadiationDoseSR	
VLEndoscopicImageStorage	
BreastTomosynthesisImageStorage	
FujiPrivateCRImageStorage	
OphthalmicPhotography8BitImageStorage	
OphthalmicTomographyImageStorage	
VLMicroscopicImageStorage	
EnhancedPETImageStorage	
VideoPhotographicImageStorage	
XRay3DCraniofacialImageStorage	
IVOCTForPresentation	
IVOCTForProcessing	
LegacyConvertedEnhancedCTImageStorage	
LegacyConvertedEnhancedMRIImageStorage	
LegacyConvertedEnhancedPETImageStorage	
BreastProjectionXRayImageStorageForPresentation	
BreastProjectionXRayImageStorageForProcessing	
HardcopyColorImageStorage	
EnhancedMRColorImageStorage	
FujiPrivateMammoCRImageStorage	
OphthalmicPhotography16BitImageStorage	
VideoMicroscopicImageStorage	
MS_END	

### Examples

[GenerateStandardSOPClasses.cxx](#), and [MpegVideoInfo.cs](#).

### 12.189.2.2 ObjectType

enum `gdcm::MediaStorage::ObjectType`

#### Enumerator

NoObject	
----------	--

Video	
Waveform	
Audio	
PDF	
URI	
Segmentation	
ObjectEnd	

## 12.189.3 Constructor & Destructor Documentation

### 12.189.3.1 MediaStorage()

```
gdcm::MediaStorage::MediaStorage (
    MSType type = MS_END) [inline]
```

References [MS\\_END](#).

Referenced by [GuessFromModality\(\)](#), and [operator<<](#).

## 12.189.4 Member Function Documentation

### 12.189.4.1 GetModality()

```
const char * gdcm::MediaStorage::GetModality () const
```

### 12.189.4.2 GetModalityDimension()

```
unsigned int gdcm::MediaStorage::GetModalityDimension () const
```

### 12.189.4.3 GetMSString()

```
const char * gdcm::MediaStorage::GetMSString (
    MSType ts) [static]
```

Return the Media [String](#) associated. Will return NULL for MS\_END.

#### Examples

[GenerateStandardSOPClasses.cxx](#).

Referenced by [operator<<](#).

#### 12.189.4.4 GetMSType()

```
MSType gdcm::MediaStorage::GetMSType (
    const char * str) [static]
```

##### Examples

[MetaImageMD5Activiz.cs](#), and [TestReader.cxx](#).

#### 12.189.4.5 GetNumberOfModality()

```
unsigned int gdcm::MediaStorage::GetNumberOfModality () [static]
```

#### 12.189.4.6 GetNumberOfMSString()

```
unsigned int gdcm::MediaStorage::GetNumberOfMSString () [static]
```

#### 12.189.4.7 GetNumberOfMSType()

```
unsigned int gdcm::MediaStorage::GetNumberOfMSType () [static]
```

#### 12.189.4.8 GetString()

```
const char * gdcm::MediaStorage::GetString () const
```

Return the Media [String](#) of the object.

##### Examples

[CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#),  
[GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), and  
[iU22tomultisc.cxx](#).

#### 12.189.4.9 GuessFromModality()

```
void gdcm::MediaStorage::GuessFromModality (
    const char * modality,
    unsigned int dimension = 2)
```

References [MediaStorage\(\)](#), and [operator<<](#).

#### 12.189.4.10 IsImage()

```
bool gdcm::MediaStorage::IsImage (
    MType ts) [static]
```

Returns whether DICOM has a Pixel Data element (7fe0,0010)

##### Warning

MRSpectroscopyStorage could be image but are not

##### Examples

[MetaImageMD5Activiz.cs](#).

#### 12.189.4.11 IsUndefined()

```
bool gdcm::MediaStorage::IsUndefined () const [inline]
```

##### Examples

[TestReader.cxx](#).

References [MS\\_END](#).

#### 12.189.4.12 operator MType()

```
gdcm::MediaStorage::operator MType () const [inline]
```

#### 12.189.4.13 SetFromDataSet()

```
bool gdcm::MediaStorage::SetFromDataSet (
    DataSet const & ds)
```

Advanced user only (functions should be protected level...) Those function are lower level than SetFromFile

#### 12.189.4.14 SetFromFile()

```
bool gdcm::MediaStorage::SetFromFile (
    File const & file)
```

Attempt to set the [MediaStorage](#) from a file: WARNING: When no [MediaStorage](#) & Modality are found BUT a PixelData element is found then [MediaStorage](#) is set to the default SecondaryCaptureImageStorage (return value is false in this case)

##### Examples

[ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [TestReader.cxx](#), [gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

#### 12.189.4.15 SetFromHeader()

```
bool gdcM::MediaStorage::SetFromHeader (
    FileMetaInformation const & fmi)
```

#### 12.189.4.16 SetFromModality()

```
bool gdcM::MediaStorage::SetFromModality (
    DataSet const & ds)
```

#### 12.189.4.17 SetFromSourceImageSequence()

```
void gdcM::MediaStorage::SetFromSourceImageSequence (
    DataSet const & ds) [protected]
```

### 12.189.5 Friends And Related Symbol Documentation

#### 12.189.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const MediaStorage & ms) [friend]
```

References [MediaStorage\(\)](#), [GetMSString\(\)](#), and [operator<<](#).

Referenced by [GuessFromModality\(\)](#), and [operator<<](#).

The documentation for this class was generated from the following file:

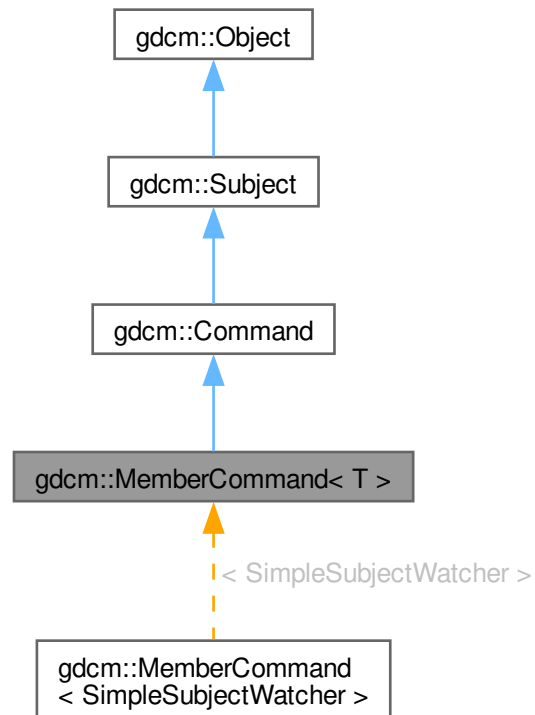
- [gdcMMediaStorage.h](#)

## 12.190 gdcM::MemberCommand< T > Class Template Reference

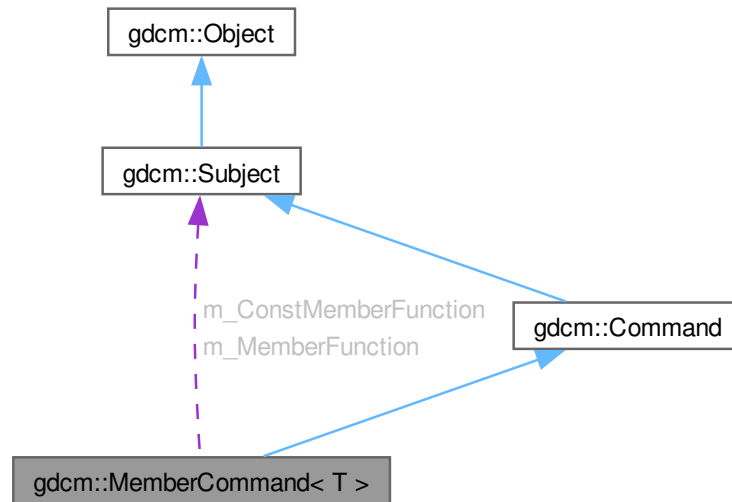
[Command](#) subclass that calls a pointer to a member function.

```
#include <gdcMCommand.h>
```

Inheritance diagram for gdcM::MemberCommand< T >:



Collaboration diagram for `gdcM::MemberCommand< T >`:



### Public Types

- typedef `MemberCommand Self`
- typedef void(`T::* TConstMemberFunctionPointer`) (`const Subject *`, `const Event &`)
- typedef void(`T::* TMemberFunctionPointer`) (`Subject *`, `const Event &`)

### Public Member Functions

- `MemberCommand` (`const Self &`)=delete
- void `Execute` (`const Subject *caller`, `const Event &event`) override
- void `Execute` (`Subject *caller`, `const Event &event`) override
- void `operator=` (`const Self &`)=delete
- void `SetCallbackFunction` (`T *object`, `TConstMemberFunctionPointer memberFunction`)
- void `SetCallbackFunction` (`T *object`, `TMemberFunctionPointer memberFunction`)

### Public Member Functions inherited from `gdcM::Command`

- `Command` (`const Command &`)=delete
- void `operator=` (`const Command &`)=delete



**Public Member Functions inherited from [gdcmmembercommand::Subject](#)**

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

**Public Member Functions inherited from [gdcmmembercommand::Object](#)**

- [Object](#) ()
- [Object](#) (const [Object](#) &)
- *Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

**Static Public Member Functions**

- static [SmartPointer](#)< [MemberCommand](#) > [New](#) ()

**Protected Member Functions**

- [MemberCommand](#) ()
- [~MemberCommand](#) () override=default

**Protected Member Functions inherited from [gdcmmembercommand::Command](#)**

- [Command](#) ()
- [~Command](#) () override

**Protected Member Functions inherited from [gdcmmembercommand::Object](#)**

- void [Register](#) ()
- void [UnRegister](#) ()

**Protected Attributes**

- [TConstMemberFunctionPointer](#) [m\\_ConstMemberFunction](#)
- [TMemberFunctionPointer](#) [m\\_MemberFunction](#)
- T \* [m\\_This](#)

### 12.190.1 Detailed Description

```
template<class T>
class gdcM::MemberCommand< T >
```

[Command](#) subclass that calls a pointer to a member function.

[MemberCommand](#) calls a pointer to a member function with the same arguments as Execute on [Command](#).

### 12.190.2 Member Typedef Documentation

#### 12.190.2.1 Self

```
template<class T>
typedef MemberCommand gdcM::MemberCommand< T >::Self
```

Standard class typedefs.

#### 12.190.2.2 TConstMemberFunctionPointer

```
template<class T>
typedef void(T::* gdcM::MemberCommand< T >::TConstMemberFunctionPointer) (const Subject *, const
Event &)
```

#### 12.190.2.3 TMemberFunctionPointer

```
template<class T>
typedef void(T::* gdcM::MemberCommand< T >::TMemberFunctionPointer) (Subject *, const Event &)
```

pointer to a member function that takes a Subject\* and the event

### 12.190.3 Constructor & Destructor Documentation

#### 12.190.3.1 MemberCommand() [1/2]

```
template<class T>
gdcM::MemberCommand< T >::MemberCommand (
    const Self & ) [delete]
```

#### 12.190.3.2 MemberCommand() [2/2]

```
template<class T>
gdcM::MemberCommand< T >::MemberCommand () [inline], [protected]
```

### 12.190.3.3 ~MemberCommand()

```
template<class T>
gdcmmembercommand< T >::~~MemberCommand () [override], [protected], [default]
```

## 12.190.4 Member Function Documentation

### 12.190.4.1 Execute() [1/2]

```
template<class T>
void gdcmmembercommand< T >::Execute (
    const Subject * caller,
    const Event & event) [inline], [override], [virtual]
```

Invoke the member function with a const object.

Implements [gdcmmembercommand::Command](#).

### 12.190.4.2 Execute() [2/2]

```
template<class T>
void gdcmmembercommand< T >::Execute (
    Subject * caller,
    const Event & event) [inline], [override], [virtual]
```

Invoke the member function.

Implements [gdcmmembercommand::Command](#).

### 12.190.4.3 New()

```
template<class T>
SmartPointer< MemberCommand > gdcmmembercommand< T >::New () [inline], [static]
```

Method for creation through the object factory.

### 12.190.4.4 operator=()

```
template<class T>
void gdcmmembercommand< T >::operator= (
    const Self & ) [delete]
```

#### 12.190.4.5 SetCallbackFunction() [1/2]

```
template<class T>
void gdcm::MemberCommand< T >::SetCallbackFunction (
    T * object,
    TConstMemberFunctionPointer memberFunction) [inline]
```

#### 12.190.4.6 SetCallbackFunction() [2/2]

```
template<class T>
void gdcm::MemberCommand< T >::SetCallbackFunction (
    T * object,
    TMemberFunctionPointer memberFunction) [inline]
```

Run-time type information (and related methods). Set the callback function along with the object that it will be invoked on.

### 12.190.5 Member Data Documentation

#### 12.190.5.1 m\_ConstMemberFunction

```
template<class T>
TConstMemberFunctionPointer gdcm::MemberCommand< T >::m_ConstMemberFunction [protected]
```

#### 12.190.5.2 m\_MemberFunction

```
template<class T>
TMemberFunctionPointer gdcm::MemberCommand< T >::m_MemberFunction [protected]
```

#### 12.190.5.3 m\_This

```
template<class T>
T* gdcm::MemberCommand< T >::m_This [protected]
```

The documentation for this class was generated from the following file:

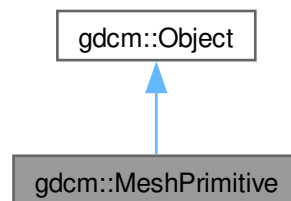
- [gdcmCommand.h](#)

## 12.191 gdcM::MeshPrimitive Class Reference

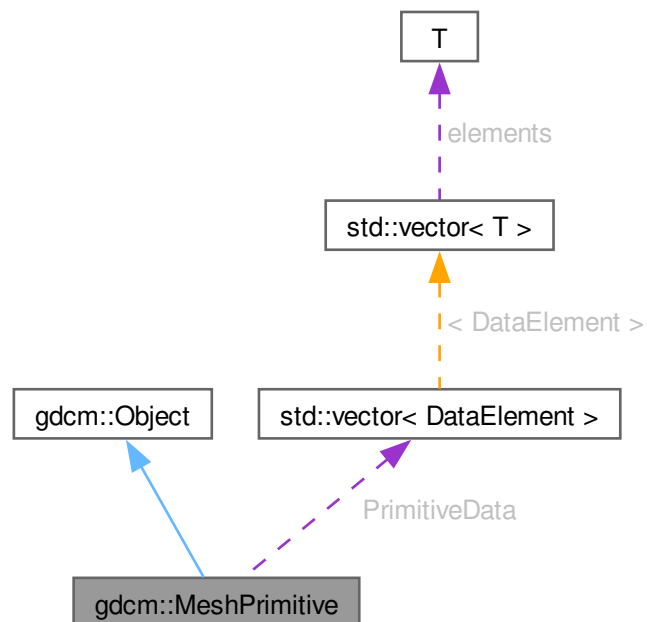
This class defines surface mesh primitives.

```
#include <gdcMMeshPrimitive.h>
```

Inheritance diagram for gdcM::MeshPrimitive:



Collaboration diagram for gdcM::MeshPrimitive:



## Public Types

- enum [MPTType](#) {  
[VERTEX](#) = 0 ,  
[EDGE](#) ,  
[TRIANGLE](#) ,  
[TRIANGLE\\_STRIP](#) ,  
[TRIANGLE\\_FAN](#) ,  
[LINE](#) ,  
[FACET](#) ,  
[MPTType\\_END](#) }

*This enumeration defines primitive types.*

- typedef std::vector< [DataElement](#) > [PrimitivesData](#)

## Public Member Functions

- [MeshPrimitive](#) ()
- [~MeshPrimitive](#) () override
- void [AddPrimitiveData](#) ([DataElement](#) const &de)
- unsigned int [GetNumberOfPrimitivesData](#) () const
- [DataElement](#) & [GetPrimitiveData](#) ()
- const [DataElement](#) & [GetPrimitiveData](#) () const
- [DataElement](#) & [GetPrimitiveData](#) (const unsigned int idx)
- const [DataElement](#) & [GetPrimitiveData](#) (const unsigned int idx) const
- [PrimitivesData](#) & [GetPrimitivesData](#) ()
- const [PrimitivesData](#) & [GetPrimitivesData](#) () const
- [MPTType](#) [GetPrimitiveType](#) () const
- void [SetPrimitiveData](#) (const unsigned int idx, [DataElement](#) const &de)
- void [SetPrimitiveData](#) ([DataElement](#) const &de)
- void [SetPrimitivesData](#) ([PrimitivesData](#) const &DEs)
- void [SetPrimitiveType](#) (const [MPTType](#) type)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)
- *Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Static Public Member Functions

- static [MPTType](#) [GetMPTType](#) (const char \*type)
- static const char \* [GetMPTTypeString](#) (const [MPTType](#) type)

### Protected Attributes

- [PrimitivesData](#) `PrimitiveData`
- [MPType](#) `PrimitiveType`

### Additional Inherited Members

### Protected Member Functions inherited from [gdcM::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## 12.191.1 Detailed Description

This class defines surface mesh primitives.

It is designed from surface mesh primitives macro.

See also

PS 3.3 C.27.4

## 12.191.2 Member Typedef Documentation

### 12.191.2.1 `PrimitivesData`

```
typedef std::vector< DataElement > gdcM::MeshPrimitive::PrimitivesData
```

## 12.191.3 Member Enumeration Documentation

### 12.191.3.1 `MPType`

```
enum gdcM::MeshPrimitive::MPType
```

This enumeration defines primitive types.

See also

PS 3.3 C.27.4.1

### Enumerator

VERTEX	
EDGE	
TRIANGLE	
TRIANGLE_STRIP	
TRIANGLE_FAN	
LINE	
FACET	
MPType_END	

## 12.191.4 Constructor & Destructor Documentation

### 12.191.4.1 MeshPrimitive()

```
gdcM::MeshPrimitive::MeshPrimitive ()
```

### 12.191.4.2 ~MeshPrimitive()

```
gdcM::MeshPrimitive::~~MeshPrimitive () [override]
```

## 12.191.5 Member Function Documentation

### 12.191.5.1 AddPrimitiveData()

```
void gdcM::MeshPrimitive::AddPrimitiveData (  
    DataElement const & de)
```

### 12.191.5.2 GetMPType()

```
MPType gdcM::MeshPrimitive::GetMPType (  
    const char * type) [static]
```

### 12.191.5.3 GetMPTypeString()

```
const char * gdcM::MeshPrimitive::GetMPTypeString (  
    const MPType type) [static]
```



#### 12.191.5.4 GetNumberOfPrimitivesData()

```
unsigned int gdcM::MeshPrimitive::GetNumberOfPrimitivesData () const
```

#### 12.191.5.5 GetPrimitiveData() [1/4]

```
DataElement & gdcM::MeshPrimitive::GetPrimitiveData ()
```

#### 12.191.5.6 GetPrimitiveData() [2/4]

```
const DataElement & gdcM::MeshPrimitive::GetPrimitiveData () const
```

#### 12.191.5.7 GetPrimitiveData() [3/4]

```
DataElement & gdcM::MeshPrimitive::GetPrimitiveData (  
    const unsigned int idx)
```

#### 12.191.5.8 GetPrimitiveData() [4/4]

```
const DataElement & gdcM::MeshPrimitive::GetPrimitiveData (  
    const unsigned int idx) const
```

#### 12.191.5.9 GetPrimitivesData() [1/2]

```
PrimitivesData & gdcM::MeshPrimitive::GetPrimitivesData ()
```

#### 12.191.5.10 GetPrimitivesData() [2/2]

```
const PrimitivesData & gdcM::MeshPrimitive::GetPrimitivesData () const
```

#### 12.191.5.11 GetPrimitiveType()

```
MPTyp gdcM::MeshPrimitive::GetPrimitiveType () const
```

#### 12.191.5.12 SetPrimitiveData() [1/2]

```
void gdcM::MeshPrimitive::SetPrimitiveData (  
    const unsigned int idx,  
    DataElement const & de)
```

**12.191.5.13 SetPrimitiveData() [2/2]**

```
void gdcM::MeshPrimitive::SetPrimitiveData (
    DataElement const & de)
```

**12.191.5.14 SetPrimitivesData()**

```
void gdcM::MeshPrimitive::SetPrimitivesData (
    PrimitivesData const & DEs)
```

**12.191.5.15 SetPrimitiveType()**

```
void gdcM::MeshPrimitive::SetPrimitiveType (
    const MPTypE type)
```

**12.191.6 Member Data Documentation****12.191.6.1 PrimitiveData**

```
PrimitivesData gdcM::MeshPrimitive::PrimitiveData [protected]
```

**12.191.6.2 PrimitiveType**

```
MPTypE gdcM::MeshPrimitive::PrimitiveType [protected]
```

The documentation for this class was generated from the following file:

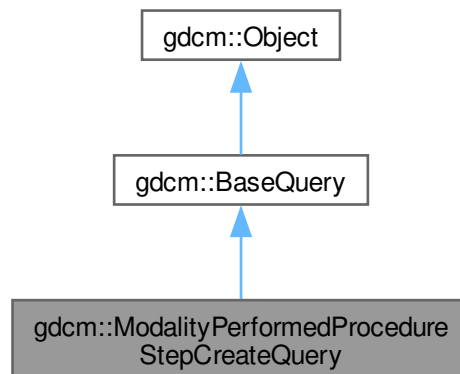
- [gdcMMeshPrimitive.h](#)

**12.192 gdcM::ModalityPerformedProcedureStepCreateQuery Class Reference**

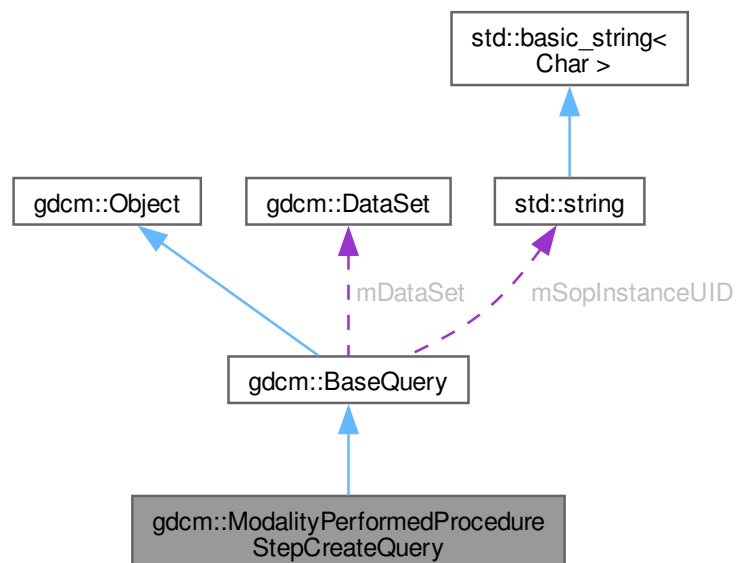
[ModalityPerformedProcedureStepCreateQuery.](#)

```
#include <gdcMModalityPerformedProcedureStepCreateQuery.h>
```

Inheritance diagram for gdcm::ModalityPerformedProcedureStepCreateQuery:



Collaboration diagram for gdcm::ModalityPerformedProcedureStepCreateQuery:



## Public Member Functions

- [ModalityPerformedProcedureStepCreateQuery](#) (const std::string &iSopInstanceUID)

- [UIDs::TSName GetAbstractSyntaxUID](#) () const override
- [gdcm::DataSet GetRequiredDataSet](#) () const
- bool [ValidateQuery](#) (bool inStrict=true) const override

### Public Member Functions inherited from [gdcm::BaseQuery](#)

- [~BaseQuery](#) () override
- void [AddQueryDataSet](#) (const [DataSet](#) &ds)
- [DataSet](#) & [GetQueryDataSet](#) ()
- [DataSet](#) const & [GetQueryDataSet](#) () const
- *Set/Get the internal representation of the query as a [DataSet](#).*
- std::string [GetSOPInstanceUID](#) () const
- void [Print](#) (std::ostream &os) const override
- void [SetSearchParameter](#) (const std::string &inKeyword, const std::string &inValue)
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const std::string &inValue)
- void [SetSOPInstanceUID](#) (const std::string &iSopInstanceUID)
- const std::ostream & [WriteHelpFile](#) (std::ostream &os)
- bool [WriteQuery](#) (const std::string &inFileName)

### Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)
- *Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

### Friends

- class [QueryFactory](#)

### Additional Inherited Members

### Protected Member Functions inherited from [gdcm::BaseQuery](#)

- [BaseQuery](#) ()
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [DictEntry](#) &inDictEntry, const std::string &inValue)
- bool [ValidDataSet](#) (const [DataSet](#) &dataSetToValid, const [DataSet](#) &dataSetReference) const

### Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## Protected Attributes inherited from [gdcm::BaseQuery](#)

- [DataSet](#) `mDataSet`
- `std::string` `mSopInstanceUID`

### 12.192.1 Detailed Description

[ModalityPerformedProcedureStepCreateQuery](#).

contains: the class which will produce a dataset for n-create for Modality Performed Procedure Step sop class

### 12.192.2 Constructor & Destructor Documentation

#### 12.192.2.1 ModalityPerformedProcedureStepCreateQuery()

```
gdcm::ModalityPerformedProcedureStepCreateQuery::ModalityPerformedProcedureStepCreateQuery (  
    const std::string & iSopInstanceUID)
```

### 12.192.3 Member Function Documentation

#### 12.192.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::ModalityPerformedProcedureStepCreateQuery::GetAbstractSyntaxUID () const [override],  
[virtual]
```

Implements [gdcm::BaseQuery](#).

#### 12.192.3.2 GetRequiredDataSet()

```
gdcm::DataSet gdcm::ModalityPerformedProcedureStepCreateQuery::GetRequiredDataSet () const
```

#### 12.192.3.3 ValidateQuery()

```
bool gdcm::ModalityPerformedProcedureStepCreateQuery::ValidateQuery (  
    bool inStrict = true) const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

## 12.192.4 Friends And Related Symbol Documentation

### 12.192.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

References [QueryFactory](#).

Referenced by [QueryFactory](#).

The documentation for this class was generated from the following file:

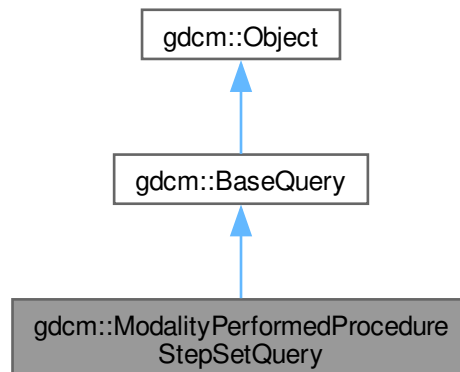
- [gdcmModalityPerformedProcedureStepCreateQuery.h](#)

## 12.193 gdcm::ModalityPerformedProcedureStepSetQuery Class Reference

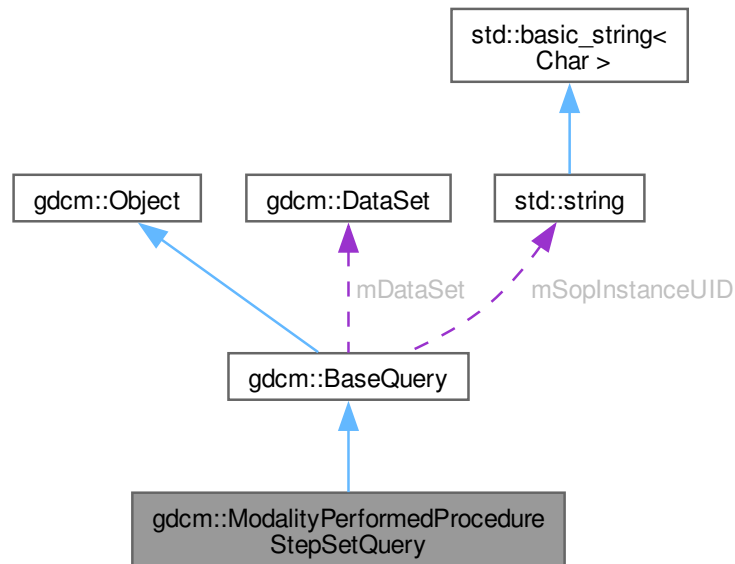
[ModalityPerformedProcedureStepSetQuery](#).

```
#include <gdcmModalityPerformedProcedureStepSetQuery.h>
```

Inheritance diagram for `gdcm::ModalityPerformedProcedureStepSetQuery`:



Collaboration diagram for gdcm::ModalityPerformedProcedureStepSetQuery:



### Public Member Functions

- [ModalityPerformedProcedureStepSetQuery](#) (const std::string &iSopInstanceUID)
- [UIDs::TSName GetAbstractSyntaxUID](#) () const override
- [gdcm::DataSet GetRequiredDataSet](#) () const
- bool [ValidateQuery](#) (bool inStrict=true) const override

### Public Member Functions inherited from [gdcm::BaseQuery](#)

- [~BaseQuery](#) () override
- void [AddQueryDataSet](#) (const [DataSet](#) &ds)
- [DataSet](#) & [GetQueryDataSet](#) ()
- [DataSet](#) const & [GetQueryDataSet](#) () const  
*Set/Get the internal representation of the query as a [DataSet](#).*
- std::string [GetSOPInstanceUID](#) () const
- void [Print](#) (std::ostream &os) const override
- void [SetSearchParameter](#) (const std::string &inKeyword, const std::string &inValue)
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const std::string &inValue)
- void [SetSOPInstanceUID](#) (const std::string &iSopInstanceUID)
- const std::ostream & [WriteHelpFile](#) (std::ostream &os)
- bool [WriteQuery](#) (const std::string &inFileName)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

## Friends

- class [QueryFactory](#)

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::BaseQuery](#)

- [BaseQuery](#) ()
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [DictEntry](#) &inDictEntry, const std::string &inValue)
- bool [ValidDataSet](#) (const [DataSet](#) &dataSetToValid, const [DataSet](#) &dataSetReference) const

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## Protected Attributes inherited from [gdcm::BaseQuery](#)

- [DataSet](#) [mDataSet](#)
- std::string [mSopInstanceUID](#)

### 12.193.1 Detailed Description

[ModalityPerformedProcedureStepSetQuery](#).

contains: the class which will produce a dataset for n-set for Modality Performed Procedure Step sop class

### 12.193.2 Constructor & Destructor Documentation

#### 12.193.2.1 [ModalityPerformedProcedureStepSetQuery](#)()

```
gdcm::ModalityPerformedProcedureStepSetQuery::ModalityPerformedProcedureStepSetQuery (
    const std::string & iSopInstanceUID)
```



## 12.193.3 Member Function Documentation

### 12.193.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::ModalityPerformedProcedureStepSetQuery::GetAbstractSyntaxUID () const [override],  
[virtual]
```

Implements [gdcm::BaseQuery](#).

### 12.193.3.2 GetRequiredDataSet()

```
gdcm::DataSet gdcm::ModalityPerformedProcedureStepSetQuery::GetRequiredDataSet () const
```

### 12.193.3.3 ValidateQuery()

```
bool gdcm::ModalityPerformedProcedureStepSetQuery::ValidateQuery (  
    bool inStrict = true) const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

## 12.193.4 Friends And Related Symbol Documentation

### 12.193.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

References [QueryFactory](#).

Referenced by [QueryFactory](#).

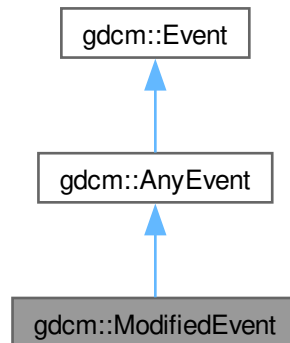
The documentation for this class was generated from the following file:

- [gdcmModalityPerformedProcedureStepSetQuery.h](#)

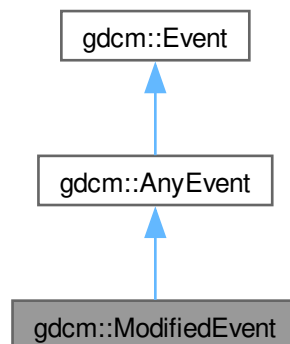
## 12.194 gdcm::ModifiedEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::ModifiedEvent:



Collaboration diagram for gdcm::ModifiedEvent:



### Additional Inherited Members

### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()

- [Event](#) (const Event &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 12.195 gdcm::Module Class Reference

Class for representing a [Module](#).

```
#include <gdcmModule.h>
```

### Public Types

- typedef std::vector< std::string > [ArrayIncludeMacrosType](#)
- typedef std::map< [Tag](#), [ModuleEntry](#) > [MapModuleEntry](#)

### Public Member Functions

- [Module](#) ()=default
- void [AddMacro](#) (const char \*include)
- void [AddModuleEntry](#) (const [Tag](#) &tag, const [ModuleEntry](#) &module)  
*Will add a [ModuleEntry](#) directly at root-level. See [Macro](#) for nested-included level.*
- void [Clear](#) ()
- bool [FindModuleEntryInMacros](#) ([Macros](#) const &macros, const [Tag](#) &tag) const
- const [ModuleEntry](#) & [GetModuleEntryInMacros](#) ([Macros](#) const &macros, const [Tag](#) &tag) const
- const char \* [GetName](#) () const
- void [SetName](#) (const char \*name)
- bool [Verify](#) (const [DataSet](#) &ds, [Usage](#) const &usage) const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Module](#) &\_val)

### 12.195.1 Detailed Description

Class for representing a [Module](#).

#### Note

[Module](#): A set of Attributes within an Information Entity or Normalized [IOD](#) which are logically related to each other.

#### See also

[Macro](#)

#### Examples

[TraverseModules.cxx](#).

### 12.195.2 Member Typedef Documentation

#### 12.195.2.1 ArrayIncludeMacroType

```
typedef std::vector<std::string> gdcm::Module::ArrayIncludeMacroType
```

#### 12.195.2.2 MapModuleEntry

```
typedef std::map<Tag, ModuleEntry> gdcm::Module::MapModuleEntry
```

### 12.195.3 Constructor & Destructor Documentation

#### 12.195.3.1 Module()

```
gdcm::Module::Module () [default]
```

References [Module\(\)](#), and [operator<<](#).

Referenced by [Module\(\)](#), and [operator<<](#).

### 12.195.4 Member Function Documentation

#### 12.195.4.1 AddMacro()

```
void gdcm::Module::AddMacro (  
    const char * include) [inline]
```

#### 12.195.4.2 AddModuleEntry()

```
void gdcmm::Module::AddModuleEntry (
    const Tag & tag,
    const ModuleEntry & module) [inline]
```

Will add a [ModuleEntry](#) directly at root-level. See [Macro](#) for nested-included level.

#### 12.195.4.3 Clear()

```
void gdcmm::Module::Clear () [inline]
```

#### 12.195.4.4 FindModuleEntryInMacros()

```
bool gdcmm::Module::FindModuleEntryInMacros (
    Macros const & macros,
    const Tag & tag) const
```

Find or Get a [ModuleEntry](#). [ModuleEntry](#) are either search are root-level or within nested-macro included in module.

#### Examples

[TraverseModules.cxx](#).

#### 12.195.4.5 GetModuleEntryInMacros()

```
const ModuleEntry & gdcmm::Module::GetModuleEntryInMacros (
    Macros const & macros,
    const Tag & tag) const
```

#### 12.195.4.6 GetName()

```
const char * gdcmm::Module::GetName () const [inline]
```

#### 12.195.4.7 SetName()

```
void gdcmm::Module::SetName (
    const char * name) [inline]
```

#### 12.195.4.8 Verify()

```
bool gdcmm::Module::Verify (
    const DataSet & ds,
    Usage const & usage) const
```

## 12.195.5 Friends And Related Symbol Documentation

### 12.195.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const Module & _val) [friend]
```

References [Module\(\)](#).

Referenced by [Module\(\)](#).

The documentation for this class was generated from the following file:

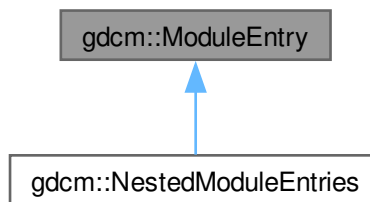
- [gdcmModule.h](#)

## 12.196 gdcm::ModuleEntry Class Reference

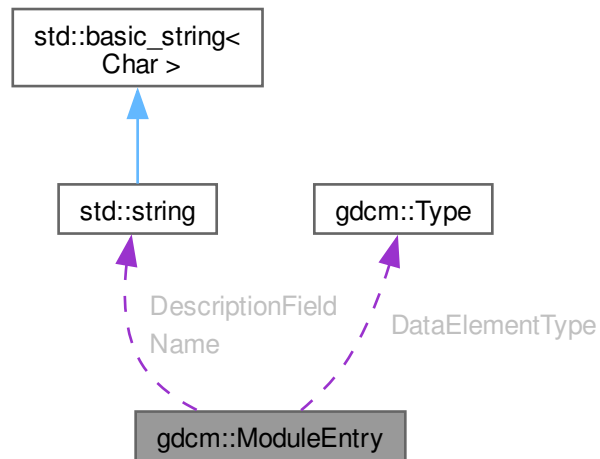
Class for representing a [ModuleEntry](#).

```
#include <gdcmModuleEntry.h>
```

Inheritance diagram for gdcm::ModuleEntry:



Collaboration diagram for gdcm::ModuleEntry:



## Public Types

- typedef std::string [Description](#)

## Public Member Functions

- [ModuleEntry](#) (const char \*name="", const char \*type="3", const char \*description="")
- virtual [~ModuleEntry](#) ()=default
- const [Description](#) & [GetDescription](#) () const
- const char \* [GetName](#) () const
- const [Type](#) & [GetType](#) () const
- void [SetDescription](#) (const char \*d)
- void [SetName](#) (const char \*name)
- void [SetType](#) (const [Type](#) &type)

## Protected Attributes

- [Type](#) [DataElementType](#)
- [Description](#) [DescriptionField](#)
- std::string [Name](#)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [ModuleEntry](#) &\_val)

### 12.196.1 Detailed Description

Class for representing a [ModuleEntry](#).

#### Note

bla

#### See also

[DictEntry](#)

#### Examples

[TraverseModules.cxx](#).

### 12.196.2 Member Typedef Documentation

#### 12.196.2.1 Description

```
typedef std::string gdcmm::ModuleEntry::Description
```

### 12.196.3 Constructor & Destructor Documentation

#### 12.196.3.1 ModuleEntry()

```
gdcmm::ModuleEntry::ModuleEntry (
    const char * name = "",
    const char * type = "3",
    const char * description = "") [inline]
```

References [DataElementType](#), [DescriptionField](#), [gdcmm::Type::GetTypeType\(\)](#), and [Name](#).

Referenced by [gdcmm::NestedModuleEntries::NestedModuleEntries\(\)](#), [~ModuleEntry\(\)](#), [gdcmm::NestedModuleEntries::AddModuleEntry\(\)](#), [gdcmm::NestedModuleEntries::GetModuleEntry\(\)](#), [gdcmm::NestedModuleEntries::GetModuleEntry\(\)](#), and [operator<<](#).

#### 12.196.3.2 ~ModuleEntry()

```
virtual gdcmm::ModuleEntry::~~ModuleEntry () [virtual], [default]
```

References [ModuleEntry\(\)](#), and [operator<<](#).



## 12.196.4 Member Function Documentation

### 12.196.4.1 GetDescription()

```
const Description & gdcmm::ModuleEntry::GetDescription () const [inline]
```

References [DescriptionField](#).

### 12.196.4.2 GetName()

```
const char * gdcmm::ModuleEntry::GetName () const [inline]
```

References [Name](#).

### 12.196.4.3 GetType()

```
const Type & gdcmm::ModuleEntry::GetType () const [inline]
```

#### Examples

[TraverseModules.cxx](#).

References [DataElementType](#).

### 12.196.4.4 SetDescription()

```
void gdcmm::ModuleEntry::SetDescription (  
    const char * d) [inline]
```

References [DescriptionField](#).

### 12.196.4.5 SetName()

```
void gdcmm::ModuleEntry::SetName (  
    const char * name) [inline]
```

References [Name](#).

### 12.196.4.6 SetType()

```
void gdcmm::ModuleEntry::SetType (  
    const Type & type) [inline]
```

References [DataElementType](#).

## 12.196.5 Friends And Related Symbol Documentation

### 12.196.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const ModuleEntry & _val) [friend]
```

References [ModuleEntry\(\)](#), [DataElementType](#), [DescriptionField](#), and [Name](#).

Referenced by [~ModuleEntry\(\)](#).

## 12.196.6 Member Data Documentation

### 12.196.6.1 DataElementType

[Type](#) `gdcm::ModuleEntry::DataElementType` [protected]

Referenced by [ModuleEntry\(\)](#), [GetType\(\)](#), [operator<<](#), [gdcm::NestedModuleEntries::operator<<](#), and [SetType\(\)](#).

### 12.196.6.2 DescriptionField

[Description](#) `gdcm::ModuleEntry::DescriptionField` [protected]

Referenced by [ModuleEntry\(\)](#), [GetDescription\(\)](#), [operator<<](#), [gdcm::NestedModuleEntries::operator<<](#), and [SetDescription\(\)](#).

### 12.196.6.3 Name

`std::string` `gdcm::ModuleEntry::Name` [protected]

Referenced by [ModuleEntry\(\)](#), [GetName\(\)](#), [operator<<](#), [gdcm::NestedModuleEntries::operator<<](#), and [SetName\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmModuleEntry.h](#)

## 12.197 gdcm::Modules Class Reference

Class for representing a [Modules](#).

```
#include <gdcmModules.h>
```

## Public Types

- typedef std::map< std::string, [Module](#) > [ModuleMapType](#)

## Public Member Functions

- [Modules](#) ()=default
- void [AddModule](#) (const char \*ref, const [Module](#) &module)
- void [Clear](#) ()
- const [Module](#) & [GetModule](#) (const char \*name) const
- bool [IsEmpty](#) () const

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Modules](#) &\_val)

## 12.197.1 Detailed Description

Class for representing a [Modules](#).

### Note

bla

### See also

[Module](#)

### Examples

[TraverseModules.cxx](#).

## 12.197.2 Member Typedef Documentation

### 12.197.2.1 ModuleMapType

```
typedef std::map<std::string, Module> gdcmm::Modules::ModuleMapType
```

## 12.197.3 Constructor & Destructor Documentation

### 12.197.3.1 Modules()

```
gdcmm::Modules::Modules () [default]
```

References [Modules\(\)](#), and [operator<<](#).

Referenced by [Modules\(\)](#), and [operator<<](#).

## 12.197.4 Member Function Documentation

### 12.197.4.1 AddModule()

```
void gdcM::Modules::AddModule (
    const char * ref,
    const Module & module) [inline]
```

### 12.197.4.2 Clear()

```
void gdcM::Modules::Clear () [inline]
```

### 12.197.4.3 GetModule()

```
const Module & gdcM::Modules::GetModule (
    const char * name) const [inline]
```

#### Examples

[TraverseModules.cxx](#).

### 12.197.4.4 IsEmpty()

```
bool gdcM::Modules::IsEmpty () const [inline]
```

## 12.197.5 Friends And Related Symbol Documentation

### 12.197.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Modules & _val) [friend]
```

References [Modules\(\)](#).

Referenced by [Modules\(\)](#).

The documentation for this class was generated from the following file:

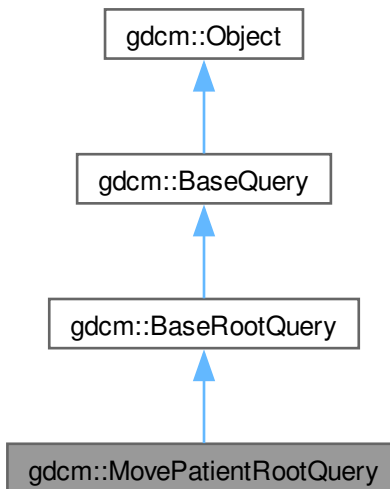
- [gdcMModules.h](#)

## 12.198 gdcm::MovePatientRootQuery Class Reference

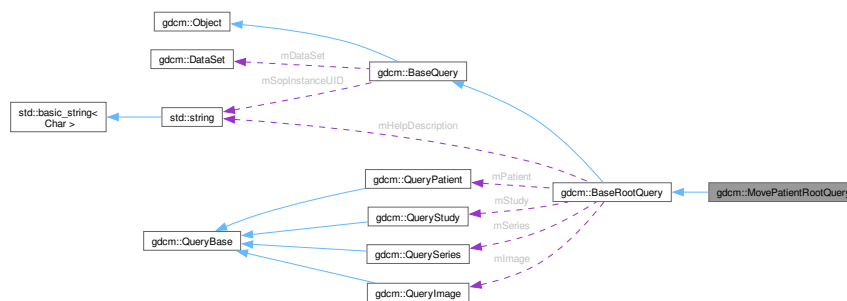
[MovePatientRootQuery](#).

```
#include <gdcmMovePatientRootQuery.h>
```

Inheritance diagram for gdcm::MovePatientRootQuery:



Collaboration diagram for gdcm::MovePatientRootQuery:



### Public Member Functions

- [MovePatientRootQuery](#) ()
- `UIDs::TSName GetAbstractSyntaxUID` () const override
- `std::vector< Tag > GetTagListByLevel` (const [EQueryLevel](#) &inQueryLevel) override
- void `InitializeDataSet` (const [EQueryLevel](#) &inQueryLevel) override
- bool `ValidateQuery` (bool inStrict=true) const override

## Public Member Functions inherited from [gdcm::BaseRootQuery](#)

- [~BaseRootQuery](#) () override=default
- [EQueryLevel GetQueryLevelFromQueryRoot](#) (ERootType roottype)

## Public Member Functions inherited from [gdcm::BaseQuery](#)

- [~BaseQuery](#) () override
  - void [AddQueryDataSet](#) (const [DataSet](#) &ds)
  - [DataSet](#) & [GetQueryDataSet](#) ()
  - [DataSet](#) const & [GetQueryDataSet](#) () const
- Set/Get the internal representation of the query as a [DataSet](#).*
- std::string [GetSOPInstanceUID](#) () const
  - void [Print](#) (std::ostream &os) const override
  - void [SetSearchParameter](#) (const std::string &inKeyword, const std::string &inValue)
  - void [SetSearchParameter](#) (const [Tag](#) &inTag, const std::string &inValue)
  - void [SetSOPInstanceUID](#) (const std::string &iSopInstanceUID)
  - const std::ostream & [WriteHelpFile](#) (std::ostream &os)
  - bool [WriteQuery](#) (const std::string &inFileName)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
  - [Object](#) (const [Object](#) &)
- Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
  - void [operator=](#) (const [Object](#) &)

## Friends

- class [QueryFactory](#)

## Additional Inherited Members

## Static Public Member Functions inherited from [gdcm::BaseRootQuery](#)

- static [QueryBase](#) \* [Construct](#) (ERootType inRootType, [EQueryLevel](#) qllevel)
- static int [GetQueryLevelFromString](#) (const char \*str)
- static const char \* [GetQueryLevelString](#) ([EQueryLevel](#) ql)

## Protected Member Functions inherited from [gdcm::BaseRootQuery](#)

- [BaseRootQuery](#) ()

**Protected Member Functions inherited from [gdcm::BaseQuery](#)**

- [BaseQuery](#) ()
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [DictEntry](#) &inDictEntry, const std::string &inValue)
- bool [ValidDataSet](#) (const [DataSet](#) &dataSetToValid, const [DataSet](#) &dataSetReference) const

**Protected Member Functions inherited from [gdcm::Object](#)**

- void [Register](#) ()
- void [UnRegister](#) ()

**Protected Attributes inherited from [gdcm::BaseRootQuery](#)**

- std::string [mHelpDescription](#)
- [QueryImage](#) [mImage](#)
- [QueryPatient](#) [mPatient](#)
- [ERootType](#) [mRootType](#)
- [QuerySeries](#) [mSeries](#)
- [QueryStudy](#) [mStudy](#)

**Protected Attributes inherited from [gdcm::BaseQuery](#)**

- [DataSet](#) [mDataSet](#)
- std::string [mSopInstanceUID](#)

**12.198.1 Detailed Description**

[MovePatientRootQuery](#).

contains: the class which will produce a dataset for c-move with patient root

**12.198.2 Constructor & Destructor Documentation****12.198.2.1 [MovePatientRootQuery](#)()**

```
gdcm::MovePatientRootQuery::MovePatientRootQuery ()
```

**12.198.3 Member Function Documentation****12.198.3.1 [GetAbstractSyntaxUID](#)()**

```
UIDs::TSName gdcm::MovePatientRootQuery::GetAbstractSyntaxUID () const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

### 12.198.3.2 GetTagListByLevel()

```
std::vector< Tag > gdcmm::MovePatientRootQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel) [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements [gdcmm::BaseRootQuery](#).

### 12.198.3.3 InitializeDataSet()

```
void gdcmm::MovePatientRootQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel) [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcm4tk

Implements [gdcmm::BaseRootQuery](#).

### 12.198.3.4 ValidateQuery()

```
bool gdcmm::MovePatientRootQuery::ValidateQuery (
    bool inStrict = true) const [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements [gdcmm::BaseRootQuery](#).

## 12.198.4 Friends And Related Symbol Documentation

### 12.198.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

References [QueryFactory](#).

Referenced by [QueryFactory](#).

The documentation for this class was generated from the following file:

- [gdcmmMovePatientRootQuery.h](#)

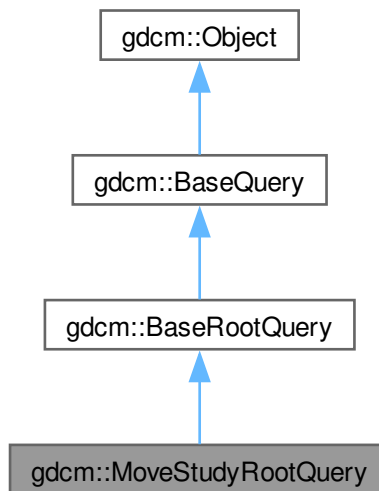


## 12.199 gdcm::MoveStudyRootQuery Class Reference

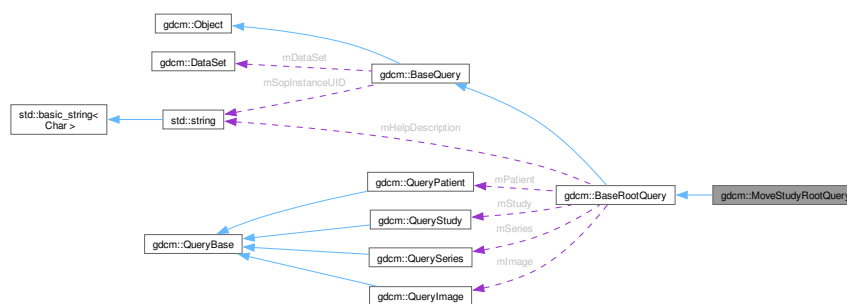
[MoveStudyRootQuery](#).

```
#include <gdcmMoveStudyRootQuery.h>
```

Inheritance diagram for gdcm::MoveStudyRootQuery:



Collaboration diagram for gdcm::MoveStudyRootQuery:



### Public Member Functions

- [MoveStudyRootQuery](#) ()
- `UIDs::TSName GetAbstractSyntaxUID ()` const override
- `std::vector< Tag > GetTagListByLevel (const EQueryLevel &inQueryLevel)` override
- `void InitializeDataSet (const EQueryLevel &inQueryLevel)` override
- `bool ValidateQuery (bool inStrict=true)` const override

## Public Member Functions inherited from [gdcm::BaseRootQuery](#)

- [~BaseRootQuery](#) () override=default
- [EQueryLevel GetQueryLevelFromQueryRoot](#) (ERootType roottype)

## Public Member Functions inherited from [gdcm::BaseQuery](#)

- [~BaseQuery](#) () override
  - void [AddQueryDataSet](#) (const [DataSet](#) &ds)
  - [DataSet](#) & [GetQueryDataSet](#) ()
  - [DataSet](#) const & [GetQueryDataSet](#) () const
- Set/Get the internal representation of the query as a [DataSet](#).*
- std::string [GetSOPInstanceUID](#) () const
  - void [Print](#) (std::ostream &os) const override
  - void [SetSearchParameter](#) (const std::string &inKeyword, const std::string &inValue)
  - void [SetSearchParameter](#) (const [Tag](#) &inTag, const std::string &inValue)
  - void [SetSOPInstanceUID](#) (const std::string &iSopInstanceUID)
  - const std::ostream & [WriteHelpFile](#) (std::ostream &os)
  - bool [WriteQuery](#) (const std::string &inFileName)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
  - [Object](#) (const [Object](#) &)
- Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
  - void [operator=](#) (const [Object](#) &)

## Friends

- class [QueryFactory](#)

## Additional Inherited Members

## Static Public Member Functions inherited from [gdcm::BaseRootQuery](#)

- static [QueryBase](#) \* [Construct](#) (ERootType inRootType, [EQueryLevel](#) qllevel)
- static int [GetQueryLevelFromString](#) (const char \*str)
- static const char \* [GetQueryLevelString](#) ([EQueryLevel](#) ql)

## Protected Member Functions inherited from [gdcm::BaseRootQuery](#)

- [BaseRootQuery](#) ()

## Protected Member Functions inherited from [gdcm::BaseQuery](#)

- [BaseQuery](#) ()
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [DictEntry](#) &inDictEntry, const std::string &inValue)
- bool [ValidDataSet](#) (const [DataSet](#) &dataSetToValid, const [DataSet](#) &dataSetReference) const

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## Protected Attributes inherited from [gdcm::BaseRootQuery](#)

- std::string [mHelpDescription](#)
- [QueryImage](#) [mImage](#)
- [QueryPatient](#) [mPatient](#)
- [ERootType](#) [mRootType](#)
- [QuerySeries](#) [mSeries](#)
- [QueryStudy](#) [mStudy](#)

## Protected Attributes inherited from [gdcm::BaseQuery](#)

- [DataSet](#) [mDataSet](#)
- std::string [mSopInstanceUID](#)

### 12.199.1 Detailed Description

[MoveStudyRootQuery](#).

contains: the class which will produce a dataset for C-MOVE with study root

### 12.199.2 Constructor & Destructor Documentation

#### 12.199.2.1 [MoveStudyRootQuery](#)()

```
gdcm::MoveStudyRootQuery::MoveStudyRootQuery ()
```

### 12.199.3 Member Function Documentation

#### 12.199.3.1 [GetAbstractSyntaxUID](#)()

```
UIDs::TSName gdcm::MoveStudyRootQuery::GetAbstractSyntaxUID () const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

### 12.199.3.2 GetTagListByLevel()

```
std::vector< Tag > gdcm::MoveStudyRootQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel) [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements [gdcm::BaseRootQuery](#).

### 12.199.3.3 InitializeDataSet()

```
void gdcm::MoveStudyRootQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel) [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmTk

Implements [gdcm::BaseRootQuery](#).

### 12.199.3.4 ValidateQuery()

```
bool gdcm::MoveStudyRootQuery::ValidateQuery (
    bool inStrict = true) const [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements [gdcm::BaseRootQuery](#).

## 12.199.4 Friends And Related Symbol Documentation

### 12.199.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

References [QueryFactory](#).

Referenced by [QueryFactory](#).

The documentation for this class was generated from the following file:

- [gdcmMoveStudyRootQuery.h](#)

## 12.200 gdcm::MrProtocol Class Reference

Class for [MrProtocol](#).

```
#include <gdcmMrProtocol.h>
```

### Classes

- struct [Slice](#)
- struct [SliceArray](#)
- struct [Vector3](#)

### Public Member Functions

- [MrProtocol](#) ()
- [~MrProtocol](#) ()
- bool [FindMrProtocolByName](#) (const char \*name) const
- const char \* [GetMrProtocolByName](#) (const char \*name) const
- bool [GetSliceArray](#) ([MrProtocol::SliceArray](#) &sa) const
- int [GetVersion](#) () const
- bool [Load](#) (const [ByteValue](#) \*bv, const char \*str, int version)
- void [Print](#) (std::ostream &os) const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [MrProtocol](#) &d)

### 12.200.1 Detailed Description

Class for [MrProtocol](#).

#### Examples

[MrProtocol.cxx](#).

### 12.200.2 Constructor & Destructor Documentation

#### 12.200.2.1 MrProtocol()

```
gdcm::MrProtocol::MrProtocol ()
```

Referenced by [operator<<](#).

### 12.200.2.2 ~MrProtocol()

```
gdcM::MrProtocol::~~MrProtocol ()
```

## 12.200.3 Member Function Documentation

### 12.200.3.1 FindMrProtocolByName()

```
bool gdcM::MrProtocol::FindMrProtocolByName (
    const char * name) const
```

### 12.200.3.2 GetMrProtocolByName()

```
const char * gdcM::MrProtocol::GetMrProtocolByName (
    const char * name) const
```

### 12.200.3.3 GetSliceArray()

```
bool gdcM::MrProtocol::GetSliceArray (
    MrProtocol::SliceArray & sa) const
```

### 12.200.3.4 GetVersion()

```
int gdcM::MrProtocol::GetVersion () const
```

### 12.200.3.5 Load()

```
bool gdcM::MrProtocol::Load (
    const ByteValue * bv,
    const char * str,
    int version)
```

### 12.200.3.6 Print()

```
void gdcM::MrProtocol::Print (
    std::ostream & os) const
```

Referenced by [operator<<](#).

## 12.200.4 Friends And Related Symbol Documentation

### 12.200.4.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const MrProtocol & d) [friend]
```

References [MrProtocol\(\)](#), and [Print\(\)](#).

The documentation for this class was generated from the following file:

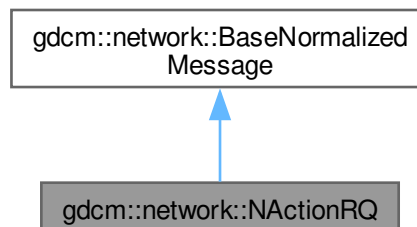
- [gdcmMrProtocol.h](#)

## 12.201 gdcm::network::NActionRQ Class Reference

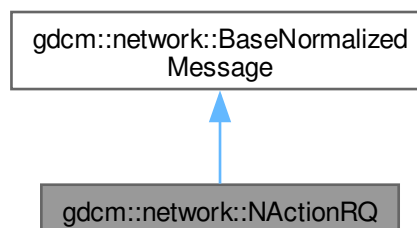
[NActionRQ](#).

```
#include <gdcmNActionMessages.h>
```

Inheritance diagram for gdcm::network::NActionRQ:



Collaboration diagram for gdcm::network::NActionRQ:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (`const ULConnection &inConnection`, `const BaseQuery *inQuery`) override

### Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)

- `virtual ~BaseNormalizedMessage ()=default`

## 12.201.1 Detailed Description

[NActionRQ](#).

this file defines the messages for the NAction action

## 12.201.2 Member Function Documentation

### 12.201.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::NActionRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [override], [virtual]
```

Implements [gdcm::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

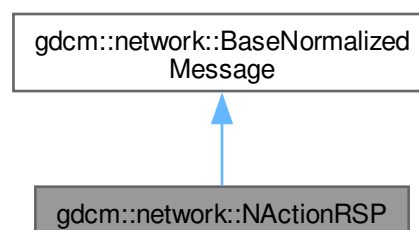
- [gdcmNActionMessages.h](#)

## 12.202 gdcm::network::NActionRSP Class Reference

[NActionRSP](#) this file defines the messages for the NAction action.

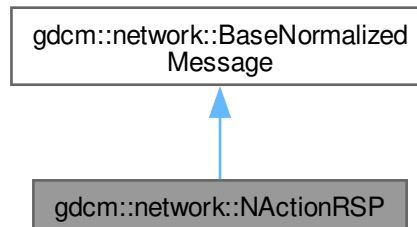
```
#include <gdcmNActionMessages.h>
```

Inheritance diagram for `gdcm::network::NActionRSP`:





Collaboration diagram for gdcm::network::NActionRSP:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)`

### Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)

- `virtual ~BaseNormalizedMessage ()=default`
- `virtual std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseQuery *inQuery)=0`

## 12.202.1 Detailed Description

[NActionRSP](#) this file defines the messages for the NAction action.

## 12.202.2 Member Function Documentation

### 12.202.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::NActionRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

The documentation for this class was generated from the following file:

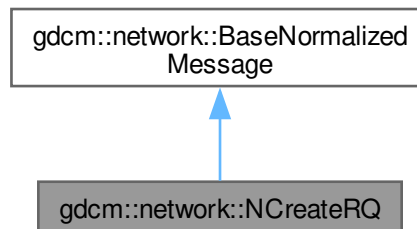
- [gdcmNActionMessages.h](#)

## 12.203 gdcm::network::NCreateRQ Class Reference

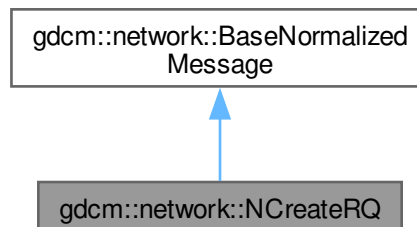
[NCreateRQ](#).

```
#include <gdcmNCreateMessages.h>
```

Inheritance diagram for `gdcm::network::NCreateRQ`:



Collaboration diagram for `gdcm::network::NCreateRQ`:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery) override

### Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)

- virtual `~BaseNormalizedMessage` ()=default

### 12.203.1 Detailed Description

[NCreateRQ](#).

this file defines the messages for the ncreate action

### 12.203.2 Member Function Documentation

#### 12.203.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::NCreateRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [override], [virtual]
```

Implements [gdcm::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

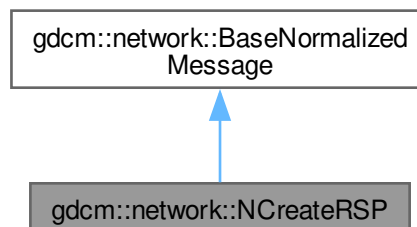
- [gdcmNCreateMessages.h](#)

## 12.204 gdcm::network::NCreateRSP Class Reference

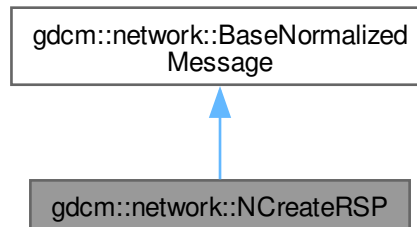
[NCreateRSP](#) this file defines the messages for the ncreate action.

```
#include <gdcmNCreateMessages.h>
```

Inheritance diagram for gdcm::network::NCreateRSP:



Collaboration diagram for `gdcm::network::NCreateRSP`:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)

- virtual `~BaseNormalizedMessage` ()=default
- virtual `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)=0

## 12.204.1 Detailed Description

[NCreateRSP](#) this file defines the messages for the ncreate action.

## 12.204.2 Member Function Documentation

### 12.204.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::NCreateRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

The documentation for this class was generated from the following file:

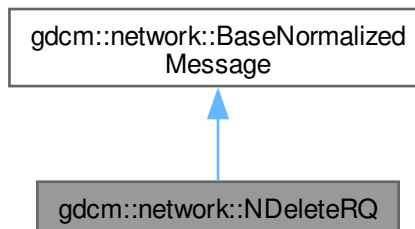
- [gdcmNCreateMessages.h](#)

## 12.205 gdcm::network::NDeleteRQ Class Reference

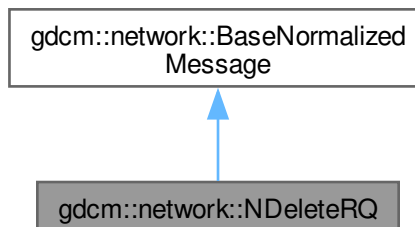
[NDeleteRQ](#).

```
#include <gdcmNDeleteMessages.h>
```

Inheritance diagram for gdcm::network::NDeleteRQ:



Collaboration diagram for gdcm::network::NDeleteRQ:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery) override

### Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)

- virtual `~BaseNormalizedMessage` ()=default

### 12.205.1 Detailed Description

[NDeleteRQ](#).

this file defines the messages for the ndelete action

### 12.205.2 Member Function Documentation

#### 12.205.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcM::network::NDeleteRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [override], [virtual]
```

Implements [gdcM::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

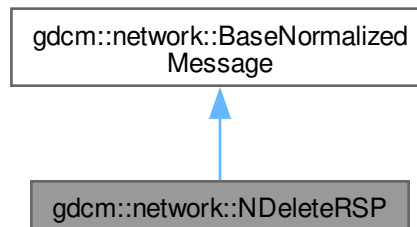
- [gdcMNDeleteMessages.h](#)

## 12.206 gdcM::network::NDeleteRSP Class Reference

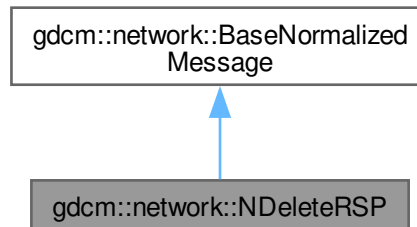
[NDeleteRSP](#) this file defines the messages for the ndelete action.

```
#include <gdcMNDeleteMessages.h>
```

Inheritance diagram for gdcM::network::NDeleteRSP:



Collaboration diagram for gdcm::network::NDeleteRSP:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)`

### Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)

- `virtual ~BaseNormalizedMessage ()=default`
- `virtual std::vector< PresentationDataValue > ConstructPDV (const ULConnection &inConnection, const BaseQuery *inQuery)=0`

## 12.206.1 Detailed Description

[NDeleteRSP](#) this file defines the messages for the ndelete action.

## 12.206.2 Member Function Documentation

### 12.206.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::NDeleteRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

The documentation for this class was generated from the following file:

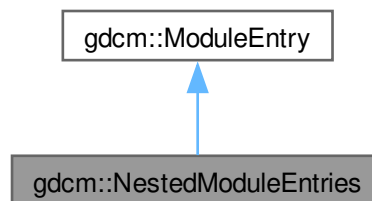
- [gdcmNDeleteMessages.h](#)

## 12.207 gdcm::NestedModuleEntries Class Reference

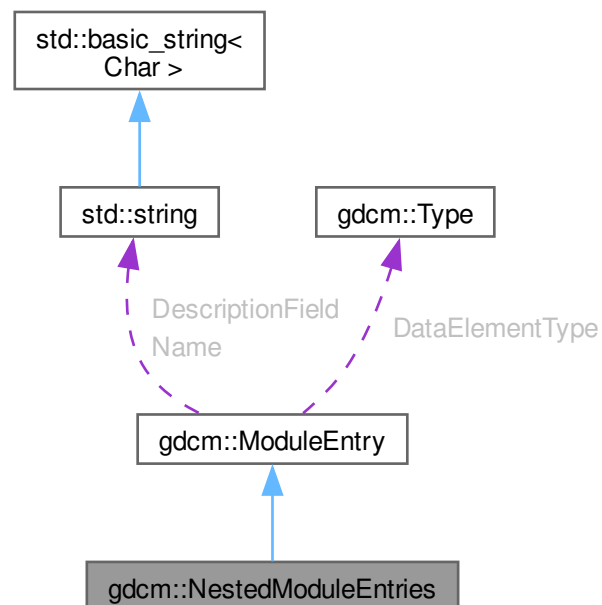
Class for representing a [NestedModuleEntries](#).

```
#include <gdcmNestedModuleEntries.h>
```

Inheritance diagram for gdcm::NestedModuleEntries:



Collaboration diagram for gdcm::NestedModuleEntries:





## Public Types

- typedef std::vector< [ModuleEntry](#) >::size\_type [SizeType](#)

## Public Types inherited from [gdcm::ModuleEntry](#)

- typedef std::string [Description](#)

## Public Member Functions

- [NestedModuleEntries](#) (const char \*name="", const char \*type="3", const char \*description="")
- void [AddModuleEntry](#) (const [ModuleEntry](#) &me)
- [ModuleEntry](#) & [GetModuleEntry](#) ([SizeType](#) idx)
- const [ModuleEntry](#) & [GetModuleEntry](#) ([SizeType](#) idx) const
- [SizeType](#) [GetNumberOfModuleEntries](#) ()

## Public Member Functions inherited from [gdcm::ModuleEntry](#)

- [ModuleEntry](#) (const char \*name="", const char \*type="3", const char \*description="")
- virtual [~ModuleEntry](#) ()=default
- const [Description](#) & [GetDescription](#) () const
- const char \* [GetName](#) () const
- const [Type](#) & [GetType](#) () const
- void [SetDescription](#) (const char \*d)
- void [SetName](#) (const char \*name)
- void [SetType](#) (const [Type](#) &type)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [NestedModuleEntries](#) &\_val)

## Additional Inherited Members

## Protected Attributes inherited from [gdcm::ModuleEntry](#)

- [Type](#) [DataElementType](#)
- [Description](#) [DescriptionField](#)
- std::string [Name](#)

### 12.207.1 Detailed Description

Class for representing a [NestedModuleEntries](#).

Note

bla

See also

[ModuleEntry](#)

### 12.207.2 Member Typedef Documentation

#### 12.207.2.1 SizeType

```
typedef std::vector<ModuleEntry>::size_type gdcmm::NestedModuleEntries::SizeType
```

### 12.207.3 Constructor & Destructor Documentation

#### 12.207.3.1 NestedModuleEntries()

```
gdcmm::NestedModuleEntries::NestedModuleEntries (  
    const char * name = "",  
    const char * type = "3",  
    const char * description = "") [inline]
```

References [gdcmm::ModuleEntry::ModuleEntry\(\)](#).

Referenced by [operator<<](#).

### 12.207.4 Member Function Documentation

#### 12.207.4.1 AddModuleEntry()

```
void gdcmm::NestedModuleEntries::AddModuleEntry (  
    const ModuleEntry & me) [inline]
```

References [gdcmm::ModuleEntry::ModuleEntry\(\)](#).

#### 12.207.4.2 GetModuleEntry() [1/2]

```
ModuleEntry & gdcmm::NestedModuleEntries::GetModuleEntry (  
    SizeType idx) [inline]
```

References [gdcmm::ModuleEntry::ModuleEntry\(\)](#).

**12.207.4.3 GetModuleEntry() [2/2]**

```
const ModuleEntry & gdcm::NestedModuleEntries::GetModuleEntry (
    SizeType idx) const [inline]
```

References [gdcm::ModuleEntry::ModuleEntry\(\)](#).

**12.207.4.4 GetNumberOfModuleEntries()**

```
SizeType gdcm::NestedModuleEntries::GetNumberOfModuleEntries () [inline]
```

**12.207.5 Friends And Related Symbol Documentation****12.207.5.1 operator<<**

```
std::ostream & operator<< (
    std::ostream & _os,
    const NestedModuleEntries & _val) [friend]
```

References [NestedModuleEntries\(\)](#), [gdcm::ModuleEntry::DataElementType](#), [gdcm::ModuleEntry::DescriptionField](#), and [gdcm::ModuleEntry::Name](#).

The documentation for this class was generated from the following file:

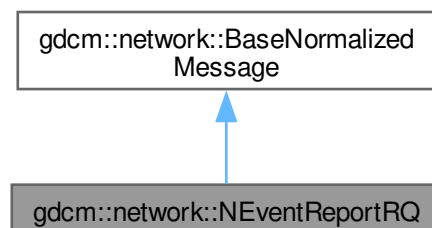
- [gdcmNestedModuleEntries.h](#)

**12.208 gdcm::network::NEventReportRQ Class Reference**

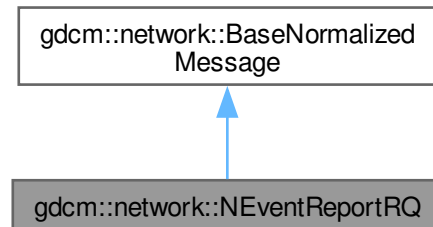
[NEventReportRQ](#).

```
#include <gdcmNEventReportMessages.h>
```

Inheritance diagram for `gdcm::network::NEventReportRQ`:



Collaboration diagram for `gdcm::network::NEventReportRQ`:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &`inConnection`, const [BaseQuery](#) \*`inQuery`) override

### Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)

- virtual `~BaseNormalizedMessage` ()=default

## 12.208.1 Detailed Description

[NEventReportRQ](#).

this file defines the messages for the neventreport action

## 12.208.2 Member Function Documentation

### 12.208.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::NEventReportRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [override], [virtual]
```

Implements [gdcm::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

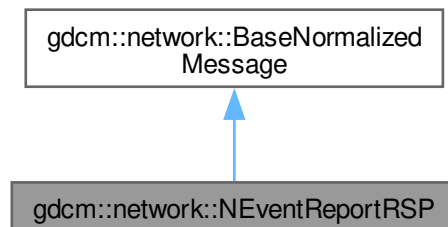
- [gdcmNEventReportMessages.h](#)

## 12.209 gdcm::network::NEventReportRSP Class Reference

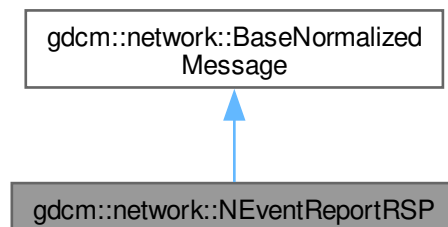
[NEventReportRSP](#) this file defines the messages for the neventreport action.

```
#include <gdcmNEventReportMessages.h>
```

Inheritance diagram for gdcm::network::NEventReportRSP:



Collaboration diagram for gdcm::network::NEventReportRSP:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)

- virtual `~BaseNormalizedMessage` ()=default
- virtual `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)=0

### 12.209.1 Detailed Description

[NEventReportRSP](#) this file defines the messages for the neventreport action.

### 12.209.2 Member Function Documentation

#### 12.209.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcmm::network::NEventReportRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

The documentation for this class was generated from the following file:

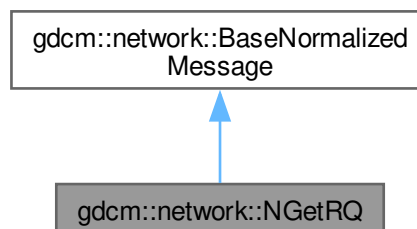
- [gdcmmNEventReportMessages.h](#)

## 12.210 gdcmm::network::NGetRQ Class Reference

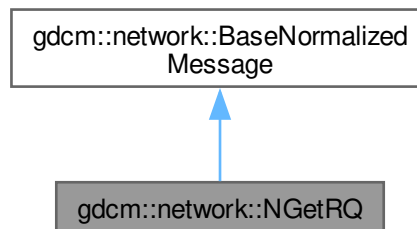
[NGetRQ](#).

```
#include <gdcmmNGetMessages.h>
```

Inheritance diagram for gdcmm::network::NGetRQ:



Collaboration diagram for gdcmm::network::NGetRQ:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &`inConnection`, const [BaseQuery](#) \*`inQuery`) override

### Public Member Functions inherited from [gdcmm::network::BaseNormalizedMessage](#)

- virtual `~BaseNormalizedMessage` ()=default

## 12.210.1 Detailed Description

[NGetRQ](#).

this file defines the messages for the nget action

## 12.210.2 Member Function Documentation

### 12.210.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcmm::network::NGetRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [override], [virtual]
```

Implements [gdcmm::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

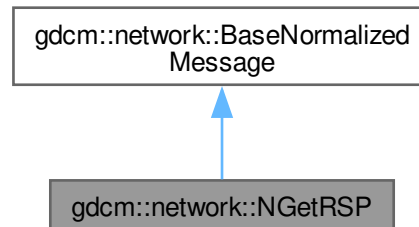
- [gdcmmNGetMessages.h](#)

## 12.211 gdcm::network::NGetRSP Class Reference

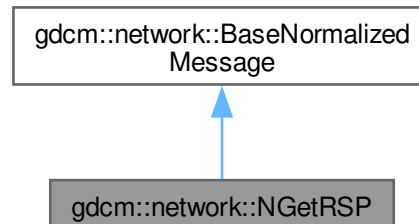
[NGetRSP](#) this file defines the messages for the nget action.

```
#include <gdcmNGetMessages.h>
```

Inheritance diagram for `gdcm::network::NGetRSP`:



Collaboration diagram for `gdcm::network::NGetRSP`:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)

- virtual `~BaseNormalizedMessage` ()=default
- virtual `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)=0



### 12.211.1 Detailed Description

[NGetRSP](#) this file defines the messages for the nget action.

### 12.211.2 Member Function Documentation

#### 12.211.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::NGetRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

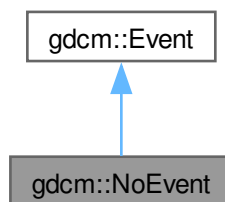
The documentation for this class was generated from the following file:

- [gdcmNGetMessages.h](#)

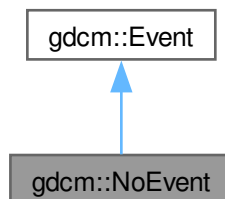
## 12.212 gdcm::NoEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::NoEvent:



Collaboration diagram for gdcm::NoEvent:



## Additional Inherited Members

### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()
- [Event](#) (const [Event](#) &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

### 12.212.1 Detailed Description

Define some common GDCM events

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 12.213 [gdcm::network::NormalizedMessageFactory](#) Class Reference

```
#include <gdcmNormalizedMessageFactory.h>
```

### Static Public Member Functions

- static std::vector< [PresentationDataValue](#) > [ConstructNAction](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructNCreate](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructNDelete](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructNEventReport](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructNGet](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructNSet](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)

### 12.213.1 Member Function Documentation

#### 12.213.1.1 [ConstructNAction\(\)](#)

```
std::vector< PresentationDataValue > gdcm::network::NormalizedMessageFactory::ConstructNAction (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

### 12.213.1.2 ConstructNCreate()

```
std::vector< PresentationDataValue > gdcm::network::NormalizedMessageFactory::ConstructNCreate (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

### 12.213.1.3 ConstructNDelete()

```
std::vector< PresentationDataValue > gdcm::network::NormalizedMessageFactory::ConstructNDelete (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

### 12.213.1.4 ConstructNEventReport()

```
std::vector< PresentationDataValue > gdcm::network::NormalizedMessageFactory::ConstructNEvent↵
Report (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

### 12.213.1.5 ConstructNGet()

```
std::vector< PresentationDataValue > gdcm::network::NormalizedMessageFactory::ConstructNGet (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

### 12.213.1.6 ConstructNSet()

```
std::vector< PresentationDataValue > gdcm::network::NormalizedMessageFactory::ConstructNSet (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

The documentation for this class was generated from the following file:

- [gdcmNormalizedMessageFactory.h](#)

## 12.214 gdcm::NormalizedNetworkFunctions Class Reference

Normalized Network Functions.

```
#include <gdcmNormalizedNetworkFunctions.h>
```

## Static Public Member Functions

- static [BaseQuery](#) \* [ConstructQuery](#) (const std::string &sopInstanceUID, const [DataSet](#) &queryds, [ENQueryType](#) queryType=[eCreateMMPS](#))
- static bool [NAction](#) (const char \*remote, uint16\_t portno, const [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)
- static bool [NCreate](#) (const char \*remote, uint16\_t portno, [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)
- static bool [NDelete](#) (const char \*remote, uint16\_t portno, const [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)
- static bool [NEventReport](#) (const char \*remote, uint16\_t portno, const [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)
- static bool [NGet](#) (const char \*remote, uint16\_t portno, const [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)
- static bool [NSet](#) (const char \*remote, uint16\_t portno, const [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)

## 12.214.1 Detailed Description

Normalized Network Functions.

These functions provide a generic API to the DICOM functions implemented in GDCM. Advanced users can use this code as a template for building their own versions of these functions (for instance, to provide progress bars or some other way of handling returned query information), but for most users, these functions should be sufficient to interface with a PACS to a local machine. Note that these functions are not contained within a static class or some other class-style interface, because multiple connections can be instantiated in the same program. The DICOM standard is much more function oriented rather than class oriented in this instance, so the design of this API reflects that functional approach. These functions implements the following SCU operations:

- N-EVENT-REPORT
- N-GET
- N-SET
- N-ACTION
- N-CREATE
- N-DELETE

## 12.214.2 Member Function Documentation

### 12.214.2.1 ConstructQuery()

```
BaseQuery * gdcmm::NormalizedNetworkFunctions::ConstructQuery (
    const std::string & sopInstanceUID,
    const DataSet & queryds,
    ENQueryType queryType = eCreateMMPS) [static]
```

References [gdcmm::eCreateMMPS](#).

### 12.214.2.2 NAction()

```
bool gdcmm::NormalizedNetworkFunctions::NAction (
    const char * remote,
    uint16_t portno,
    const BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call) [static]
```

### 12.214.2.3 NCreate()

```
bool gdcmm::NormalizedNetworkFunctions::NCreate (
    const char * remote,
    uint16_t portno,
    BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call) [static]
```

### 12.214.2.4 NDelete()

```
bool gdcmm::NormalizedNetworkFunctions::NDelete (
    const char * remote,
    uint16_t portno,
    const BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call) [static]
```

### 12.214.2.5 NEventReport()

```
bool gdcmm::NormalizedNetworkFunctions::NEventReport (
    const char * remote,
    uint16_t portno,
    const BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call) [static]
```

### 12.214.2.6 NGet()

```
bool gdcmm::NormalizedNetworkFunctions::NGet (
    const char * remote,
    uint16_t portno,
    const BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call) [static]
```

### 12.214.2.7 NSet()

```
bool gdcm::NormalizedNetworkFunctions::NSet (
    const char * remote,
    uint16_t portno,
    const BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call) [static]
```

The documentation for this class was generated from the following file:

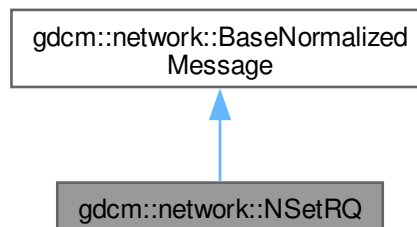
- [gdcmNormalizedNetworkFunctions.h](#)

## 12.215 gdcm::network::NSetRQ Class Reference

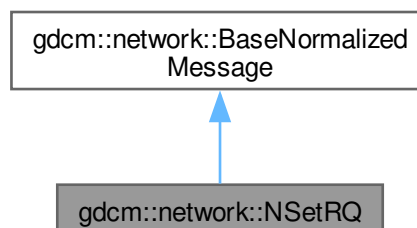
[NSetRQ](#).

```
#include <gdcmNSetMessages.h>
```

Inheritance diagram for gdcm::network::NSetRQ:



Collaboration diagram for gdcm::network::NSetRQ:



**Public Member Functions**

- `std::vector< PresentationDataValue > ConstructPDV` (`const ULConnection &inConnection`, `const BaseQuery *inQuery`) override

**Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)**

- `virtual ~BaseNormalizedMessage ()`=default

**12.215.1 Detailed Description**

[NSetRQ](#).

this file defines the messages for the nset action

**12.215.2 Member Function Documentation****12.215.2.1 ConstructPDV()**

```
std::vector< PresentationDataValue > gdcm::network::NSetRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [override], [virtual]
```

Implements [gdcm::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

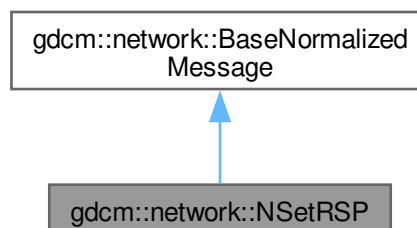
- [gdcmNSetMessages.h](#)

**12.216 gdcm::network::NSetRSP Class Reference**

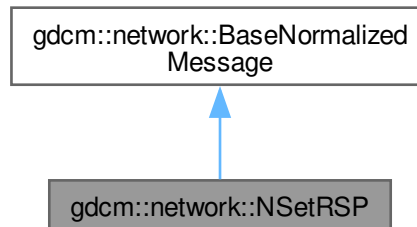
[NSetRSP](#) this file defines the messages for the nset action.

```
#include <gdcmNSetMessages.h>
```

Inheritance diagram for `gdcm::network::NSetRSP`:



Collaboration diagram for `gdcm::network::NSetRSP`:



### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### Public Member Functions inherited from [gdcm::network::BaseNormalizedMessage](#)

- virtual `~BaseNormalizedMessage` ()=default
- virtual `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)=0

## 12.216.1 Detailed Description

[NSetRSP](#) this file defines the messages for the nset action.

## 12.216.2 Member Function Documentation

### 12.216.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::NSetRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet)
```

The documentation for this class was generated from the following file:

- [gdcmNSetMessages.h](#)

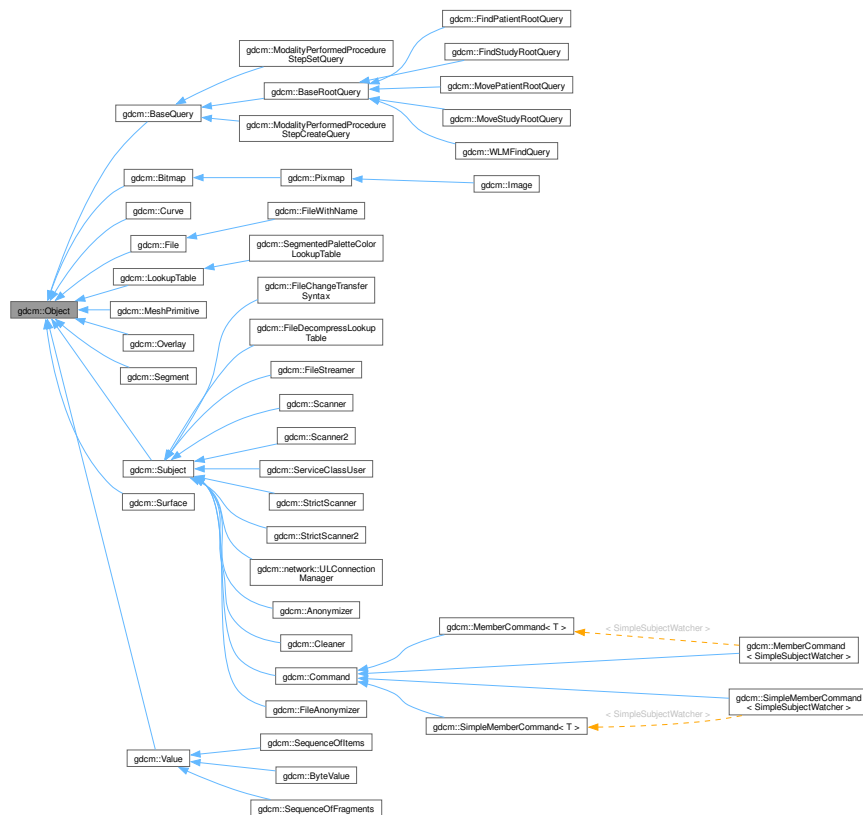


## 12.217 gdcm::Object Class Reference

Object.

```
#include <gdcmObject.h>
```

Inheritance diagram for gdcm::Object:



### Public Member Functions

- [Object](#) ()
  - [Object](#) (const [Object](#) &)
  - virtual [~Object](#) ()
  - void [operator=](#) (const [Object](#) &)
  - virtual void [Print](#) (std::ostream &) const
- Special requirement for copy/cstor, assignment operator.*

### Protected Member Functions

- void [Register](#) ()
- void [UnRegister](#) ()

## Friends

- `std::ostream & operator<< (std::ostream &os, const Object &obj)`
- `template<class ObjectType>  
class SmartPointer`

## 12.217.1 Detailed Description

[Object](#).

### Note

main superclass for object that want to use [SmartPointer](#) invasive ref counting system

### See also

[SmartPointer](#)

## 12.217.2 Constructor & Destructor Documentation

### 12.217.2.1 [Object\(\)](#) [1/2]

```
gdcmm::Object::Object () [inline]
```

Referenced by [gdcmm::LookupTable::LookupTable\(\)](#), [Object\(\)](#), [operator<<](#), [operator=\(\)](#), and [SmartPointer](#).

### 12.217.2.2 [~Object\(\)](#)

```
virtual gdcmm::Object::~~Object () [inline], [virtual]
```

### 12.217.2.3 [Object\(\)](#) [2/2]

```
gdcmm::Object::Object (  
    const Object & ) [inline]
```

Special requirement for copy/cstor, assignment operator.

References [Object\(\)](#).

## 12.217.3 Member Function Documentation

### 12.217.3.1 operator=()

```
void gdcm::Object::operator= (
    const Object & ) [inline]
```

References [Object\(\)](#).

### 12.217.3.2 Print()

```
virtual void gdcm::Object::Print (
    std::ostream & ) const [inline], [virtual]
```

Reimplemented in [gdcm::BaseQuery](#), [gdcm::Bitmap](#), [gdcm::ByteValue](#), [gdcm::Curve](#), [gdcm::Image](#), [gdcm::LookupTable](#), [gdcm::Overlay](#), [gdcm::Pixmap](#), [gdcm::Scanner2](#), [gdcm::Scanner](#), [gdcm::SegmentedPaletteColorLookupTable](#), [gdcm::SequenceOfFragments](#), [gdcm::SequenceOfItems](#), [gdcm::StrictScanner2](#), and [gdcm::StrictScanner](#).

#### Examples

[ReadAndDumpDICOMDIR.cxx](#).

Referenced by [gdcm::DataElement::operator<<](#), and [operator<<](#).

### 12.217.3.3 Register()

```
void gdcm::Object::Register () [inline], [protected]
```

### 12.217.3.4 UnRegister()

```
void gdcm::Object::UnRegister () [inline], [protected]
```

## 12.217.4 Friends And Related Symbol Documentation

### 12.217.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const Object & obj) [friend]
```

References [Object\(\)](#), and [Print\(\)](#).

Referenced by [SmartPointer](#).

#### 12.217.4.2 SmartPointer

```
template<class ObjectType>
friend class SmartPointer [friend]
```

References [Object\(\)](#), [operator<<](#), and [SmartPointer](#).

Referenced by [gdcM::Segment::AddSurface\(\)](#), [gdcM::Segment::GetSurface\(\)](#), [gdcM::Bitmap::SetLUT\(\)](#), [gdcM::Surface::SetMeshPrimitive](#) and [SmartPointer](#).

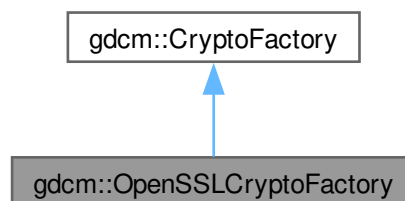
The documentation for this class was generated from the following file:

- [gdcMObject.h](#)

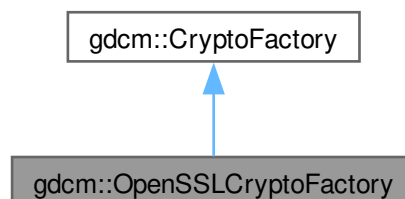
### 12.218 gdcM::OpenSSLCryptoFactory Class Reference

```
#include <gdcMOpenSSLCryptoFactory.h>
```

Inheritance diagram for gdcM::OpenSSLCryptoFactory:



Collaboration diagram for gdcM::OpenSSLCryptoFactory:



## Public Member Functions

- [OpenSSLCryptoFactory](#) ([CryptoLib](#) id)
- [CryptographicMessageSyntax](#) \* [CreateCMSProvider](#) ()

## Protected Member Functions

- void [InitOpenSSL](#) ()

## Protected Member Functions inherited from [gdcm::CryptoFactory](#)

- [CryptoFactory](#) ()=default
- [CryptoFactory](#) ([CryptoLib](#) id)
- [~CryptoFactory](#) ()=default

## Additional Inherited Members

## Public Types inherited from [gdcm::CryptoFactory](#)

- enum [CryptoLib](#) {  
    [DEFAULT](#) = 0 ,  
    [OPENSSL](#) = 1 ,  
    [CAPI](#) = 2 ,  
    [OPENSSL7](#) = 3 }

## Static Public Member Functions inherited from [gdcm::CryptoFactory](#)

- static [CryptoFactory](#) \* [GetFactoryInstance](#) ([CryptoLib](#) id=DEFAULT)

## 12.218.1 Constructor & Destructor Documentation

### 12.218.1.1 [OpenSSLCryptoFactory](#)()

```
gdcm::OpenSSLCryptoFactory::OpenSSLCryptoFactory (  
    CryptoLib id) [inline]
```

References [gdcm::CryptoFactory::CryptoFactory\(\)](#), and [gdcmDebugMacro](#).

Referenced by [InitOpenSSL\(\)](#).

## 12.218.2 Member Function Documentation

### 12.218.2.1 CreateCMSProvider()

`CryptographicMessageSyntax * gdcM::OpenSSLCryptoFactory::CreateCMSProvider () [inline], [virtual]`

Implements [gdcM::CryptoFactory](#).

References [InitOpenSSL\(\)](#).

### 12.218.2.2 InitOpenSSL()

`void gdcM::OpenSSLCryptoFactory::InitOpenSSL () [protected]`

References [OpenSSLCryptoFactory\(\)](#).

Referenced by [CreateCMSProvider\(\)](#).

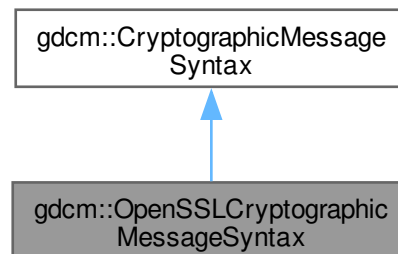
The documentation for this class was generated from the following file:

- [gdcMOpenSSLCryptoFactory.h](#)

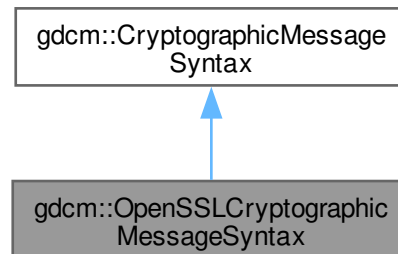
## 12.219 gdcM::OpenSSLCryptographicMessageSyntax Class Reference

```
#include <gdcMOpenSSLCryptographicMessageSyntax.h>
```

Inheritance diagram for `gdcM::OpenSSLCryptographicMessageSyntax`:



Collaboration diagram for gdcm::OpenSSLCryptographicMessageSyntax:



### Public Member Functions

- [OpenSSLCryptographicMessageSyntax](#) ()
- [~OpenSSLCryptographicMessageSyntax](#) ()
- bool [Decrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*decrypt content from a PKCS#7 envelopedData structure*
- bool [Encrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*create a CMS envelopedData structure*
- [CipherTypes](#) [GetCipherType](#) () const
- bool [ParseCertificateFile](#) (const char \*filename)
- bool [ParseKeyFile](#) (const char \*filename)
- void [SetCipherType](#) ([CipherTypes](#) type)
- bool [SetPassword](#) (const char \*pass, size\_t passLen)

### Public Member Functions inherited from [gdcm::CryptographicMessageSyntax](#)

- [CryptographicMessageSyntax](#) ()=default
- [CryptographicMessageSyntax](#) (const [CryptographicMessageSyntax](#) &)=delete
- virtual [~CryptographicMessageSyntax](#) ()=default
- void [operator=](#) (const [CryptographicMessageSyntax](#) &)=delete

### Additional Inherited Members

### Public Types inherited from [gdcm::CryptographicMessageSyntax](#)

- enum [CipherTypes](#) {  
    [DES3\\_CIPHER](#) ,  
    [AES128\\_CIPHER](#) ,  
    [AES192\\_CIPHER](#) ,  
    [AES256\\_CIPHER](#) }

## 12.219.1 Constructor & Destructor Documentation

### 12.219.1.1 OpenSSLCryptographicMessageSyntax()

```
gdcmm::OpenSSLCryptographicMessageSyntax::OpenSSLCryptographicMessageSyntax ()
```

Referenced by [Decrypt\(\)](#).

### 12.219.1.2 ~OpenSSLCryptographicMessageSyntax()

```
gdcmm::OpenSSLCryptographicMessageSyntax::~~OpenSSLCryptographicMessageSyntax ()
```

## 12.219.2 Member Function Documentation

### 12.219.2.1 Decrypt()

```
bool gdcmm::OpenSSLCryptographicMessageSyntax::Decrypt (  
    char * output,  
    size_t & outlen,  
    const char * array,  
    size_t len) const [virtual]
```

decrypt content from a PKCS#7 envelopedData structure

Implements [gdcmm::CryptographicMessageSyntax](#).

References [OpenSSLCryptographicMessageSyntax\(\)](#).

### 12.219.2.2 Encrypt()

```
bool gdcmm::OpenSSLCryptographicMessageSyntax::Encrypt (  
    char * output,  
    size_t & outlen,  
    const char * array,  
    size_t len) const [virtual]
```

create a CMS envelopedData structure

Implements [gdcmm::CryptographicMessageSyntax](#).

### 12.219.2.3 GetCipherType()

```
CipherTypes gdcmm::OpenSSLCryptographicMessageSyntax::GetCipherType () const [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).



#### 12.219.2.4 ParseCertificateFile()

```
bool gdcmm::OpenSSLCryptographicMessageSyntax::ParseCertificateFile (
    const char * filename) [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

#### 12.219.2.5 ParseKeyFile()

```
bool gdcmm::OpenSSLCryptographicMessageSyntax::ParseKeyFile (
    const char * filename) [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

#### 12.219.2.6 SetCipherType()

```
void gdcmm::OpenSSLCryptographicMessageSyntax::SetCipherType (
    CipherTypes type) [virtual]
```

Set Cipher [Type](#). Default is: AES256\_CIPHER

Implements [gdcmm::CryptographicMessageSyntax](#).

#### 12.219.2.7 SetPassword()

```
bool gdcmm::OpenSSLCryptographicMessageSyntax::SetPassword (
    const char * pass,
    size_t passLen) [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

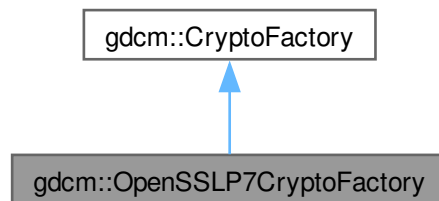
The documentation for this class was generated from the following file:

- [gdcmmOpenSSLCryptographicMessageSyntax.h](#)

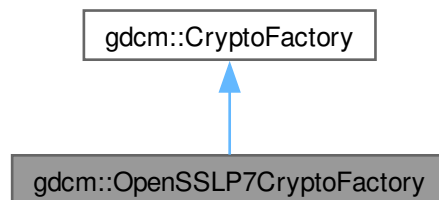
## 12.220 gdcmm::OpenSSLP7CryptoFactory Class Reference

```
#include <gdcmmOpenSSLP7CryptoFactory.h>
```

Inheritance diagram for gdcmm::OpenSSLP7CryptoFactory:



Collaboration diagram for gdcmm::OpenSSLP7CryptoFactory:



### Public Member Functions

- [OpenSSLP7CryptoFactory](#) ([CryptoLib](#) id)
- [CryptographicMessageSyntax](#) \* [CreateCMSProvider](#) ()

### Additional Inherited Members

### Public Types inherited from [gdcmm::CryptoFactory](#)

- enum [CryptoLib](#) {  
    [DEFAULT](#) = 0 ,  
    [OPENSSL](#) = 1 ,  
    [CAPI](#) = 2 ,  
    [OPENSSLP7](#) = 3 }

## Static Public Member Functions inherited from [gdcmm::CryptoFactory](#)

- static [CryptoFactory](#) \* [GetFactoryInstance](#) ([CryptoLib](#) id=DEFAULT)

## Protected Member Functions inherited from [gdcmm::CryptoFactory](#)

- [CryptoFactory](#) ()=default
- [CryptoFactory](#) ([CryptoLib](#) id)
- [~CryptoFactory](#) ()=default

### 12.220.1 Constructor & Destructor Documentation

#### 12.220.1.1 OpenSSLP7CryptoFactory()

```
gdcmm::OpenSSLP7CryptoFactory::OpenSSLP7CryptoFactory (  
    CryptoLib id) [inline]
```

References [gdcmm::CryptoFactory::CryptoFactory\(\)](#), and [gdcmmDebugMacro](#).

### 12.220.2 Member Function Documentation

#### 12.220.2.1 CreateCMSProvider()

```
CryptographicMessageSyntax * gdcmm::OpenSSLP7CryptoFactory::CreateCMSProvider () [inline], [virtual]
```

Implements [gdcmm::CryptoFactory](#).

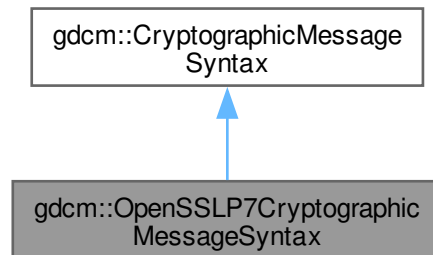
The documentation for this class was generated from the following file:

- [gdcmmOpenSSLP7CryptoFactory.h](#)

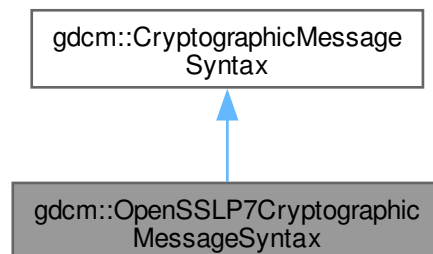
## 12.221 gdcmm::OpenSSLP7CryptographicMessageSyntax Class Reference

```
#include <gdcmmOpenSSLP7CryptographicMessageSyntax.h>
```

Inheritance diagram for gdcmm::OpenSSLP7CryptographicMessageSyntax:



Collaboration diagram for gdcmm::OpenSSLP7CryptographicMessageSyntax:



### Public Member Functions

- [OpenSSLP7CryptographicMessageSyntax](#) ()
- [~OpenSSLP7CryptographicMessageSyntax](#) ()
- bool [Decrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*decrypt content from a PKCS#7 envelopedData structure*
- bool [Encrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*create a PKCS#7 envelopedData structure*
- [CipherTypes GetCipherType](#) () const
- bool [ParseCertificateFile](#) (const char \*filename)
- bool [ParseKeyFile](#) (const char \*filename)
- void [SetCipherType](#) ([CipherTypes](#) type)
- bool [SetPassword](#) (const char \*, size\_t)

## Public Member Functions inherited from `gdcmm::CryptographicMessageSyntax`

- `CryptographicMessageSyntax` ()=default
- `CryptographicMessageSyntax` (const `CryptographicMessageSyntax` &)=delete
- virtual `~CryptographicMessageSyntax` ()=default
- void `operator=` (const `CryptographicMessageSyntax` &)=delete

## Additional Inherited Members

## Public Types inherited from `gdcmm::CryptographicMessageSyntax`

- enum `CipherTypes` {  
    `DES3_CIPHER` ,  
    `AES128_CIPHER` ,  
    `AES192_CIPHER` ,  
    `AES256_CIPHER` }

### 12.221.1 Detailed Description

Class for `CryptographicMessageSyntax` encryption. This is just a simple wrapper around openssl PKCS7\_encrypt functionalities

See online documentation [http://www.openssl.org/docs/crypto/PKCS7\\_encrypt.html](http://www.openssl.org/docs/crypto/PKCS7_encrypt.html)

### 12.221.2 Constructor & Destructor Documentation

#### 12.221.2.1 `OpenSSLP7CryptographicMessageSyntax()`

```
gdcmm::OpenSSLP7CryptographicMessageSyntax::OpenSSLP7CryptographicMessageSyntax ()
```

Referenced by `Decrypt()`.

#### 12.221.2.2 `~OpenSSLP7CryptographicMessageSyntax()`

```
gdcmm::OpenSSLP7CryptographicMessageSyntax::~~OpenSSLP7CryptographicMessageSyntax ()
```

### 12.221.3 Member Function Documentation

#### 12.221.3.1 `Decrypt()`

```
bool gdcmm::OpenSSLP7CryptographicMessageSyntax::Decrypt (  
    char * output,  
    size_t & outlen,  
    const char * array,  
    size_t len) const [virtual]
```

decrypt content from a PKCS#7 envelopedData structure

Implements `gdcmm::CryptographicMessageSyntax`.

References `OpenSSLP7CryptographicMessageSyntax()`.

### 12.221.3.2 Encrypt()

```
bool gdcM::OpenSSL7CryptographicMessageSyntax::Encrypt (  
    char * output,  
    size_t & outlen,  
    const char * array,  
    size_t len) const [virtual]
```

create a PKCS#7 envelopedData structure

Implements [gdcM::CryptographicMessageSyntax](#).

### 12.221.3.3 GetCipherType()

```
CipherTypes gdcM::OpenSSL7CryptographicMessageSyntax::GetCipherType () const [virtual]
```

Implements [gdcM::CryptographicMessageSyntax](#).

### 12.221.3.4 ParseCertificateFile()

```
bool gdcM::OpenSSL7CryptographicMessageSyntax::ParseCertificateFile (  
    const char * filename) [virtual]
```

Implements [gdcM::CryptographicMessageSyntax](#).

### 12.221.3.5 ParseKeyFile()

```
bool gdcM::OpenSSL7CryptographicMessageSyntax::ParseKeyFile (  
    const char * filename) [virtual]
```

Implements [gdcM::CryptographicMessageSyntax](#).

### 12.221.3.6 SetCipherType()

```
void gdcM::OpenSSL7CryptographicMessageSyntax::SetCipherType (  
    CipherTypes type) [virtual]
```

Set Cipher [Type](#). Default is: AES256\_CIPHER

Implements [gdcM::CryptographicMessageSyntax](#).

### 12.221.3.7 SetPassword()

```
bool gdcm::OpenSSL7CryptographicMessageSyntax::SetPassword (
    const char * ,
    size_t ) [inline], [virtual]
```

Implements [gdcm::CryptographicMessageSyntax](#).

References [gdcmWarningMacro](#).

The documentation for this class was generated from the following file:

- [gdcmOpenSSL7CryptographicMessageSyntax.h](#)

## 12.222 gdcm::Orientation Class Reference

class to handle [Orientation](#)

```
#include <gdcmOrientation.h>
```

### Public Types

- enum [OrientationType](#) {  
[UNKNOWN](#) ,  
[AXIAL](#) ,  
[CORONAL](#) ,  
[SAGITTAL](#) ,  
[OBLIQUE](#) }

### Public Member Functions

- [Orientation](#) ()
- [~Orientation](#) ()=default
- void [Print](#) (std::ostream &) const  
*Print.*

### Static Public Member Functions

- static const char \* [GetLabel](#) ([OrientationType](#) type)  
*Return the label of an [Orientation](#).*
- static double [GetObliquityThresholdCosineValue](#) ()
- static [OrientationType](#) [GetType](#) (const double dircos[6])
- static void [SetObliquityThresholdCosineValue](#) (double val)  
*ObliquityThresholdCosineValue stuff.*

### Static Protected Member Functions

- static char [GetMajorAxisFromPatientRelativeDirectionCosine](#) (double x, double y, double z)

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Orientation](#) &o)

## 12.222.1 Detailed Description

class to handle [Orientation](#)

## 12.222.2 Member Enumeration Documentation

### 12.222.2.1 OrientationType

```
enum gdcm::Orientation::OrientationType
```

#### Enumerator

UNKNOWN	
AXIAL	
CORONAL	
SAGITTAL	
OBLIQUE	

#### Examples

[FixOrientation.cxx](#).

## 12.222.3 Constructor & Destructor Documentation

### 12.222.3.1 Orientation()

```
gdcm::Orientation::Orientation ()
```

Referenced by [operator<<](#).

### 12.222.3.2 ~Orientation()

```
gdcm::Orientation::~~Orientation () [default]
```



## 12.222.4 Member Function Documentation

### 12.222.4.1 GetLabel()

```
const char * gdcm::Orientation::GetLabel (
    OrientationType type) [static]
```

Return the label of an [Orientation](#).

#### Examples

[FixOrientation.cxx](#).

### 12.222.4.2 GetMajorAxisFromPatientRelativeDirectionCosine()

```
char gdcm::Orientation::GetMajorAxisFromPatientRelativeDirectionCosine (
    double x,
    double y,
    double z) [static], [protected]
```

### 12.222.4.3 GetObliquityThresholdCosineValue()

```
double gdcm::Orientation::GetObliquityThresholdCosineValue () [static]
```

### 12.222.4.4 GetType()

```
OrientationType gdcm::Orientation::GetType (
    const double dircos[6]) [static]
```

Return the type of orientation from a direction cosines Input is an array of 6 double

#### Examples

[FixOrientation.cxx](#).

### 12.222.4.5 Print()

```
void gdcm::Orientation::Print (
    std::ostream & ) const
```

Print.

Referenced by [operator<<](#).

#### 12.222.4.6 SetObliquityThresholdCosineValue()

```
void gdcM::Orientation::SetObliquityThresholdCosineValue (
    double val) [static]
```

ObliquityThresholdCosineValue stuff.

### 12.222.5 Friends And Related Symbol Documentation

#### 12.222.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Orientation & o) [friend]
```

References [Orientation\(\)](#), and [Print\(\)](#).

The documentation for this class was generated from the following file:

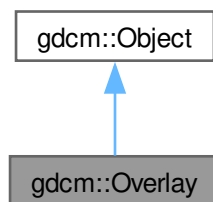
- [gdcMOrientation.h](#)

### 12.223 gdcM::Overlay Class Reference

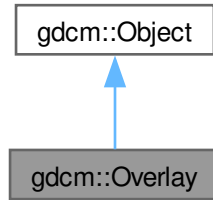
[Overlay](#) class.

```
#include <gdcMOverlay.h>
```

Inheritance diagram for gdcM::Overlay:



Collaboration diagram for gdcm::Overlay:



### Public Types

- enum `OverlayType` {  
`Invalid` = 0 ,  
`Graphics` = 1 ,  
`ROI` = 2 }

### Public Member Functions

- `Overlay` ()
- `Overlay` (Overlay const &ov)
- `~Overlay` () override
- void `Decompress` (std::ostream &os) const  
*Decode the internal OverlayData (packed bits) into unpacked representation.*
- unsigned short `GetBitPosition` () const  
*return bit position*
- unsigned short `GetBitsAllocated` () const  
*return bits allocated*
- unsigned short `GetColumns` () const  
*get columns*
- const char \* `GetDescription` () const  
*get description*
- unsigned short `GetGroup` () const  
*Get Group number.*
- const signed short \* `GetOrigin` () const  
*get origin*
- const `ByteValue` & `GetOverlayData` () const
- unsigned short `GetRows` () const  
*get rows*
- const char \* `GetType` () const  
*get type*
- `OverlayType` `GetTypeAsEnum` () const

- bool [GetUnpackBuffer](#) (char \*buffer, size\_t len) const
- size\_t [GetUnpackBufferLength](#) () const
- bool [GrabOverlayFromPixelData](#) ([DataSet](#) const &ds)
- bool [IsEmpty](#) () const
  - Return whether or not the [Overlay](#) is empty:*
- bool [IsInPixelData](#) () const
  - return if the [Overlay](#) is stored in the pixel data or not*
- void [IsInPixelData](#) (bool b)
  - Set whether or no the OverlayData is in the Pixel Data:*
- bool [IsZero](#) () const
  - return true if all bits are set to 0*
- [Overlay](#) & [operator=](#) ([Overlay](#) const &ov)
- void [Print](#) (std::ostream &) const override
  - Print.*
- void [SetBitPosition](#) (unsigned short bitposition)
  - set bit position*
- void [SetBitsAllocated](#) (unsigned short bitsallocated)
  - set bits allocated*
- void [SetColumns](#) (unsigned short columns)
  - set columns*
- void [SetDescription](#) (const char \*description)
  - set description*
- void [SetFrameOrigin](#) (unsigned short frameorigin)
  - set frame origin*
- void [SetGroup](#) (unsigned short group)
  - Set Group number.*
- void [SetNumberOfFrames](#) (unsigned int numberofframes)
  - set number of frames*
- void [SetOrigin](#) (const signed short origin[2])
  - set origin*
- void [SetOverlay](#) (const char \*array, size\_t length)
  - set overlay from byte array + length*
- void [SetRows](#) (unsigned short rows)
  - set rows*
- void [SetType](#) (const char \*type)
  - set type*
- void [Update](#) (const [DataElement](#) &de)
  - Update overlay from data element de:*

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)
  - Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

**Static Public Member Functions**

- static const char \* [GetOverlayTypeAsString](#) ([OverlayType](#) ot)
- static [OverlayType](#) [GetOverlayTypeFromString](#) (const char \*)

**Additional Inherited Members****Protected Member Functions inherited from [gdcm::Object](#)**

- void [Register](#) ()
- void [UnRegister](#) ()

**12.223.1 Detailed Description**

[Overlay](#) class.

**Note**

see [AreOverlaysInPixelData](#)

**Todo** Is there actually any way to recognize an overlay ? On images with multiple overlay I do not see any way to differentiate them (other than the group tag).

Example:

**12.223.2 Member Enumeration Documentation****12.223.2.1 OverlayType**

```
enum gdcm::Overlay::OverlayType
```

**Enumerator**

Invalid	
Graphics	
ROI	

**12.223.3 Constructor & Destructor Documentation****12.223.3.1 Overlay() [1/2]**

```
gdcm::Overlay::Overlay ()
```

Referenced by [Overlay\(\)](#), and [operator=\(\)](#).

### 12.223.3.2 ~Overlay()

```
gdcmm::Overlay::~~Overlay () [override]
```

### 12.223.3.3 Overlay() [2/2]

```
gdcmm::Overlay::Overlay (  
    Overlay const & ov)
```

References [Overlay\(\)](#).

## 12.223.4 Member Function Documentation

### 12.223.4.1 Decompress()

```
void gdcmm::Overlay::Decompress (  
    std::ostream & os) const
```

Decode the internal OverlayData (packed bits) into unpacked representation.

### 12.223.4.2 GetBitPosition()

```
unsigned short gdcmm::Overlay::GetBitPosition () const
```

return bit position

### 12.223.4.3 GetBitsAllocated()

```
unsigned short gdcmm::Overlay::GetBitsAllocated () const
```

return bits allocated

### 12.223.4.4 GetColumns()

```
unsigned short gdcmm::Overlay::GetColumns () const
```

get columns

### 12.223.4.5 GetDescription()

```
const char * gdcmm::Overlay::GetDescription () const
```

get description

#### 12.223.4.6 GetGroup()

```
unsigned short gdcm::Overlay::GetGroup () const
```

Get Group number.

#### 12.223.4.7 GetOrigin()

```
const signed short * gdcm::Overlay::GetOrigin () const
```

get origin

#### 12.223.4.8 GetOverlayData()

```
const ByteValue & gdcm::Overlay::GetOverlayData () const
```

Return the [Overlay](#) Data as [ByteValue](#): Not thread safe

#### 12.223.4.9 GetOverlayTypeAsString()

```
const char * gdcm::Overlay::GetOverlayTypeAsString (  
    OverlayType ot) [static]
```

#### 12.223.4.10 GetOverlayTypeFromString()

```
OverlayType gdcm::Overlay::GetOverlayTypeFromString (  
    const char * ) [static]
```

#### 12.223.4.11 GetRows()

```
unsigned short gdcm::Overlay::GetRows () const
```

get rows

#### 12.223.4.12 GetType()

```
const char * gdcm::Overlay::GetType () const
```

get type

#### 12.223.4.13 GetTypeAsEnum()

```
OverlayType gdcm::Overlay::GetTypeAsEnum () const
```

#### 12.223.4.14 GetUnpackBuffer()

```
bool gdcm::Overlay::GetUnpackBuffer (
    char * buffer,
    size_t len) const
```

Retrieve the unpack buffer for [Overlay](#). This is an error if the size is below [GetUnpackBufferLength\(\)](#)

#### 12.223.4.15 GetUnpackBufferLength()

```
size_t gdcm::Overlay::GetUnpackBufferLength () const
```

Retrieve the size of the buffer needed to hold the [Overlay](#) as specified by Col & Row parameters

#### 12.223.4.16 GrabOverlayFromPixelData()

```
bool gdcm::Overlay::GrabOverlayFromPixelData (
    DataSet const & ds)
```

##### Warning

Before calling this method, you must verify the consistency between the image metadata ([Image PixelFormat](#), Rows, Columns) and the overlay parameters. This pre-verification is required to ensure that the bit-depth is compatible and that the overlay data fits within the allocated pixel storage.

#### 12.223.4.17 IsEmpty()

```
bool gdcm::Overlay::IsEmpty () const
```

Return whether or not the [Overlay](#) is empty:

#### 12.223.4.18 IsInPixelData() [1/2]

```
bool gdcm::Overlay::IsInPixelData () const
```

return if the [Overlay](#) is stored in the pixel data or not



**12.223.4.19 IsInPixelData()** [2/2]

```
void gdcm::Overlay::IsInPixelData (
    bool b)
```

Set whether or no the OverlayData is in the Pixel Data:

**12.223.4.20 IsZero()**

```
bool gdcm::Overlay::IsZero () const
```

return true if all bits are set to 0

**12.223.4.21 operator=()**

```
Overlay & gdcm::Overlay::operator= (
    Overlay const & ov)
```

References [Overlay\(\)](#).

**12.223.4.22 Print()**

```
void gdcm::Overlay::Print (
    std::ostream & ) const [override], [virtual]
```

Print.

Reimplemented from [gdcm::Object](#).

**12.223.4.23 SetBitPosition()**

```
void gdcm::Overlay::SetBitPosition (
    unsigned short bitposition)
```

set bit position

**12.223.4.24 SetBitsAllocated()**

```
void gdcm::Overlay::SetBitsAllocated (
    unsigned short bitsallocated)
```

set bits allocated

**12.223.4.25 SetColumns()**

```
void gdcM::Overlay::SetColumns (
    unsigned short columns)
```

set columns

**12.223.4.26 SetDescription()**

```
void gdcM::Overlay::SetDescription (
    const char * description)
```

set description

**12.223.4.27 SetFrameOrigin()**

```
void gdcM::Overlay::SetFrameOrigin (
    unsigned short frameorigin)
```

set frame origin

**12.223.4.28 SetGroup()**

```
void gdcM::Overlay::SetGroup (
    unsigned short group)
```

Set Group number.

**12.223.4.29 SetNumberOfFrames()**

```
void gdcM::Overlay::SetNumberOfFrames (
    unsigned int numberofframes)
```

set number of frames

**12.223.4.30 SetOrigin()**

```
void gdcM::Overlay::SetOrigin (
    const signed short origin[2])
```

set origin

#### 12.223.4.31 SetOverlay()

```
void gdcm::Overlay::SetOverlay (
    const char * array,
    size_t length)
```

set overlay from byte array + length

#### 12.223.4.32 SetRows()

```
void gdcm::Overlay::SetRows (
    unsigned short rows)
```

set rows

#### 12.223.4.33 SetType()

```
void gdcm::Overlay::SetType (
    const char * type)
```

set type

#### 12.223.4.34 Update()

```
void gdcm::Overlay::Update (
    const DataElement & de)
```

Update overlay from data element de:

The documentation for this class was generated from the following file:

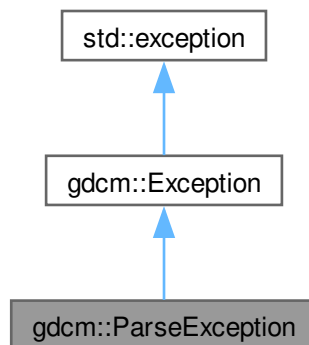
- [gdcmOverlay.h](#)

## 12.224 gdcm::ParseException Class Reference

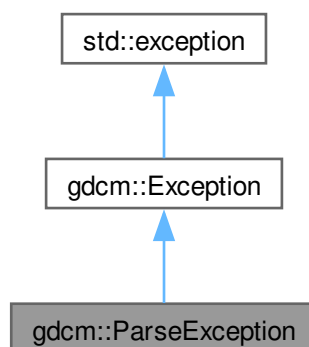
[ParseException](#) Standard exception handling object.

```
#include <gdcmParseException.h>
```

Inheritance diagram for `gdcm::ParseException`:



Collaboration diagram for `gdcm::ParseException`:



## Public Member Functions

- [ParseException](#) ()=default
- [ParseException](#) (const [ParseException](#) &orig)
- [~ParseException](#) () override throw ()
- const [DataElement](#) & [GetLastElement](#) () const
- [ParseException](#) & [operator=](#) (const [ParseException](#) &orig)
- void [SetLastElement](#) ([DataElement](#) &de)

## Public Member Functions inherited from [gdcm::Exception](#)

- [Exception](#) (const char \*desc="None", const char \*file=\_\_FILE\_\_, unsigned int lineNumber=\_\_LINE\_\_, const char \*func="")
- [~Exception](#) () override throw ()
- const char \* [GetDescription](#) () const  
*Return the Description.*
- const char \* [what](#) () const override throw ()  
*what implementation*

### 12.224.1 Detailed Description

[ParseException](#) Standard exception handling object.

### 12.224.2 Constructor & Destructor Documentation

#### 12.224.2.1 [ParseException](#)() [1/2]

```
gdcm::ParseException::ParseException () [default]
```

Referenced by [ParseException\(\)](#), and [operator=\(\)](#).

#### 12.224.2.2 [~ParseException](#)()

```
gdcm::ParseException::~~ParseException () throw ( ) [inline], [override]
```

#### 12.224.2.3 [ParseException](#)() [2/2]

```
gdcm::ParseException::ParseException (
    const ParseException & orig) [inline]
```

References [gdcm::Exception::Exception\(\)](#), and [ParseException\(\)](#).

### 12.224.3 Member Function Documentation

#### 12.224.3.1 GetLastElement()

```
const DataElement & gdcM::ParseException::GetLastElement () const [inline]
```

#### 12.224.3.2 operator=()

```
ParseException & gdcM::ParseException::operator= (
    const ParseException & orig) [inline]
```

Assignment operator.

References [ParseException\(\)](#).

#### 12.224.3.3 SetLastElement()

```
void gdcM::ParseException::SetLastElement (
    DataElement & de) [inline]
```

Equivalence operator.

Referenced by [gdcM::BasicOffsetTable::Read\(\)](#), [gdcM::Fragment::ReadBacktrack\(\)](#), and [gdcM::Fragment::ReadValue\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMParseException.h](#)

## 12.225 gdcM::Parser Class Reference

[Parser](#) ala XML\_Parser from expat (SAX).

```
#include <gdcMParser.h>
```

### Public Types

- typedef void(\* [EndElementHandler](#)) (void \*userData, const [Tag](#) &name)
- enum [ErrorType](#) {
  - [NoError](#) ,
  - [NoMemoryError](#) ,
  - [SyntaxError](#) ,
  - [NoElementsError](#) ,
  - [TagMismatchError](#) ,
  - [DuplicateAttributeError](#) ,
  - [JunkAfterDocElementError](#) ,
  - [UndefinedEntityError](#) ,
  - [UnexpectedStateError](#) }
- typedef void(\* [StartElementHandler](#)) (void \*userData, const [Tag](#) &tag, const char \*atts[])

## Public Member Functions

- [Parser](#) ()
- [~Parser](#) ()
- unsigned long [GetCurrentByteIndex](#) () const
- [ErrorType](#) [GetErrorCode](#) () const
- void \* [GetUserData](#) () const
- bool [Parse](#) (const char \*s, int len, bool isFinal)
- void [SetElementHandler](#) ([StartElementHandler](#) start, [EndElementHandler](#) end)
- void [SetUserData](#) (void \*userData)

## Static Public Member Functions

- static const char \* [GetErrorString](#) ([ErrorType](#) const &err)

## Protected Member Functions

- char \* [GetBuffer](#) (int len)
- bool [ParseBuffer](#) (int len, bool isFinal)
- [ErrorType](#) [Process](#) ()

### 12.225.1 Detailed Description

[Parser](#) ala XML\_Parser from expat (SAX).

Detailed description here

#### Note

Simple API for DICOM

### 12.225.2 Member Typedef Documentation

#### 12.225.2.1 EndElementHandler

```
typedef void(* gdcm::Parser::EndElementHandler) (void *userData, const Tag &name)
```

#### 12.225.2.2 StartElementHandler

```
typedef void(* gdcm::Parser::StartElementHandler) (void *userData, const Tag &tag, const char  
*atts[])
```

## 12.225.3 Member Enumeration Documentation

### 12.225.3.1 ErrorType

enum `gdcm::Parser::ErrorType`

#### Enumerator

NoError	
NoMemoryError	
SyntaxError	
NoElementsError	
TagMismatchError	
DuplicateAttributeError	
JunkAfterDocElementError	
UndefinedEntityError	
UnexpectedStateError	

## 12.225.4 Constructor & Destructor Documentation

### 12.225.4.1 Parser()

```
gdcm::Parser::Parser () [inline]
```

References [NoError](#).

### 12.225.4.2 ~Parser()

```
gdcm::Parser::~~Parser () [inline]
```

## 12.225.5 Member Function Documentation

### 12.225.5.1 GetBuffer()

```
char * gdcm::Parser::GetBuffer (
    int len) [protected]
```

### 12.225.5.2 GetCurrentByteIndex()

```
unsigned long gdcm::Parser::GetCurrentByteIndex () const
```



### 12.225.5.3 GetErrorCode()

```
ErrorCode gdcm::Parser::GetErrorCode () const
```

### 12.225.5.4 GetErrorString()

```
const char * gdcm::Parser::GetErrorString (  
    ErrorCode const & err) [static]
```

### 12.225.5.5 GetUserData()

```
void * gdcm::Parser::GetUserData () const
```

### 12.225.5.6 Parse()

```
bool gdcm::Parser::Parse (  
    const char * s,  
    int len,  
    bool isFinal)
```

### 12.225.5.7 ParseBuffer()

```
bool gdcm::Parser::ParseBuffer (  
    int len,  
    bool isFinal) [protected]
```

### 12.225.5.8 Process()

```
ErrorCode gdcm::Parser::Process () [protected]
```

### 12.225.5.9 SetElementHandler()

```
void gdcm::Parser::SetElementHandler (  
    StartElementHandler start,  
    EndElementHandler end)
```

### 12.225.5.10 SetUserData()

```
void gdcm::Parser::SetUserData (  
    void * userData)
```

The documentation for this class was generated from the following file:

- [gdcmParser.h](#)

## 12.226 gdcmm::Patient Class Reference

See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.

```
#include <gdcmmPatient.h>
```

### Public Member Functions

- [Patient](#) ()=default

### 12.226.1 Detailed Description

See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.

### 12.226.2 Constructor & Destructor Documentation

#### 12.226.2.1 Patient()

```
gdcmm::Patient::Patient () [default]
```

The documentation for this class was generated from the following file:

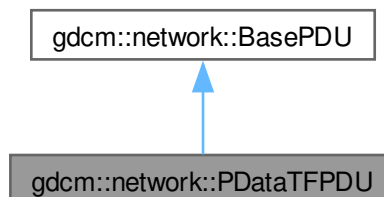
- [gdcmmPatient.h](#)

## 12.227 gdcmm::network::PDataTFPDU Class Reference

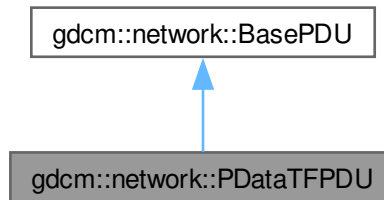
[PDataTFPDU](#).

```
#include <gdcmmPDataTFPDU.h>
```

Inheritance diagram for gdcmm::network::PDataTFPDU:



Collaboration diagram for gdcm::network::PDataTFPDU:



### Public Types

- typedef std::vector< [PresentationDataValue](#) >::size\_type [SizeType](#)

### Public Member Functions

- [PDataTFPDU](#) ()
- void [AddPresentationDataValue](#) ([PresentationDataValue](#) const &pdv)
- [SizeType](#) [GetNumberOfPresentationDataValues](#) () const
- [PresentationDataValue](#) const & [GetPresentationDataValue](#) ([SizeType](#) i) const
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

### Public Member Functions inherited from [gdcm::network::BasePDU](#)

- virtual [~BasePDU](#) ()=default

### Protected Member Functions

- std::istream & [ReadInto](#) (std::istream &is, std::ostream &os)

## 12.227.1 Detailed Description

[PDataTFPDU](#).

[Table 9-22 P-DATA-TF PDU FIELDS](#)

## 12.227.2 Member Typedef Documentation

### 12.227.2.1 SizeType

```
typedef std::vector<PresentationDataValue>::size_type gdc::network::PDataTFPDU::SizeType
```

## 12.227.3 Constructor & Destructor Documentation

### 12.227.3.1 PDataTFPDU()

```
gdc::network::PDataTFPDU::PDataTFPDU ()
```

## 12.227.4 Member Function Documentation

### 12.227.4.1 AddPresentationDataValue()

```
void gdc::network::PDataTFPDU::AddPresentationDataValue (  
    PresentationDataValue const & pdv) [inline]
```

References [Size\(\)](#).

### 12.227.4.2 GetNumberOfPresentationDataValues()

```
SizeType gdc::network::PDataTFPDU::GetNumberOfPresentationDataValues () const [inline]
```

### 12.227.4.3 GetPresentationDataValue()

```
PresentationDataValue const & gdc::network::PDataTFPDU::GetPresentationDataValue (  
    SizeType i) const [inline]
```

### 12.227.4.4 IsLastFragment()

```
bool gdc::network::PDataTFPDU::IsLastFragment () const [override], [virtual]
```

Implements [gdc::network::BasePDU](#).

### 12.227.4.5 Print()

```
void gdc::network::PDataTFPDU::Print (  
    std::ostream & os) const [override], [virtual]
```

Implements [gdc::network::BasePDU](#).

#### 12.227.4.6 Read()

```
std::istream & gdcm::network::PDataTFPDU::Read (
    std::istream & is)  [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

#### 12.227.4.7 ReadInto()

```
std::istream & gdcm::network::PDataTFPDU::ReadInto (
    std::istream & is,
    std::ostream & os)  [protected]
```

#### 12.227.4.8 Size()

```
size_t gdcm::network::PDataTFPDU::Size () const  [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

Referenced by [AddPresentationDataValue\(\)](#).

#### 12.227.4.9 Write()

```
const std::ostream & gdcm::network::PDataTFPDU::Write (
    std::ostream & os) const  [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

The documentation for this class was generated from the following file:

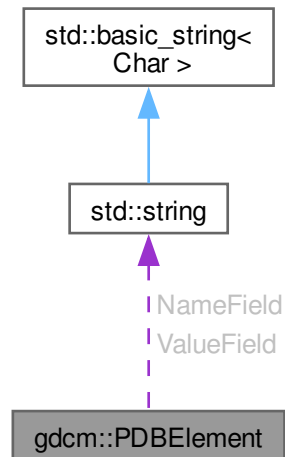
- [gdcmPDataTFPDU.h](#)

## 12.228 gdcm::PDBElement Class Reference

Class to represent a PDB [Element](#).

```
#include <gdcmPDBElement.h>
```

Collaboration diagram for gdcm::PDBElement:



### Public Member Functions

- [PDBElement](#) ()=default
- const char \* [GetName](#) () const  
*Set/Get Name.*
- const char \* [GetValue](#) () const  
*Set/Get Value.*
- bool [operator==](#) (const [PDBElement](#) &de) const
- void [SetName](#) (const char \*name)
- void [SetValue](#) (const char \*value)

### Protected Attributes

- std::string [NameField](#)
- std::string [ValueField](#)

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [PDBElement](#) &val)

## 12.228.1 Detailed Description

Class to represent a PDB [Element](#).

See also

[PDBHeader](#)

## 12.228.2 Constructor & Destructor Documentation

### 12.228.2.1 PDBelement()

```
gdcm::PDBelement::PDBelement () [default]
```

References [PDBelement\(\)](#), and [operator<<](#).

Referenced by [PDBelement\(\)](#), [operator<<](#), and [operator==\( \)](#).

## 12.228.3 Member Function Documentation

### 12.228.3.1 GetName()

```
const char * gdcm::PDBelement::GetName () const [inline]
```

Set/Get Name.

References [NameField](#).

### 12.228.3.2 GetValue()

```
const char * gdcm::PDBelement::GetValue () const [inline]
```

Set/Get [Value](#).

References [ValueField](#).

### 12.228.3.3 operator==( )

```
bool gdcm::PDBelement::operator==(
    const PDBelement & de) const [inline]
```

References [PDBelement\(\)](#), [NameField](#), and [ValueField](#).

#### 12.228.3.4 SetName()

```
void gdcM::PDBelement::SetName (  
    const char * name) [inline]
```

References [NameField](#).

#### 12.228.3.5 SetValue()

```
void gdcM::PDBelement::SetValue (  
    const char * value) [inline]
```

References [ValueField](#).

### 12.228.4 Friends And Related Symbol Documentation

#### 12.228.4.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & os,  
    const PDBelement & val) [friend]
```

References [PDBelement\(\)](#), [NameField](#), and [ValueField](#).

Referenced by [PDBelement\(\)](#).

### 12.228.5 Member Data Documentation

#### 12.228.5.1 NameField

```
std::string gdcM::PDBelement::NameField [protected]
```

Referenced by [GetName\(\)](#), [operator<<](#), [operator==\(\)](#), and [SetName\(\)](#).

#### 12.228.5.2 ValueField

```
std::string gdcM::PDBelement::ValueField [protected]
```

Referenced by [GetValue\(\)](#), [operator<<](#), [operator==\(\)](#), and [SetValue\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMPDBelement.h](#)



## 12.229 gdcm::PDBHeader Class Reference

Class for [PDBHeader](#).

```
#include <gdcmPDBHeader.h>
```

### Public Member Functions

- [PDBHeader](#) ()=default
- [~PDBHeader](#) ()=default
- bool [FindPDBElementByName](#) (const char \*name)  
*Return true if the PDB element matching name is found or not.*
- const [PDBElement](#) & [GetPDBElementByName](#) (const char \*name)
- bool [LoadFromDataElement](#) ([DataElement](#) const &de)  
*Load the PDB Header from a [DataElement](#) of a [DataSet](#).*
- void [Print](#) (std::ostream &os) const  
*Print.*

### Static Public Member Functions

- static const [PrivateTag](#) & [GetPDBInfoTag](#) ()  
*Return the Private [Tag](#) where the PDB header is stored within a DICOM [DataSet](#).*

### Protected Member Functions

- const [PDBElement](#) & [GetPDBEEnd](#) () const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [PDBHeader](#) &d)

### 12.229.1 Detailed Description

Class for [PDBHeader](#).

GEMS MR [Image](#) have an [Attribute](#) (0025,1b,GEMS\_SERS\_01) which store the Acquisition parameter of the MR [Image](#). It is compressed and can therefore not be used as is. This class de-encapsulated the Protocol Data Block and allow users to query element by name.

#### Warning

Everything you do with this code is at your own risk, since decoding process was not written from specification documents.

: the API of this class might change.

: SEDESC is not always pure ASCII it can contains latin1

See also

[CSAHeader](#)

## 12.229.2 Constructor & Destructor Documentation

### 12.229.2.1 PDBHeader()

```
gdcm::PDBHeader::PDBHeader () [default]
```

Referenced by [operator<<](#).

### 12.229.2.2 ~PDBHeader()

```
gdcm::PDBHeader::~~PDBHeader () [default]
```

## 12.229.3 Member Function Documentation

### 12.229.3.1 FindPDBElementByName()

```
bool gdcm::PDBHeader::FindPDBElementByName (
    const char * name)
```

Return true if the PDB element matching name is found or not.

### 12.229.3.2 GetPDBEEnd()

```
const PDBElement & gdcm::PDBHeader::GetPDBEEnd () const [protected]
```

### 12.229.3.3 GetPDBElementByName()

```
const PDBElement & gdcm::PDBHeader::GetPDBElementByName (
    const char * name)
```

Lookup in the PDB header if a PDB element match the name 'name':

#### Warning

Case Sensitive

### 12.229.3.4 GetPDBInfoTag()

```
const PrivateTag & gdcm::PDBHeader::GetPDBInfoTag () [static]
```

Return the Private [Tag](#) where the PDB header is stored within a DICOM [DataSet](#).

### 12.229.3.5 LoadFromDataElement()

```
bool gdcm::PDBHeader::LoadFromDataElement (
    DataElement const & de)
```

Load the PDB Header from a [DataElement](#) of a [DataSet](#).

### 12.229.3.6 Print()

```
void gdcm::PDBHeader::Print (
    std::ostream & os) const
```

Print.

Referenced by [operator<<](#).

## 12.229.4 Friends And Related Symbol Documentation

### 12.229.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const PDBHeader & d) [friend]
```

References [PDBHeader\(\)](#), and [Print\(\)](#).

The documentation for this class was generated from the following file:

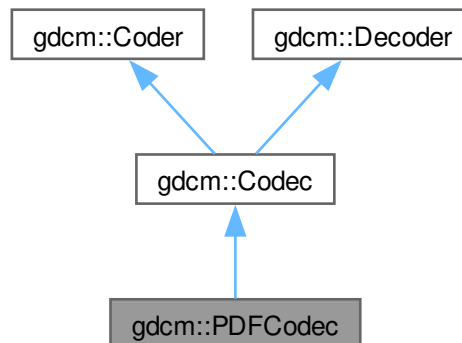
- [gdcmPDBHeader.h](#)

## 12.230 gdcm::PDFCodec Class Reference

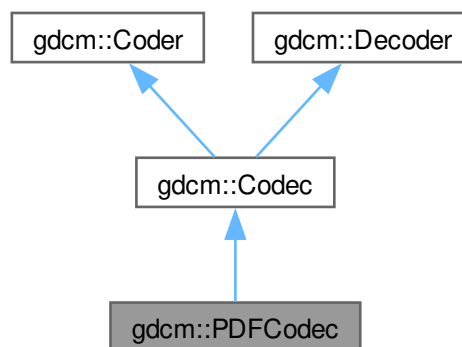
[PDFCodec](#) class.

```
#include <gdcmPDFCodec.h>
```

Inheritance diagram for `gdcm::PDFCodec`:



Collaboration diagram for `gdcm::PDFCodec`:



### Public Member Functions

- [PDFCodec](#) ()
- [~PDFCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*

**Public Member Functions inherited from [gdcm::Coder](#)**

- virtual [~Coder](#) ()=default
- virtual bool [Code](#) ([DataElement](#) const &in\_, [DataElement](#) &out\_) *Code.*

**Public Member Functions inherited from [gdcm::Decoder](#)**

- virtual [~Decoder](#) ()=default

**Additional Inherited Members****Protected Member Functions inherited from [gdcm::Coder](#)**

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

**Protected Member Functions inherited from [gdcm::Decoder](#)**

- virtual bool [DecodeByStreams](#) (std::istream &, std::ostream &)

**12.230.1 Detailed Description**

[PDFCodec](#) class.

**12.230.2 Constructor & Destructor Documentation****12.230.2.1 PDFCodec()**

```
gdcm::PDFCodec::PDFCodec ()
```

**12.230.2.2 ~PDFCodec()**

```
gdcm::PDFCodec::~~PDFCodec () [override]
```

**12.230.3 Member Function Documentation****12.230.3.1 CanCode()**

```
bool gdcm::PDFCodec::CanCode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Implements [gdcm::Coder](#).

### 12.230.3.2 CanDecode()

```
bool gdcm::PDFCodec::CanDecode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Implements [gdcm::Decoder](#).

### 12.230.3.3 Decode()

```
bool gdcm::PDFCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::Decoder](#).

The documentation for this class was generated from the following file:

- [gdcmPDFCodec.h](#)

## 12.231 gdcm::network::PDUFactory Class Reference

[PDUFactory](#) basically, given an initial byte, construct the.

```
#include <gdcmPDUFactory.h>
```

### Static Public Member Functions

- static [BasePDU](#) \* [ConstructAbortPDU](#) ()
- static [BasePDU](#) \* [ConstructPDU](#) (uint8\_t itemtype)
- static [BasePDU](#) \* [ConstructReleasePDU](#) ()
- static std::vector< [BasePDU](#) \* > [CreateCEchoPDU](#) (const [ULConnection](#) &inConnection)
- static std::vector< [BasePDU](#) \* > [CreateCFindPDU](#) (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)
- static std::vector< [BasePDU](#) \* > [CreateCMovePDU](#) (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)
- static std::vector< [BasePDU](#) \* > [CreateCStoreRQPDU](#) (const [ULConnection](#) &inConnection, const [File](#) &file, bool writeDataSet=true)
- static std::vector< [BasePDU](#) \* > [CreateCStoreRSPPDU](#) (const [DataSet](#) \*inDataSet, const [BasePDU](#) \*inPC)
- static std::vector< [BasePDU](#) \* > [CreateNActionPDU](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [BasePDU](#) \* > [CreateNCreatePDU](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [BasePDU](#) \* > [CreateNDeletePDU](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [BasePDU](#) \* > [CreateNEventReportPDU](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [BasePDU](#) \* > [CreateNGetPDU](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [BasePDU](#) \* > [CreateNSetPDU](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static [EEventID](#) [DetermineEventByPDU](#) (const [BasePDU](#) \*inPDU)
- static std::vector< [PresentationDataValue](#) > [GetPDVs](#) (const std::vector< [BasePDU](#) \* > &inDataPDUs)

## 12.231.1 Detailed Description

[PDUFactory](#) basically, given an initial byte, construct the.

appropriate PDU. This way, the event loop doesn't have to know about all the different PDU types.

## 12.231.2 Member Function Documentation

### 12.231.2.1 ConstructAbortPDU()

```
BasePDU * gdcm::network::PDUFactory::ConstructAbortPDU () [static]
```

### 12.231.2.2 ConstructPDU()

```
BasePDU * gdcm::network::PDUFactory::ConstructPDU (
    uint8_t itemtype) [static]
```

### 12.231.2.3 ConstructReleasePDU()

```
BasePDU * gdcm::network::PDUFactory::ConstructReleasePDU () [static]
```

### 12.231.2.4 CreateCEchoPDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateCEchoPDU (
    const ULConnection & inConnection) [static]
```

### 12.231.2.5 CreateCFindPDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateCFindPDU (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery) [static]
```

### 12.231.2.6 CreateCMovePDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateCMovePDU (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery) [static]
```

### 12.231.2.7 CreateCStoreRQPDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateCStoreRQPDU (
    const ULConnection & inConnection,
    const File & file,
    bool writeDataSet = true) [static]
```

### 12.231.2.8 CreateCStoreRSPDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateCStoreRSPDU (
    const DataSet * inDataSet,
    const BasePDU * inPC) [static]
```

### 12.231.2.9 CreateNActionPDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateNActionPDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

### 12.231.2.10 CreateNCreatePDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateNCreatePDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

### 12.231.2.11 CreateNDeletePDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateNDeletePDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

### 12.231.2.12 CreateNEventReportPDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateNEventReportPDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

### 12.231.2.13 CreateNGetPDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateNGetPDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```



### 12.231.2.14 CreateNSetPDU()

```
std::vector< BasePDU * > gdcm::network::PDUFactory::CreateNSetPDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery) [static]
```

### 12.231.2.15 DetermineEventByPDU()

```
EEventID gdcm::network::PDUFactory::DetermineEventByPDU (
    const BasePDU * inPDU) [static]
```

### 12.231.2.16 GetPDVs()

```
std::vector< PresentationDataValue > gdcm::network::PDUFactory::GetPDVs (
    const std::vector< BasePDU * > & inDataPDUs) [static]
```

The documentation for this class was generated from the following file:

- [gdcmPDUFactory.h](#)

## 12.232 gdcm::PersonName Class Reference

[PersonName](#) class.

```
#include <gdcmPersonName.h>
```

### Public Member Functions

- unsigned int [GetMaxLength](#) () const
- unsigned int [GetNumberOfComponents](#) () const
- void [Print](#) (std::ostream &os) const
- void [SetBlob](#) (const std::vector< char > &v)
- void [SetComponents](#) (const char \*comp1="", const char \*comp2="", const char \*comp3="", const char \*comp4="", const char \*comp5="")
- void [SetComponents](#) (const char \*components[])

### Public Attributes

- char [Component](#) [[MaxNumberOfComponents](#)][[MaxLength](#)+1]

## Static Public Attributes

- static const unsigned int [MaxLength](#) = 64
- static const unsigned int [MaxNumberOfComponents](#) = 5
- static const char [Padding](#) = ''
- static const char [Separator](#) = '^'

## 12.232.1 Detailed Description

[PersonName](#) class.

## 12.232.2 Member Function Documentation

### 12.232.2.1 GetMaxLength()

```
unsigned int gdcm::PersonName::GetMaxLength () const [inline]
```

References [MaxLength](#).

Referenced by [SetComponents\(\)](#).

### 12.232.2.2 GetNumberOfComponents()

```
unsigned int gdcm::PersonName::GetNumberOfComponents () const [inline]
```

References [Component](#).

### 12.232.2.3 Print()

```
void gdcm::PersonName::Print (  
    std::ostream & os) const [inline]
```

References [Component](#).

### 12.232.2.4 SetBlob()

```
void gdcm::PersonName::SetBlob (  
    const std::vector< char > & v) [inline]
```

#### 12.232.2.5 SetComponents() [1/2]

```
void gdcM::PersonName::SetComponents (
    const char * comp1 = "",
    const char * comp2 = "",
    const char * comp3 = "",
    const char * comp4 = "",
    const char * comp5 = "") [inline]
```

References [SetComponents\(\)](#).

Referenced by [SetComponents\(\)](#).

#### 12.232.2.6 SetComponents() [2/2]

```
void gdcM::PersonName::SetComponents (
    const char * components[]) [inline]
```

References [Component](#), and [GetMaxLength\(\)](#).

### 12.232.3 Member Data Documentation

#### 12.232.3.1 Component

```
char gdcM::PersonName::Component [MaxNumberOfComponents] [MaxLength+1]
```

Referenced by [GetNumberOfComponents\(\)](#), [Print\(\)](#), and [SetComponents\(\)](#).

#### 12.232.3.2 MaxLength

```
const unsigned int gdcM::PersonName::MaxLength = 64 [static]
```

Referenced by [GetMaxLength\(\)](#).

#### 12.232.3.3 MaxNumberOfComponents

```
const unsigned int gdcM::PersonName::MaxNumberOfComponents = 5 [static]
```

#### 12.232.3.4 Padding

```
const char gdcM::PersonName::Padding = ' ' [static]
```

### 12.232.3.5 Separator

```
const char gdcM::PersonName::Separator = '^' [static]
```

The documentation for this class was generated from the following file:

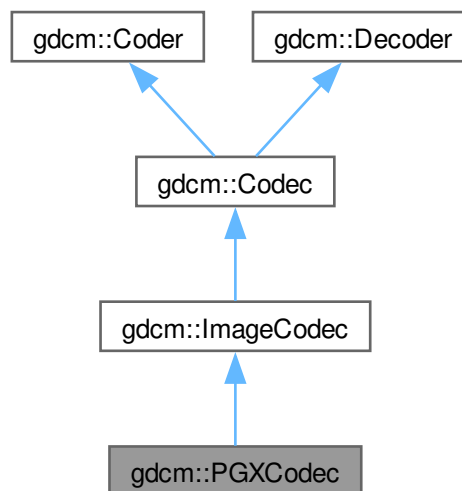
- [gdcMPersonName.h](#)

## 12.233 gdcM::PGXCodec Class Reference

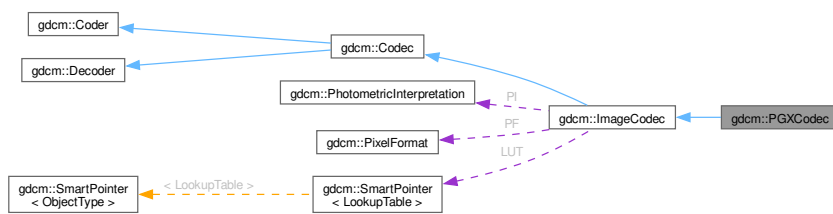
Class to do PGX.

```
#include <gdcMPGXCodec.h>
```

Inheritance diagram for gdcM::PGXCodec:



Collaboration diagram for gdcM::PGXCodec:



**Public Member Functions**

- [PGXCodec](#) ()
- [~PGXCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [Read](#) (const char \*filename, [DataElement](#) &out) const
- bool [Write](#) (const char \*filename, const [DataElement](#) &out) const

**Public Member Functions inherited from [gdcm::ImageCodec](#)**

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- bool [Decode](#) ([DataElement](#) const &is\_, [DataElement](#) &os) override  
*Decode.*
- const unsigned int \* [GetDimensions](#) () const
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

**Public Member Functions inherited from [gdcm::Coder](#)**

- virtual [~Coder](#) ()=default
- virtual bool [Code](#) ([DataElement](#) const &in\_, [DataElement](#) &out\_)  
*Code.*

## Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

## Additional Inherited Members

## Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

## Protected Member Functions inherited from [gdcm::ImageCodec](#)

- virtual bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- virtual bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- bool [DecodeByStreams](#) (std::istream &is\_, std::ostream &os) override
- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsFrameEncoder](#) ()
- virtual bool [IsRowEncoder](#) ()
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)
- virtual bool [StartEncode](#) (std::ostream &os)
- virtual bool [StopEncode](#) (std::ostream &os)

## Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

## Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) [LUT](#)
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) [PF](#)
- [PhotometricInterpretation](#) [PI](#)
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

### 12.233.1 Detailed Description

Class to do PGX.

See PGX as used in JPEG 2000 implementation and reference images

### 12.233.2 Constructor & Destructor Documentation

#### 12.233.2.1 PGXCodec()

```
gdcm::PGXCodec::PGXCodec ()
```

#### 12.233.2.2 ~PGXCodec()

```
gdcm::PGXCodec::~~PGXCodec () [override]
```

### 12.233.3 Member Function Documentation

#### 12.233.3.1 CanCode()

```
bool gdcm::PGXCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Reimplemented from [gdcm::ImageCodec](#).

#### 12.233.3.2 CanDecode()

```
bool gdcm::PGXCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Reimplemented from [gdcm::ImageCodec](#).

#### 12.233.3.3 Clone()

```
ImageCodec * gdcm::PGXCodec::Clone () const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

References [gdcm::ImageCodec::ImageCodec\(\)](#).

#### 12.233.3.4 GetHeaderInfo()

```
bool gdcM::PGXCodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts) [override], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

#### 12.233.3.5 Read()

```
bool gdcM::PGXCodec::Read (
    const char * filename,
    DataElement & out) const
```

#### 12.233.3.6 Write()

```
bool gdcM::PGXCodec::Write (
    const char * filename,
    const DataElement & out) const
```

The documentation for this class was generated from the following file:

- [gdcM\\_PGXCodec.h](#)

## 12.234 gdcM::PhotometricInterpretation Class Reference

Class to represent an [PhotometricInterpretation](#).

```
#include <gdcMPhotometricInterpretation.h>
```

### Public Types

- enum [PType](#) {  
[UNKNOWN](#) = 0 ,  
[MONOCHROME1](#) ,  
[MONOCHROME2](#) ,  
[PALETTE\\_COLOR](#) ,  
[RGB](#) ,  
[HSV](#) ,  
[ARGB](#) ,  
[CMYK](#) ,  
[YBR\\_FULL](#) ,  
[YBR\\_FULL\\_422](#) ,  
[YBR\\_PARTIAL\\_422](#) ,  
[YBR\\_PARTIAL\\_420](#) ,  
[YBR\\_ICT](#) ,  
[YBR\\_RCT](#) ,  
[PI\\_END](#) }



## Public Member Functions

- [PhotometricInterpretation](#) ([PType](#) pi=[UNKNOWN](#))
- unsigned short [GetSamplesPerPixel](#) () const  
*return the value for Sample Per Pixel associated with a particular Photometric Interpretation*
- const char \* [GetString](#) () const
- [PType](#) [GetType](#) () const
- bool [IsLossless](#) () const
- bool [IsLossy](#) () const
- bool [IsSameColorSpace](#) ([PhotometricInterpretation](#) const &pi) const
- [operator PType](#) () const

## Static Public Member Functions

- static const char \* [GetPIString](#) ([PType](#) pi)
- static [PType](#) [GetPType](#) (const char \*pi)
- static bool [IsRetired](#) ([PType](#) pi)

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [PhotometricInterpretation](#) &pi)

## 12.234.1 Detailed Description

Class to represent an [PhotometricInterpretation](#).

### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [ExtractImageRegion.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [HelloVizWorld.cxx](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

## 12.234.2 Member Enumeration Documentation

### 12.234.2.1 PType

```
enum gdcmm::PhotometricInterpretation::PType
```

#### Enumerator

UNKNOWN	
MONOCHROME1	
MONOCHROME2	

PALETTE_COLOR	
RGB	
HSV	
ARGB	
CMYK	
YBR_FULL	
YBR_FULL_422	
YBR_PARTIAL_422	
YBR_PARTIAL_420	
YBR_ICT	
YBR_RCT	
PI_END	

### Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), and [MpegVideoInfo.cs](#).

## 12.234.3 Constructor & Destructor Documentation

### 12.234.3.1 PhotometricInterpretation()

```
gdcm::PhotometricInterpretation::PhotometricInterpretation (
    PType pi = UNKNOWN) [inline]
```

References [UNKNOWN](#).

Referenced by [GetSamplesPerPixel\(\)](#), [IsSameColorSpace\(\)](#), and [operator<<](#).

## 12.234.4 Member Function Documentation

### 12.234.4.1 GetPIString()

```
const char * gdcm::PhotometricInterpretation::GetPIString (
    PType pi) [static]
```

Referenced by [operator<<](#).

### 12.234.4.2 GetPType()

```
PType gdcm::PhotometricInterpretation::GetPType (
    const char * pi) [static]
```

#### 12.234.4.3 GetSamplesPerPixel()

```
unsigned short gdcm::PhotometricInterpretation::GetSamplesPerPixel () const
```

return the value for Sample Per Pixel associated with a particular Photometric Interpretation

References [PhotometricInterpretation\(\)](#), and [operator<<](#).

#### 12.234.4.4 GetString()

```
const char * gdcm::PhotometricInterpretation::GetString () const
```

#### 12.234.4.5 GetType()

```
PIType gdcm::PhotometricInterpretation::GetType () const [inline]
```

#### 12.234.4.6 IsLossless()

```
bool gdcm::PhotometricInterpretation::IsLossless () const
```

#### 12.234.4.7 IsLossy()

```
bool gdcm::PhotometricInterpretation::IsLossy () const
```

#### 12.234.4.8 IsRetired()

```
bool gdcm::PhotometricInterpretation::IsRetired (  
    PIType pi) [static]
```

#### 12.234.4.9 IsSameColorSpace()

```
bool gdcm::PhotometricInterpretation::IsSameColorSpace (  
    PhotometricInterpretation const & pi) const
```

References [PhotometricInterpretation\(\)](#).

#### 12.234.4.10 operator PIType()

```
gdcm::PhotometricInterpretation::operator PIType () const [inline]
```

## 12.234.5 Friends And Related Symbol Documentation

### 12.234.5.1 `operator<<`

```
std::ostream & operator<< (  
    std::ostream & os,  
    const PhotometricInterpretation & pi) [friend]
```

References [PhotometricInterpretation\(\)](#), and [GetPIString\(\)](#).

Referenced by [GetSamplesPerPixel\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmPhotometricInterpretation.h](#)

## 12.235 `gdcm::PixelFormat` Class Reference

[PixelFormat](#).

```
#include <gdcmPixelFormat.h>
```

### Public Types

- enum [ScalarType](#) {  
 [UINT8](#) ,  
 [INT8](#) ,  
 [UINT12](#) ,  
 [INT12](#) ,  
 [UINT16](#) ,  
 [INT16](#) ,  
 [UINT32](#) ,  
 [INT32](#) ,  
 [UINT64](#) ,  
 [INT64](#) ,  
 [FLOAT16](#) ,  
 [FLOAT32](#) ,  
 [FLOAT64](#) ,  
 [SINGLEBIT](#) ,  
 [UNKNOWN](#) }

## Public Member Functions

- [PixelFormat](#) ()
- [PixelFormat](#) ([ScalarType](#) st)
- [PixelFormat](#) (unsigned short samplesperpixel, unsigned short bitsallocated=8, unsigned short bitsstored=8, unsigned short highbit=7, unsigned short pixelrepresentation=0)
- unsigned short [GetBitsAllocated](#) () const  
*BitsAllocated see [Tag](#) (0028,0100) US Bits Allocated.*
- unsigned short [GetBitsStored](#) () const  
*BitsStored see [Tag](#) (0028,0101) US Bits Stored.*
- unsigned short [GetHighBit](#) () const  
*HighBit see [Tag](#) (0028,0102) US High Bit.*
- int64\_t [GetMax](#) () const  
*return the max possible of the pixel*
- int64\_t [GetMin](#) () const  
*return the min possible of the pixel*
- unsigned short [GetPixelRepresentation](#) () const  
*PixelRepresentation: 0 or 1, see [Tag](#) (0028,0103) US Pixel Representation.*
- uint8\_t [GetPixelSize](#) () const
- unsigned short [GetSamplesPerPixel](#) () const
- [ScalarType](#) [GetScalarType](#) () const  
*ScalarType does not take into account the sample per pixel.*
- const char \* [GetScalarTypeAsString](#) () const
- bool [IsCompatible](#) (const [TransferSyntax](#) &ts) const
- bool [IsValid](#) () const  
*return IsValid*
- [operator \[ScalarType\]\(#\)](#) () const
- bool [operator!=](#) (const [PixelFormat](#) &pf) const
- bool [operator!=](#) ([ScalarType](#) st) const
- bool [operator==](#) (const [PixelFormat](#) &pf) const
- bool [operator==](#) ([ScalarType](#) st) const
- void [Print](#) (std::ostream &os) const  
*Print.*
- void [SetBitsAllocated](#) (unsigned short ba)
- void [SetBitsStored](#) (unsigned short bs)
- void [SetHighBit](#) (unsigned short hb)
- void [SetPixelRepresentation](#) (unsigned short pr)
- void [SetSamplesPerPixel](#) (unsigned short spp)
- void [SetScalarType](#) ([ScalarType](#) st)

## Protected Member Functions

- bool [Validate](#) ()  
*When image with 24/24/23 was read, need to validate.*

## Friends

- class [Bitmap](#)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [PixelFormat](#) &pf)

## 12.235.1 Detailed Description

### PixelFormat.

By default the Pixel [Type](#) will be instantiated with the following parameters:

- SamplesPerPixel : 1
- BitsAllocated : 8
- BitsStored : 8
- HighBit : 7
- PixelRepresentation : 0

Fundamentally [PixelFormat](#) is very close to what DICOM allows. It will be very hard to extend this class for the upcoming DICOM standard where Floating 32 and 64bits will be allowed.

It is also very hard for this class to fully support 64bits integer type (see GetMin / GetMax signature restricted to 64bits signed).

### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), [FixJAIBugJPEGLS.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [MpegVideoInfo.cs](#), [RescaleImage.cs](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), [iU22tomultisc.cxx](#), and [threadgdcm.cxx](#).

## 12.235.2 Member Enumeration Documentation

### 12.235.2.1 ScalarType

```
enum gdcm::PixelFormat::ScalarType
```

#### Enumerator

UINT8	
INT8	
UINT12	
INT12	
UINT16	
INT16	
UINT32	
INT32	
UINT64	

INT64	
FLOAT16	
FLOAT32	
FLOAT64	
SINGLEBIT	
UNKNOWN	

#### Examples

[GetArray.cs](#).

## 12.235.3 Constructor & Destructor Documentation

### 12.235.3.1 PixelFormat() [1/3]

```
gdcm::PixelFormat::PixelFormat () [inline]
```

References [PixelFormat\(\)](#).

Referenced by [PixelFormat\(\)](#), [Bitmap](#), [operator!=\(\)](#), [operator<<](#), and [operator==\(\)](#).

### 12.235.3.2 PixelFormat() [2/3]

```
gdcm::PixelFormat::PixelFormat (
    unsigned short samplesperpixel,
    unsigned short bitsallocated = 8,
    unsigned short bitsstored = 8,
    unsigned short highbit = 7,
    unsigned short pixelrepresentation = 0) [inline], [explicit]
```

### 12.235.3.3 PixelFormat() [3/3]

```
gdcm::PixelFormat::PixelFormat (
    ScalarType st)
```

## 12.235.4 Member Function Documentation

### 12.235.4.1 GetBitsAllocated()

```
unsigned short gdcm::PixelFormat::GetBitsAllocated () const [inline]
```

BitsAllocated see [Tag](#) (0028,0100) US Bits Allocated.

#### Examples

[GetJPEGSamplePrecision.cxx](#).

#### 12.235.4.2 GetBitsStored()

```
unsigned short gdcm::PixelFormat::GetBitsStored () const [inline]
```

BitsStored see [Tag](#) (0028,0101) US Bits Stored.

##### Examples

[GetJPEGSamplePrecision.cxx](#).

#### 12.235.4.3 GetHighBit()

```
unsigned short gdcm::PixelFormat::GetHighBit () const [inline]
```

HighBit see [Tag](#) (0028,0102) US High Bit.

#### 12.235.4.4 GetMax()

```
int64_t gdcm::PixelFormat::GetMax () const
```

return the max possible of the pixel

#### 12.235.4.5 GetMin()

```
int64_t gdcm::PixelFormat::GetMin () const
```

return the min possible of the pixel

#### 12.235.4.6 GetPixelRepresentation()

```
unsigned short gdcm::PixelFormat::GetPixelRepresentation () const [inline]
```

PixelRepresentation: 0 or 1, see [Tag](#) (0028,0103) US Pixel Representation.

#### 12.235.4.7 GetPixelSize()

```
uint8_t gdcm::PixelFormat::GetPixelSize () const
```

return the size of the pixel This is the number of words it would take to store one pixel

##### Warning

the return value takes into account the SamplesPerPixel

in the rare case when BitsAllocated == 12, the function assume word padding and value returned will be identical as if BitsAllocated == 16

##### Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), and [threadgdcm.cxx](#).



#### 12.235.4.8 GetSamplesPerPixel()

```
unsigned short gdcm::PixelFormat::GetSamplesPerPixel () const
```

Samples Per Pixel see (0028,0002) US Samples Per Pixel DICOM - only allows 1, 3 and 4 as valid value. Other value are undefined behavior.

##### Examples

[threadgdcm.cxx](#).

#### 12.235.4.9 GetScalarType()

```
ScalarType gdcm::PixelFormat::GetScalarType () const
```

[ScalarType](#) does not take into account the sample per pixel.

##### Examples

[GetArray.cs](#).

Referenced by [operator ScalarType\(\)](#), [operator!=\(\)](#), and [operator==\(\)](#).

#### 12.235.4.10 GetScalarTypeAsString()

```
const char * gdcm::PixelFormat::GetScalarTypeAsString () const
```

##### Examples

[GetArray.cs](#).

#### 12.235.4.11 IsCompatible()

```
bool gdcm::PixelFormat::IsCompatible (  
    const TransferSyntax & ts) const
```

#### 12.235.4.12 IsValid()

```
bool gdcm::PixelFormat::IsValid () const
```

return IsValid

**12.235.4.13 operator ScalarType()**

```
gdcm::PixelFormat::operator ScalarType () const [inline]
```

References [GetScalarType\(\)](#).

**12.235.4.14 operator!=(()) [1/2]**

```
bool gdcm::PixelFormat::operator!= (
    const PixelFormat & pf) const [inline]
```

References [PixelFormat\(\)](#).

**12.235.4.15 operator!=(()) [2/2]**

```
bool gdcm::PixelFormat::operator!= (
    ScalarType st) const [inline]
```

References [GetScalarType\(\)](#).

**12.235.4.16 operator==(()) [1/2]**

```
bool gdcm::PixelFormat::operator== (
    const PixelFormat & pf) const [inline]
```

References [PixelFormat\(\)](#).

**12.235.4.17 operator==(()) [2/2]**

```
bool gdcm::PixelFormat::operator== (
    ScalarType st) const [inline]
```

References [GetScalarType\(\)](#).

**12.235.4.18 Print()**

```
void gdcm::PixelFormat::Print (
    std::ostream & os) const
```

Print.

Referenced by [operator<<](#).

#### 12.235.4.19 SetBitsAllocated()

```
void gdcm::PixelFormat::SetBitsAllocated (
    unsigned short ba) [inline]
```

#### 12.235.4.20 SetBitsStored()

```
void gdcm::PixelFormat::SetBitsStored (
    unsigned short bs) [inline]
```

References [SetHighBit\(\)](#).

#### 12.235.4.21 SetHighBit()

```
void gdcm::PixelFormat::SetHighBit (
    unsigned short hb) [inline]
```

Referenced by [SetBitsStored\(\)](#).

#### 12.235.4.22 SetPixelRepresentation()

```
void gdcm::PixelFormat::SetPixelRepresentation (
    unsigned short pr) [inline]
```

##### Examples

[TemplateEmptyImage.cxx](#).

#### 12.235.4.23 SetSamplesPerPixel()

```
void gdcm::PixelFormat::SetSamplesPerPixel (
    unsigned short spp) [inline]
```

##### Examples

[CreateARGBImage.cxx](#), and [CreateCMYKImage.cxx](#).

References [gdcmAssertMacro](#).

#### 12.235.4.24 SetScalarType()

```
void gdcmm::PixelFormat::SetScalarType (  
    ScalarType st)
```

Set [PixelFormat](#) based only on the [ScalarType](#)

##### Warning

: You need to call SetScalarType *before* SetSamplesPerPixel

#### 12.235.4.25 Validate()

```
bool gdcmm::PixelFormat::Validate () [protected]
```

When image with 24/24/23 was read, need to validate.

### 12.235.5 Friends And Related Symbol Documentation

#### 12.235.5.1 Bitmap

```
friend class Bitmap [friend]
```

References [PixelFormat\(\)](#), [Bitmap](#), and [operator<<](#).

Referenced by [Bitmap](#).

#### 12.235.5.2 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const PixelFormat & pf) [friend]
```

References [PixelFormat\(\)](#), and [Print\(\)](#).

Referenced by [Bitmap](#).

The documentation for this class was generated from the following file:

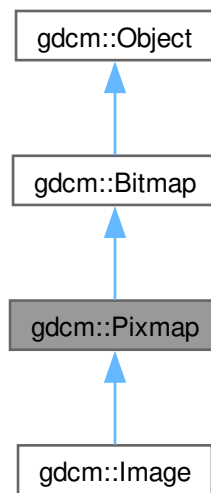
- [gdcmmPixelFormat.h](#)

## 12.236 gdcm::Pixmap Class Reference

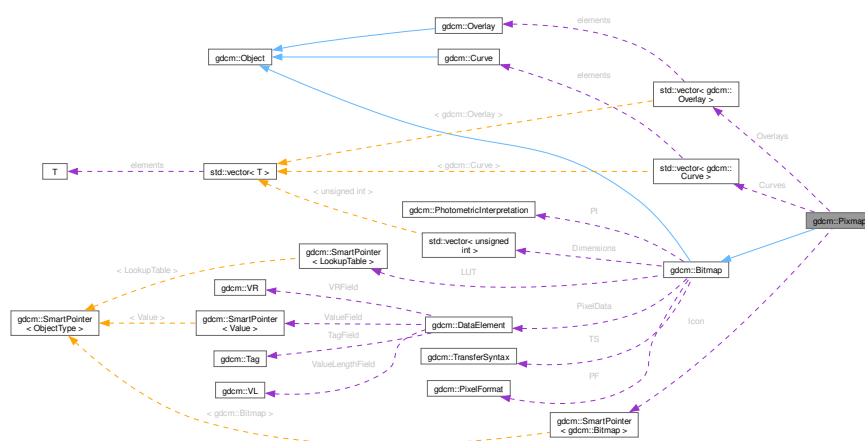
[Pixmap](#) class.

```
#include <gdcmPixmap.h>
```

Inheritance diagram for gdcm::Pixmap:



Collaboration diagram for gdcm::Pixmap:



## Public Member Functions

- [Pixmap](#) ()
- [~Pixmap](#) () override
- bool [AreOverlaysInPixelData](#) () const override  
*returns if Overlays are stored in the unused bit of the pixel data:*
- [Curve](#) & [GetCurve](#) (size\_t i=0)  
*Curve: group 50xx.*
- const [Curve](#) & [GetCurve](#) (size\_t i=0) const
- [IconImage](#) & [GetIconImage](#) ()
- const [IconImage](#) & [GetIconImage](#) () const  
*Set/Get Icon Image.*
- size\_t [GetNumberOfCurves](#) () const
- size\_t [GetNumberOfOverlays](#) () const
- [Overlay](#) & [GetOverlay](#) (size\_t i=0)  
*Overlay: group 60xx.*
- const [Overlay](#) & [GetOverlay](#) (size\_t i=0) const
- void [Print](#) (std::ostream &) const override
- void [RemoveOverlay](#) (size\_t i)
- void [SetIconImage](#) ([IconImage](#) const &ii)
- void [SetNumberOfCurves](#) (size\_t n)
- void [SetNumberOfOverlays](#) (size\_t n)
- bool [UnusedBitsPresentInPixelData](#) () const override  
*returns if there are unused bits in the pixel data*

## Public Member Functions inherited from [gdcm::Bitmap](#)

- [Bitmap](#) ()
- [~Bitmap](#) () override
- void [Clear](#) ()
- bool [GetBuffer](#) (char \*buffer) const  
*Access the raw data.*
- unsigned long [GetBufferLength](#) () const
- unsigned int [GetColumns](#) () const
- [DataElement](#) & [GetDataElement](#) ()
- const [DataElement](#) & [GetDataElement](#) () const
- unsigned int [GetDimension](#) (unsigned int idx) const
- const unsigned int \* [GetDimensions](#) () const  
*Return the dimension of the pixel data, first dimension (x), then 2nd (y), then 3rd (z)...*
- [LookupTable](#) & [GetLUT](#) ()
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const  
*INTERNAL do not use.*
- unsigned int [GetNumberOfDimensions](#) () const  
*Return the number of dimension of the pixel data bytes; for example 2 for a 2D matrices of values.*
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const  
*return the photometric interpretation*
- [PixelFormat](#) & [GetPixelFormat](#) ()

- const [PixelFormat](#) & [GetPixelFormat](#) () const  
*Get/Set PixelFormat.*
- unsigned int [GetPlanarConfiguration](#) () const  
*return the planar configuration*
- unsigned int [GetRows](#) () const
- const [TransferSyntax](#) & [GetTransferSyntax](#) () const
- bool [IsEmpty](#) () const
- bool [IsLossy](#) () const  
*Return whether or not the image was compressed using a lossy compressor or not.*
- bool [IsTransferSyntaxCompatible](#) ([TransferSyntax](#) const &ts) const
- void [SetColumns](#) (unsigned int col)
- void [SetDataElement](#) ([DataElement](#) const &de)
- void [SetDimension](#) (unsigned int idx, unsigned int dim)
- void [SetDimensions](#) (const unsigned int dims[3])
- void [SetLossyFlag](#) (bool f)  
*Specifically set that the image was compressed using a lossy compression mechanism.*
- void [SetLUT](#) ([LookupTable](#) const &lut)  
*Set/Get LUT.*
- void [SetNeedByteSwap](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)
- void [SetRows](#) (unsigned int rows)
- void [SetTransferSyntax](#) ([TransferSyntax](#) const &ts)  
*Transfer syntax.*

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

## Protected Attributes

- std::vector< [Curve](#) > [Curves](#)
- [SmartPointer](#)< [IconImage](#) > [Icon](#)
- std::vector< [Overlay](#) > [Overlays](#)

### Protected Attributes inherited from [gdcm::Bitmap](#)

- `std::vector< unsigned int >` [Dimensions](#)
- `bool` [LossyFlag](#)
- `LUTPtr` [LUT](#)
- `bool` [NeedByteSwap](#)
- `unsigned int` [NumberOfDimensions](#)
- `PixelFormat` [PF](#)
- `PhotometricInterpretation` [PI](#)
- `DataElement` [PixelData](#)
- `unsigned int` [PlanarConfiguration](#)
- `TransferSyntax` [TS](#)

### Additional Inherited Members

### Protected Types inherited from [gdcm::Bitmap](#)

- `typedef` [SmartPointer< LookupTable >](#) [LUTPtr](#)

### Protected Member Functions inherited from [gdcm::Bitmap](#)

- `bool` [ComputeLossyFlag](#) ()
- `bool` [GetBuffer2](#) (std::ostream &os) const
- `bool` [TryJPEG2000Codec](#) (char \*buffer, bool &lossyflag) const
- `bool` [TryJPEG2000Codec2](#) (std::ostream &os) const
- `bool` [TryJPEGCodec](#) (char \*buffer, bool &lossyflag) const
- `bool` [TryJPEGCodec2](#) (std::ostream &os) const
- `bool` [TryJPEGLSCCodec](#) (char \*buffer, bool &lossyflag) const
- `bool` [TryKAKADUCodec](#) (char \*buffer, bool &lossyflag) const
- `bool` [TryPVRGCodec](#) (char \*buffer, bool &lossyflag) const
- `bool` [TryRAWCodec](#) (char \*buffer, bool &lossyflag) const
- `bool` [TryRLECodec](#) (char \*buffer, bool &lossyflag) const

### Protected Member Functions inherited from [gdcm::Object](#)

- `void` [Register](#) ()
- `void` [UnRegister](#) ()

## 12.236.1 Detailed Description

[Pixmap](#) class.

A bitmap based image. Used as parent for both [IconImage](#) and the main Pixel Data [Image](#) It does not contains any World Space information (IPP, IOP)

See also

[PixmapReader](#)

Examples

[FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), and [StandardizeFiles.cs](#).



## 12.236.2 Constructor & Destructor Documentation

### 12.236.2.1 Pixmap()

```
gdcm::Pixmap::Pixmap ()
```

### 12.236.2.2 ~Pixmap()

```
gdcm::Pixmap::~Pixmap () [override]
```

## 12.236.3 Member Function Documentation

### 12.236.3.1 AreOverlaysInPixelData()

```
bool gdcm::Pixmap::AreOverlaysInPixelData () const [override], [virtual]
```

returns if Overlays are stored in the unused bit of the pixel data:

Reimplemented from [gdcm::Bitmap](#).

### 12.236.3.2 GetCurve() [1/2]

```
Curve & gdcm::Pixmap::GetCurve (
    size_t i = 0) [inline]
```

[Curve](#): group 50xx.

References [Curves](#).

### 12.236.3.3 GetCurve() [2/2]

```
const Curve & gdcm::Pixmap::GetCurve (
    size_t i = 0) const [inline]
```

References [Curves](#).

### 12.236.3.4 GetIconImage() [1/2]

```
IconImage & gdcm::Pixmap::GetIconImage () [inline]
```

References [Icon](#).

### 12.236.3.5 GetIconImage() [2/2]

```
const IconImage & gdcm::Pixmap::GetIconImage () const [inline]
```

Set/Get [Icon Image](#).

References [Icon](#).

### 12.236.3.6 GetNumberOfCurves()

```
size_t gdcm::Pixmap::GetNumberOfCurves () const [inline]
```

References [Curves](#).

### 12.236.3.7 GetNumberOfOverlays()

```
size_t gdcm::Pixmap::GetNumberOfOverlays () const [inline]
```

References [Overlays](#).

### 12.236.3.8 GetOverlay() [1/2]

```
Overlay & gdcm::Pixmap::GetOverlay (  
    size_t i = 0) [inline]
```

[Overlay](#): group 60xx.

References [Overlays](#).

### 12.236.3.9 GetOverlay() [2/2]

```
const Overlay & gdcm::Pixmap::GetOverlay (  
    size_t i = 0) const [inline]
```

References [Overlays](#).

### 12.236.3.10 Print()

```
void gdcm::Pixmap::Print (  
    std::ostream & ) const [override], [virtual]
```

Reimplemented from [gdcm::Bitmap](#).

### 12.236.3.11 RemoveOverlay()

```
void gdcm::Pixmap::RemoveOverlay (
    size_t i) [inline]
```

References [Overlays](#).

### 12.236.3.12 SetIconImage()

```
void gdcm::Pixmap::SetIconImage (
    IconImage const & ii) [inline]
```

References [Icon](#).

### 12.236.3.13 SetNumberOfCurves()

```
void gdcm::Pixmap::SetNumberOfCurves (
    size_t n) [inline]
```

References [Curves](#).

### 12.236.3.14 SetNumberOfOverlays()

```
void gdcm::Pixmap::SetNumberOfOverlays (
    size_t n) [inline]
```

References [Overlays](#).

### 12.236.3.15 UnusedBitsPresentInPixelData()

```
bool gdcm::Pixmap::UnusedBitsPresentInPixelData () const [override], [virtual]
```

returns if there are unused bits in the pixel data

Reimplemented from [gdcm::Bitmap](#).

## 12.236.4 Member Data Documentation

### 12.236.4.1 Curves

```
std::vector<Curve> gdcm::Pixmap::Curves [protected]
```

Referenced by [GetCurve\(\)](#), [GetCurve\(\)](#), [GetNumberOfCurves\(\)](#), and [SetNumberOfCurves\(\)](#).

#### 12.236.4.2 Icon

```
SmartPointer<IconImage> gdcM::Pixmap::Icon [protected]
```

Referenced by [GetIconImage\(\)](#), [GetIconImage\(\)](#), and [SetIconImage\(\)](#).

#### 12.236.4.3 Overlays

```
std::vector<Overlay> gdcM::Pixmap::Overlays [protected]
```

Referenced by [GetNumberOfOverlays\(\)](#), [GetOverlay\(\)](#), [GetOverlay\(\)](#), [RemoveOverlay\(\)](#), and [SetNumberOfOverlays\(\)](#).

The documentation for this class was generated from the following file:

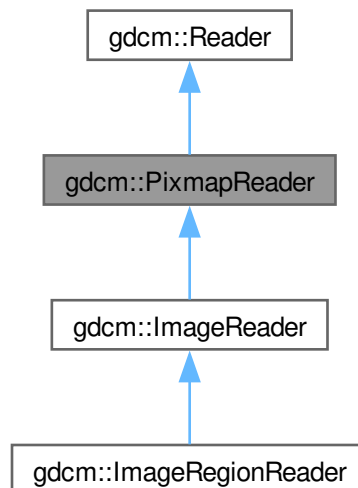
- [gdcMPixmap.h](#)

### 12.237 gdcM::PixmapReader Class Reference

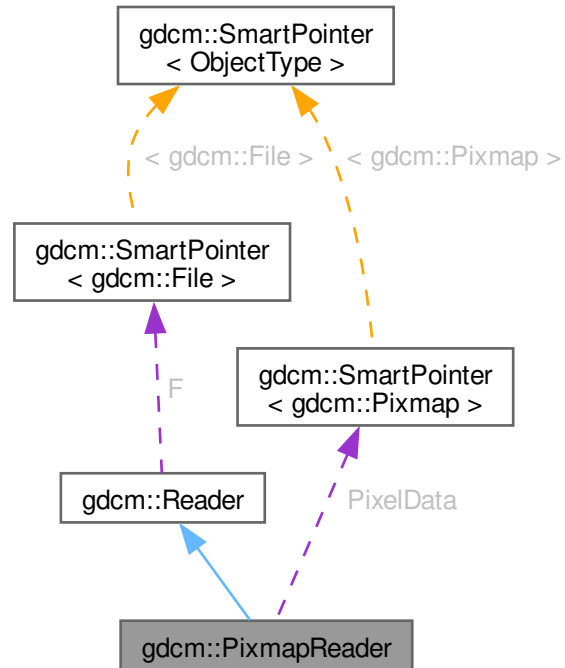
[PixmapReader](#).

```
#include <gdcMPixmapReader.h>
```

Inheritance diagram for gdcM::PixmapReader:



Collaboration diagram for gdcm::PixmapReader:



### Public Member Functions

- [PixmapReader](#) ()
- [~PixmapReader](#) () override
- [Pixmap](#) & [GetPixmap](#) ()
- const [Pixmap](#) & [GetPixmap](#) () const  
*Return the read image (need to call [Read\(\)](#) first).*
- bool [Read](#) () override

### Public Member Functions inherited from [gdcm::Reader](#)

- [Reader](#) ()
- virtual [~Reader](#) ()
- bool [CanRead](#) () const
- [File](#) & [GetFile](#) ()  
*Set/Get [File](#).*
- const [File](#) & [GetFile](#) () const  
*Set/Get [File](#).*
- size\_t [GetStreamCurrentPosition](#) () const

- bool [ReadSelectedPrivateTags](#) (std::set< [PrivateTag](#) > const &ptags, bool readvalues=true)  
*Will only read the specified selected private tags.*
- bool [ReadSelectedTags](#) (std::set< [Tag](#) > const &tags, bool readvalues=true)  
*Will only read the specified selected tags.*
- bool [ReadUpToTag](#) (const [Tag](#) &tag, std::set< [Tag](#) > const &skiptags=std::set< [Tag](#) >())
- void [SetFile](#) ([File](#) &file)  
*Set/Get [File](#).*
- void [SetFileName](#) (const char \*filename\_native)
- void [SetStream](#) (std::istream &input\_stream)  
*Set the open-ed stream directly.*

### Protected Member Functions

- virtual bool [ReadACRNEMAIImage](#) ()
- virtual bool [ReadImage](#) ([MediaStorage](#) const &ms)
- bool [ReadImageInternal](#) ([MediaStorage](#) const &ms, bool handlepixeldata=true)

### Protected Member Functions inherited from [gdcm::Reader](#)

- std::istream \* [GetStreamPtr](#) () const
- bool [ReadDataSet](#) ()
- bool [ReadMetaInformation](#) ()
- bool [ReadPreamble](#) ()

### Protected Attributes

- [SmartPointer](#)< [Pixmap](#) > [PixelData](#)

### Protected Attributes inherited from [gdcm::Reader](#)

- [SmartPointer](#)< [File](#) > [F](#)

## 12.237.1 Detailed Description

[PixmapReader](#).

#### Note

its role is to convert the DICOM [DataSet](#) into a [Pixmap](#) representation By default it is also loading the lookup table and overlay when found as they impact the rendering or the image

See PS 3.3-2008, [Table C.7-11b](#) IMAGE PIXEL MACRO ATTRIBUTES for the list of attribute that belong to what gdcm calls a '[Pixmap](#)'

#### Warning

the API [ReadUpToTag](#) and [ReadSelectedTag](#)

#### See also

[Pixmap](#)

#### Examples

[StandardizeFiles.cs](#).

## 12.237.2 Constructor & Destructor Documentation

### 12.237.2.1 PixmapReader()

```
gdcm::PixmapReader::PixmapReader ()
```

### 12.237.2.2 ~PixmapReader()

```
gdcm::PixmapReader::~~PixmapReader () [override]
```

## 12.237.3 Member Function Documentation

### 12.237.3.1 GetPixmap() [1/2]

```
Pixmap & gdcm::PixmapReader::GetPixmap ()
```

### 12.237.3.2 GetPixmap() [2/2]

```
const Pixmap & gdcm::PixmapReader::GetPixmap () const
```

Return the read image (need to call [Read\(\)](#) first).

#### Examples

[StandardizeFiles.cs](#).

### 12.237.3.3 Read()

```
bool gdcm::PixmapReader::Read () [override], [virtual]
```

Read the DICOM image. There are two reason for failure:

1. The input filename is not DICOM
2. The input DICOM file does not contains an [Pixmap](#).

Reimplemented from [gdcm::Reader](#).

#### Examples

[StandardizeFiles.cs](#).

### 12.237.3.4 ReadACRNEMAIImage()

```
virtual bool gdcm::PixmapReader::ReadACRNEMAIImage () [protected], [virtual]
```

Reimplemented in [gdcm::ImageReader](#).

### 12.237.3.5 ReadImage()

```
virtual bool gdcm::PixmapReader::ReadImage (
    MediaStorage const & ms) [protected], [virtual]
```

Reimplemented in [gdcm::ImageReader](#).

### 12.237.3.6 ReadImageInternal()

```
bool gdcm::PixmapReader::ReadImageInternal (
    MediaStorage const & ms,
    bool handlepixeldata = true) [protected]
```

## 12.237.4 Member Data Documentation

### 12.237.4.1 PixelData

```
SmartPointer<Pixmap> gdcm::PixmapReader::PixelData [protected]
```

The documentation for this class was generated from the following file:

- [gdcmPixmapReader.h](#)

## 12.238 gdcm::PixmapToPixmapFilter Class Reference

[PixmapToPixmapFilter](#) class.

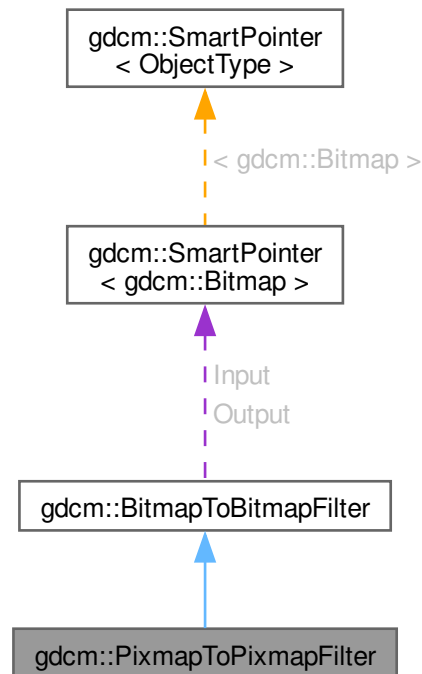
```
#include <gdcmPixmapToPixmapFilter.h>
```

Inheritance diagram for `gdcm::PixmapToPixmapFilter`:





Collaboration diagram for gdcm::PixmapToPixmapFilter:



### Public Member Functions

- [PixmapToPixmapFilter \(\)](#)
- [~PixmapToPixmapFilter \(\)](#)=default
- [Pixmap & GetInput \(\)](#)
- [const Pixmap & GetOutput \(\)](#) const  
*Get Output image.*
- [const Pixmap & GetOutputAsPixmap \(\)](#) const

### Public Member Functions inherited from [gdcm::BitmapToBitmapFilter](#)

- [BitmapToBitmapFilter \(\)](#)
- [~BitmapToBitmapFilter \(\)](#)=default
- [const Bitmap & GetOutput \(\)](#) const  
*Get Output image.*
- [const Bitmap & GetOutputAsBitmap \(\)](#) const
- [void SetInput \(const Bitmap &image\)](#)  
*Set input image.*

## Additional Inherited Members

## Protected Attributes inherited from [gdcm::BitmapToBitmapFilter](#)

- [SmartPointer](#)< [Bitmap](#) > [Input](#)
- [SmartPointer](#)< [Bitmap](#) > [Output](#)

## 12.238.1 Detailed Description

[PixmapToPixmapFilter](#) class.

Super class for all filter taking an image and producing an output image

### Examples

[StandardizeFiles.cs](#).

## 12.238.2 Constructor & Destructor Documentation

### 12.238.2.1 [PixmapToPixmapFilter](#)()

```
gdcm::PixmapToPixmapFilter::PixmapToPixmapFilter ()
```

### 12.238.2.2 [~PixmapToPixmapFilter](#)()

```
gdcm::PixmapToPixmapFilter::~~PixmapToPixmapFilter () [default]
```

## 12.238.3 Member Function Documentation

### 12.238.3.1 [GetInput](#)()

```
Pixmap & gdcm::PixmapToPixmapFilter::GetInput ()
```

### 12.238.3.2 [GetOutput](#)()

```
const Pixmap & gdcm::PixmapToPixmapFilter::GetOutput () const
```

Get Output image.

### 12.238.3.3 GetOutputAsPixmap()

```
const Pixmap & gdcm::PixmapToPixmapFilter::GetOutputAsPixmap () const
```

The documentation for this class was generated from the following file:

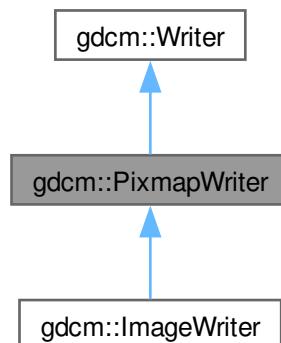
- [gdcmPixmapToPixmapFilter.h](#)

## 12.239 gdcm::PixmapWriter Class Reference

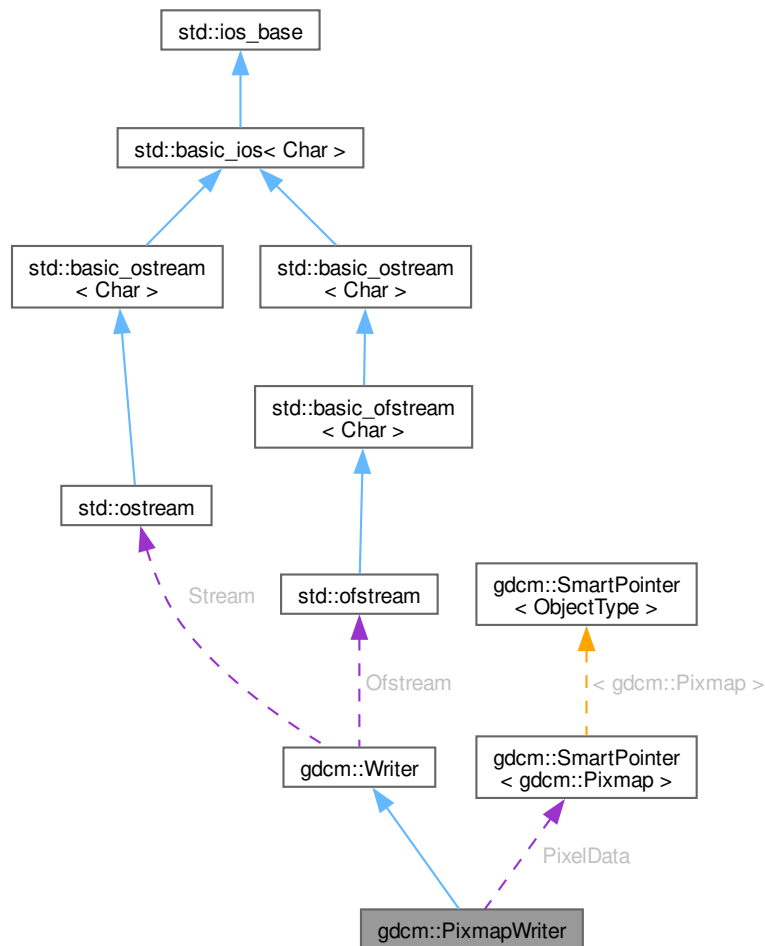
[PixmapWriter](#).

```
#include <gdcmPixmapWriter.h>
```

Inheritance diagram for gdcm::PixmapWriter:



Collaboration diagram for `gdcm::PixmapWriter`:



## Public Member Functions

- `PixmapWriter ()`
- `~PixmapWriter ()` override
- virtual `Pixmap & GetImage ()`
- virtual const `Pixmap & GetImage ()` const
- `Pixmap & GetPixmap ()`
- const `Pixmap & GetPixmap ()` const
- virtual void `SetImage (Pixmap const &img)`
- void `SetPixmap (Pixmap const &img)`
- bool `Write ()` override

*Write.*

## Public Member Functions inherited from [gdcm::Writer](#)

- [Writer](#) ()
- virtual [~Writer](#) ()
- void [CheckFileMetaInformationOff](#) ()
- void [CheckFileMetaInformationOn](#) ()
- [File](#) & [GetFile](#) ()
- void [SetCheckFileMetaInformation](#) (bool b)  
*Undocumented function, do not use (= leave default).*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get the DICOM file ([DataSet](#) + Header).*
- void [SetFileName](#) (const char \*filename\_native)  
*Set the filename of DICOM file to write:*
- void [SetStream](#) (std::ostream &output\_stream)  
*Set user ostream buffer.*

## Protected Member Functions

- void [DolconImage](#) ([DataSet](#) &ds, [Pixmap](#) const &image)
- bool [PrepareWrite](#) ([MediaStorage](#) const &refms)

## Protected Member Functions inherited from [gdcm::Writer](#)

- bool [GetCheckFileMetaInformation](#) () const
- std::ostream \* [GetStreamPtr](#) () const
- void [SetWriteDataSetOnly](#) (bool b)

## Protected Attributes

- [SmartPointer](#)< [Pixmap](#) > [PixelData](#)

## Protected Attributes inherited from [gdcm::Writer](#)

- std::ofstream \* [Ofstream](#)
- std::ostream \* [Stream](#)

### 12.239.1 Detailed Description

[PixmapWriter](#).

This class will takes two inputs:

1. The DICOM [DataSet](#)
2. The [Image](#) input It will override any info from the [Image](#) over the [DataSet](#).

For instance when one read in a lossy compressed image and write out as unencapsulated (ie implicitly lossless) then some attribute are definitely needed to mark this dataset as Lossy (typically 0028,2114)

#### Examples

[StandardizeFiles.cs](#).

## 12.239.2 Constructor & Destructor Documentation

### 12.239.2.1 PixmapWriter()

```
gdcm::PixmapWriter::PixmapWriter ()
```

### 12.239.2.2 ~PixmapWriter()

```
gdcm::PixmapWriter::~~PixmapWriter () [override]
```

## 12.239.3 Member Function Documentation

### 12.239.3.1 DoIconImage()

```
void gdcm::PixmapWriter::DoIconImage (  
    DataSet & ds,  
    Pixmap const & image) [protected]
```

### 12.239.3.2 GetImage() [1/2]

```
virtual Pixmap & gdcm::PixmapWriter::GetImage () [inline], [virtual]
```

Reimplemented in [gdcm::ImageWriter](#).

References [PixelData](#).

### 12.239.3.3 GetImage() [2/2]

```
virtual const Pixmap & gdcm::PixmapWriter::GetImage () const [inline], [virtual]
```

Set/Get [Pixmap](#) to be written It will overwrite anything [Pixmap](#) infos found in [DataSet](#) (see parent class to see how to pass dataset)

Reimplemented in [gdcm::ImageWriter](#).

References [PixelData](#).

### 12.239.3.4 GetPixmap() [1/2]

```
Pixmap & gdcm::PixmapWriter::GetPixmap () [inline]
```

References [PixelData](#).

### 12.239.3.5 GetPixmap() [2/2]

```
const Pixmap & gdcm::PixmapWriter::GetPixmap () const [inline]
```

References [PixelData](#).

### 12.239.3.6 PrepareWrite()

```
bool gdcm::PixmapWriter::PrepareWrite (  
    MediaStorage const & refs) [protected]
```

### 12.239.3.7 SetImage()

```
virtual void gdcm::PixmapWriter::SetImage (  
    Pixmap const & img) [virtual]
```

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [DecompressImage.cs](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), and [TemplateEmptyImage.cxx](#).

### 12.239.3.8 SetPixmap()

```
void gdcm::PixmapWriter::SetPixmap (  
    Pixmap const & img)
```

#### Examples

[StandardizeFiles.cs](#).

### 12.239.3.9 Write()

```
bool gdcm::PixmapWriter::Write () [override], [virtual]
```

Write.

Reimplemented from [gdcm::Writer](#).

#### Examples

[StandardizeFiles.cs](#).

## 12.239.4 Member Data Documentation

### 12.239.4.1 PixelData

`SmartPointer<Pixmap> gdcM::PixmapWriter::PixelData` [protected]

Referenced by [GetImage\(\)](#), [GetImage\(\)](#), [GetPixmap\(\)](#), and [GetPixmap\(\)](#).

The documentation for this class was generated from the following file:

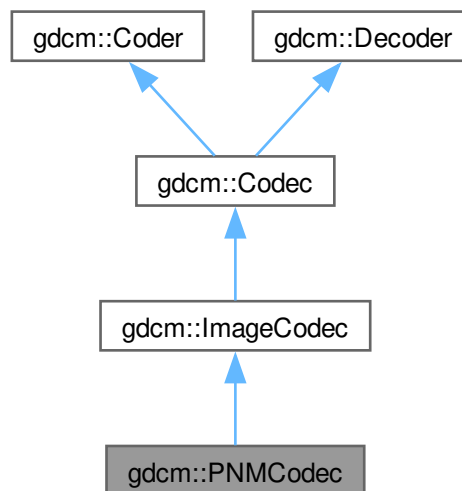
- [gdcMPixmapWriter.h](#)

## 12.240 gdcM::PNMCodec Class Reference

Class to do PNM.

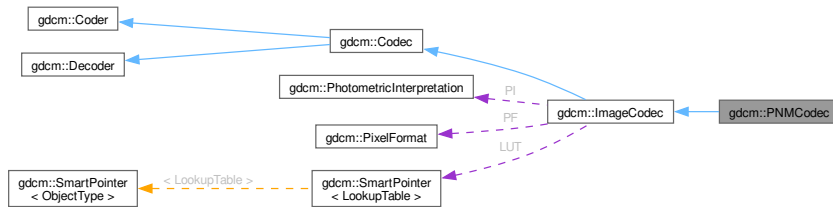
```
#include <gdcMPNMCodec.h>
```

Inheritance diagram for gdcM::PNMCodec:





Collaboration diagram for gdcm::PNMCodec:



## Public Member Functions

- [PNMCodec](#) ()
- [~PNMCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- [ImageCodec](#) \* [Clone](#) () const override
- unsigned long [GetBufferLength](#) () const
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [Read](#) (const char \*filename, [DataElement](#) &out) const
- void [SetBufferLength](#) (unsigned long l)
- bool [Write](#) (const char \*filename, const [DataElement](#) &out) const

## Public Member Functions inherited from [gdcm::ImageCodec](#)

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- bool [Decode](#) ([DataElement](#) const &is\_, [DataElement](#) &os) override  
*Decode.*
- const unsigned int \* [GetDimensions](#) () const
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)

- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

### Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default
- virtual bool [Code](#) ([DataElement](#) const &in\_, [DataElement](#) &out\_)  
*Code.*

### Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

### Additional Inherited Members

### Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

### Protected Member Functions inherited from [gdcm::ImageCodec](#)

- virtual bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- virtual bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- bool [DecodeByStreams](#) (std::istream &is\_, std::ostream &os) override
- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsFrameEncoder](#) ()
- virtual bool [IsRowEncoder](#) ()
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)
- virtual bool [StartEncode](#) (std::ostream &os)
- virtual bool [StopEncode](#) (std::ostream &os)

### Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

## Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) LUT
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) PF
- [PhotometricInterpretation](#) PI
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

### 12.240.1 Detailed Description

Class to do PNM.

PNM is the Portable anmap file format. The main web page can be found at: <http://netpbm.sourceforge.net/>.↵

#### Note

Only support P5 & P6 PNM file (binary grayscale and binary rgb)

#### Examples

[ExtractIconFromFile.cxx](#).

### 12.240.2 Constructor & Destructor Documentation

#### 12.240.2.1 PNMCodec()

```
gdcm::PNMCodec::PNMCodec ()
```

#### 12.240.2.2 ~PNMCodec()

```
gdcm::PNMCodec::~~PNMCodec () [override]
```

### 12.240.3 Member Function Documentation

#### 12.240.3.1 CanCode()

```
bool gdcm::PNMCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.240.3.2 CanDecode()

```
bool gdcM::PNMCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Reimplemented from [gdcM::ImageCodec](#).

### 12.240.3.3 Clone()

```
ImageCodec * gdcM::PNMCodec::Clone () const [override], [virtual]
```

Implements [gdcM::ImageCodec](#).

References [gdcM::ImageCodec::ImageCodec\(\)](#).

### 12.240.3.4 GetBufferLength()

```
unsigned long gdcM::PNMCodec::GetBufferLength () const [inline]
```

### 12.240.3.5 GetHeaderInfo()

```
bool gdcM::PNMCodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts) [override], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

### 12.240.3.6 Read()

```
bool gdcM::PNMCodec::Read (
    const char * filename,
    DataElement & out) const
```

### 12.240.3.7 SetBufferLength()

```
void gdcM::PNMCodec::SetBufferLength (
    unsigned long l) [inline]
```

### 12.240.3.8 Write()

```
bool gdcm::PNMCodec::Write (
    const char * filename,
    const DataElement & out) const
```

#### Examples

[ExtractIconFromFile.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmPNMCodec.h](#)

## 12.241 gdcm::Preamble Class Reference

DICOM [Preamble](#) (Part 10).

```
#include <gdcmPreamble.h>
```

### Public Member Functions

- [Preamble](#) ()
- [Preamble](#) (Preamble const &)
- [~Preamble](#) ()
- void [Clear](#) ()
  - Clear.*
- void [Create](#) ()
- const char \* [GetInternal](#) () const
  - Get internal pointer to preamble.*
- [VL GetLength](#) () const
  - Return size of [Preamble](#).*
- bool [IsEmpty](#) () const
  - Check if [Preamble](#) is empty.*
- [Preamble](#) & [operator=](#) (Preamble const &)
- void [Print](#) (std::ostream &os) const
  - Print [Preamble](#).*
- std::istream & [Read](#) (std::istream &is)
  - Read [Preamble](#).*
- void [Remove](#) ()
- void [Valid](#) ()
  - Set [Preamble](#) to the default one.*
- std::ostream const & [Write](#) (std::ostream &os) const
  - Write [Preamble](#).*

### Protected Member Functions

- bool [IsValid](#) () const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Preamble](#) &\_val)

## 12.241.1 Detailed Description

DICOM [Preamble](#) (Part 10).

## 12.241.2 Constructor & Destructor Documentation

### 12.241.2.1 Preamble() [1/2]

```
gdcm::Preamble::Preamble ()
```

Referenced by [Preamble\(\)](#), [~Preamble\(\)](#), [operator<<](#), and [operator=\(\)](#).

### 12.241.2.2 ~Preamble()

```
gdcm::Preamble::~~Preamble ()
```

References [Preamble\(\)](#), and [operator<<](#).

### 12.241.2.3 Preamble() [2/2]

```
gdcm::Preamble::Preamble (  
    Preamble const & ) [inline]
```

References [Preamble\(\)](#), and [Create\(\)](#).

## 12.241.3 Member Function Documentation

### 12.241.3.1 Clear()

```
void gdcm::Preamble::Clear ()
```

Clear.

### 12.241.3.2 Create()

```
void gdcm::Preamble::Create ()
```

Referenced by [Preamble\(\)](#), and [operator=\(\)](#).

### 12.241.3.3 GetInternal()

```
const char * gdcm::Preamble::GetInternal () const [inline]
```

Get internal pointer to preamble.

### 12.241.3.4 GetLength()

```
VL gdcm::Preamble::GetLength () const [inline]
```

Return size of [Preamble](#).

### 12.241.3.5 IsEmpty()

```
bool gdcm::Preamble::IsEmpty () const [inline]
```

Check if [Preamble](#) is empty.

### 12.241.3.6 IsValid()

```
bool gdcm::Preamble::IsValid () const [inline], [protected]
```

### 12.241.3.7 operator=()

```
Preamble & gdcm::Preamble::operator= (  
    Preamble const & ) [inline]
```

References [Preamble\(\)](#), and [Create\(\)](#).

### 12.241.3.8 Print()

```
void gdcm::Preamble::Print (  
    std::ostream & os) const
```

Print [Preamble](#).

### 12.241.3.9 Read()

```
std::istream & gdcM::Preamble::Read (  
    std::istream & is)
```

Read [Preamble](#).

### 12.241.3.10 Remove()

```
void gdcM::Preamble::Remove ()
```

### 12.241.3.11 Valid()

```
void gdcM::Preamble::Valid ()
```

Set [Preamble](#) to the default one.

### 12.241.3.12 Write()

```
std::ostream const & gdcM::Preamble::Write (  
    std::ostream & os) const
```

Write [Preamble](#).

## 12.241.4 Friends And Related Symbol Documentation

### 12.241.4.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const Preamble & _val) [friend]
```

References [Preamble\(\)](#).

Referenced by [~Preamble\(\)](#).

The documentation for this class was generated from the following file:

- [gdcM\\_Preamble.h](#)

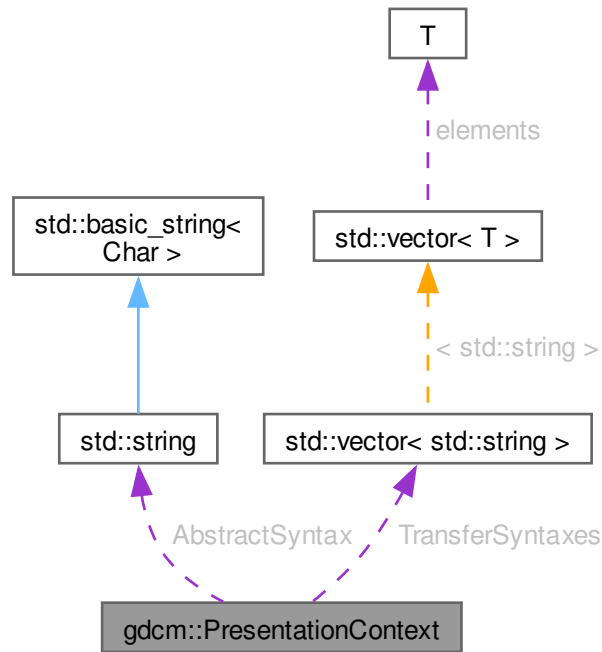


## 12.242 gdcm::PresentationContext Class Reference

[PresentationContext](#).

```
#include <gdcmPresentationContext.h>
```

Collaboration diagram for gdcm::PresentationContext:



### Public Types

- typedef `TransferSyntaxArrayType::size_type` [SizeType](#)
- typedef `std::vector< std::string >` [TransferSyntaxArrayType](#)

### Public Member Functions

- [PresentationContext](#) ()
- [PresentationContext](#) (UIDs::TSName asname, UIDs::TSName tsname=UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM)
- void [AddTransferSyntax](#) (const char \*sstr)
- const char \* [GetAbstractSyntax](#) () const
- [SizeType](#) [GetNumberOfTransferSyntaxes](#) () const
- uint8\_t [GetPresentationContextID](#) () const
- const char \* [GetTransferSyntax](#) ([SizeType](#) i) const
- bool [operator==](#) (const [PresentationContext](#) &pc) const
- void [Print](#) (std::ostream &os) const
- void [SetAbstractSyntax](#) (const char \*absyn)
- void [SetPresentationContextID](#) (uint8\_t id)

**Protected Attributes**

- std::string [AbstractSyntax](#)
- uint8\_t [ID](#)
- std::vector< std::string > [TransferSyntaxes](#)

**12.242.1 Detailed Description**

[PresentationContext](#).

See also

[PresentationContextAC](#) [PresentationContextRQ](#)

**12.242.2 Member Typedef Documentation****12.242.2.1 SizeType**

```
typedef TransferSyntaxArrayType::size_type gdcmm::PresentationContext::SizeType
```

**12.242.2.2 TransferSyntaxArrayType**

```
typedef std::vector<std::string> gdcmm::PresentationContext::TransferSyntaxArrayType
```

**12.242.3 Constructor & Destructor Documentation****12.242.3.1 PresentationContext() [1/2]**

```
gdcmm::PresentationContext::PresentationContext ()
```

Referenced by [operator==\( \)](#).

**12.242.3.2 PresentationContext() [2/2]**

```
gdcmm::PresentationContext::PresentationContext (
    UIDs::TSName asname,
    UIDs::TSName tsname = UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM)
```

Initialize Presentation Context with AbstractSyntax set to asname and with a single [TransferSyntax](#) set to tsname (default to Implicit [VR](#) LittleEndian when not specified ).

References [gdcmm::UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM](#).

## 12.242.4 Member Function Documentation

### 12.242.4.1 AddTransferSyntax()

```
void gdcm::PresentationContext::AddTransferSyntax (
    const char * tsstr)
```

### 12.242.4.2 GetAbstractSyntax()

```
const char * gdcm::PresentationContext::GetAbstractSyntax () const [inline]
```

References [AbstractSyntax](#).

### 12.242.4.3 GetNumberOfTransferSyntaxes()

```
SizeType gdcm::PresentationContext::GetNumberOfTransferSyntaxes () const [inline]
```

References [TransferSyntaxes](#).

### 12.242.4.4 GetPresentationContextID()

```
uint8_t gdcm::PresentationContext::GetPresentationContextID () const
```

### 12.242.4.5 GetTransferSyntax()

```
const char * gdcm::PresentationContext::GetTransferSyntax (
    SizeType i) const [inline]
```

References [TransferSyntaxes](#).

### 12.242.4.6 operator==(())

```
bool gdcm::PresentationContext::operator== (
    const PresentationContext & pc) const [inline]
```

References [PresentationContext\(\)](#), [AbstractSyntax](#), and [TransferSyntaxes](#).

### 12.242.4.7 Print()

```
void gdcm::PresentationContext::Print (
    std::ostream & os) const
```

#### 12.242.4.8 SetAbstractSyntax()

```
void gdcM::PresentationContext::SetAbstractSyntax (  
    const char * absyn)    [inline]
```

References [AbstractSyntax](#).

#### 12.242.4.9 SetPresentationContextID()

```
void gdcM::PresentationContext::SetPresentationContextID (  
    uint8_t id)
```

### 12.242.5 Member Data Documentation

#### 12.242.5.1 AbstractSyntax

```
std::string gdcM::PresentationContext::AbstractSyntax    [protected]
```

Referenced by [GetAbstractSyntax\(\)](#), [operator==\(\)](#), and [SetAbstractSyntax\(\)](#).

#### 12.242.5.2 ID

```
uint8_t gdcM::PresentationContext::ID    [protected]
```

#### 12.242.5.3 TransferSyntaxes

```
std::vector<std::string> gdcM::PresentationContext::TransferSyntaxes    [protected]
```

Referenced by [GetNumberOfTransferSyntaxes\(\)](#), [GetTransferSyntax\(\)](#), and [operator==\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMPresentationContext.h](#)

## 12.243 gdcM::network::PresentationContextAC Class Reference

[PresentationContextAC](#).

```
#include <gdcMPresentationContextAC.h>
```

## Public Member Functions

- [PresentationContextAC](#) ()
- [uint8\\_t GetPresentationContextID](#) () const
- [uint8\\_t GetReason](#) () const
- [TransferSyntaxSub](#) const & [GetTransferSyntax](#) () const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetPresentationContextID](#) (uint8\_t id)
- void [SetReason](#) (uint8\_t r)
- void [SetTransferSyntax](#) ([TransferSyntaxSub](#) const &ts)
- [size\\_t Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.243.1 Detailed Description

[PresentationContextAC](#).

[Table 9-18](#) PRESENTATION CONTEXT ITEM FIELDS

See also

[PresentationContext](#)

### 12.243.2 Constructor & Destructor Documentation

#### 12.243.2.1 PresentationContextAC()

```
gdcm::network::PresentationContextAC::PresentationContextAC ()
```

### 12.243.3 Member Function Documentation

#### 12.243.3.1 GetPresentationContextID()

```
uint8_t gdcm::network::PresentationContextAC::GetPresentationContextID () const [inline]
```

#### 12.243.3.2 GetReason()

```
uint8_t gdcm::network::PresentationContextAC::GetReason () const [inline]
```

#### 12.243.3.3 GetTransferSyntax()

```
TransferSyntaxSub const & gdcm::network::PresentationContextAC::GetTransferSyntax () const [inline]
```

#### 12.243.3.4 Print()

```
void gdcm::network::PresentationContextAC::Print (  
    std::ostream & os) const
```

#### 12.243.3.5 Read()

```
std::istream & gdcm::network::PresentationContextAC::Read (  
    std::istream & is)
```

#### 12.243.3.6 SetPresentationContextID()

```
void gdcm::network::PresentationContextAC::SetPresentationContextID (  
    uint8_t id)
```

#### 12.243.3.7 SetReason()

```
void gdcm::network::PresentationContextAC::SetReason (  
    uint8_t r) [inline]
```

#### 12.243.3.8 SetTransferSyntax()

```
void gdcm::network::PresentationContextAC::SetTransferSyntax (  
    TransferSyntaxSub const & ts)
```

#### 12.243.3.9 Size()

```
size_t gdcm::network::PresentationContextAC::Size () const
```

#### 12.243.3.10 Write()

```
const std::ostream & gdcm::network::PresentationContextAC::Write (  
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

- [gdcmPresentationContextAC.h](#)

## 12.244 gdcm::PresentationContextGenerator Class Reference

[PresentationContextGenerator](#).

```
#include <gdcmPresentationContextGenerator.h>
```

### Public Types

- typedef std::vector< [PresentationContext](#) > [PresentationContextArrayType](#)
- typedef [PresentationContextArrayType](#)::size\_type [SizeType](#)

### Public Member Functions

- [PresentationContextGenerator](#) ()
- bool [AddFromFile](#) (const [File](#) &file)
- bool [GenerateFromFilenames](#) (const [Directory::FilenamesType](#) &files)
- bool [GenerateFromUID](#) ([UIDs::TSName](#) asname)  
*Generate the [PresentationContext](#) array from a UID (eg. [VerificationSOPClass](#)).*
- [PresentationContextArrayType](#) const & [GetPresentationContexts](#) ()
- void [SetDefaultTransferSyntax](#) (const [TransferSyntax](#) &ts)  
*Not implemented for now. GDCM internally uses Implicit Little Endian.*
- void [SetMergeModeToAbstractSyntax](#) ()
- void [SetMergeModeToTransferSyntax](#) ()

### Protected Member Functions

- bool [AddPresentationContext](#) (const char \*absyn, const char \*ts)
- const char \* [GetDefaultTransferSyntax](#) () const

### 12.244.1 Detailed Description

[PresentationContextGenerator](#).

This class is responsible for generating the proper [PresentationContext](#) that will be used in subsequent operation during a DICOM Query/Retrieve association. The step of the association is very sensible as special care need to be taken to explicitly define what instance are going to be send and how they are encoded.

For example a [PresentationContext](#) will express that negotiation requires that CT [Image](#) Storage are send using JPEG Lossless, while US [Image](#) Storage are sent using RLE Transfer Syntax.

Two very different API are exposed one which will always default to little endian transfer syntax see [GenerateFromUID\(\)](#) This API is used for C-ECHO, C-FIND and C-MOVE (SCU). Another API: [GenerateFromFilenames\(\)](#) is used for C-↔ STORE (SCU) as it will loop over all filenames argument to detect the actual encoding. and therefore find the proper encoding to be used.

Two modes are available. The default mode ([SetMergeModeToAbstractSyntax](#)) append [PresentationContext](#) (one [AbstractSyntax](#) and one [TransferSyntax](#)), as long a they are different. Eg MR [Image](#) Storage/JPEG2000 and MR [Image](#) Storage/JPEGLossless would be considered different. the other mode [SetMergeModeToTransferSyntax](#) merge any new [TransferSyntax](#) to the already existing [PresentationContext](#) in order to re-use the same [AbstractSyntax](#).

See also

[PresentationContext](#)

Examples

[CStoreQtProgress.cxx](#).

## 12.244.2 Member Typedef Documentation

### 12.244.2.1 PresentationContextArrayType

```
typedef std::vector<PresentationContext> gdcm::PresentationContextGenerator::PresentationContextArrayType
```

### 12.244.2.2 SizeType

```
typedef PresentationContextArrayType::size_type gdcm::PresentationContextGenerator::SizeType
```

## 12.244.3 Constructor & Destructor Documentation

### 12.244.3.1 PresentationContextGenerator()

```
gdcm::PresentationContextGenerator::PresentationContextGenerator ()
```

## 12.244.4 Member Function Documentation

### 12.244.4.1 AddFromFile()

```
bool gdcm::PresentationContextGenerator::AddFromFile (
    const File & file)
```

Add a single [PresentationContext](#) from a single [File](#). Call multiple times when dealing with multiple files.

### 12.244.4.2 AddPresentationContext()

```
bool gdcm::PresentationContextGenerator::AddPresentationContext (
    const char * absyn,
    const char * ts) [protected]
```

### 12.244.4.3 GenerateFromFileNames()

```
bool gdcm::PresentationContextGenerator::GenerateFromFileNames (
    const Directory::FileNamesType & files)
```

Generate the [PresentationContext](#) array from a File-Set. [File](#) specified needs to be valid DICOM files. Used for C-↔-STORE operations

#### Examples

[CStoreQtProgress.cxx](#).



#### 12.244.4.4 GenerateFromUID()

```
bool gdcm::PresentationContextGenerator::GenerateFromUID (
    UIDs::TSName asname)
```

Generate the [PresentationContext](#) array from a UID (eg. VerificationSOPClass).

#### 12.244.4.5 GetDefaultTransferSyntax()

```
const char * gdcm::PresentationContextGenerator::GetDefaultTransferSyntax () const [protected]
```

#### 12.244.4.6 GetPresentationContexts()

```
PresentationContextArrayType const & gdcm::PresentationContextGenerator::GetPresentationContexts
() [inline]
```

#### Examples

[CStoreQtProgress.cxx](#).

#### 12.244.4.7 SetDefaultTransferSyntax()

```
void gdcm::PresentationContextGenerator::SetDefaultTransferSyntax (
    const TransferSyntax & ts)
```

Not implemented for now. GDCM internally uses Implicit Little Endian.

#### 12.244.4.8 SetMergeModeToAbstractSyntax()

```
void gdcm::PresentationContextGenerator::SetMergeModeToAbstractSyntax ()
```

#### 12.244.4.9 SetMergeModeToTransferSyntax()

```
void gdcm::PresentationContextGenerator::SetMergeModeToTransferSyntax ()
```

The documentation for this class was generated from the following file:

- [gdcmPresentationContextGenerator.h](#)

## 12.245 gdcm::network::PresentationContextRQ Class Reference

[PresentationContextRQ.](#)

```
#include <gdcmPresentationContextRQ.h>
```

### Public Types

- typedef std::vector< [TransferSyntaxSub](#) >::size\_type [SizeType](#)

### Public Member Functions

- [PresentationContextRQ](#) ()
- [PresentationContextRQ](#) (const [PresentationContext](#) &pc)
- [PresentationContextRQ](#) (UIDs::TSName asname, UIDs::TSName tsname=UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM)
- void [AddTransferSyntax](#) ([TransferSyntaxSub](#) const &ts)
- [AbstractSyntax](#) & [GetAbstractSyntax](#) ()
- [AbstractSyntax](#) const & [GetAbstractSyntax](#) () const
- [SizeType](#) [GetNumberOfTransferSyntaxes](#) () const
- uint8\_t [GetPresentationContextID](#) () const
- [TransferSyntaxSub](#) & [GetTransferSyntax](#) ([SizeType](#) i)
- [TransferSyntaxSub](#) const & [GetTransferSyntax](#) ([SizeType](#) i) const
- std::vector< [TransferSyntaxSub](#) > const & [GetTransferSyntaxes](#) () const
- bool [operator==](#) (const [PresentationContextRQ](#) &pc) const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetAbstractSyntax](#) ([AbstractSyntax](#) const &absyn)
- void [SetPresentationContextID](#) (uint8\_t id)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.245.1 Detailed Description

[PresentationContextRQ.](#)

[Table 9-13 PRESENTATION CONTEXT ITEM FIELDS](#)

See also

[PresentationContextAC](#)

### 12.245.2 Member Typedef Documentation

#### 12.245.2.1 SizeType

```
typedef std::vector<TransferSyntaxSub>::size_type gdcm::network::PresentationContextRQ::SizeType
```

## 12.245.3 Constructor & Destructor Documentation

### 12.245.3.1 PresentationContextRQ() [1/3]

```
gdcm::network::PresentationContextRQ::PresentationContextRQ ()
```

Referenced by [operator==\(.\)](#).

### 12.245.3.2 PresentationContextRQ() [2/3]

```
gdcm::network::PresentationContextRQ::PresentationContextRQ (
    UIDs::TSName asname,
    UIDs::TSName tsname = UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM)
```

Initialize Presentation Context with [AbstractSyntax](#) set to asname and with a single [TransferSyntax](#) set to tsname (default to Implicit VR LittleEndian when not specified ).

References [gdcm::UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM](#).

### 12.245.3.3 PresentationContextRQ() [3/3]

```
gdcm::network::PresentationContextRQ::PresentationContextRQ (
    const PresentationContext & pc)
```

## 12.245.4 Member Function Documentation

### 12.245.4.1 AddTransferSyntax()

```
void gdcm::network::PresentationContextRQ::AddTransferSyntax (
    TransferSyntaxSub const & ts)
```

### 12.245.4.2 GetAbstractSyntax() [1/2]

```
AbstractSyntax & gdcm::network::PresentationContextRQ::GetAbstractSyntax () [inline]
```

### 12.245.4.3 GetAbstractSyntax() [2/2]

```
AbstractSyntax const & gdcm::network::PresentationContextRQ::GetAbstractSyntax () const [inline]
```

### 12.245.4.4 GetNumberOfTransferSyntaxes()

```
SizeType gdcm::network::PresentationContextRQ::GetNumberOfTransferSyntaxes () const [inline]
```

#### 12.245.4.5 GetPresentationContextID()

```
uint8_t gdcM::network::PresentationContextRQ::GetPresentationContextID () const
```

#### 12.245.4.6 GetTransferSyntax() [1/2]

```
TransferSyntaxSub & gdcM::network::PresentationContextRQ::GetTransferSyntax (
    SizeType i) [inline]
```

#### 12.245.4.7 GetTransferSyntax() [2/2]

```
TransferSyntaxSub const & gdcM::network::PresentationContextRQ::GetTransferSyntax (
    SizeType i) const [inline]
```

#### 12.245.4.8 GetTransferSyntaxes()

```
std::vector< TransferSyntaxSub > const & gdcM::network::PresentationContextRQ::GetTransfer←
Syntaxes () const [inline]
```

#### 12.245.4.9 operator==( )

```
bool gdcM::network::PresentationContextRQ::operator== (
    const PresentationContextRQ & pc) const [inline]
```

References [PresentationContextRQ\(\)](#).

#### 12.245.4.10 Print()

```
void gdcM::network::PresentationContextRQ::Print (
    std::ostream & os) const
```

#### 12.245.4.11 Read()

```
std::istream & gdcM::network::PresentationContextRQ::Read (
    std::istream & is)
```

#### 12.245.4.12 SetAbstractSyntax()

```
void gdcM::network::PresentationContextRQ::SetAbstractSyntax (
    AbstractSyntax const & absyn)
```

**12.245.4.13 SetPresentationContextID()**

```
void gdcm::network::PresentationContextRQ::SetPresentationContextID (
    uint8_t id)
```

**12.245.4.14 Size()**

```
size_t gdcm::network::PresentationContextRQ::Size () const
```

**12.245.4.15 Write()**

```
const std::ostream & gdcm::network::PresentationContextRQ::Write (
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

- [gdcmPresentationContextRQ.h](#)

**12.246 gdcm::network::PresentationDataValue Class Reference**

[PresentationDataValue](#).

```
#include <gdcmPresentationDataValue.h>
```

**Public Member Functions**

- [PresentationDataValue](#) ()
- const std::string & [GetBlob](#) () const
- bool [GetIsCommand](#) () const
- bool [GetIsLastFragment](#) () const
- uint8\_t [GetMessageHeader](#) () const
- uint8\_t [GetPresentationContextID](#) () const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- std::istream & [ReadInfo](#) (std::istream &is, std::ostream &os)
- void [SetBlob](#) (const std::string &partialblob)
- void [SetCommand](#) (bool inCommand)
- void [SetDataSet](#) (const [DataSet](#) &ds)
- void [SetLastFragment](#) (bool inLast)
- void [SetMessageHeader](#) (uint8\_t messageheader)
- void [SetPresentationContextID](#) (uint8\_t id)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

## Static Public Member Functions

- static [DataSet ConcatenatePDVBlobs](#) (const std::vector< [PresentationDataValue](#) > &inPDVs)
- static [DataSet ConcatenatePDVBlobsAsExplicit](#) (const std::vector< [PresentationDataValue](#) > &inPDVs)

## 12.246.1 Detailed Description

[PresentationDataValue](#).

[Table 9-23](#) PRESENTATION-DATA-VALUE ITEM FIELDS

## 12.246.2 Constructor & Destructor Documentation

### 12.246.2.1 PresentationDataValue()

```
gdcm::network::PresentationDataValue::PresentationDataValue ()
```

## 12.246.3 Member Function Documentation

### 12.246.3.1 ConcatenatePDVBlobs()

```
DataSet gdcm::network::PresentationDataValue::ConcatenatePDVBlobs (
    const std::vector< PresentationDataValue > & inPDVs) [static]
```

Warning

[DataSet](#) will be read as Implicit Little Endian TS

### 12.246.3.2 ConcatenatePDVBlobsAsExplicit()

```
DataSet gdcm::network::PresentationDataValue::ConcatenatePDVBlobsAsExplicit (
    const std::vector< PresentationDataValue > & inPDVs) [static]
```

### 12.246.3.3 GetBlob()

```
const std::string & gdcm::network::PresentationDataValue::GetBlob () const
```

### 12.246.3.4 GetIsCommand()

```
bool gdcm::network::PresentationDataValue::GetIsCommand () const
```

### 12.246.3.5 GetIsLastFragment()

```
bool gdcm::network::PresentationDataValue::GetIsLastFragment () const
```

### 12.246.3.6 GetMessageHeader()

```
uint8_t gdcm::network::PresentationDataValue::GetMessageHeader () const [inline]
```

### 12.246.3.7 GetPresentationContextID()

```
uint8_t gdcm::network::PresentationDataValue::GetPresentationContextID () const [inline]
```

### 12.246.3.8 Print()

```
void gdcm::network::PresentationDataValue::Print (  
    std::ostream & os) const
```

### 12.246.3.9 Read()

```
std::istream & gdcm::network::PresentationDataValue::Read (  
    std::istream & is)
```

### 12.246.3.10 ReadInto()

```
std::istream & gdcm::network::PresentationDataValue::ReadInto (  
    std::istream & is,  
    std::ostream & os)
```

### 12.246.3.11 SetBlob()

```
void gdcm::network::PresentationDataValue::SetBlob (  
    const std::string & partialblob)
```

### 12.246.3.12 SetCommand()

```
void gdcm::network::PresentationDataValue::SetCommand (  
    bool inCommand)
```

### 12.246.3.13 SetDataSet()

```
void gdcm::network::PresentationDataValue::SetDataSet (
    const DataSet & ds)
```

Set [DataSet](#). Write [DataSet](#) in implicit.

#### Warning

size of dataset should be below maxpdu size

### 12.246.3.14 SetLastFragment()

```
void gdcm::network::PresentationDataValue::SetLastFragment (
    bool inLast)
```

### 12.246.3.15 SetMessageHeader()

```
void gdcm::network::PresentationDataValue::SetMessageHeader (
    uint8_t messageheader) [inline]
```

### 12.246.3.16 SetPresentationContextID()

```
void gdcm::network::PresentationDataValue::SetPresentationContextID (
    uint8_t id) [inline]
```

### 12.246.3.17 Size()

```
size_t gdcm::network::PresentationDataValue::Size () const
```

### 12.246.3.18 Write()

```
const std::ostream & gdcm::network::PresentationDataValue::Write (
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

- [gdcmPresentationDataValue.h](#)

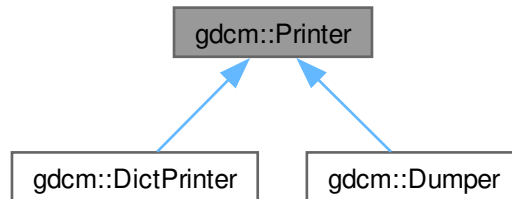


## 12.247 gdcm::Printer Class Reference

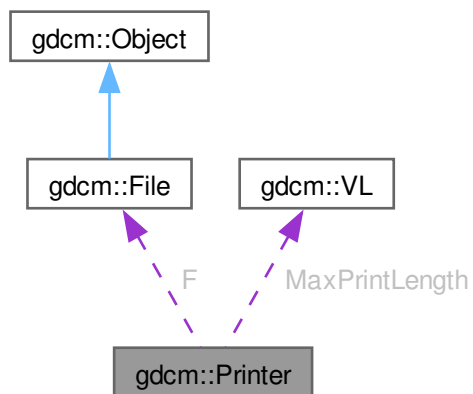
[Printer](#) class.

```
#include <gdcmPrinter.h>
```

Inheritance diagram for gdcm::Printer:



Collaboration diagram for gdcm::Printer:



### Public Types

- enum [PrintStyles](#) {  
    [VERBOSE\\_STYLE](#) = 0 ,  
    [CONDENSED\\_STYLE](#) ,  
    [XML](#) ,  
    [CXX](#) }

## Public Member Functions

- [Printer](#) ()
- [~Printer](#) ()=default
- [PrintStyles](#) [GetPrintStyle](#) () const  
*Get PrintStyle value.*
- void [Print](#) (std::ostream &os)  
*Print.*
- void [PrintDataSet](#) (const [DataSet](#) &ds, std::ostream &os, const std::string &s="")  
*Print an individual dataset.*
- void [SetColor](#) (bool c)  
*Set color mode or not.*
- void [SetFile](#) ([File](#) const &f)  
*Set file.*
- void [SetStyle](#) ([PrintStyles](#) ps)  
*Set PrintStyle value.*

## Protected Member Functions

- [VR PrintDataElement](#) (std::ostringstream &os, const [Dicts](#) &dicts, const [DataSet](#) &ds, const [DataElement](#) &de, std::ostream &out, std::string const &indent)
- void [PrintSQ](#) (const [SequenceOfItems](#) \*sqi, std::ostream &os, std::string const &indent)

## Protected Attributes

- const [File](#) \* F
- [VL MaxPrintLength](#)
- [PrintStyles](#) [PrintStyle](#)

## 12.247.1 Detailed Description

[Printer](#) class.

### Examples

[DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), and [DumpToshibaDTI2.cxx](#).

## 12.247.2 Member Enumeration Documentation

### 12.247.2.1 PrintStyles

enum [gdcm::Printer::PrintStyles](#)

#### Enumerator

VERBOSE_STYLE	
CONDENSED_STYLE	
XML	
CXX	

## 12.247.3 Constructor & Destructor Documentation

### 12.247.3.1 Printer()

`gdcm::Printer::Printer ()`

### 12.247.3.2 ~Printer()

`gdcm::Printer::~~Printer () [default]`

## 12.247.4 Member Function Documentation

### 12.247.4.1 GetPrintStyle()

`PrintStyles gdcm::Printer::GetPrintStyle () const [inline]`

Get PrintStyle value.

References [PrintStyle](#).

### 12.247.4.2 Print()

```
void gdcm::Printer::Print (  
    std::ostream & os)
```

Print.

#### Examples

[DumpSiemensBase64.cxx](#).

#### 12.247.4.3 PrintDataElement()

```
VR gdcmm::Printer::PrintDataElement (
    std::ostringstream & os,
    const Dicts & dicts,
    const DataSet & ds,
    const DataElement & de,
    std::ostream & out,
    std::string const & indent) [protected]
```

#### 12.247.4.4 PrintDataSet()

```
void gdcmm::Printer::PrintDataSet (
    const DataSet & ds,
    std::ostream & os,
    const std::string & s = "")
```

Print an individual dataset.

#### 12.247.4.5 PrintSQ()

```
void gdcmm::Printer::PrintSQ (
    const SequenceOfItems * sqi,
    std::ostream & os,
    std::string const & indent) [protected]
```

#### 12.247.4.6 SetColor()

```
void gdcmm::Printer::SetColor (
    bool c)
```

Set color mode or not.

#### 12.247.4.7 SetFile()

```
void gdcmm::Printer::SetFile (
    File const & f) [inline]
```

Set file.

#### Examples

[DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), and [DumpToshibaDTI2.cxx](#).

References [F](#).

#### 12.247.4.8 SetStyle()

```
void gdcm::Printer::SetStyle (
    PrintStyles ps) [inline]
```

Set PrintStyle value.

References [PrintStyle](#).

### 12.247.5 Member Data Documentation

#### 12.247.5.1 F

```
const File* gdcm::Printer::F [protected]
```

Referenced by [SetFile\(\)](#).

#### 12.247.5.2 MaxPrintLength

```
VL gdcm::Printer::MaxPrintLength [protected]
```

#### 12.247.5.3 PrintStyle

```
PrintStyles gdcm::Printer::PrintStyle [protected]
```

Referenced by [gdcm::Dumper::Dumper\(\)](#), [GetPrintStyle\(\)](#), and [SetStyle\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmPrinter.h](#)

## 12.248 gdcm::PrivateDict Class Reference

Private [Dict](#).

```
#include <gdcmDict.h>
```

### Public Member Functions

- [PrivateDict](#) ()=default
- [~PrivateDict](#) ()=default
- void [AddDictEntry](#) (const [PrivateTag](#) &tag, const [DictEntry](#) &de)
- bool [FindDictEntry](#) (const [PrivateTag](#) &tag) const
- const [DictEntry](#) & [GetDictEntry](#) (const [PrivateTag](#) &tag) const
- bool [IsEmpty](#) () const
- void [PrintXML](#) () const
- bool [RemoveDictEntry](#) (const [PrivateTag](#) &tag)

## Protected Member Functions

- void [LoadDefault](#) ()

## Friends

- class [Dicts](#)
- std::ostream & [operator<<](#) (std::ostream &os, const [PrivateDict](#) &val)

## 12.248.1 Detailed Description

Private [Dict](#).

## 12.248.2 Constructor & Destructor Documentation

### 12.248.2.1 PrivateDict()

```
gdcm::PrivateDict::PrivateDict () [default]
```

Referenced by [LoadDefault\(\)](#), and [operator<<](#).

### 12.248.2.2 ~PrivateDict()

```
gdcm::PrivateDict::~~PrivateDict () [default]
```

## 12.248.3 Member Function Documentation

### 12.248.3.1 AddDictEntry()

```
void gdcm::PrivateDict::AddDictEntry (  
    const PrivateTag & tag,  
    const DictEntry & de) [inline]
```

References [GetDictEntry\(\)](#), [gdcm::DictEntry::GetVM\(\)](#), [gdcm::DictEntry::GetVR\(\)](#), [gdcm::DictEntry::SetVM\(\)](#), [gdcm::DictEntry::SetVR\(\)](#), and [gdcm::VR::UN](#).

### 12.248.3.2 FindDictEntry()

```
bool gdcm::PrivateDict::FindDictEntry (  
    const PrivateTag & tag) const [inline]
```

### 12.248.3.3 GetDictEntry()

```
const DictEntry & gdcmm::PrivateDict::GetDictEntry (
    const PrivateTag & tag) const [inline]
```

Referenced by [AddDictEntry\(\)](#).

### 12.248.3.4 IsEmpty()

```
bool gdcmm::PrivateDict::IsEmpty () const [inline]
```

### 12.248.3.5 LoadDefault()

```
void gdcmm::PrivateDict::LoadDefault () [protected]
```

References [PrivateDict\(\)](#).

### 12.248.3.6 PrintXML()

```
void gdcmm::PrivateDict::PrintXML () const [inline]
```

References [gdcmm::Tag::GetElement\(\)](#), [gdcmm::Tag::GetGroup\(\)](#), [gdcmm::DictEntry::GetName\(\)](#), [gdcmm::PrivateTag::GetOwner\(\)](#), [gdcmm::DictEntry::GetVM\(\)](#), and [gdcmm::DictEntry::GetVR\(\)](#).

### 12.248.3.7 RemoveDictEntry()

```
bool gdcmm::PrivateDict::RemoveDictEntry (
    const PrivateTag & tag) [inline]
```

Remove entry 'tag'. Return true on success (element was found and remove). return false if element was not found.

## 12.248.4 Friends And Related Symbol Documentation

### 12.248.4.1 Dicts

```
friend class Dicts [friend]
```

References [Dicts](#).

Referenced by [Dicts](#).

#### 12.248.4.2 operator<<

```
std::ostream & operator<< (  
    std::ostream & os,  
    const PrivateDict & val) [friend]
```

References [PrivateDict\(\)](#).

The documentation for this class was generated from the following file:

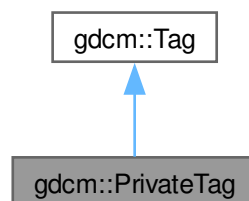
- [gdcmDict.h](#)

### 12.249 gdcm::PrivateTag Class Reference

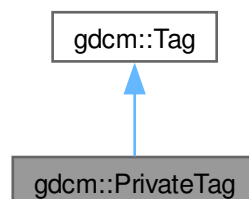
Class to represent a Private DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#), Owner).

```
#include <gdcmPrivateTag.h>
```

Inheritance diagram for gdcm::PrivateTag:



Collaboration diagram for gdcm::PrivateTag:





## Public Member Functions

- [PrivateTag](#) ([Tag](#) const &t, const char \*owner="")
- [PrivateTag](#) (uint16\_t group=0, uint16\_t element=0, const char \*owner="")
- [DataElement GetAsDataElement](#) () const
- const char \* [GetOwner](#) () const
- bool [operator!=](#) (const [PrivateTag](#) &\_val) const
- bool [operator!=](#) (const [Tag](#) &\_val) const
- bool [operator<](#) (const [PrivateTag](#) &\_val) const
- [PrivateTag](#) & [operator=](#) (const [PrivateTag](#) &\_val)
- bool [operator==](#) (const [PrivateTag](#) &\_val) const
- bool [operator==](#) (const [Tag](#) &\_val) const
- bool [ReadFromCommaSeparatedString](#) (const char \*str)
- void [SetOwner](#) (const char \*owner)

## Public Member Functions inherited from [gdcm::Tag](#)

- [Tag](#) (const [Tag](#) &\_val)
- [Tag](#) (uint16\_t group, uint16\_t element)  
*Constructor with 2\*uint16\_t.*
- [Tag](#) (uint32\_t tag=0)  
*Constructor with 1\*uint32\_t Prefer the ctor that takes two uint16\_t.*
- uint16\_t [GetElement](#) () const  
*Returns the 'Element number' of the given Tag.*
- uint32\_t [GetElementTag](#) () const  
*Returns the full tag value of the given Tag.*
- uint16\_t [GetGroup](#) () const  
*Returns the 'Group number' of the given Tag.*
- uint32\_t [GetLength](#) () const  
*return the length of tag (read: size on disk)*
- [Tag](#) [GetPrivateCreator](#) () const  
*Return the Private Creator Data Element tag of a private data element.*
- bool [IsGroupLength](#) () const  
*return whether the tag correspond to a group length tag:*
- bool [IsGroupXX](#) (const [Tag](#) &t) const  
*e.g 6002,3000 belong to groupXX: 6000,3000*
- bool [IsIllegal](#) () const  
*return if the tag is considered to be an illegal tag*
- bool [IsPrivate](#) () const
- bool [IsPrivateCreator](#) () const
- bool [IsPublic](#) () const
- bool [operator!=](#) (const [Tag](#) &\_val) const
- bool [operator<](#) (const [Tag](#) &\_val) const
- bool [operator<=](#) (const [Tag](#) &t2) const
- [Tag](#) & [operator=](#) (const [Tag](#) &\_val)
- bool [operator==](#) (const [Tag](#) &\_val) const
- uint16\_t & [operator\[\]](#) (const unsigned int &\_id)  
*Returns the Group or Element of the given Tag, depending on id (0/1).*

- `const uint16_t & operator[] (const unsigned int &_id) const`  
Returns the Group or *Element* of the given *Tag*, depending on id (0/1).
- `std::string PrintAsContinuousString () const`
- `std::string PrintAsContinuousUpperCaseString () const`  
Same as *PrintAsContinuousString*, but hexadecimal [a-f] are printed using upper case.
- `std::string PrintAsPipeSeparatedString () const`
- `template<typename TSwap>`  
`std::istream & Read (std::istream &is)`  
Read a tag from binary representation.
- `bool ReadFromCommaSeparatedString (const char *str)`
- `bool ReadFromContinuousString (const char *str)`
- `bool ReadFromPipeSeparatedString (const char *str)`
- `void SetElement (uint16_t element)`  
Sets the '*Element number*' of the given *Tag*.
- `void SetElementTag (uint16_t group, uint16_t element)`  
Sets the '*Group number*' & '*Element number*' of the given *Tag*.
- `void SetElementTag (uint32_t tag)`  
Sets the full tag value of the given *Tag*.
- `void SetGroup (uint16_t group)`  
Sets the '*Group number*' of the given *Tag*.
- `void SetPrivateCreator (Tag const &t)`  
Set private creator:
- `template<typename TSwap>`  
`const std::ostream & Write (std::ostream &os) const`  
Write a tag in binary rep.

## Friends

- `std::ostream & operator<< (std::ostream &_os, const PrivateTag &_val)`

## 12.249.1 Detailed Description

Class to represent a Private DICOM Data *Element* (*Attribute*) *Tag* (Group, *Element*, Owner).

### Note

private tag have element value in: [0x10,0xff], for instance 0x0009,0x0000 is NOT a private tag

### Examples

[ChangePrivateTags.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ELSCINT1WaveToText.cxx](#), [FileStreaming.cs](#), [GetSubSequenceData.cxx](#), [MrProtocol.cxx](#), [PublicDict.cxx](#), [ReadGEMSSDO.cxx](#), [csa2img.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

## 12.249.2 Constructor & Destructor Documentation

### 12.249.2.1 PrivateTag() [1/2]

```
gdcm::PrivateTag::PrivateTag (  
    uint16_t group = 0,  
    uint16_t element = 0,  
    const char * owner = "") [inline]
```

References [gdcm::Tag::Tag\(\)](#), and [gdcm::Tag::SetElement\(\)](#).

Referenced by [operator!=\(\)](#), [operator<\(\)](#), [operator<<\(\)](#), [operator=\(\)](#), and [operator==\(\)](#).

### 12.249.2.2 PrivateTag() [2/2]

```
gdcm::PrivateTag::PrivateTag (  
    Tag const & t,  
    const char * owner = "") [inline]
```

References [gdcm::Tag::Tag\(\)](#), [gdcm::Tag::GetElement\(\)](#), and [gdcm::Tag::SetElement\(\)](#).

## 12.249.3 Member Function Documentation

### 12.249.3.1 GetAsDataElement()

```
DataElement gdcm::PrivateTag::GetAsDataElement () const
```

### 12.249.3.2 GetOwner()

```
const char * gdcm::PrivateTag::GetOwner () const [inline]
```

#### Examples

[PublicDict.cxx](#).

Referenced by [gdcm::PrivateDict::PrintXML\(\)](#).

### 12.249.3.3 operator!=() [1/2]

```
bool gdcm::PrivateTag::operator!= (  
    const PrivateTag & _val) const [inline]
```

References [PrivateTag\(\)](#), and [gdcm::Tag::GetElementTag\(\)](#).

#### 12.249.3.4 operator"!=( ) [2/2]

```
bool gdcm::PrivateTag::operator!= (
    const Tag & _val) const [inline]
```

References [gdcm::Tag::Tag\(\)](#), and [gdcm::Tag::GetElementTag\(\)](#).

#### 12.249.3.5 operator<( )

```
bool gdcm::PrivateTag::operator< (
    const PrivateTag & _val) const
```

References [PrivateTag\(\)](#).

#### 12.249.3.6 operator=( )

```
PrivateTag & gdcm::PrivateTag::operator= (
    const PrivateTag & _val) [inline]
```

References [PrivateTag\(\)](#), [gdcm::Tag::GetElementTag\(\)](#), and [gdcm::Tag::SetElementTag\(\)](#).

#### 12.249.3.7 operator==( ) [1/2]

```
bool gdcm::PrivateTag::operator== (
    const PrivateTag & _val) const [inline]
```

References [PrivateTag\(\)](#), and [gdcm::Tag::GetElementTag\(\)](#).

#### 12.249.3.8 operator==( ) [2/2]

```
bool gdcm::PrivateTag::operator== (
    const Tag & _val) const [inline]
```

References [gdcm::Tag::Tag\(\)](#), and [gdcm::Tag::GetElementTag\(\)](#).

#### 12.249.3.9 ReadFromCommaSeparatedString()

```
bool gdcm::PrivateTag::ReadFromCommaSeparatedString (
    const char * str)
```

Read [PrivateTag](#) from a string. [Element](#) number will be truncated to 8bits. Eg: "1234,5678,GDCM" is private tag: (1234,78,"GDCM")

### 12.249.3.10 SetOwner()

```
void gdcm::PrivateTag::SetOwner (
    const char * owner) [inline]
```

References [gdcm::String<'\', 64 >::Trim\(\)](#).

## 12.249.4 Friends And Related Symbol Documentation

### 12.249.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const PrivateTag & _val) [friend]
```

References [PrivateTag\(\)](#), and [operator<<](#).

Referenced by [operator<<](#).

The documentation for this class was generated from the following file:

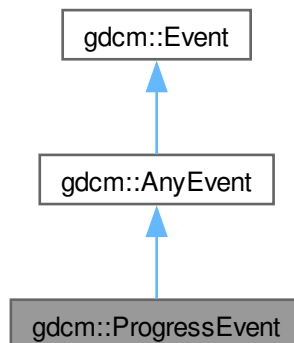
- [gdcmPrivateTag.h](#)

## 12.250 gdcm::ProgressEvent Class Reference

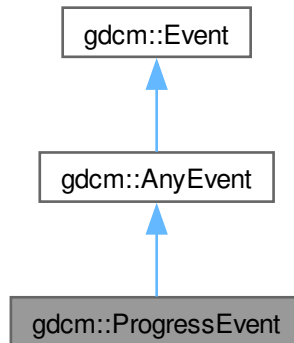
[ProgressEvent](#).

```
#include <gdcmProgressEvent.h>
```

Inheritance diagram for gdcm::ProgressEvent:



Collaboration diagram for `gdcm::ProgressEvent`:



### Public Types

- typedef [ProgressEvent](#) `Self`
- typedef [AnyEvent](#) `Superclass`

### Public Member Functions

- [ProgressEvent](#) (`const Self &s`)
- [ProgressEvent](#) (`double p=0`)
- [~ProgressEvent](#) () `override=default`
- `bool` [CheckEvent](#) (`const ::gdcm::Event *e`) `const override`
- `const char *` [GetEventName](#) () `const override`
- `double` [GetProgress](#) () `const`
- `::gdcm::Event *` [MakeObject](#) () `const override`
- `void` [operator=](#) (`const Self &`) `=delete`
- `void` [SetProgress](#) (`double p`)

### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()
- [Event](#) (`const Event &`)
- `virtual` [~Event](#) ()
- `virtual bool` [CheckEvent](#) (`const Event *`) `const =0`
- `void` [operator=](#) (`const Event &`) `=delete`
- `virtual void` [Print](#) (`std::ostream &os`) `const`

## 12.250.1 Detailed Description

[ProgressEvent](#).

Special type of event triggered during

See also

[AnyEvent](#)

Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

## 12.250.2 Member Typedef Documentation

### 12.250.2.1 Self

```
typedef ProgressEvent gdcm::ProgressEvent::Self
```

### 12.250.2.2 Superclass

```
typedef AnyEvent gdcm::ProgressEvent::Superclass
```

## 12.250.3 Constructor & Destructor Documentation

### 12.250.3.1 ProgressEvent() [1/2]

```
gdcm::ProgressEvent::ProgressEvent (
    double p = 0) [inline]
```

### 12.250.3.2 ~ProgressEvent()

```
gdcm::ProgressEvent::~~ProgressEvent () [override], [default]
```

### 12.250.3.3 ProgressEvent() [2/2]

```
gdcm::ProgressEvent::ProgressEvent (
    const Self & s) [inline]
```

## 12.250.4 Member Function Documentation

### 12.250.4.1 CheckEvent()

```
bool gdcm::ProgressEvent::CheckEvent (
    const ::gdcm::Event * e) const [inline], [override]
```

### 12.250.4.2 GetEventName()

```
const char * gdcm::ProgressEvent::GetEventName () const [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements [gdcm::Event](#).

### 12.250.4.3 GetProgress()

```
double gdcm::ProgressEvent::GetProgress () const [inline]
```

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 12.250.4.4 MakeObject()

```
::gdcm::Event * gdcm::ProgressEvent::MakeObject () const [inline], [override], [virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implements [gdcm::Event](#).

### 12.250.4.5 operator=()

```
void gdcm::ProgressEvent::operator= (
    const Self & ) [delete]
```

### 12.250.4.6 SetProgress()

```
void gdcm::ProgressEvent::SetProgress (
    double p) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmProgressEvent.h](#)

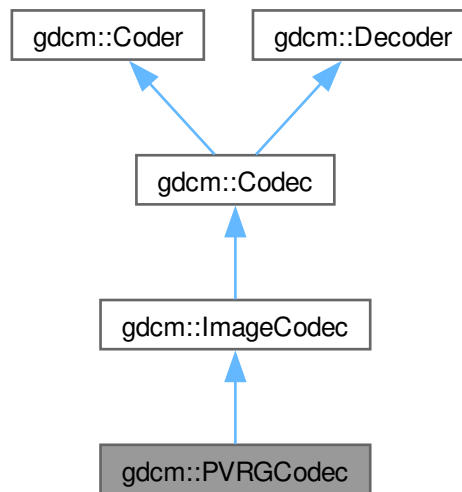


## 12.251 gdcm::PVRGCodec Class Reference

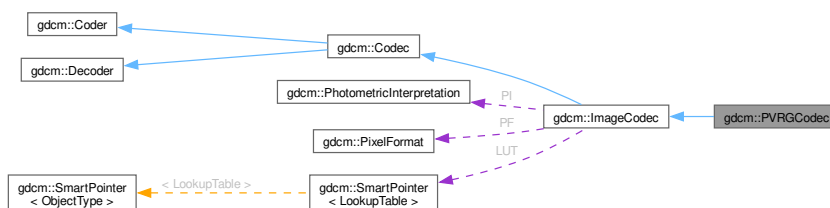
[PVRGCodec](#).

```
#include <gdcmPVRGCodec.h>
```

Inheritance diagram for gdcm::PVRGCodec:



Collaboration diagram for gdcm::PVRGCodec:



### Public Member Functions

- [PVRGCodec](#) ()
- [~PVRGCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it).*

- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Code.*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- void [SetLossyFlag](#) (bool l)

## Public Member Functions inherited from [gdcm::ImageCodec](#)

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- const unsigned int \* [GetDimensions](#) () const
- virtual bool [GetHeaderInfo](#) (std::istream &is\_, [TransferSyntax](#) &ts)
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

## Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default

## Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

## Additional Inherited Members

## Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > LUTPtr

## Protected Member Functions inherited from [gdcm::ImageCodec](#)

- virtual bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- virtual bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- bool [DecodeByStreams](#) (std::istream &is\_, std::ostream &os) override
- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsFrameEncoder](#) ()
- virtual bool [IsRowEncoder](#) ()
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)
- virtual bool [StartEncode](#) (std::ostream &os)
- virtual bool [StopEncode](#) (std::ostream &os)

## Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

## Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) LUT
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) PF
- [PhotometricInterpretation](#) PI
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

## 12.251.1 Detailed Description

[PVRGCodec](#).

### Note

pvrp is a broken implementation of the JPEG standard. It is known to have a bug in the 16bits lossless implementation of the standard.

In an ideal world, you should not need this codec at all. But to support some broken file such as:

PHILIPS\_Gyrosan-12-Jpeg\_Extended\_Process\_2\_4.dcm

we have to...

## 12.251.2 Constructor & Destructor Documentation

### 12.251.2.1 PVRGCodec()

```
gdcm::PVRGCodec::PVRGCodec ()
```

### 12.251.2.2 ~PVRGCodec()

```
gdcm::PVRGCodec::~~PVRGCodec () [override]
```

## 12.251.3 Member Function Documentation

### 12.251.3.1 CanCode()

```
bool gdcm::PVRGCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.251.3.2 CanDecode()

```
bool gdcm::PVRGCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.251.3.3 Clone()

```
ImageCodec * gdcm::PVRGCodec::Clone () const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

References [gdcm::ImageCodec::ImageCodec\(\)](#).

### 12.251.3.4 Code()

```
bool gdcm::PVRGCodec::Code (
    DataElement const & in_,
    DataElement & out_) [override], [virtual]
```

Code.

Reimplemented from [gdcm::Coder](#).

### 12.251.3.5 Decode()

```
bool gdcm::PVRGCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

### 12.251.3.6 SetLossyFlag()

```
void gdcm::PVRGCodec::SetLossyFlag (
    bool l)
```

The documentation for this class was generated from the following file:

- [gdcmPVRGCodec.h](#)

## 12.252 gdcm::PythonFilter Class Reference

[PythonFilter](#) [PythonFilter](#) is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a [DataElement](#) into a string, typically this is a nice feature to have for wrapped language.

```
#include <gdcmPythonFilter.h>
```

## Public Member Functions

- [PythonFilter](#) ()
- [~PythonFilter](#) ()
- [File](#) & [GetFile](#) ()
- const [File](#) & [GetFile](#) () const
- void [SetDicts](#) (const [Dicts](#) &dicts)
- void [SetFile](#) (const [File](#) &f)
- PyObject \* [ToPyObject](#) (const [Tag](#) &t) const
- void [UseDictAlways](#) (bool)

### 12.252.1 Detailed Description

[PythonFilter](#) [PythonFilter](#) is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a [DataElement](#) into a string, typically this is a nice feature to have for wrapped language.

### 12.252.2 Constructor & Destructor Documentation

#### 12.252.2.1 [PythonFilter](#)()

```
gdcm::PythonFilter::PythonFilter ()
```

#### 12.252.2.2 [~PythonFilter](#)()

```
gdcm::PythonFilter::~~PythonFilter ()
```

### 12.252.3 Member Function Documentation

#### 12.252.3.1 [GetFile](#)() [1/2]

```
File & gdcm::PythonFilter::GetFile ()
```

#### 12.252.3.2 [GetFile](#)() [2/2]

```
const File & gdcm::PythonFilter::GetFile () const
```

#### 12.252.3.3 [SetDicts](#)()

```
void gdcm::PythonFilter::SetDicts (  
    const Dicts & dicts)
```

#### 12.252.3.4 SetFile()

```
void gdcm::PythonFilter::SetFile (
    const File & f)
```

#### 12.252.3.5 ToPyObject()

```
PyObject * gdcm::PythonFilter::ToPyObject (
    const Tag & t) const
```

#### 12.252.3.6 UseDictAlways()

```
void gdcm::PythonFilter::UseDictAlways (
    bool ) [inline]
```

The documentation for this class was generated from the following file:

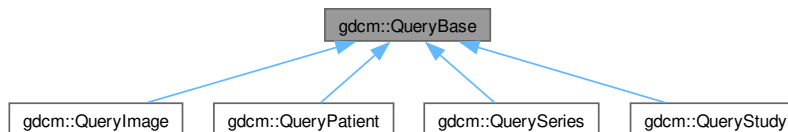
- [gdcmPythonFilter.h](#)

## 12.253 gdcm::QueryBase Class Reference

[QueryBase.](#)

```
#include <gdcmQueryBase.h>
```

Inheritance diagram for gdcm::QueryBase:



### Public Member Functions

- virtual [~QueryBase](#) ()=default
- std::vector< [Tag](#) > [GetAllRequiredTags](#) (const [ERootType](#) &inRootType) const
- std::vector< [Tag](#) > [GetAllTags](#) (const [ERootType](#) &inRootType) const
- virtual std::vector< [Tag](#) > [GetHierachicalSearchTags](#) (const [ERootType](#) &inRootType) const =0  
*Return all Unique Key for a particular Query Root type (from the same level and above).*
- virtual const char \* [GetName](#) () const =0
- virtual std::vector< [Tag](#) > [GetOptionalTags](#) (const [ERootType](#) &inRootType) const =0
- virtual [DataElement](#) [GetQueryLevel](#) () const =0
- virtual std::vector< [Tag](#) > [GetRequiredTags](#) (const [ERootType](#) &inRootType) const =0
- virtual std::vector< [Tag](#) > [GetUniqueTags](#) (const [ERootType](#) &inRootType) const =0

## 12.253.1 Detailed Description

[QueryBase](#).

contains: the base class for constructing a query dataset for a C-FIND and a C-MOVE

There are four levels of C-FIND and C-MOVE query:

- [Patient](#)
- [Study](#)
- [Series](#)
- [Image](#)

Each one has its own required and optional tags. This class provides an interface for getting those tags. This is an interface class.

See 3.4 C 6.1 and 3.4 C 6.2 for the patient and study root query types. These sections define the tags allowed by a particular query. The caller must pass in which root type they want, patient or study. A third root type, Modality Worklist Query, isn't yet supported.

This class (or rather it's derived classes) will be held in the RootQuery types. These query types actually make the dataset, and will use this dataset to list the required, unique, and optional tags for each type of query. This design is somewhat overly complicated, but is kept so that if we ever wanted to try to guess the query type from the given tags, we could do so.

## 12.253.2 Constructor & Destructor Documentation

### 12.253.2.1 ~QueryBase()

```
virtual gdcm::QueryBase::~~QueryBase () [virtual], [default]
```

## 12.253.3 Member Function Documentation

### 12.253.3.1 GetAllRequiredTags()

```
std::vector< Tag > gdcm::QueryBase::GetAllRequiredTags (
    const ERootType & inRootType) const
```

In order to validate a query dataset we need to check that there exists at least one required (or unique) key

### 12.253.3.2 GetAllTags()

```
std::vector< Tag > gdcm::QueryBase::GetAllTags (
    const ERootType & inRootType) const
```

In order to validate a query dataset, just check for the presence of a tag, not it's requirement level in the spec



### 12.253.3.3 GetHierarchicalSearchTags()

```
virtual std::vector< Tag > gdcmm::QueryBase::GetHierarchicalSearchTags (
    const ERootType & inRootType) const [pure virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implemented in [gdcmm::QueryImage](#), [gdcmm::QueryPatient](#), [gdcmm::QuerySeries](#), and [gdcmm::QueryStudy](#).

### 12.253.3.4 GetName()

```
virtual const char * gdcmm::QueryBase::GetName () const [pure virtual]
```

Implemented in [gdcmm::QueryImage](#), [gdcmm::QueryPatient](#), [gdcmm::QuerySeries](#), and [gdcmm::QueryStudy](#).

### 12.253.3.5 GetOptionalTags()

```
virtual std::vector< Tag > gdcmm::QueryBase::GetOptionalTags (
    const ERootType & inRootType) const [pure virtual]
```

Implemented in [gdcmm::QueryImage](#), [gdcmm::QueryPatient](#), [gdcmm::QuerySeries](#), and [gdcmm::QueryStudy](#).

### 12.253.3.6 GetQueryLevel()

```
virtual DataElement gdcmm::QueryBase::GetQueryLevel () const [pure virtual]
```

Implemented in [gdcmm::QueryImage](#), [gdcmm::QueryPatient](#), [gdcmm::QuerySeries](#), and [gdcmm::QueryStudy](#).

### 12.253.3.7 GetRequiredTags()

```
virtual std::vector< Tag > gdcmm::QueryBase::GetRequiredTags (
    const ERootType & inRootType) const [pure virtual]
```

Implemented in [gdcmm::QueryImage](#), [gdcmm::QueryPatient](#), [gdcmm::QuerySeries](#), and [gdcmm::QueryStudy](#).

### 12.253.3.8 GetUniqueTags()

```
virtual std::vector< Tag > gdcmm::QueryBase::GetUniqueTags (
    const ERootType & inRootType) const [pure virtual]
```

Implemented in [gdcmm::QueryImage](#), [gdcmm::QueryPatient](#), [gdcmm::QuerySeries](#), and [gdcmm::QueryStudy](#).

The documentation for this class was generated from the following file:

- [gdcmmQueryBase.h](#)

## 12.254 gdcm::QueryFactory Class Reference

QueryFactory.h.

```
#include <gdcmQueryFactory.h>
```

### Static Public Member Functions

- static [ECharSet](#) [GetCharacterFromCurrentLocale](#) ()
- static void [ListCharSets](#) (std::ostream &os)  
*List all possible CharSet.*
- static [DataElement](#) [ProduceCharacterSetDataElement](#) (const std::vector< [ECharSet](#) > &inCharSetType)
- static [BaseQuery](#) \* [ProduceQuery](#) (const std::string &sopInstanceUID, [ENQueryType](#) inQueryType)
- static [BaseRootQuery](#) \* [ProduceQuery](#) ([ERootType](#) inRootType, [EQueryType](#) inQueryType, [EQueryLevel](#) inQueryLevel)

### 12.254.1 Detailed Description

QueryFactory.h.

contains: a class to produce a query based off of user-entered information

Essentially, this class is used to construct a query based off of user input (typically from the command line; if in code directly, the query itself could just be instantiated)

In theory, could also be used as the interface to validate incoming datasets as belonging to a particular query style

### 12.254.2 Member Function Documentation

#### 12.254.2.1 GetCharacterFromCurrentLocale()

```
ECharSet gdcm::QueryFactory::GetCharacterFromCurrentLocale () [static]
```

This function will return the corresponding [ECharSet](#) associated with the current locale of the running system (based on the value of locale() ).

#### 12.254.2.2 ListCharSets()

```
void gdcm::QueryFactory::ListCharSets (  
    std::ostream & os) [static]
```

List all possible CharSet.

**12.254.2.3 ProduceCharacterSetDataElement()**

```
DataElement gdcm::QueryFactory::ProduceCharacterSetDataElement (
    const std::vector< ECharSet > & inCharSetType) [static]
```

This function will produce the appropriate dataelement given a list of charsets. The first charset will be used directly, while the second and subsequent will be prepended with "ISO2022 ". Redundant character sets are not permitted, so if they are encountered, they will just be skipped. if UTF8 or GB18030 is used, no subsequent character sets will be used if the vector passed in is empty, then the dataelement that's passed out will be empty and Latin1 is the presumed encoding

**12.254.2.4 ProduceQuery() [1/2]**

```
BaseQuery * gdcm::QueryFactory::ProduceQuery (
    const std::string & sopInstanceUID,
    ENQueryType inQueryType) [static]
```

**12.254.2.5 ProduceQuery() [2/2]**

```
BaseRootQuery * gdcm::QueryFactory::ProduceQuery (
    ERootType inRootType,
    EQueryType inQueryType,
    EQueryLevel inQueryLevel) [static]
```

this function will produce a query (basically, a wrapper to a dataset that can validate whether or not the query is a valid cfind/cmove query) and the level of the query (patient, study, series, image). If the user provides an invalid instantiation (ie, study root type, query level of patient), then the result is NULL.

The documentation for this class was generated from the following file:

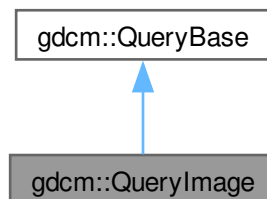
- [gdcmQueryFactory.h](#)

**12.255 gdcm::QueryImage Class Reference**

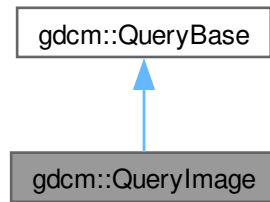
[QueryImage.](#)

```
#include <gdcmQueryImage.h>
```

Inheritance diagram for gdcm::QueryImage:



Collaboration diagram for `gdcm::QueryImage`:



### Public Member Functions

- `std::vector< Tag > GetHierachicalSearchTags` (const `ERootType` &`inRootType`) const override  
*Return all Unique Key for a particular Query Root type (from the same level and above).*
- `const char * GetName` () const override
- `std::vector< Tag > GetOptionalTags` (const `ERootType` &`inRootType`) const override
- `DataElement GetQueryLevel` () const override
- `std::vector< Tag > GetRequiredTags` (const `ERootType` &`inRootType`) const override
- `std::vector< Tag > GetUniqueTags` (const `ERootType` &`inRootType`) const override

### Public Member Functions inherited from `gdcm::QueryBase`

- virtual `~QueryBase` ()=default
- `std::vector< Tag > GetAllRequiredTags` (const `ERootType` &`inRootType`) const
- `std::vector< Tag > GetAllTags` (const `ERootType` &`inRootType`) const

## 12.255.1 Detailed Description

`QueryImage`.

contains: class to construct an image-based query for C-FIND and C-MOVE

## 12.255.2 Member Function Documentation

### 12.255.2.1 `GetHierachicalSearchTags()`

```
std::vector< Tag > gdcm::QueryImage::GetHierachicalSearchTags (
    const ERootType & inRootType) const [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements `gdcm::QueryBase`.

### 12.255.2.2 GetName()

```
const char * gdcm::QueryImage::GetName () const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

### 12.255.2.3 GetOptionalTags()

```
std::vector< Tag > gdcm::QueryImage::GetOptionalTags (
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

### 12.255.2.4 GetQueryLevel()

```
DataElement gdcm::QueryImage::GetQueryLevel () const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

### 12.255.2.5 GetRequiredTags()

```
std::vector< Tag > gdcm::QueryImage::GetRequiredTags (
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

### 12.255.2.6 GetUniqueTags()

```
std::vector< Tag > gdcm::QueryImage::GetUniqueTags (
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

The documentation for this class was generated from the following file:

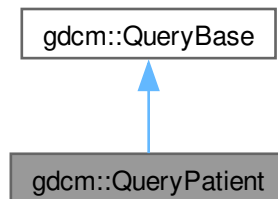
- [gdcmQueryImage.h](#)

## 12.256 gdcm::QueryPatient Class Reference

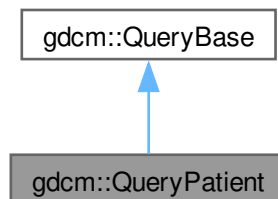
[QueryPatient](#).

```
#include <gdcmQueryPatient.h>
```

Inheritance diagram for gdcm::QueryPatient:



Collaboration diagram for gdcm::QueryPatient:



### Public Member Functions

- `std::vector< Tag > GetHierarchicalSearchTags (const ERootType &inRootType) const` override  
*Return all Unique Key for a particular Query Root type (from the same level and above).*
- `const char * GetName ()` const override
- `std::vector< Tag > GetOptionalTags (const ERootType &inRootType) const` override
- `DataElement GetQueryLevel ()` const override
- `std::vector< Tag > GetRequiredTags (const ERootType &inRootType) const` override
- `std::vector< Tag > GetUniqueTags (const ERootType &inRootType) const` override

## Public Member Functions inherited from [gdcm::QueryBase](#)

- virtual [~QueryBase](#) ()=default
- std::vector< [Tag](#) > [GetAllRequiredTags](#) (const [ERootType](#) &inRootType) const
- std::vector< [Tag](#) > [GetAllTags](#) (const [ERootType](#) &inRootType) const

### 12.256.1 Detailed Description

[QueryPatient](#).

contains: class to construct a patient-based query for c-find and c-move

### 12.256.2 Member Function Documentation

#### 12.256.2.1 [GetHierachicalSearchTags\(\)](#)

```
std::vector< Tag > gdcm::QueryPatient::GetHierachicalSearchTags (  
    const ERootType & inRootType) const [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements [gdcm::QueryBase](#).

#### 12.256.2.2 [GetName\(\)](#)

```
const char * gdcm::QueryPatient::GetName () const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

#### 12.256.2.3 [GetOptionalTags\(\)](#)

```
std::vector< Tag > gdcm::QueryPatient::GetOptionalTags (  
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

#### 12.256.2.4 [GetQueryLevel\(\)](#)

```
DataElement gdcm::QueryPatient::GetQueryLevel () const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

### 12.256.2.5 GetRequiredTags()

```
std::vector< Tag > gdcM::QueryPatient::GetRequiredTags (
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 12.256.2.6 GetUniqueTags()

```
std::vector< Tag > gdcM::QueryPatient::GetUniqueTags (
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

The documentation for this class was generated from the following file:

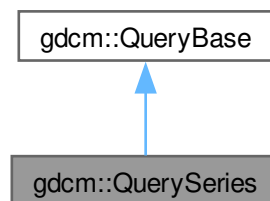
- [gdcMQueryPatient.h](#)

## 12.257 gdcM::QuerySeries Class Reference

[QuerySeries](#).

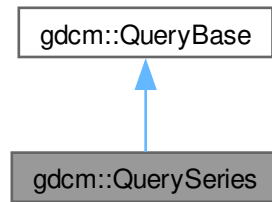
```
#include <gdcMQuerySeries.h>
```

Inheritance diagram for gdcM::QuerySeries:





Collaboration diagram for gdcm::QuerySeries:



### Public Member Functions

- `std::vector< Tag > GetHierachicalSearchTags (const ERootType &inRootType) const` override  
*Return all Unique Key for a particular Query Root type (from the same level and above).*
- `const char * GetName () const` override
- `std::vector< Tag > GetOptionalTags (const ERootType &inRootType) const` override
- `DataElement GetQueryLevel () const` override
- `std::vector< Tag > GetRequiredTags (const ERootType &inRootType) const` override
- `std::vector< Tag > GetUniqueTags (const ERootType &inRootType) const` override

### Public Member Functions inherited from [gdcm::QueryBase](#)

- `virtual ~QueryBase ()=default`
- `std::vector< Tag > GetAllRequiredTags (const ERootType &inRootType) const`
- `std::vector< Tag > GetAllTags (const ERootType &inRootType) const`

## 12.257.1 Detailed Description

[QuerySeries](#).

contains: class to construct a series-based query for c-find and c-move

## 12.257.2 Member Function Documentation

### 12.257.2.1 GetHierachicalSearchTags()

```
std::vector< Tag > gdcm::QuerySeries::GetHierachicalSearchTags (
    const ERootType & inRootType) const [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements [gdcm::QueryBase](#).

### 12.257.2.2 GetName()

```
const char * gdcM::QuerySeries::GetName () const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 12.257.2.3 GetOptionalTags()

```
std::vector< Tag > gdcM::QuerySeries::GetOptionalTags (  
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 12.257.2.4 GetQueryLevel()

```
DataElement gdcM::QuerySeries::GetQueryLevel () const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 12.257.2.5 GetRequiredTags()

```
std::vector< Tag > gdcM::QuerySeries::GetRequiredTags (  
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 12.257.2.6 GetUniqueTags()

```
std::vector< Tag > gdcM::QuerySeries::GetUniqueTags (  
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

The documentation for this class was generated from the following file:

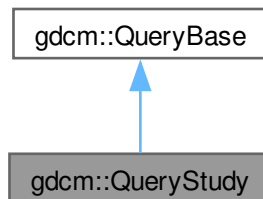
- [gdcMQuerySeries.h](#)

## 12.258 gdcm::QueryStudy Class Reference

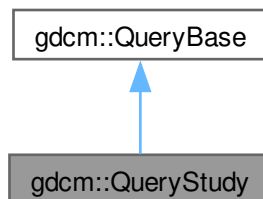
QueryStudy.h.

```
#include <gdcmQueryStudy.h>
```

Inheritance diagram for gdcm::QueryStudy:



Collaboration diagram for gdcm::QueryStudy:



### Public Member Functions

- `std::vector< Tag > GetHierarchicalSearchTags` (const `ERootType` &inRootType) const override  
*Return all Unique Key for a particular Query Root type (from the same level and above).*
- `const char * GetName` () const override
- `std::vector< Tag > GetOptionalTags` (const `ERootType` &inRootType) const override
- `DataElement GetQueryLevel` () const override
- `std::vector< Tag > GetRequiredTags` (const `ERootType` &inRootType) const override
- `std::vector< Tag > GetUniqueTags` (const `ERootType` &inRootType) const override

## Public Member Functions inherited from [gdcm::QueryBase](#)

- virtual [~QueryBase](#) ()=default
- std::vector< [Tag](#) > [GetAllRequiredTags](#) (const [ERootType](#) &inRootType) const
- std::vector< [Tag](#) > [GetAllTags](#) (const [ERootType](#) &inRootType) const

### 12.258.1 Detailed Description

QueryStudy.h.

contains: class to construct a study-based query for C-FIND and C-MOVE

### 12.258.2 Member Function Documentation

#### 12.258.2.1 GetHierarchicalSearchTags()

```
std::vector< Tag > gdcm::QueryStudy::GetHierarchicalSearchTags (
    const ERootType & inRootType) const [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements [gdcm::QueryBase](#).

#### 12.258.2.2 GetName()

```
const char * gdcm::QueryStudy::GetName () const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

#### 12.258.2.3 GetOptionalTags()

```
std::vector< Tag > gdcm::QueryStudy::GetOptionalTags (
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

#### 12.258.2.4 GetQueryLevel()

```
DataElement gdcm::QueryStudy::GetQueryLevel () const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

### 12.258.2.5 GetRequiredTags()

```
std::vector< Tag > gdcm::QueryStudy::GetRequiredTags (
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

### 12.258.2.6 GetUniqueTags()

```
std::vector< Tag > gdcm::QueryStudy::GetUniqueTags (
    const ERootType & inRootType) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

The documentation for this class was generated from the following file:

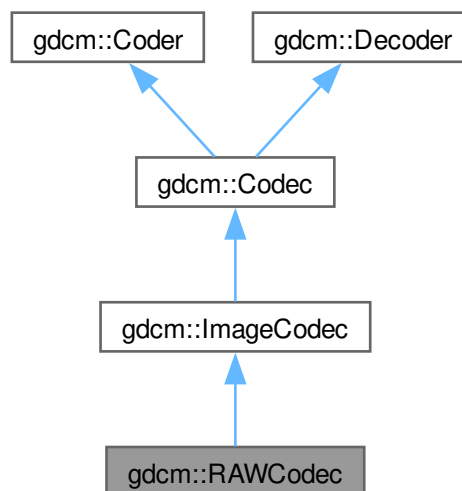
- [gdcmQueryStudy.h](#)

## 12.259 gdcm::RAWCodec Class Reference

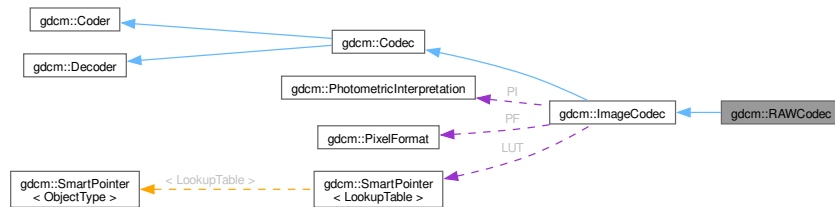
[RAWCodec](#) class.

```
#include <gdcmRAWCodec.h>
```

Inheritance diagram for [gdcm::RAWCodec](#):



Collaboration diagram for `gdcm::RAWCodec`:



## Public Member Functions

- [RAWCodec](#) ()
- [~RAWCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it).*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it).*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Code.*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- bool [DecodeBytes](#) (const char \*inBytes, size\_t inBufferLength, char \*outBytes, size\_t inOutBufferLength)
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override

## Public Member Functions inherited from [gdcm::ImageCodec](#)

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- const unsigned int \* [GetDimensions](#) () const
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)

- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

### Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default

### Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

### Protected Member Functions

- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override

### Protected Member Functions inherited from [gdcm::ImageCodec](#)

- virtual bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- virtual bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsFrameEncoder](#) ()
- virtual bool [IsRowEncoder](#) ()
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)
- virtual bool [StartEncode](#) (std::ostream &os)
- virtual bool [StopEncode](#) (std::ostream &os)

### Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

### Additional Inherited Members

### Protected Types inherited from [gdcm::ImageCodec](#)

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

## Protected Attributes inherited from [gdcm::ImageCodec](#)

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) LUT
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) PF
- [PhotometricInterpretation](#) PI
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

### 12.259.1 Detailed Description

[RAWCodec](#) class.

### 12.259.2 Constructor & Destructor Documentation

#### 12.259.2.1 RAWCodec()

```
gdcm::RAWCodec::RAWCodec ()
```

#### 12.259.2.2 ~RAWCodec()

```
gdcm::RAWCodec::~~RAWCodec () [override]
```

### 12.259.3 Member Function Documentation

#### 12.259.3.1 CanCode()

```
bool gdcm::RAWCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Reimplemented from [gdcm::ImageCodec](#).

#### 12.259.3.2 CanDecode()

```
bool gdcm::RAWCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Reimplemented from [gdcm::ImageCodec](#).



### 12.259.3.3 Clone()

```
ImageCodec * gdcm::RAWCodec::Clone () const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

References [gdcm::ImageCodec::ImageCodec\(\)](#).

### 12.259.3.4 Code()

```
bool gdcm::RAWCodec::Code (
    DataElement const & in_,
    DataElement & out_) [override], [virtual]
```

Code.

Reimplemented from [gdcm::Coder](#).

### 12.259.3.5 Decode()

```
bool gdcm::RAWCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

### 12.259.3.6 DecodeByStreams()

```
bool gdcm::RAWCodec::DecodeByStreams (
    std::istream & is,
    std::ostream & os) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.259.3.7 DecodeBytes()

```
bool gdcm::RAWCodec::DecodeBytes (
    const char * inBytes,
    size_t inBufferLength,
    char * outBytes,
    size_t inOutBufferLength)
```

Used by the ImageStreamReader– converts a read in buffer into one with the proper encodings.

### 12.259.3.8 GetHeaderInfo()

```
bool gdcM::RAWCodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts) [override], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

The documentation for this class was generated from the following file:

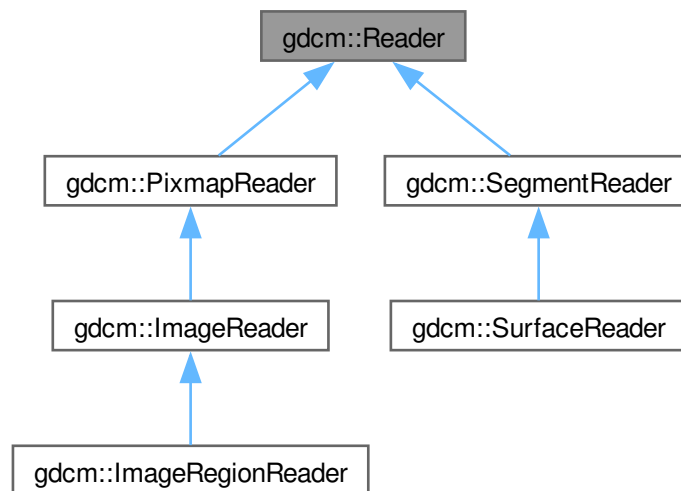
- [gdcMRAWCodec.h](#)

## 12.260 gdcM::Reader Class Reference

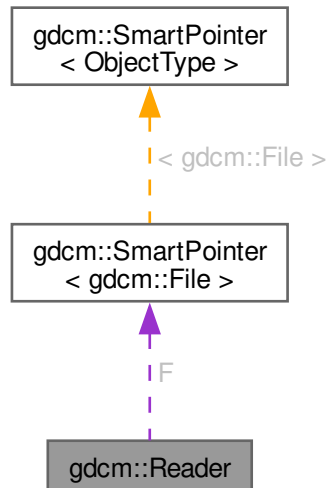
[Reader](#) ala DOM (Document [Object](#) Model).

```
#include <gdcMReader.h>
```

Inheritance diagram for gdcM::Reader:



Collaboration diagram for gdcm::Reader:



### Public Member Functions

- [Reader](#) ()
- virtual [~Reader](#) ()
- bool [CanRead](#) () const
- [File](#) & [GetFile](#) ()
  - Set/Get File.*
- const [File](#) & [GetFile](#) () const
  - Set/Get File.*
- size\_t [GetStreamCurrentPosition](#) () const
- virtual bool [Read](#) ()
  - Main function to read a file.*
- bool [ReadSelectedPrivateTags](#) (std::set< [PrivateTag](#) > const &ptags, bool readvalues=true)
  - Will only read the specified selected private tags.*
- bool [ReadSelectedTags](#) (std::set< [Tag](#) > const &tags, bool readvalues=true)
  - Will only read the specified selected tags.*
- bool [ReadUpToTag](#) (const [Tag](#) &tag, std::set< [Tag](#) > const &skiptags=std::set< [Tag](#) >())
- void [SetFile](#) ([File](#) &file)
  - Set/Get File.*
- void [SetFileName](#) (const char \*filename\_native)
- void [SetStream](#) (std::istream &input\_stream)
  - Set the open-ed stream directly.*

**Protected Member Functions**

- `std::istream * GetStreamPtr () const`
- `bool ReadDataSet ()`
- `bool ReadMetaInformation ()`
- `bool ReadPreamble ()`

**Protected Attributes**

- `SmartPointer< File > F`

**Friends**

- class [StreamImageReader](#)

**12.260.1 Detailed Description**

[Reader](#) ala DOM (Document [Object](#) Model).

This class is a non-validating reader, it will only performs well- formedness check only, and to some extent catch known error (non well-formed document).

Detailed description here

A [DataSet](#) DOES NOT contains group 0x0002 (see [FileMetaInformation](#))

This is really a [DataSet](#) reader. This will not make sure the dataset conform to any [IOD](#) at all. This is a completely different step. The reasoning was that user could control the [IOD](#) there lib would handle and thus we would not be able to read a [DataSet](#) if the [IOD](#) was not found Instead we separate the reading from the validation.

**Note**

From GDCM1.x. Users will realize that one feature is missing from this DOM implementation. In GDCM 1.x user used to be able to control the size of the [Value](#) to be read. By default it was 0xffff. The main author of GDCM2 thought this was too dangerous and harmful and therefore this feature did not make it into GDCM2

**Warning**

GDCM will not produce warning for unordered (non-alphabetical order).

**See also**

[Writer](#) [FileMetaInformation](#) [DataSet](#) [File](#)

**Examples**

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CreateFakeRTDOSE.cxx](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [FixBrokenJ2K.cxx](#), [FixOrientation.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [ReadUTF8QtDir.cxx](#), [ReformatFile.cs](#), [SimplePrint.cs](#), [SimplePrintPatientName.cs](#), [TestReader.cxx](#), [csa2img.cxx](#), [gdcmrtnplan.cxx](#), [gdcmrtpplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

## 12.260.2 Constructor & Destructor Documentation

### 12.260.2.1 Reader()

```
gdcm::Reader::Reader ()
```

### 12.260.2.2 ~Reader()

```
virtual gdcm::Reader::~Reader () [virtual]
```

## 12.260.3 Member Function Documentation

### 12.260.3.1 CanRead()

```
bool gdcm::Reader::CanRead () const
```

Test whether this is a DICOM file

#### Warning

need to call either `SetFileName` or `SetStream` first

#### Examples

[ReadUTF8QtDir.cxx](#).

### 12.260.3.2 GetFile() [1/2]

```
File & gdcm::Reader::GetFile () [inline]
```

Set/Get [File](#).

References [F](#).

### 12.260.3.3 GetFile() [2/2]

```
const File & gdcm::Reader::GetFile () const [inline]
```

Set/Get [File](#).

#### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [CreateFakeRTDOSE.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [MergeTwoFiles.cxx](#), [MrProtocol.cxx](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [ReformatFile.cs](#), [SimplePrint.cs](#), [SimplePrintPatientName.cs](#), [StandardizeFiles.cs](#), [TestReader.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

References [F](#).

#### 12.260.3.4 GetStreamCurrentPosition()

```
size_t gdcm::Reader::GetStreamCurrentPosition () const
```

For wrapped language. return type is compatible with [System::FileSize](#) return type Use native `std::streampos` / `std::streamoff` directly from the stream from C++

##### Examples

[ExtractImageRegion.cs](#).

#### 12.260.3.5 GetStreamPtr()

```
std::istream * gdcm::Reader::GetStreamPtr () const [inline], [protected]
```

#### 12.260.3.6 Read()

```
virtual bool gdcm::Reader::Read () [virtual]
```

Main function to read a file.

Reimplemented in [gdcm::ImageReader](#), [gdcm::ImageRegionReader](#), [gdcm::PixmapReader](#), [gdcm::SegmentReader](#), and [gdcm::SurfaceReader](#).

##### Examples

[BasicAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CreateFakeRTDOSE.cxx](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [FixBrokenJ2K.cxx](#), [FixOrientation.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [ReformatFile.cs](#), [SimplePrint.cs](#), [SimplePrintPatientName.cs](#), [TestReader.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

#### 12.260.3.7 ReadDataSet()

```
bool gdcm::Reader::ReadDataSet () [protected]
```

#### 12.260.3.8 ReadMetaInformation()

```
bool gdcm::Reader::ReadMetaInformation () [protected]
```

### 12.260.3.9 ReadPreamble()

```
bool gdcm::Reader::ReadPreamble () [protected]
```

### 12.260.3.10 ReadSelectedPrivateTags()

```
bool gdcm::Reader::ReadSelectedPrivateTags (
    std::set< PrivateTag > const & ptags,
    bool readvalues = true)
```

Will only read the specified selected private tags.

### 12.260.3.11 ReadSelectedTags()

```
bool gdcm::Reader::ReadSelectedTags (
    std::set< Tag > const & tags,
    bool readvalues = true)
```

Will only read the specified selected tags.

### 12.260.3.12 ReadUpToTag()

```
bool gdcm::Reader::ReadUpToTag (
    const Tag & tag,
    std::set< Tag > const & skiptags = std::set< Tag >())
```

Will read only up to [Tag](#)

#### Parameters

<i>tag</i>	and skipping any tag specified in
<i>skiptags</i>	

#### Examples

[DumpVisusChange.cxx](#).

### 12.260.3.13 SetFile()

```
void gdcm::Reader::SetFile (
    File & file) [inline]
```

Set/Get [File](#).

References [F](#).

### 12.260.3.14 SetFileName()

```
void gdcm::Reader::SetFileName (
    const char * filename_native)
```

Set the filename to open. This will create a `std::ifstream` internally See `SetStream` if you are dealing with different `std::istream` object

#### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CheckBigEndianBug.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [ConvertToQImage.cxx](#), [CreateFakeRTDOSE.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [FixBrokenJ2K.cxx](#), [FixJAI BugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [MergeTwoFiles.cxx](#), [MrProtocol.cxx](#), [NewSequence.cs](#), [PatchFile.cxx](#), [PrintLUT.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [ReadMultiTimesException.cxx](#), [ReadUTF8QtDir.cxx](#), [ReformatFile.cs](#), [RescaleImage.cs](#), [SimplePrint.cs](#), [SimplePrintPatientName.cs](#), [StandardizeFiles.cs](#), [TemplateEmptyImage.cxx](#), [TestReader.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), [rle2img.cxx](#), and [threadgdcm.cxx](#).

### 12.260.3.15 SetStream()

```
void gdcm::Reader::SetStream (
    std::istream & input_stream) [inline]
```

Set the open-ed stream directly.

#### Examples

[ReadUTF8QtDir.cxx](#).

## 12.260.4 Friends And Related Symbol Documentation

### 12.260.4.1 StreamImageReader

```
friend class StreamImageReader [friend]
```

References [StreamImageReader](#).

Referenced by [StreamImageReader](#).



## 12.260.5 Member Data Documentation

### 12.260.5.1 F

`SmartPointer<File> gdcm::Reader::F` [protected]

Referenced by [GetFile\(\)](#), [GetFile\(\)](#), and [SetFile\(\)](#).

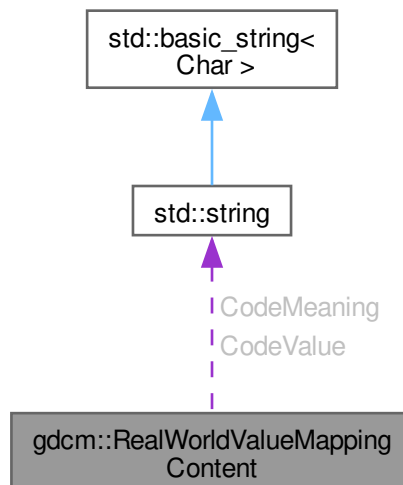
The documentation for this class was generated from the following file:

- [gdcmReader.h](#)

## 12.261 gdcm::RealWorldValueMappingContent Struct Reference

```
#include <gdcmImageHelper.h>
```

Collaboration diagram for gdcm::RealWorldValueMappingContent:



### Public Attributes

- `std::string` [CodeMeaning](#)
- `std::string` [CodeValue](#)
- `double` [RealWorldValueIntercept](#)
- `double` [RealWorldValueSlope](#)

## 12.261.1 Member Data Documentation

### 12.261.1.1 CodeMeaning

```
std::string gdcM::RealWorldValueMappingContent::CodeMeaning
```

### 12.261.1.2 CodeValue

```
std::string gdcM::RealWorldValueMappingContent::CodeValue
```

### 12.261.1.3 RealWorldValueIntercept

```
double gdcM::RealWorldValueMappingContent::RealWorldValueIntercept
```

### 12.261.1.4 RealWorldValueSlope

```
double gdcM::RealWorldValueMappingContent::RealWorldValueSlope
```

The documentation for this struct was generated from the following file:

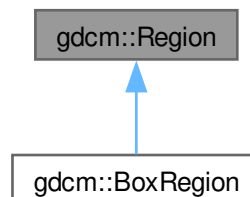
- [gdcMImageHelper.h](#)

## 12.262 gdcM::Region Class Reference

Class for manipulation region.

```
#include <gdcMRegion.h>
```

Inheritance diagram for gdcM::Region:



## Public Member Functions

- [Region](#) ()
- virtual [~Region](#) ()
- virtual size\_t [Area](#) () const =0  
*compute the area*
- virtual [Region](#) \* [Clone](#) () const =0
- virtual [BoxRegion](#) [ComputeBoundingBox](#) ()=0  
*Return the Axis-Aligned minimum bounding box for all regions.*
- virtual bool [Empty](#) () const =0  
*return whether this domain is empty:*
- virtual bool [IsValid](#) () const =0  
*return whether this is valid domain*
- virtual void [Print](#) (std::ostream &os=std::cout) const  
*Print.*

## 12.262.1 Detailed Description

Class for manipulation region.

## 12.262.2 Constructor & Destructor Documentation

### 12.262.2.1 Region()

```
gdcm::Region::Region ()
```

Referenced by [gdcm::BoxRegion::Clone\(\)](#), and [Clone\(\)](#).

### 12.262.2.2 ~Region()

```
virtual gdcm::Region::~~Region () [virtual]
```

## 12.262.3 Member Function Documentation

### 12.262.3.1 Area()

```
virtual size_t gdcm::Region::Area () const [pure virtual]
```

compute the area

Implemented in [gdcm::BoxRegion](#).

### 12.262.3.2 Clone()

```
virtual Region * gdcm::Region::Clone () const [pure virtual]
```

Implemented in [gdcm::BoxRegion](#).

References [Region\(\)](#).

### 12.262.3.3 ComputeBoundingBox()

```
virtual BoxRegion gdcm::Region::ComputeBoundingBox () [pure virtual]
```

Return the Axis-Aligned minimum bounding box for all regions.

Implemented in [gdcm::BoxRegion](#).

### 12.262.3.4 Empty()

```
virtual bool gdcm::Region::Empty () const [pure virtual]
```

return whether this domain is empty:

Implemented in [gdcm::BoxRegion](#).

### 12.262.3.5 IsValid()

```
virtual bool gdcm::Region::IsValid () const [pure virtual]
```

return whether this is valid domain

Implemented in [gdcm::BoxRegion](#).

### 12.262.3.6 Print()

```
virtual void gdcm::Region::Print (  
    std::ostream & os = std::cout) const [virtual]
```

Print.

Reimplemented in [gdcm::BoxRegion](#).

Referenced by [gdcm::operator<<\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmRegion.h](#)

## 12.263 gdcm::Rescaler Class Reference

Rescale class.

```
#include <gdcmRescaler.h>
```

### Public Member Functions

- [Rescaler](#) ()
- [~Rescaler](#) ()=default
- [PixelFormat::ScalarType ComputeInterceptSlopePixelFormat](#) ()
- [PixelFormat ComputePixelFormatFromMinMax](#) ()
- double [GetIntercept](#) () const
- double [GetSlope](#) () const
- bool [InverseRescale](#) (char \*out, const char \*in, size\_t n)  
*Inverse transform.*
- bool [Rescale](#) (char \*out, const char \*in, size\_t n)  
*Direct transform.*
- void [SetIntercept](#) (double i)  
*Set Intercept: used for both direct&inverse transformation.*
- void [SetMinMaxForPixelFormat](#) (double min, double max)
- void [SetPixelFormat](#) ([PixelFormat](#) const &pf)  
*Set Pixel Format of input data.*
- void [SetSlope](#) (double s)  
*Set Slope: user for both direct&inverse transformation.*
- void [SetTargetPixelFormat](#) ([PixelFormat](#) const &targetst)
- void [SetUseTargetPixelFormat](#) (bool b)  
*Override default behavior of Rescale.*

### Protected Member Functions

- template<typename TIn>  
void [InverseRescaleFunctionIntoBestFit](#) (char \*out, const TIn \*in, size\_t n)
- template<typename TIn>  
void [RescaleFunctionIntoBestFit](#) (char \*out, const TIn \*in, size\_t n)

### 12.263.1 Detailed Description

Rescale class.

This class is meant to apply the linear transform of Stored Pixel [Value](#) to Real World [Value](#). This is mostly found in CT or PET dataset, where the value are stored using one type, but need to be converted to another scale using a linear transform. There are basically two cases: In CT: the linear transform is generally integer based. E.g. the Stored Pixel [Type](#) is unsigned short 12bits, but to get Hounsfield unit, one need to apply the linear transform:

$$RWV = 1. * SV - 1024$$

So the best scalar to store the Real World [Value](#) will be 16 bits signed type.

In PET: the linear transform is generally floating point based. Since the dynamic range can be quite high, the Rescale Slope / Rescale Intercept can be changing throughout the [Series](#). So it is important to read all linear transform and deduce the best Pixel [Type](#) only at the end (when all the images to be read have been parsed).

### Warning

Internally any time a floating point value is found either in the Rescale Slope or the Rescale Intercept it is assumed that the best matching output pixel type is FLOAT64 (in previous implementation it was FLOAT32). Because [VR:DS](#) is closer to a 64bits floating point type FLOAT64 is thus a best matching pixel type for the floating point transformation.

Example: Let say input is FLOAT64, and we want UINT16 as output, we would do:

```
Rescaler ir;
ir.SetIntercept( 0 );
ir.SetSlope( 5.6789 );
ir.SetPixelFormat( FLOAT64 );
ir.SetMinMaxForPixelType( ((PixelFormat)UINT16).GetMin(), ((PixelFormat)UINT16).GetMax() );
ir.InverseRescale(output,input,numberofbytes );
```

### Note

handle floating point transformation back and forth to integer properly (no loss)

### See also

[Unpacker12Bits](#)

### Examples

[RescaleImage.cs](#).

## 12.263.2 Constructor & Destructor Documentation

### 12.263.2.1 Rescaler()

```
gdcm::Rescaler::Rescaler () [inline]
```

### 12.263.2.2 ~Rescaler()

```
gdcm::Rescaler::~~Rescaler () [default]
```

## 12.263.3 Member Function Documentation

### 12.263.3.1 ComputeInterceptSlopePixelType()

```
PixelFormat::ScalarType gdcm::Rescaler::ComputeInterceptSlopePixelType ()
```

Compute the Pixel Format of the output data Used for direct transformation

### Examples

[RescaleImage.cs](#).

### 12.263.3.2 ComputePixelTypeFromMinMax()

```
PixelFormat gdcm::Rescaler::ComputePixelTypeFromMinMax ()
```

Compute the Pixel Format of the output data Used for inverse transformation

### 12.263.3.3 GetIntercept()

```
double gdcm::Rescaler::GetIntercept () const [inline]
```

### 12.263.3.4 GetSlope()

```
double gdcm::Rescaler::GetSlope () const [inline]
```

### 12.263.3.5 InverseRescale()

```
bool gdcm::Rescaler::InverseRescale (  
    char * out,  
    const char * in,  
    size_t n)
```

Inverse transform.

### 12.263.3.6 InverseRescaleFunctionIntoBestFit()

```
template<typename TIn>  
void gdcm::Rescaler::InverseRescaleFunctionIntoBestFit (  
    char * out,  
    const TIn * in,  
    size_t n) [protected]
```

### 12.263.3.7 Rescale()

```
bool gdcm::Rescaler::Rescale (  
    char * out,  
    const char * in,  
    size_t n)
```

Direct transform.

#### Examples

[RescaleImage.cs](#).

#### 12.263.3.8 RescaleFunctionIntoBestFit()

```
template<typename TIn>
void gdcM::Rescaler::RescaleFunctionIntoBestFit (
    char * out,
    const TIn * in,
    size_t n) [protected]
```

#### 12.263.3.9 SetIntercept()

```
void gdcM::Rescaler::SetIntercept (
    double i) [inline]
```

Set Intercept: used for both direct&inverse transformation.

##### Examples

[RescaleImage.cs.](#)

#### 12.263.3.10 SetMinMaxForPixelType()

```
void gdcM::Rescaler::SetMinMaxForPixelType (
    double min,
    double max)
```

Set target interval for output data. A best match will be computed (if possible) Used for inverse transformation

#### 12.263.3.11 SetPixelFormat()

```
void gdcM::Rescaler::SetPixelFormat (
    PixelFormat const & pf) [inline]
```

Set Pixel Format of input data.

##### Examples

[RescaleImage.cs.](#)

#### 12.263.3.12 SetSlope()

```
void gdcM::Rescaler::SetSlope (
    double s) [inline]
```

Set Slope: user for both direct&inverse transformation.

##### Examples

[RescaleImage.cs.](#)



### 12.263.3.13 SetTargetPixelFormat()

```
void gdcm::Rescaler::SetTargetPixelFormat (
    PixelFormat const & targetst)
```

By default (when UseTargetPixelFormat is false), a best matching Target Pixel [Type](#) is computed. However user can override this auto selection by switching UseTargetPixelFormat:true and also specifying the specific Target Pixel [Type](#)

### 12.263.3.14 SetUseTargetPixelFormat()

```
void gdcm::Rescaler::SetUseTargetPixelFormat (
    bool b)
```

Override default behavior of Rescale.

The documentation for this class was generated from the following file:

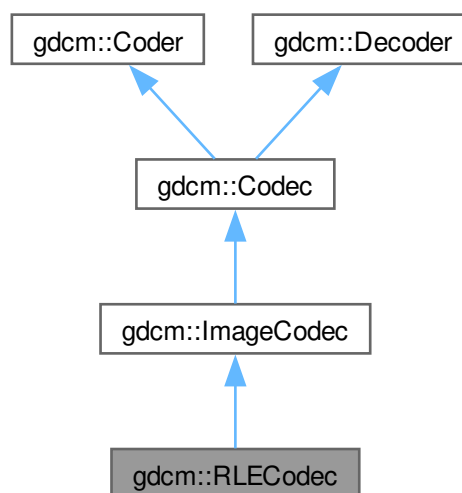
- [gdcmRescaler.h](#)

## 12.264 gdcm::RLECodec Class Reference

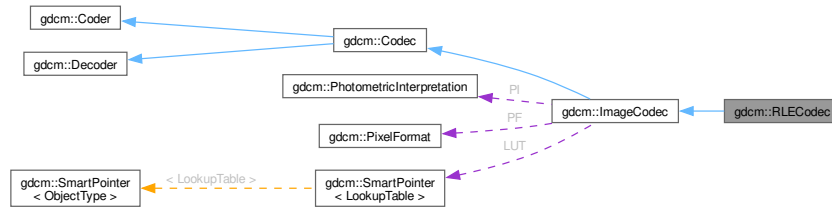
Class to do RLE.

```
#include <gdcmRLECodec.h>
```

Inheritance diagram for gdcm::RLECodec:



Collaboration diagram for `gdcm::RLECodec`:



## Public Member Functions

- `RLECodec ()`
- `~RLECodec ()` override
- `bool CanCode (TransferSyntax const &ts) const` override  
*Return whether this coder support this transfer syntax (can code it).*
- `bool CanDecode (TransferSyntax const &ts) const` override  
*Return whether this decoder support this transfer syntax (can decode it).*
- `ImageCodec * Clone ()` const override
- `bool Code (DataElement const &in, DataElement &out)` override  
*Code.*
- `bool Decode (DataElement const &is, DataElement &os)` override  
*Decode.*
- `unsigned long GetBufferLength ()` const
- `bool GetHeaderInfo (std::istream &is, TransferSyntax &ts)` override
- `void SetBufferLength (unsigned long l)`
- `void SetLength (unsigned long l)`

## Public Member Functions inherited from `gdcm::ImageCodec`

- `ImageCodec ()`
- `~ImageCodec ()` override
- `bool CleanupUnusedBits (char *data, size_t datalen)`
- `const unsigned int * GetDimensions ()` const
- `bool GetLossyFlag ()` const
- `const LookupTable & GetLUT ()` const
- `bool GetNeedByteSwap ()` const
- `unsigned int GetNumberOfDimensions ()` const
- `const PhotometricInterpretation & GetPhotometricInterpretation ()` const
- `PixelFormat & GetPixelFormat ()`
- `const PixelFormat & GetPixelFormat ()` const
- `unsigned int GetPlanarConfiguration ()` const
- `bool IsLossy ()` const
- `void SetDimensions (const std::vector< unsigned int > &d)`
- `void SetDimensions (const unsigned int d[3])`

- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

### Public Member Functions inherited from [gdcm::Coder](#)

- virtual [~Coder](#) ()=default

### Public Member Functions inherited from [gdcm::Decoder](#)

- virtual [~Decoder](#) ()=default

### Protected Member Functions

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int XMin, unsigned int XMax, unsigned int YMin, unsigned int YMax, unsigned int ZMin, unsigned int ZMax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override

### Protected Member Functions inherited from [gdcm::ImageCodec](#)

- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)
- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)

### Protected Member Functions inherited from [gdcm::Coder](#)

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

**Friends**

- class [ImageRegionReader](#)

**Additional Inherited Members****Protected Types inherited from [gdcm::ImageCodec](#)**

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

**Protected Attributes inherited from [gdcm::ImageCodec](#)**

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) [LUT](#)
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) [PF](#)
- [PhotometricInterpretation](#) [PI](#)
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

**12.264.1 Detailed Description**

Class to do RLE.

**Note**

ANSI X3.9 A.4.2 RLE Compression Annex G defines a RLE Compression Transfer Syntax. This transfer Syntax is identified by the UID value "1.2.840.10008.1.2.5". If the object allows multi-frame images in the pixel data field, then each frame shall be encoded separately. Each frame shall be encoded in one and only one [Fragment](#) (see PS 3.5.8.2).

**12.264.2 Constructor & Destructor Documentation****12.264.2.1 RLECodec()**

```
gdcm::RLECodec::RLECodec ()
```

**12.264.2.2 ~RLECodec()**

```
gdcm::RLECodec::~~RLECodec () [override]
```

## 12.264.3 Member Function Documentation

### 12.264.3.1 AppendFrameEncode()

```
bool gdcm::RLECodec::AppendFrameEncode (
    std::ostream & out,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.264.3.2 AppendRowEncode()

```
bool gdcm::RLECodec::AppendRowEncode (
    std::ostream & out,
    const char * data,
    size_t datalen) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.264.3.3 CanCode()

```
bool gdcm::RLECodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.264.3.4 CanDecode()

```
bool gdcm::RLECodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it).

Reimplemented from [gdcm::ImageCodec](#).

### 12.264.3.5 Clone()

```
ImageCodec * gdcm::RLECodec::Clone () const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

References [gdcm::ImageCodec::ImageCodec\(\)](#).

### 12.264.3.6 Code()

```
bool gdcm::RLECodec::Code (
    DataElement const & in_,
    DataElement & out_) [override], [virtual]
```

Code.

Reimplemented from [gdcm::Coder](#).

### 12.264.3.7 Decode()

```
bool gdcm::RLECodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

### 12.264.3.8 DecodeByStreams()

```
bool gdcm::RLECodec::DecodeByStreams (
    std::istream & is,
    std::ostream & os) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.264.3.9 DecodeExtent()

```
bool gdcm::RLECodec::DecodeExtent (
    char * buffer,
    unsigned int XMin,
    unsigned int XMax,
    unsigned int YMin,
    unsigned int YMax,
    unsigned int ZMin,
    unsigned int ZMax,
    std::istream & is) [protected]
```

### 12.264.3.10 GetBufferLength()

```
unsigned long gdcm::RLECodec::GetBufferLength () const [inline]
```

### 12.264.3.11 GetHeaderInfo()

```
bool gdcm::RLECodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.264.3.12 IsFrameEncoder()

```
bool gdcm::RLECodec::IsFrameEncoder () [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.264.3.13 IsRowEncoder()

```
bool gdcm::RLECodec::IsRowEncoder () [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.264.3.14 SetBufferLength()

```
void gdcm::RLECodec::SetBufferLength (
    unsigned long l) [inline]
```

### 12.264.3.15 SetLength()

```
void gdcm::RLECodec::SetLength (
    unsigned long l) [inline]
```

### 12.264.3.16 StartEncode()

```
bool gdcm::RLECodec::StartEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 12.264.3.17 StopEncode()

```
bool gdcm::RLECodec::StopEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

## 12.264.4 Friends And Related Symbol Documentation

### 12.264.4.1 ImageRegionReader

```
friend class ImageRegionReader [friend]
```

References [ImageRegionReader](#).

Referenced by [ImageRegionReader](#).

The documentation for this class was generated from the following file:

- [gdcmRLECodec.h](#)

## 12.265 gdcm::network::RoleSelectionSub Class Reference

[RoleSelectionSub](#).

```
#include <gdcmRoleSelectionSub.h>
```

### Public Member Functions

- [RoleSelectionSub](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetTuple](#) (const char \*uid, uint8\_t scurole, uint8\_t scprole)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.265.1 Detailed Description

[RoleSelectionSub](#).

PS 3.7 [Table D.3-9](#) SCP/SCU ROLE SELECTION SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

### 12.265.2 Constructor & Destructor Documentation

#### 12.265.2.1 RoleSelectionSub()

```
gdcm::network::RoleSelectionSub::RoleSelectionSub ()
```



## 12.265.3 Member Function Documentation

### 12.265.3.1 Print()

```
void gdcm::network::RoleSelectionSub::Print (  
    std::ostream & os) const
```

### 12.265.3.2 Read()

```
std::istream & gdcm::network::RoleSelectionSub::Read (  
    std::istream & is)
```

### 12.265.3.3 SetTuple()

```
void gdcm::network::RoleSelectionSub::SetTuple (  
    const char * uid,  
    uint8_t scurole,  
    uint8_t scprole)
```

### 12.265.3.4 Size()

```
size_t gdcm::network::RoleSelectionSub::Size () const
```

### 12.265.3.5 Write()

```
const std::ostream & gdcm::network::RoleSelectionSub::Write (  
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

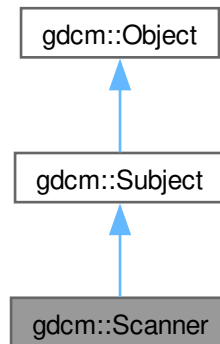
- [gdcmRoleSelectionSub.h](#)

## 12.266 gdcm::Scanner Class Reference

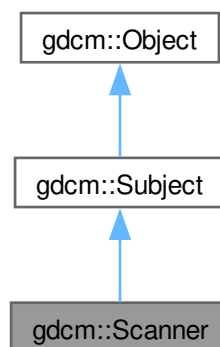
[Scanner.](#)

```
#include <gdcmScanner.h>
```

Inheritance diagram for gdcm::Scanner:



Collaboration diagram for gdcm::Scanner:



### Classes

- struct [ltstr](#)

## Public Types

- typedef MappingType::const\_iterator [ConstIterator](#)
- typedef std::map< const char \*, [TagToValue](#), [Itstr](#) > [MappingType](#)
- typedef std::map< [Tag](#), const char \* > [TagToValue](#)
- typedef TagToValue::value\_type [TagToValueValueType](#)
- typedef std::set< std::string > [ValuesType](#)

## Public Member Functions

- [Scanner](#) ()
- [~Scanner](#) () override
- void [AddPrivateTag](#) ([PrivateTag](#) const &t)
- void [AddSkipTag](#) ([Tag](#) const &t)  
*Add a tag that will need to be skipped. Those are root level skip tags.*
- void [AddTag](#) ([Tag](#) const &t)  
*Add a tag that will need to be read. Those are root level tags.*
- [ConstIterator](#) [Begin](#) () const
- void [ClearSkipTags](#) ()
- void [ClearTags](#) ()
- [ConstIterator](#) [End](#) () const
- [Directory::FileNamesType](#) [GetAllFileNamesFromTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- const char \* [GetFilenameFromTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- [Directory::FileNamesType](#) const & [GetFileNames](#) () const
- [Directory::FileNamesType](#) [GetKeys](#) () const
- [TagToValue](#) const & [GetMapping](#) (const char \*filename) const  
*Get the std::map mapping filenames to value for file 'filename'.*
- [TagToValue](#) const & [GetMappingFromTagToValue](#) ([Tag](#) const &t, const char \*value) const  
*See [GetFilenameFromTagToValue\(\)](#). This is simply [GetFilenameFromTagToValue](#) followed.*
- [MappingType](#) const & [GetMappings](#) () const  
*Mappings are the mapping from a particular tag to the map, mapping filename to value:*
- [Directory::FileNamesType](#) [GetOrderedValues](#) ([Tag](#) const &t) const
- const char \* [GetValue](#) (const char \*filename, [Tag](#) const &t) const
- [ValuesType](#) const & [GetValues](#) () const  
*Get all the values found (in lexicographic order).*
- [ValuesType](#) [GetValues](#) ([Tag](#) const &t) const  
*Get all the values found (in lexicographic order) associated with [Tag](#) 't'.*
- bool [IsKey](#) (const char \*filename) const
- void [Print](#) (std::ostream &os) const override  
*Print result.*
- void [PrintTable](#) (std::ostream &os) const
- bool [Scan](#) ([Directory::FileNamesType](#) const &filenames)  
*Start the scan !*

## Public Member Functions inherited from [gdcm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

## Static Public Member Functions

- static [SmartPointer](#)< [Scanner](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Protected Member Functions

- void [ProcessPublicTag](#) ([StringFilter](#) &sf, const char \*filename)

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Scanner](#) &s)

## 12.266.1 Detailed Description

[Scanner](#).

This filter is meant for quickly browsing a [FileSet](#) (a set of files on disk). Special consideration are taken so as to read the minimum amount of information in each file in order to retrieve the user specified set of DICOM [Attribute](#).

This filter is dealing with both VRASCII and VRBINARY element, thanks to the help of [StringFilter](#)

### Warning

IMPORTANT In case of file where tags are not ordered (illegal as per DICOM specification), the output will be missing information

### Note

implementation details. All values are stored in a `std::set of std::string`. Then the address of the `cstring` underlying the `std::string` is used in the `std::map`.

This class implement the Subject/Observer pattern trigger the following events:

- [ProgressEvent](#)
- [StartEvent](#)
- [EndEvent](#)

### Examples

[DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [SortImage.cxx](#), and [VolumeSorter.cxx](#).

## 12.266.2 Member Typedef Documentation

### 12.266.2.1 ConstIterator

```
typedef MappingType::const_iterator gdcm::Scanner::ConstIterator
```

### 12.266.2.2 MappingType

```
typedef std::map<const char *, TagToValue, ltstr> gdcm::Scanner::MappingType
```

### 12.266.2.3 TagToValue

```
typedef std::map<Tag, const char*> gdcm::Scanner::TagToValue
```

struct to map a filename to a value Implementation note: all `std::map` in this class will be using `const char *` and not `std::string` since we are pointing to existing `std::string` (hold in a `std::vector`) this avoid an extra copy of the byte array. [Tag](#) are used as [Tag](#) class since `sizeof(tag) <= sizeof(pointer)`

#### 12.266.2.4 TagToValueValueType

```
typedef TagToValue::value_type gdcM::Scanner::TagToValueValueType
```

#### 12.266.2.5 ValueType

```
typedef std::set< std::string > gdcM::Scanner::ValueType
```

#### Examples

[DiscriminateVolume.cxx](#), [SortImage.cxx](#), and [VolumeSorter.cxx](#).

### 12.266.3 Constructor & Destructor Documentation

#### 12.266.3.1 Scanner()

```
gdcM::Scanner::Scanner () [inline]
```

Referenced by [New\(\)](#), and [operator<<](#).

#### 12.266.3.2 ~Scanner()

```
gdcM::Scanner::~~Scanner () [override]
```

### 12.266.4 Member Function Documentation

#### 12.266.4.1 AddPrivateTag()

```
void gdcM::Scanner::AddPrivateTag (  
    PrivateTag const & t)
```

#### 12.266.4.2 AddSkipTag()

```
void gdcM::Scanner::AddSkipTag (  
    Tag const & t)
```

Add a tag that will need to be skipped. Those are root level skip tags.

### 12.266.4.3 AddTag()

```
void gdcmm::Scanner::AddTag (  
    Tag const & t)
```

Add a tag that will need to be read. Those are root level tags.

#### Examples

[DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [SortImage.cxx](#), and [VolumeSorter.cxx](#).

### 12.266.4.4 Begin()

```
ConstIterator gdcmm::Scanner::Begin () const [inline]
```

### 12.266.4.5 ClearSkipTags()

```
void gdcmm::Scanner::ClearSkipTags ()
```

### 12.266.4.6 ClearTags()

```
void gdcmm::Scanner::ClearTags ()
```

### 12.266.4.7 End()

```
ConstIterator gdcmm::Scanner::End () const [inline]
```

### 12.266.4.8 GetAllFileNamesFromTagToValue()

```
Directory::FileNamesType gdcmm::Scanner::GetAllFileNamesFromTagToValue (  
    Tag const & t,  
    const char * valuref) const
```

Will loop over all files and return a vector of std::strings of filenames where value match the reference value 'valuref'

### 12.266.4.9 GetFilenameFromTagToValue()

```
const char * gdcmm::Scanner::GetFilenameFromTagToValue (  
    Tag const & t,  
    const char * valuref) const
```

Will loop over all files and return the first file where value match the reference value 'valuref'

#### 12.266.4.10 GetFileNames()

```
Directory::FilenameType const & gdcM::Scanner::GetFileNames () const [inline]
```

#### 12.266.4.11 GetKeys()

```
Directory::FilenameType gdcM::Scanner::GetKeys () const
```

Return the list of filename that are key in the internal map, which means those filename were properly parsed

##### Examples

[VolumeSorter.cxx](#).

#### 12.266.4.12 GetMapping()

```
TagToValue const & gdcM::Scanner::GetMapping (
    const char * filename) const
```

Get the std::map mapping filenames to value for file 'filename'.

##### Examples

[DumpToSQLITE3.cxx](#).

#### 12.266.4.13 GetMappingFromTagToValue()

```
TagToValue const & gdcM::Scanner::GetMappingFromTagToValue (
    Tag const & t,
    const char * value) const
```

See [GetFilenameFromTagToValue\(\)](#). This is simply GetFilenameFromTagToValue followed.

#### 12.266.4.14 GetMappings()

```
MappingType const & gdcM::Scanner::GetMappings () const [inline]
```

Mappings are the mapping from a particular tag to the map, mapping filename to value:

#### 12.266.4.15 GetOrderedValues()

```
Directory::FilenameType gdcM::Scanner::GetOrderedValues (
    Tag const & t) const
```

Get all the values found (in a vector) associated with [Tag](#) 't' This function is identical to GetValues, but is accessible from the wrapped layer (python, C#, java)



#### 12.266.4.16 GetValue()

```
const char * gdcm::Scanner::GetValue (
    const char * filename,
    Tag const & t) const
```

Retrieve the value found for tag: t associated with file: filename This is meant for a single short call. If multiple calls (multiple tags) should be done, prefer the GetMapping function, and then reuse the [TagToValue](#) hash table.

##### Warning

[Tag](#) 't' should have been added via [AddTag\(\)](#) prior to the [Scan\(\)](#) call !

#### 12.266.4.17 GetValues() [1/2]

```
ValueType const & gdcm::Scanner::GetValues () const [inline]
```

Get all the values found (in lexicographic order).

##### Examples

[SortImage.cxx](#), and [VolumeSorter.cxx](#).

#### 12.266.4.18 GetValues() [2/2]

```
ValueType gdcm::Scanner::GetValues (
    Tag const & t) const
```

Get all the values found (in lexicographic order) associated with [Tag](#) 't'.

#### 12.266.4.19 IsKey()

```
bool gdcm::Scanner::IsKey (
    const char * filename) const
```

Check if filename is a key in the Mapping table. returns true only if file can be found, which means the file was indeed a DICOM file that could be processed

##### Examples

[DumpToSQLITE3.cxx](#).

#### 12.266.4.20 New()

```
SmartPointer< Scanner > gdcM::Scanner::New () [inline], [static]
```

for wrapped language: instantiate a reference counted object

References [Scanner\(\)](#).

#### 12.266.4.21 Print()

```
void gdcM::Scanner::Print (
    std::ostream & os) const [override], [virtual]
```

Print result.

Reimplemented from [gdcM::Object](#).

Referenced by [operator<<](#).

#### 12.266.4.22 PrintTable()

```
void gdcM::Scanner::PrintTable (
    std::ostream & os) const
```

#### 12.266.4.23 ProcessPublicTag()

```
void gdcM::Scanner::ProcessPublicTag (
    StringFilter & sf,
    const char * filename) [protected]
```

#### 12.266.4.24 Scan()

```
bool gdcM::Scanner::Scan (
    Directory::FileNamesType const & filenames)
```

Start the scan !

#### Examples

[DiscriminateVolume.cxx](#), [DumpToSQLite3.cxx](#), [SortImage.cxx](#), and [VolumeSorter.cxx](#).

## 12.266.5 Friends And Related Symbol Documentation

### 12.266.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const Scanner & s) [friend]
```

References [Scanner\(\)](#), and [Print\(\)](#).

The documentation for this class was generated from the following file:

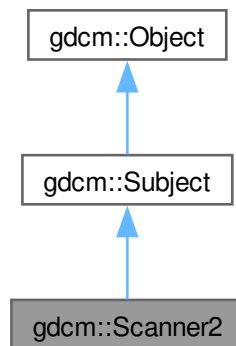
- [gdcmScanner.h](#)

## 12.267 gdcm::Scanner2 Class Reference

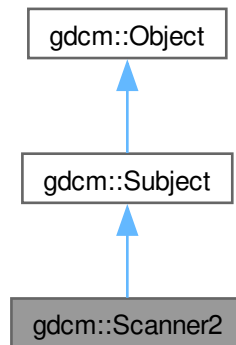
[Scanner2](#).

```
#include <gdcmScanner2.h>
```

Inheritance diagram for gdcm::Scanner2:



Collaboration diagram for gdcm::Scanner2:



## Classes

- struct [Itstr](#)

## Public Types

- typedef PrivateMappingType::const\_iterator [PrivateConstIterator](#)
- typedef std::map< const char \*, [PrivateTagToValue](#), [Itstr](#) > [PrivateMappingType](#)
- typedef std::map< [PrivateTag](#), const char \* > [PrivateTagToValue](#)
- typedef PrivateTagToValue::value\_type [PrivateTagToValueValueType](#)
- typedef PublicMappingType::const\_iterator [PublicConstIterator](#)
- typedef std::map< const char \*, [PublicTagToValue](#), [Itstr](#) > [PublicMappingType](#)
- typedef std::map< [Tag](#), const char \* > [PublicTagToValue](#)
- typedef PublicTagToValue::value\_type [PublicTagToValueValueType](#)
- typedef std::set< std::string > [ValuesType](#)

## Public Member Functions

- [Scanner2](#) ()
- [~Scanner2](#) () override
- bool [AddPrivateTag](#) ([PrivateTag](#) const &pt)
- bool [AddPublicTag](#) ([Tag](#) const &t)  
*Add a tag that will need to be read. Those are root level tags.*
- bool [AddSkipTag](#) ([Tag](#) const &t)  
*Add a tag that will need to be skipped. Those are root level skip tags.*
- [PublicConstIterator](#) [Begin](#) () const
- void [ClearPrivateTags](#) ()
- void [ClearPublicTags](#) ()

- void [ClearSkipTags](#) ()
- [PublicConstIterator End](#) () const
- [Directory::FilenamesType GetAllFilenamesFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*valueref) const
- [Directory::FilenamesType GetAllFilenamesFromPublicTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- const char \* [GetFilenameFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*valueref) const
- const char \* [GetFilenameFromPublicTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- [Directory::FilenamesType](#) const & [GetFilenames](#) () const
 

*Return the list of filenames.*
- [Directory::FilenamesType GetKeys](#) () const
- [PrivateTagToValue](#) const & [GetMappingFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*value) const
- [PublicTagToValue](#) const & [GetMappingFromPublicTagToValue](#) ([Tag](#) const &t, const char \*value) const
 

*See [GetFilenameFromTagToValue](#)(). This is simply [GetFilenameFromTagToValue](#) followed.*
- [PrivateTagToValue](#) const & [GetPrivateMapping](#) (const char \*filename) const
- [PrivateMappingType](#) const & [GetPrivateMappings](#) () const
- [Directory::FilenamesType GetPrivateOrderedValues](#) ([PrivateTag](#) const &pt) const
- const char \* [GetPrivateValue](#) (const char \*filename, [PrivateTag](#) const &t) const
- [ValuesType GetPrivateValues](#) ([PrivateTag](#) const &pt) const
 

*Get all the values found (in lexicographic order) associated with [PrivateTag](#) 'pt'.*
- [PublicTagToValue](#) const & [GetPublicMapping](#) (const char \*filename) const
 

*Get the std::map mapping filenames to value for file 'filename'.*
- [PublicMappingType](#) const & [GetPublicMappings](#) () const
 

*Mappings are the mapping from a particular tag to the map, mapping filename to value:*
- [Directory::FilenamesType GetPublicOrderedValues](#) ([Tag](#) const &t) const
- const char \* [GetPublicValue](#) (const char \*filename, [Tag](#) const &t) const
- [ValuesType GetPublicValues](#) ([Tag](#) const &t) const
 

*Get all the values found (in lexicographic order) associated with [Tag](#) 't'.*
- [ValuesType](#) const & [GetValues](#) () const
 

*Get all the values found (in lexicographic order).*
- bool [IsKey](#) (const char \*filename) const
- void [Print](#) (std::ostream &os) const override
 

*Print result.*
- void [PrintTable](#) (std::ostream &os, bool header=false) const
 

*Print result as CSV table.*
- [PrivateConstIterator PrivateBegin](#) () const
- [PrivateConstIterator PrivateEnd](#) () const
- bool [Scan](#) ([Directory::FilenamesType](#) const &filenames)
 

*Start the scan !*

## Public Member Functions inherited from [gdcmm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

## Static Public Member Functions

- static [SmartPointer](#)< [Scanner2](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Protected Member Functions

- void [ProcessPrivateTag](#) ([StringFilter](#) &sf, const char \*filename)
- void [ProcessPublicTag](#) ([StringFilter](#) &sf, const char \*filename)

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Scanner2](#) &s)

## 12.267.1 Detailed Description

### [Scanner2](#).

This filter is meant for quickly browsing a [FileSet](#) (a set of files on disk). Special consideration are taken so as to read the minimum amount of information in each file in order to retrieve the user specified set of DICOM [Attribute](#).

This filter is dealing with both VRASCII and VRBINARY element, thanks to the help of [StringFilter](#)

### Warning

IMPORTANT In case of file where tags are not ordered (illegal as per DICOM specification), the output will be missing information

### Note

implementation details. All values are stored in a std::set of std::string. Then the address of the cstring underlying the std::string is used in the std::map.

This class implement the Subject/Observer pattern trigger the following events:

- [ProgressEvent](#)
- [StartEvent](#)
- [EndEvent](#)

## 12.267.2 Member Typedef Documentation

### 12.267.2.1 PrivateConstIterator

```
typedef PrivateMappingType::const_iterator gdcm::Scanner2::PrivateConstIterator
```

### 12.267.2.2 PrivateMappingType

```
typedef std::map<const char *,PrivateTagToValue, ltstr> gdcm::Scanner2::PrivateMappingType
```

### 12.267.2.3 PrivateTagToValue

```
typedef std::map<PrivateTag, const char*> gdcm::Scanner2::PrivateTagToValue
```

### 12.267.2.4 PrivateTagToValueValueType

```
typedef PrivateTagToValue::value_type gdcm::Scanner2::PrivateTagToValueValueType
```

### 12.267.2.5 PublicConstIterator

```
typedef PublicMappingType::const_iterator gdcm::Scanner2::PublicConstIterator
```

### 12.267.2.6 PublicMappingType

```
typedef std::map<const char *,PublicTagToValue, ltstr> gdcm::Scanner2::PublicMappingType
```

### 12.267.2.7 PublicTagToValue

```
typedef std::map<Tag, const char*> gdcm::Scanner2::PublicTagToValue
```

struct to map a filename to a value Implementation note: all std::map in this class will be using const char \* and not std::string since we are pointing to existing std::string (held in a std::vector) this avoid an extra copy of the byte array. [Tag](#) are used as [Tag](#) class since sizeof(tag) <= sizeof(pointer)

### 12.267.2.8 PublicTagToValueValueType

```
typedef PublicTagToValue::value_type gdcm::Scanner2::PublicTagToValueValueType
```

### 12.267.2.9 ValueType

```
typedef std::set< std::string > gdcM::Scanner2::ValueType
```

## 12.267.3 Constructor & Destructor Documentation

### 12.267.3.1 Scanner2()

```
gdcM::Scanner2::Scanner2 () [inline]
```

Referenced by [New\(\)](#), and [operator<<](#).

### 12.267.3.2 ~Scanner2()

```
gdcM::Scanner2::~~Scanner2 () [override]
```

## 12.267.4 Member Function Documentation

### 12.267.4.1 AddPrivateTag()

```
bool gdcM::Scanner2::AddPrivateTag (  
    PrivateTag const & pt)
```

### 12.267.4.2 AddPublicTag()

```
bool gdcM::Scanner2::AddPublicTag (  
    Tag const & t)
```

Add a tag that will need to be read. Those are root level tags.

### 12.267.4.3 AddSkipTag()

```
bool gdcM::Scanner2::AddSkipTag (  
    Tag const & t)
```

Add a tag that will need to be skipped. Those are root level skip tags.

### 12.267.4.4 Begin()

```
PublicConstIterator gdcM::Scanner2::Begin () const [inline]
```



#### 12.267.4.5 ClearPrivateTags()

```
void gdcm::Scanner2::ClearPrivateTags ()
```

#### 12.267.4.6 ClearPublicTags()

```
void gdcm::Scanner2::ClearPublicTags ()
```

#### 12.267.4.7 ClearSkipTags()

```
void gdcm::Scanner2::ClearSkipTags ()
```

#### 12.267.4.8 End()

```
PublicConstIterator gdcm::Scanner2::End () const [inline]
```

#### 12.267.4.9 GetAllFileNamesFromPrivateTagToValue()

```
Directory::FileNamesType gdcm::Scanner2::GetAllFileNamesFromPrivateTagToValue (
    PrivateTag const & pt,
    const char * valueref) const
```

#### 12.267.4.10 GetAllFileNamesFromPublicTagToValue()

```
Directory::FileNamesType gdcm::Scanner2::GetAllFileNamesFromPublicTagToValue (
    Tag const & t,
    const char * valueref) const
```

Will loop over all files and return a vector of std::strings of filenames where value match the reference value 'valueref'

#### 12.267.4.11 GetFilenameFromPrivateTagToValue()

```
const char * gdcm::Scanner2::GetFilenameFromPrivateTagToValue (
    PrivateTag const & pt,
    const char * valueref) const
```

#### 12.267.4.12 GetFilenameFromPublicTagToValue()

```
const char * gdcm::Scanner2::GetFilenameFromPublicTagToValue (
    Tag const & t,
    const char * valueref) const
```

Will loop over all files and return the first file where value match the reference value 'valueref'

#### 12.267.4.13 GetFilenames()

```
Directory::FilenamesType const & gdcm::Scanner2::GetFilenames () const [inline]
```

Return the list of filenames.

#### 12.267.4.14 GetKeys()

```
Directory::FilenamesType gdcm::Scanner2::GetKeys () const
```

Return the list of filename that are key in the internal map, which means those filename were properly parsed

#### 12.267.4.15 GetMappingFromPrivateTagToValue()

```
PrivateTagToValue const & gdcm::Scanner2::GetMappingFromPrivateTagToValue (  
    PrivateTag const & pt,  
    const char * value) const
```

#### 12.267.4.16 GetMappingFromPublicTagToValue()

```
PublicTagToValue const & gdcm::Scanner2::GetMappingFromPublicTagToValue (  
    Tag const & t,  
    const char * value) const
```

See GetFilenameFromTagToValue(). This is simply GetFilenameFromTagToValue followed.

#### 12.267.4.17 GetPrivateMapping()

```
PrivateTagToValue const & gdcm::Scanner2::GetPrivateMapping (  
    const char * filename) const
```

#### 12.267.4.18 GetPrivateMappings()

```
PrivateMappingType const & gdcm::Scanner2::GetPrivateMappings () const [inline]
```

#### 12.267.4.19 GetPrivateOrderedValues()

```
Directory::FilenamesType gdcm::Scanner2::GetPrivateOrderedValues (  
    PrivateTag const & pt) const
```

#### 12.267.4.20 GetPrivateValue()

```
const char * gdcmm::Scanner2::GetPrivateValue (
    const char * filename,
    PrivateTag const & t) const
```

#### 12.267.4.21 GetPrivateValues()

```
ValuesType gdcmm::Scanner2::GetPrivateValues (
    PrivateTag const & pt) const
```

Get all the values found (in lexicographic order) associated with [PrivateTag](#) 'pt'.

#### 12.267.4.22 GetPublicMapping()

```
PublicTagToValue const & gdcmm::Scanner2::GetPublicMapping (
    const char * filename) const
```

Get the std::map mapping filenames to value for file 'filename'.

#### 12.267.4.23 GetPublicMappings()

```
PublicMappingType const & gdcmm::Scanner2::GetPublicMappings () const [inline]
```

Mappings are the mapping from a particular tag to the map, mapping filename to value:

#### 12.267.4.24 GetPublicOrderedValues()

```
Directory::FileNamesType gdcmm::Scanner2::GetPublicOrderedValues (
    Tag const & t) const
```

Get all the values found (in a vector) associated with [Tag](#) 't' This function is identical to `GetValues`, but is accessible from the wrapped layer (python, C#, java)

#### 12.267.4.25 GetPublicValue()

```
const char * gdcmm::Scanner2::GetPublicValue (
    const char * filename,
    Tag const & t) const
```

Retrieve the value found for tag: t associated with file: filename This is meant for a single short call. If multiple calls (multiple tags) should be done, prefer the `GetMapping` function, and then reuse the `TagToValue` hash table.

#### Warning

[Tag](#) 't' should have been added via `AddTag()` prior to the `Scan()` call !

#### 12.267.4.26 GetPublicValues()

```
ValueType gdcM::Scanner2::GetPublicValues (
    Tag const & t) const
```

Get all the values found (in lexicographic order) associated with [Tag](#) 't'.

#### 12.267.4.27 GetValues()

```
ValueType const & gdcM::Scanner2::GetValues () const [inline]
```

Get all the values found (in lexicographic order).

#### 12.267.4.28 IsKey()

```
bool gdcM::Scanner2::IsKey (
    const char * filename) const
```

Check if filename is a key in the Mapping table. returns true only if file can be found, which means the file was indeed a DICOM file that could be processed

#### 12.267.4.29 New()

```
SmartPointer< Scanner2 > gdcM::Scanner2::New () [inline], [static]
```

for wrapped language: instantiate a reference counted object

References [Scanner2\(\)](#).

#### 12.267.4.30 Print()

```
void gdcM::Scanner2::Print (
    std::ostream & os) const [override], [virtual]
```

Print result.

Reimplemented from [gdcM::Object](#).

Referenced by [operator<<](#).

#### 12.267.4.31 PrintTable()

```
void gdcM::Scanner2::PrintTable (
    std::ostream & os,
    bool header = false) const
```

Print result as CSV table.

#### 12.267.4.32 PrivateBegin()

```
PrivateConstIterator gdcm::Scanner2::PrivateBegin () const [inline]
```

#### 12.267.4.33 PrivateEnd()

```
PrivateConstIterator gdcm::Scanner2::PrivateEnd () const [inline]
```

#### 12.267.4.34 ProcessPrivateTag()

```
void gdcm::Scanner2::ProcessPrivateTag (  
    StringFilter & sf,  
    const char * filename) [protected]
```

#### 12.267.4.35 ProcessPublicTag()

```
void gdcm::Scanner2::ProcessPublicTag (  
    StringFilter & sf,  
    const char * filename) [protected]
```

#### 12.267.4.36 Scan()

```
bool gdcm::Scanner2::Scan (  
    Directory::FileNamesType const & filenames)
```

Start the scan !

### 12.267.5 Friends And Related Symbol Documentation

#### 12.267.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const Scanner2 & s) [friend]
```

References [Scanner2\(\)](#), and [Print\(\)](#).

The documentation for this class was generated from the following file:

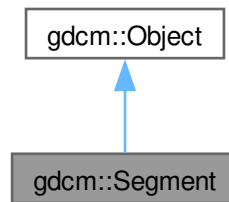
- [gdcmScanner2.h](#)

## 12.268 gdcm::Segment Class Reference

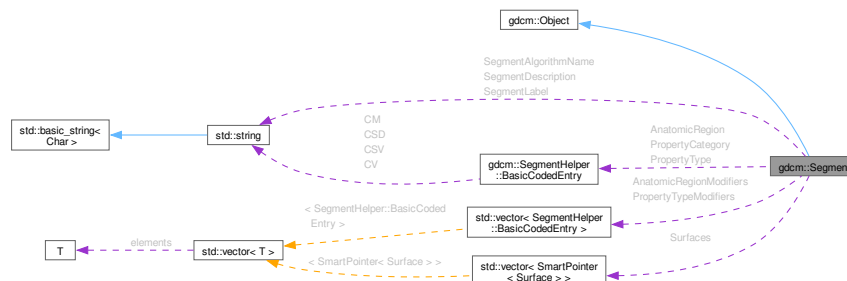
This class defines a segment.

```
#include <gdcmSegment.h>
```

Inheritance diagram for gdcm::Segment:



Collaboration diagram for gdcm::Segment:



### Public Types

- enum `ALGOType` {  
`AUTOMATIC` = 0 ,  
`SEMIAUTOMATIC` ,  
`MANUAL` ,  
`ALGOType_END` }
- typedef `std::vector< SegmentHelper::BasicCodedEntry >` `BasicCodedEntryVector`
- typedef `std::vector< SmartPointer< Surface > >` `SurfaceVector`

**Public Member Functions**

- [Segment](#) ()
- [~Segment](#) () override
- void [AddSurface](#) ([SmartPointer](#)< [Surface](#) > surface)
- [SegmentHelper::BasicCodedEntry](#) & [GetAnatomicRegion](#) ()
- [SegmentHelper::BasicCodedEntry](#) const & [GetAnatomicRegion](#) () const
- [BasicCodedEntryVector](#) & [GetAnatomicRegionModifiers](#) ()
- [BasicCodedEntryVector](#) const & [GetAnatomicRegionModifiers](#) () const
- [SegmentHelper::BasicCodedEntry](#) & [GetPropertyCategory](#) ()
- [SegmentHelper::BasicCodedEntry](#) const & [GetPropertyCategory](#) () const
- [SegmentHelper::BasicCodedEntry](#) & [GetPropertyType](#) ()
- [SegmentHelper::BasicCodedEntry](#) const & [GetPropertyType](#) () const
- [BasicCodedEntryVector](#) & [GetPropertyTypeModifiers](#) ()
- [BasicCodedEntryVector](#) const & [GetPropertyTypeModifiers](#) () const
- const char \* [GetSegmentAlgorithmName](#) () const
- [ALGOType](#) [GetSegmentAlgorithmType](#) () const
- const char \* [GetSegmentDescription](#) () const
- const char \* [GetSegmentLabel](#) () const
- unsigned short [GetSegmentNumber](#) () const
- [SmartPointer](#)< [Surface](#) > [GetSurface](#) (const unsigned int idx=0) const
- unsigned long [GetSurfaceCount](#) ()
- [SurfaceVector](#) & [GetSurfaces](#) ()
- [SurfaceVector](#) const & [GetSurfaces](#) () const
- void [SetAnatomicRegion](#) ([SegmentHelper::BasicCodedEntry](#) const &BSE)
- void [SetAnatomicRegionModifiers](#) ([BasicCodedEntryVector](#) const &BSEV)
- void [SetPropertyCategory](#) ([SegmentHelper::BasicCodedEntry](#) const &BSE)
- void [SetPropertyType](#) ([SegmentHelper::BasicCodedEntry](#) const &BSE)
- void [SetPropertyTypeModifiers](#) ([BasicCodedEntryVector](#) const &BSEV)
- void [SetSegmentAlgorithmName](#) (const char \*name)
- void [SetSegmentAlgorithmType](#) ([ALGOType](#) type)
- void [SetSegmentAlgorithmType](#) (const char \*typeStr)
- void [SetSegmentDescription](#) (const char \*description)
- void [SetSegmentLabel](#) (const char \*label)
- void [SetSegmentNumber](#) (const unsigned short num)
- void [SetSurfaceCount](#) (const unsigned long nb)

**Public Member Functions inherited from [gdcm::Object](#)**

- [Object](#) ()
- [Object](#) (const [Object](#) &)
- *Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

**Static Public Member Functions**

- static [ALGOType](#) [GetALGOType](#) (const char \*type)
- static const char \* [GetALGOTypeString](#) ([ALGOType](#) type)

**Protected Attributes**

- [SegmentHelper::BasicCodedEntry](#) [AnatomicRegion](#)
- [BasicCodedEntryVector](#) [AnatomicRegionModifiers](#)
- [SegmentHelper::BasicCodedEntry](#) [PropertyCategory](#)
- [SegmentHelper::BasicCodedEntry](#) [PropertyType](#)
- [BasicCodedEntryVector](#) [PropertyTypeModifiers](#)
- [std::string](#) [SegmentAlgorithmName](#)
- [ALGOType](#) [SegmentAlgorithmType](#)
- [std::string](#) [SegmentDescription](#)
- [std::string](#) [SegmentLabel](#)
- [unsigned short](#) [SegmentNumber](#)
- [unsigned long](#) [SurfaceCount](#)
- [SurfaceVector](#) [Surfaces](#)

**Additional Inherited Members****Protected Member Functions inherited from [gdcm::Object](#)**

- [void](#) [Register](#) ()
- [void](#) [UnRegister](#) ()

**12.268.1 Detailed Description**

This class defines a segment.

It mainly contains attributes of group 0x0062. In addition, it can be associated with surface.

See also

PS 3.3 C.8.20.2 and C.8.23

**12.268.2 Member Typedef Documentation****12.268.2.1 BasicCodedEntryVector**

```
typedef std::vector< SegmentHelper::BasicCodedEntry > gdcm::Segment::BasicCodedEntryVector
```

**12.268.2.2 SurfaceVector**

```
typedef std::vector< SmartPointer< Surface > > gdcm::Segment::SurfaceVector
```



## 12.268.3 Member Enumeration Documentation

### 12.268.3.1 ALGOType

```
enum gdcm::Segment::ALGOType
```

#### Enumerator

AUTOMATIC	
SEMIAUTOMATIC	
MANUAL	
ALGOType_END	

## 12.268.4 Constructor & Destructor Documentation

### 12.268.4.1 Segment()

```
gdcm::Segment::Segment ()
```

### 12.268.4.2 ~Segment()

```
gdcm::Segment::~~Segment () [override]
```

## 12.268.5 Member Function Documentation

### 12.268.5.1 AddSurface()

```
void gdcm::Segment::AddSurface (  
    SmartPointer< Surface > surface)
```

References [gdcm::Object::SmartPointer](#).

### 12.268.5.2 GetALGOType()

```
ALGOType gdcm::Segment::GetALGOType (  
    const char * type) [static]
```

### 12.268.5.3 GetALGOTypeString()

```
const char * gdcm::Segment::GetALGOTypeString (  
    ALGOType type) [static]
```

**12.268.5.4 GetAnatomicRegion() [1/2]**

`SegmentHelper::BasicCodedEntry` & `gdcm::Segment::GetAnatomicRegion ()`

**12.268.5.5 GetAnatomicRegion() [2/2]**

`SegmentHelper::BasicCodedEntry` const & `gdcm::Segment::GetAnatomicRegion ()` const

**12.268.5.6 GetAnatomicRegionModifiers() [1/2]**

`BasicCodedEntryVector` & `gdcm::Segment::GetAnatomicRegionModifiers ()`

**12.268.5.7 GetAnatomicRegionModifiers() [2/2]**

`BasicCodedEntryVector` const & `gdcm::Segment::GetAnatomicRegionModifiers ()` const

**12.268.5.8 GetPropertyCategory() [1/2]**

`SegmentHelper::BasicCodedEntry` & `gdcm::Segment::GetPropertyCategory ()`

**12.268.5.9 GetPropertyCategory() [2/2]**

`SegmentHelper::BasicCodedEntry` const & `gdcm::Segment::GetPropertyCategory ()` const

**12.268.5.10 GetPropertyType() [1/2]**

`SegmentHelper::BasicCodedEntry` & `gdcm::Segment::GetPropertyType ()`

**12.268.5.11 GetPropertyType() [2/2]**

`SegmentHelper::BasicCodedEntry` const & `gdcm::Segment::GetPropertyType ()` const

**12.268.5.12 GetPropertyTypeModifiers() [1/2]**

`BasicCodedEntryVector` & `gdcm::Segment::GetPropertyTypeModifiers ()`

**12.268.5.13 GetPropertyTypeModifiers() [2/2]**

`BasicCodedEntryVector` const & `gdcm::Segment::GetPropertyTypeModifiers ()` const

#### 12.268.5.14 GetSegmentAlgorithmName()

```
const char * gdcm::Segment::GetSegmentAlgorithmName () const
```

#### 12.268.5.15 GetSegmentAlgorithmType()

```
ALGOType gdcm::Segment::GetSegmentAlgorithmType () const
```

#### 12.268.5.16 GetSegmentDescription()

```
const char * gdcm::Segment::GetSegmentDescription () const
```

#### 12.268.5.17 GetSegmentLabel()

```
const char * gdcm::Segment::GetSegmentLabel () const
```

#### 12.268.5.18 GetSegmentNumber()

```
unsigned short gdcm::Segment::GetSegmentNumber () const
```

#### 12.268.5.19 GetSurface()

```
SmartPointer< Surface > gdcm::Segment::GetSurface (
    const unsigned int idx = 0) const
```

References [gdcm::Object::SmartPointer](#).

#### 12.268.5.20 GetSurfaceCount()

```
unsigned long gdcm::Segment::GetSurfaceCount ()
```

#### 12.268.5.21 GetSurfaces() [1/2]

```
SurfaceVector & gdcm::Segment::GetSurfaces ()
```

#### 12.268.5.22 GetSurfaces() [2/2]

```
SurfaceVector const & gdcm::Segment::GetSurfaces () const
```

**12.268.5.23 SetAnatomicRegion()**

```
void gdcM::Segment::SetAnatomicRegion (
    SegmentHelper::BasicCodedEntry const & BSE)
```

**12.268.5.24 SetAnatomicRegionModifiers()**

```
void gdcM::Segment::SetAnatomicRegionModifiers (
    BasicCodedEntryVector const & BSEV)
```

**12.268.5.25 SetPropertyCategory()**

```
void gdcM::Segment::SetPropertyCategory (
    SegmentHelper::BasicCodedEntry const & BSE)
```

**12.268.5.26 SetPropertyType()**

```
void gdcM::Segment::SetPropertyType (
    SegmentHelper::BasicCodedEntry const & BSE)
```

**12.268.5.27 SetPropertyTypeModifiers()**

```
void gdcM::Segment::SetPropertyTypeModifiers (
    BasicCodedEntryVector const & BSEV)
```

**12.268.5.28 SetSegmentAlgorithmName()**

```
void gdcM::Segment::SetSegmentAlgorithmName (
    const char * name)
```

**12.268.5.29 SetSegmentAlgorithmType() [1/2]**

```
void gdcM::Segment::SetSegmentAlgorithmType (
    ALGOType type)
```

**12.268.5.30 SetSegmentAlgorithmType() [2/2]**

```
void gdcM::Segment::SetSegmentAlgorithmType (
    const char * typeStr)
```

### 12.268.5.31 SetSegmentDescription()

```
void gdcm::Segment::SetSegmentDescription (
    const char * description)
```

### 12.268.5.32 SetSegmentLabel()

```
void gdcm::Segment::SetSegmentLabel (
    const char * label)
```

### 12.268.5.33 SetSegmentNumber()

```
void gdcm::Segment::SetSegmentNumber (
    const unsigned short num)
```

### 12.268.5.34 SetSurfaceCount()

```
void gdcm::Segment::SetSurfaceCount (
    const unsigned long nb)
```

## 12.268.6 Member Data Documentation

### 12.268.6.1 AnatomicRegion

[SegmentHelper::BasicCodedEntry](#) gdcm::Segment::AnatomicRegion [protected]

### 12.268.6.2 AnatomicRegionModifiers

[BasicCodedEntryVector](#) gdcm::Segment::AnatomicRegionModifiers [protected]

### 12.268.6.3 PropertyCategory

[SegmentHelper::BasicCodedEntry](#) gdcm::Segment::PropertyCategory [protected]

### 12.268.6.4 PropertyType

[SegmentHelper::BasicCodedEntry](#) gdcm::Segment::PropertyType [protected]

#### 12.268.6.5 PropertyTypeModifiers

`BasicCodedEntryVector` `gdcm::Segment::PropertyTypeModifiers` [protected]

#### 12.268.6.6 SegmentAlgorithmName

`std::string` `gdcm::Segment::SegmentAlgorithmName` [protected]

#### 12.268.6.7 SegmentAlgorithmType

`ALGOType` `gdcm::Segment::SegmentAlgorithmType` [protected]

#### 12.268.6.8 SegmentDescription

`std::string` `gdcm::Segment::SegmentDescription` [protected]

#### 12.268.6.9 SegmentLabel

`std::string` `gdcm::Segment::SegmentLabel` [protected]

#### 12.268.6.10 SegmentNumber

`unsigned short` `gdcm::Segment::SegmentNumber` [protected]

#### 12.268.6.11 SurfaceCount

`unsigned long` `gdcm::Segment::SurfaceCount` [protected]

#### 12.268.6.12 Surfaces

`SurfaceVector` `gdcm::Segment::Surfaces` [protected]

The documentation for this class was generated from the following file:

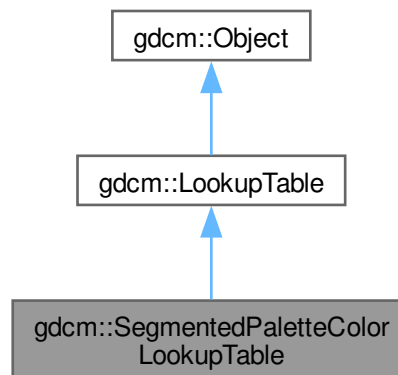
- [gdcmSegment.h](#)

## 12.269 gdcm::SegmentedPaletteColorLookupTable Class Reference

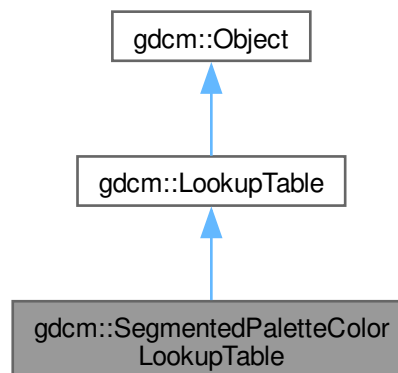
[SegmentedPaletteColorLookupTable](#) class.

```
#include <gdcmSegmentedPaletteColorLookupTable.h>
```

Inheritance diagram for gdcm::SegmentedPaletteColorLookupTable:



Collaboration diagram for gdcm::SegmentedPaletteColorLookupTable:



## Public Member Functions

- [SegmentedPaletteColorLookupTable](#) ()
- [~SegmentedPaletteColorLookupTable](#) () override
- void [Print](#) (std::ostream &) const override
- void [SetLUT](#) ([LookupTableType](#) type, const unsigned char \*array, unsigned int length) override

*Initialize a [SegmentedPaletteColorLookupTable](#).*

## Public Member Functions inherited from [gdcm::LookupTable](#)

- [LookupTable](#) ()
- [LookupTable](#) (LookupTable const &lut)
- [~LookupTable](#) () override
- void [Allocate](#) (unsigned short bitsample=8)  
*Allocate the LUT.*
- void [Clear](#) ()  
*Clear the LUT.*
- bool [Decode](#) (char \*outputbuffer, size\_t outlen, const char \*inputbuffer, size\_t inlen) const
- void [Decode](#) (std::istream &is, std::ostream &os) const  
*Decode the LUT.*
- bool [Decode8](#) (char \*outputbuffer, size\_t outlen, const char \*inputbuffer, size\_t inlen) const  
*Decode into RGB 8 bits space.*
- unsigned short [GetBitSample](#) () const  
*return the bit sample*
- bool [GetBufferAsRGBA](#) (unsigned char \*rgba) const  
*return the LUT as RGBA buffer*
- void [GetLUT](#) ([LookupTableType](#) type, unsigned char \*array, unsigned int &length) const
- void [GetLUTDescriptor](#) ([LookupTableType](#) type, unsigned short &length, unsigned short &subscript, unsigned short &bitsize) const
- unsigned int [GetLUTLength](#) ([LookupTableType](#) type) const
- const unsigned char \* [GetPointer](#) () const  
*return a raw pointer to the LUT*
- void [InitializeBlueLUT](#) (unsigned short length, unsigned short subscript, unsigned short bitsize)
- bool [Initialized](#) () const  
*return whether the LUT has been initialized*
- void [InitializeGreenLUT](#) (unsigned short length, unsigned short subscript, unsigned short bitsize)
- void [InitializeLUT](#) ([LookupTableType](#) type, unsigned short length, unsigned short subscript, unsigned short bitsize)  
*Generic interface:*
- void [InitializeRedLUT](#) (unsigned short length, unsigned short subscript, unsigned short bitsize)  
*RED / GREEN / BLUE specific:*
- bool [IsRGB8](#) () const  
*Return whether 16 bits LUT is in RGB 8 bits space.*
- void [SetBlueLUT](#) (const unsigned char \*blue, unsigned int length)
- void [SetGreenLUT](#) (const unsigned char \*green, unsigned int length)
- void [SetRedLUT](#) (const unsigned char \*red, unsigned int length)
- bool [WriteBufferAsRGBA](#) (const unsigned char \*rgba)  
*Write the LUT as RGBA.*



**Public Member Functions inherited from [gdcm::Object](#)**

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

**Additional Inherited Members****Public Types inherited from [gdcm::LookupTable](#)**

- enum [LookupTableType](#) {  
    [RED](#) = 0 ,  
    [GREEN](#) ,  
    [BLUE](#) ,  
    [GRAY](#) ,  
    [UNKNOWN](#) }

**Protected Member Functions inherited from [gdcm::Object](#)**

- void [Register](#) ()
- void [UnRegister](#) ()

**Protected Attributes inherited from [gdcm::LookupTable](#)**

- unsigned short [BitSample](#)
- bool [IncompleteLUT](#):1
- [LookupTableInternal](#) \* [Internal](#)

**12.269.1 Detailed Description**

[SegmentedPaletteColorLookupTable](#) class.

**12.269.2 Constructor & Destructor Documentation****12.269.2.1 [SegmentedPaletteColorLookupTable](#)()**

```
gdcm::SegmentedPaletteColorLookupTable::SegmentedPaletteColorLookupTable ()
```

**12.269.2.2 [~SegmentedPaletteColorLookupTable](#)()**

```
gdcm::SegmentedPaletteColorLookupTable::~~SegmentedPaletteColorLookupTable () [override]
```

### 12.269.3 Member Function Documentation

#### 12.269.3.1 Print()

```
void gdcm::SegmentedPaletteColorLookupTable::Print (  
    std::ostream & ) const [inline], [override], [virtual]
```

Reimplemented from [gdcm::LookupTable](#).

#### 12.269.3.2 SetLUT()

```
void gdcm::SegmentedPaletteColorLookupTable::SetLUT (  
    LookupTableType type,  
    const unsigned char * array,  
    unsigned int length) [override], [virtual]
```

Initialize a [SegmentedPaletteColorLookupTable](#).

Reimplemented from [gdcm::LookupTable](#).

The documentation for this class was generated from the following file:

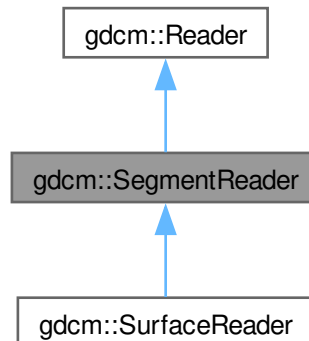
- [gdcmSegmentedPaletteColorLookupTable.h](#)

## 12.270 gdcm::SegmentReader Class Reference

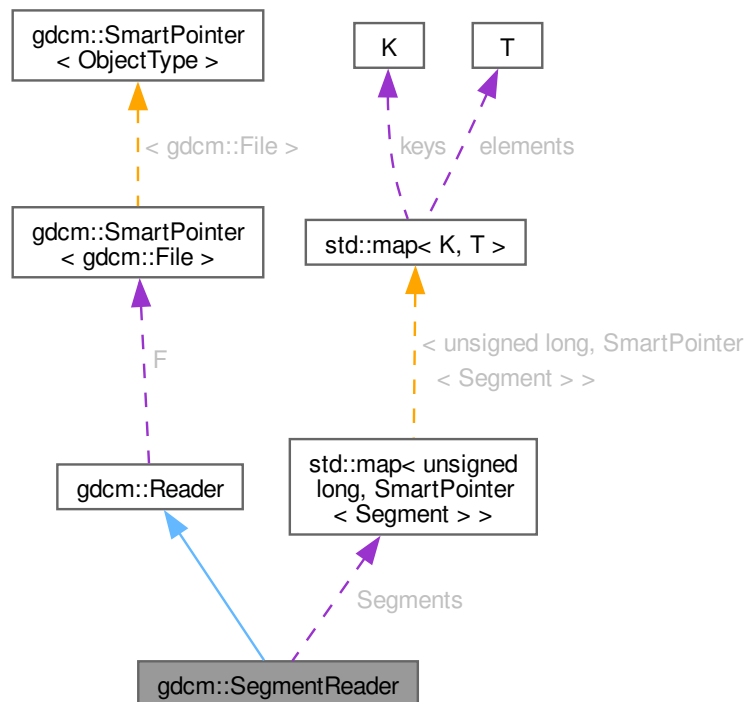
This class defines a segment reader.

```
#include <gdcmSegmentReader.h>
```

Inheritance diagram for gdcm::SegmentReader:



Collaboration diagram for gdcm::SegmentReader:



## Public Types

- typedef std::vector< [SmartPointer< Segment >](#) > [SegmentVector](#)

## Public Member Functions

- [SegmentReader](#) ()
  - [~SegmentReader](#) () override
  - [SegmentVector GetSegments](#) ()
  - [SegmentVector GetSegments](#) () const
  - bool [Read](#) () override
- Read.*

## Public Member Functions inherited from [gdcm::Reader](#)

- [Reader](#) ()
- virtual [~Reader](#) ()
- bool [CanRead](#) () const

- [File](#) & [GetFile](#) ()  
*Set/Get File.*
- const [File](#) & [GetFile](#) () const  
*Set/Get File.*
- size\_t [GetStreamCurrentPosition](#) () const
- bool [ReadSelectedPrivateTags](#) (std::set< [PrivateTag](#) > const &ptags, bool readvalues=true)  
*Will only read the specified selected private tags.*
- bool [ReadSelectedTags](#) (std::set< [Tag](#) > const &tags, bool readvalues=true)  
*Will only read the specified selected tags.*
- bool [ReadUpToTag](#) (const [Tag](#) &tag, std::set< [Tag](#) > const &skiptags=std::set< [Tag](#) >())
- void [SetFile](#) ([File](#) &file)  
*Set/Get File.*
- void [SetFileName](#) (const char \*filename\_native)
- void [SetStream](#) (std::istream &input\_stream)  
*Set the open-ed stream directly.*

### Protected Types

- typedef std::map< unsigned long, [SmartPointer](#)< [Segment](#) > > [SegmentMap](#)

### Protected Member Functions

- bool [ReadSegment](#) (const [Item](#) &segmentItem, const unsigned int idx)
- bool [ReadSegments](#) ()

### Protected Member Functions inherited from [gdcm::Reader](#)

- std::istream \* [GetStreamPtr](#) () const
- bool [ReadDataSet](#) ()
- bool [ReadMetaInformation](#) ()
- bool [ReadPreamble](#) ()

### Protected Attributes

- [SegmentMap](#) Segments

### Protected Attributes inherited from [gdcm::Reader](#)

- [SmartPointer](#)< [File](#) > F

## 12.270.1 Detailed Description

This class defines a segment reader.

It reads attributes of group 0x0062.

See also

PS 3.3 C.8.20.2 and C.8.23

## 12.270.2 Member Typedef Documentation

### 12.270.2.1 SegmentMap

```
typedef std::map< unsigned long, SmartPointer< Segment > > gdcm::SegmentReader::SegmentMap [protected]
```

### 12.270.2.2 SegmentVector

```
typedef std::vector< SmartPointer< Segment > > gdcm::SegmentReader::SegmentVector
```

## 12.270.3 Constructor & Destructor Documentation

### 12.270.3.1 SegmentReader()

```
gdcm::SegmentReader::SegmentReader ()
```

### 12.270.3.2 ~SegmentReader()

```
gdcm::SegmentReader::~~SegmentReader () [override]
```

## 12.270.4 Member Function Documentation

### 12.270.4.1 GetSegments() [1/2]

```
SegmentVector gdcm::SegmentReader::GetSegments ()
```

### 12.270.4.2 GetSegments() [2/2]

```
SegmentVector gdcm::SegmentReader::GetSegments () const
```

#### 12.270.4.3 Read()

```
bool gdcm::SegmentReader::Read () [override], [virtual]
```

Read.

Reimplemented from [gdcm::Reader](#).

Reimplemented in [gdcm::SurfaceReader](#).

#### 12.270.4.4 ReadSegment()

```
bool gdcm::SegmentReader::ReadSegment (
    const Item & segmentItem,
    const unsigned int idx) [protected]
```

#### 12.270.4.5 ReadSegments()

```
bool gdcm::SegmentReader::ReadSegments () [protected]
```

### 12.270.5 Member Data Documentation

#### 12.270.5.1 Segments

```
SegmentMap gdcm::SegmentReader::Segments [protected]
```

The documentation for this class was generated from the following file:

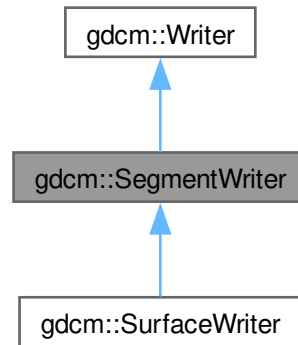
- [gdcmSegmentReader.h](#)

## 12.271 gdcm::SegmentWriter Class Reference

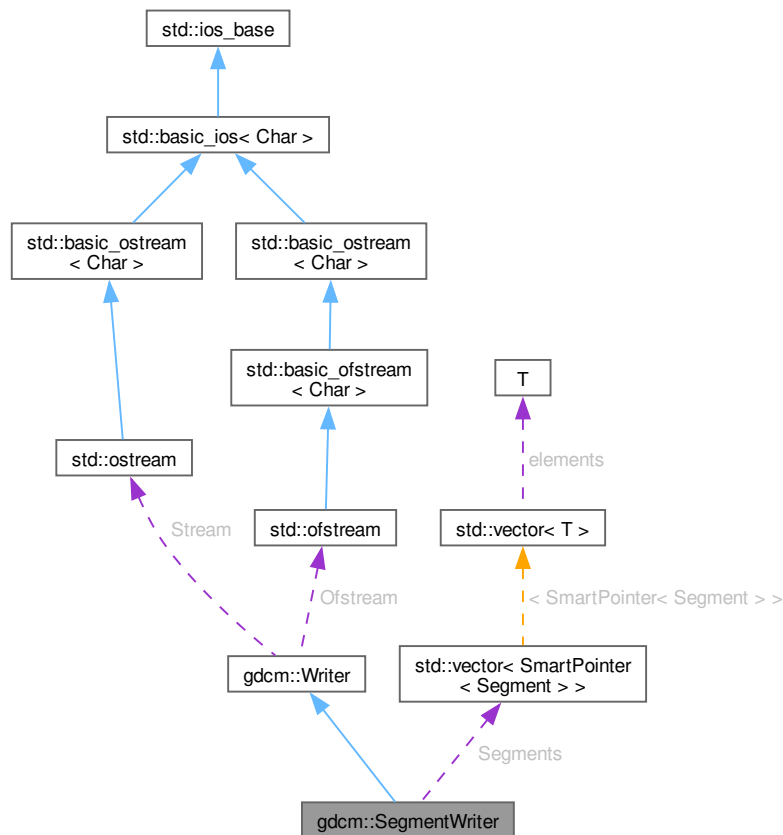
This class defines a segment writer.

```
#include <gdcmSegmentWriter.h>
```

Inheritance diagram for `gdcm::SegmentWriter`:



Collaboration diagram for `gdcm::SegmentWriter`:



## Public Types

- typedef `std::vector< SmartPointer< Segment > >` [SegmentVector](#)

## Public Member Functions

- [SegmentWriter](#) ()
- [~SegmentWriter](#) () override
- void [AddSegment](#) ([SmartPointer< Segment >](#) segment)
- unsigned int [GetNumberOfSegments](#) () const
- [SmartPointer< Segment >](#) [GetSegment](#) (const unsigned int idx=0) const
- [SegmentVector](#) & [GetSegments](#) ()
- const [SegmentVector](#) & [GetSegments](#) () const
- void [SetNumberOfSegments](#) (const unsigned int size)
- void [SetSegments](#) ([SegmentVector](#) &segments)
- bool [Write](#) () override

*Write.*



## Public Member Functions inherited from [gdcm::Writer](#)

- [Writer](#) ()
- virtual [~Writer](#) ()
- void [CheckFileMetaInformationOff](#) ()
- void [CheckFileMetaInformationOn](#) ()
- [File](#) & [GetFile](#) ()
- void [SetCheckFileMetaInformation](#) (bool b)  
*Undocumented function, do not use (= leave default).*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get the DICOM file ([DataSet](#) + Header).*
- void [SetFileName](#) (const char \*filename\_native)  
*Set the filename of DICOM file to write:*
- void [SetStream](#) (std::ostream &output\_stream)  
*Set user ostream buffer.*

## Protected Member Functions

- bool [PrepareWrite](#) ()

## Protected Member Functions inherited from [gdcm::Writer](#)

- bool [GetCheckFileMetaInformation](#) () const
- std::ostream \* [GetStreamPtr](#) () const
- void [SetWriteDataSetOnly](#) (bool b)

## Protected Attributes

- [SegmentVector](#) [Segments](#)

## Protected Attributes inherited from [gdcm::Writer](#)

- std::ofstream \* [Ofstream](#)
- std::ostream \* [Stream](#)

### 12.271.1 Detailed Description

This class defines a segment writer.

It writes attributes of group 0x0062.

See also

PS 3.3 C.8.20.2 and C.8.23

## 12.271.2 Member Typedef Documentation

### 12.271.2.1 SegmentVector

```
typedef std::vector< SmartPointer< Segment > > gdcM::SegmentWriter::SegmentVector
```

## 12.271.3 Constructor & Destructor Documentation

### 12.271.3.1 SegmentWriter()

```
gdcM::SegmentWriter::SegmentWriter ()
```

### 12.271.3.2 ~SegmentWriter()

```
gdcM::SegmentWriter::~~SegmentWriter () [override]
```

## 12.271.4 Member Function Documentation

### 12.271.4.1 AddSegment()

```
void gdcM::SegmentWriter::AddSegment (  
    SmartPointer< Segment > segment)
```

### 12.271.4.2 GetNumberOfSegments()

```
unsigned int gdcM::SegmentWriter::GetNumberOfSegments () const
```

### 12.271.4.3 GetSegment()

```
SmartPointer< Segment > gdcM::SegmentWriter::GetSegment (  
    const unsigned int idx = 0) const
```

### 12.271.4.4 GetSegments() [1/2]

```
SegmentVector & gdcM::SegmentWriter::GetSegments ()
```

### 12.271.4.5 GetSegments() [2/2]

```
const SegmentVector & gdcM::SegmentWriter::GetSegments () const
```

#### 12.271.4.6 PrepareWrite()

```
bool gdcm::SegmentWriter::PrepareWrite () [protected]
```

#### 12.271.4.7 SetNumberOfSegments()

```
void gdcm::SegmentWriter::SetNumberOfSegments (
    const unsigned int size)
```

#### 12.271.4.8 SetSegments()

```
void gdcm::SegmentWriter::SetSegments (
    SegmentVector & segments)
```

#### 12.271.4.9 Write()

```
bool gdcm::SegmentWriter::Write () [override], [virtual]
```

Write.

Reimplemented from [gdcm::Writer](#).

Reimplemented in [gdcm::SurfaceWriter](#).

### 12.271.5 Member Data Documentation

#### 12.271.5.1 Segments

```
SegmentVector gdcm::SegmentWriter::Segments [protected]
```

The documentation for this class was generated from the following file:

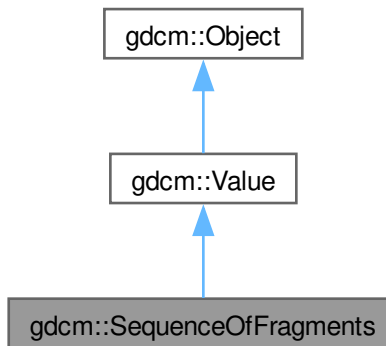
- [gdcmSegmentWriter.h](#)

## 12.272 gdcm::SequenceOfFragments Class Reference

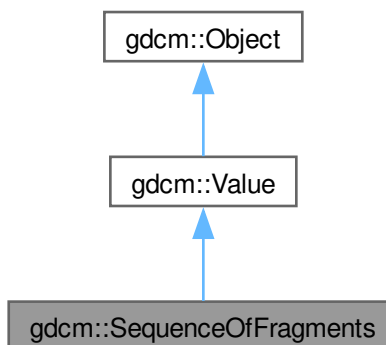
Class to represent a Sequence Of Fragments.

```
#include <gdcmSequenceOfFragments.h>
```

Inheritance diagram for gdcm::SequenceOfFragments:



Collaboration diagram for gdcm::SequenceOfFragments:



### Public Types

- typedef FragmentVector::const\_iterator [ConstIterator](#)
- typedef std::vector< [Fragment](#) > [FragmentVector](#)
- typedef FragmentVector::iterator [Iterator](#)
- typedef FragmentVector::size\_type [SizeType](#)

**Public Member Functions**

- [SequenceOfFragments](#) ()  
*constructor (UndefinedLength by default)*
- void [AddFragment](#) ([Fragment](#) const &item)  
*Appends a [Fragment](#) to the already added ones.*
- [Iterator Begin](#) ()
- [ConstIterator Begin](#) () const
- void [Clear](#) () override  
*Clear.*
- unsigned long [ComputeByteLength](#) () const
- [VL ComputeLength](#) () const
- [Iterator End](#) ()
- [ConstIterator End](#) () const
- bool [GetBuffer](#) (char \*buffer, unsigned long length) const
- bool [GetFragBuffer](#) (unsigned int fragNb, char \*buffer, unsigned long &length) const
- const [Fragment](#) & [GetFragment](#) ([SizeType](#) num) const
- [VL GetLength](#) () const override  
*Returns the SQ length, as read from disk.*
- [SizeType GetNumberOfFragments](#) () const
- [BasicOffsetTable](#) & [GetTable](#) ()
- const [BasicOffsetTable](#) & [GetTable](#) () const
- bool [operator==](#) (const [Value](#) &val) const override
- void [Print](#) (std::ostream &os) const override
- template<typename TSwap>  
std::istream & [Read](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is, bool)
- void [SetLength](#) ([VL](#) length) override  
*Sets the actual SQ length.*
- template<typename TSwap>  
std::ostream const & [Write](#) (std::ostream &os) const
- bool [WriteBuffer](#) (std::ostream &os) const

**Public Member Functions inherited from [gdcm::Value](#)**

- [Value](#) ()=default
- [~Value](#) () override=default

**Public Member Functions inherited from [gdcm::Object](#)**

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

### Static Public Member Functions

- static [SmartPointer](#)< [SequenceOfFragments](#) > [New](#) ()

### Additional Inherited Members

### Protected Member Functions inherited from [gdcm::Value](#)

- virtual void [SetLengthOnly](#) (VL I)

### Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## 12.272.1 Detailed Description

Class to represent a Sequence Of Fragments.

**Todo** I do not enforce that Sequence of Fragments ends with a SQ end del

### Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetJPEGSamplePrecision.cxx](#), and [MpegVideoInfo.cs](#).

## 12.272.2 Member Typedef Documentation

### 12.272.2.1 ConstIterator

```
typedef FragmentVector::const_iterator gdcm::SequenceOfFragments::ConstIterator
```

### 12.272.2.2 FragmentVector

```
typedef std::vector<Fragment> gdcm::SequenceOfFragments::FragmentVector
```

### 12.272.2.3 Iterator

```
typedef FragmentVector::iterator gdcm::SequenceOfFragments::Iterator
```

#### 12.272.2.4 SizeType

```
typedef FragmentVector::size_type gdcm::SequenceOfFragments::SizeType
```

### 12.272.3 Constructor & Destructor Documentation

#### 12.272.3.1 SequenceOfFragments()

```
gdcm::SequenceOfFragments::SequenceOfFragments () [inline]
```

constructor (UndefinedLength by default)

Referenced by [New\(\)](#), and [operator==\(\)](#).

### 12.272.4 Member Function Documentation

#### 12.272.4.1 AddFragment()

```
void gdcm::SequenceOfFragments::AddFragment (
    Fragment const & item)
```

Appends a [Fragment](#) to the already added ones.

#### 12.272.4.2 Begin() [1/2]

```
Iterator gdcm::SequenceOfFragments::Begin () [inline]
```

Referenced by [Print\(\)](#), and [Write\(\)](#).

#### 12.272.4.3 Begin() [2/2]

```
ConstIterator gdcm::SequenceOfFragments::Begin () const [inline]
```

#### 12.272.4.4 Clear()

```
void gdcm::SequenceOfFragments::Clear () [override], [virtual]
```

Clear.

Implements [gdcm::Value](#).

#### 12.272.4.5 ComputeByteLength()

```
unsigned long gdcm::SequenceOfFragments::ComputeByteLength () const
```

#### 12.272.4.6 ComputeLength()

```
VL gdcm::SequenceOfFragments::ComputeLength () const
```

#### 12.272.4.7 End() [1/2]

```
Iterator gdcm::SequenceOfFragments::End () [inline]
```

Referenced by [Print\(\)](#), and [Write\(\)](#).

#### 12.272.4.8 End() [2/2]

```
ConstIterator gdcm::SequenceOfFragments::End () const [inline]
```

#### 12.272.4.9 GetBuffer()

```
bool gdcm::SequenceOfFragments::GetBuffer (
    char * buffer,
    unsigned long length) const
```

#### 12.272.4.10 GetFragBuffer()

```
bool gdcm::SequenceOfFragments::GetFragBuffer (
    unsigned int fragNb,
    char * buffer,
    unsigned long & length) const
```

#### 12.272.4.11 GetFragment()

```
const Fragment & gdcm::SequenceOfFragments::GetFragment (
    SizeType num) const
```

#### Examples

[DecompressImage.cs](#), [FixBrokenJ2K.cxx](#), and [FixJAIBugJPEGLS.cxx](#).



#### 12.272.4.12 GetLength()

```
VL gdcM::SequenceOfFragments::GetLength () const [inline], [override], [virtual]
```

Returns the SQ length, as read from disk.

Implements [gdcM::Value](#).

#### 12.272.4.13 GetNumberOfFragments()

```
SizeType gdcM::SequenceOfFragments::GetNumberOfFragments () const
```

##### Examples

[FixJAIBugJPEGLS.cxx](#).

#### 12.272.4.14 GetTable() [1/2]

```
BasicOffsetTable & gdcM::SequenceOfFragments::GetTable () [inline]
```

#### 12.272.4.15 GetTable() [2/2]

```
const BasicOffsetTable & gdcM::SequenceOfFragments::GetTable () const [inline]
```

#### 12.272.4.16 New()

```
SmartPointer< SequenceOfFragments > gdcM::SequenceOfFragments::New () [inline], [static]
```

##### Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), and [MpegVideoInfo.cs](#).

References [SequenceOfFragments\(\)](#).

#### 12.272.4.17 operator==( )

```
bool gdcM::SequenceOfFragments::operator== (
    const Value & val) const [inline], [override], [virtual]
```

Implements [gdcM::Value](#).

References [SequenceOfFragments\(\)](#), and [gdcM::Value::Value\(\)](#).

**12.272.4.18 Print()**

```
void gdcM::SequenceOfFragments::Print (
    std::ostream & os) const [inline], [override], [virtual]
```

Reimplemented from [gdcM::Object](#).

References [Begin\(\)](#), and [End\(\)](#).

**12.272.4.19 Read()**

```
template<typename TSwap>
std::istream & gdcM::SequenceOfFragments::Read (
    std::istream & is,
    bool readvalues = true) [inline]
```

References [ReadPreValue\(\)](#), and [ReadValue\(\)](#).

**12.272.4.20 ReadPreValue()**

```
template<typename TSwap>
std::istream & gdcM::SequenceOfFragments::ReadPreValue (
    std::istream & is) [inline]
```

References [gdcMDebugMacro](#).

Referenced by [Read\(\)](#).

**12.272.4.21 ReadValue()**

```
template<typename TSwap>
std::istream & gdcM::SequenceOfFragments::ReadValue (
    std::istream & is,
    bool ) [inline]
```

References [gdcMAssertAlwaysMacro](#), [gdcMDebugMacro](#), [gdcMWarningMacro](#), [gdcM::Tag::GetElement\(\)](#), [gdcM::Tag::GetGroup\(\)](#), [gdcM::ByteValue::GetLength\(\)](#), [gdcM::ByteValue::GetPointer\(\)](#), [gdcM::DataElement::GetTag\(\)](#), [gdcM::DataElement::GetVL\(\)](#), [gdcM::Fragment::Read\(\)](#), [gdcM::Fragment::ReadBacktrack\(\)](#), and [gdcM::Exception::what\(\)](#).

Referenced by [Read\(\)](#).

**12.272.4.22 SetLength()**

```
void gdcM::SequenceOfFragments::SetLength (
    VL length) [inline], [override], [virtual]
```

Sets the actual SQ length.

Implements [gdcM::Value](#).

#### 12.272.4.23 Write()

```
template<typename TSwap>
std::ostream const & gdcm::SequenceOfFragments::Write (
    std::ostream & os) const [inline]
```

References [Begin\(\)](#), [End\(\)](#), [gdcm::Tag::Write\(\)](#), and [gdcm::VL::Write\(\)](#).

#### 12.272.4.24 WriteBuffer()

```
bool gdcm::SequenceOfFragments::WriteBuffer (
    std::ostream & os) const
```

#### Examples

[GetJPEGSamplePrecision.cxx](#).

The documentation for this class was generated from the following file:

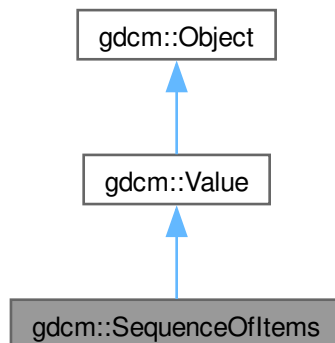
- [gdcmSequenceOfFragments.h](#)

## 12.273 gdcm::SequenceOfItems Class Reference

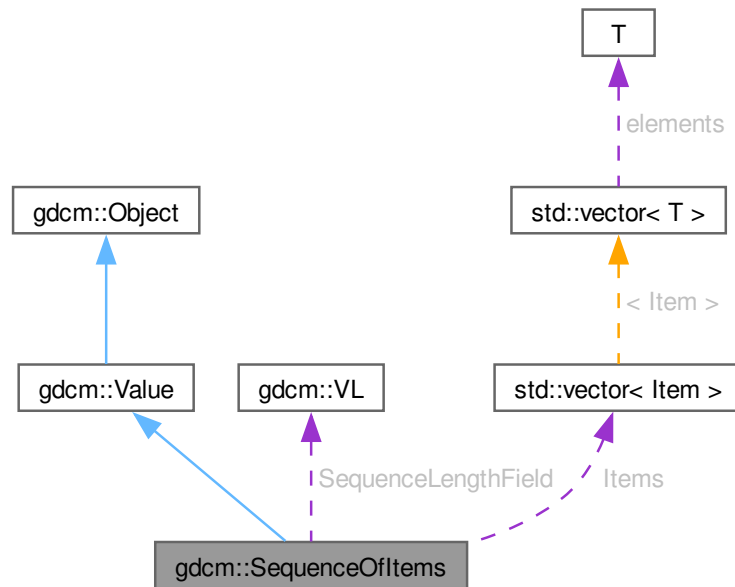
Class to represent a Sequence Of Items.

```
#include <gdcmSequenceOfItems.h>
```

Inheritance diagram for gdcm::SequenceOfItems:



Collaboration diagram for `gdcm::SequenceOfItems`:



## Public Types

- typedef `ItemVector::const_iterator` [ConstIterator](#)
- typedef `std::vector< Item >` [ItemVector](#)
- typedef `ItemVector::iterator` [Iterator](#)
- typedef `ItemVector::size_type` [SizeType](#)

## Public Member Functions

- [SequenceOfItems](#) ()  
*constructor (UndefinedLength by default)*
- void [AddItem](#) ([Item](#) const &item)  
*Appends an [Item](#) to the already added ones.*
- [Item](#) & [AddNewUndefinedLengthItem](#) ()  
*Appends an [Item](#) to the already added ones.*
- [Iterator](#) [Begin](#) ()
- [ConstIterator](#) [Begin](#) () const
- void [Clear](#) () override  
*remove all items within the sequence*
- template<typename TDE>  
  [VL ComputeLength](#) () const
- [Iterator](#) [End](#) ()

- [ConstIterator End](#) () const
- bool [FindDataElement](#) (const [Tag](#) &t) const
- [Item](#) & [GetItem](#) ([SizeType](#) position)
- const [Item](#) & [GetItem](#) ([SizeType](#) position) const
- [VL GetLength](#) () const override  
*Returns the SQ length, as read from disk.*
- [SizeType GetNumberOfItems](#) () const
- bool [IsEmpty](#) () const
- bool [IsUndefinedLength](#) () const  
*return if [Value](#) Length if of undefined length*
- [SequenceOfItems](#) & [operator=](#) (const [SequenceOfItems](#) &val)
- bool [operator==](#) (const [Value](#) &val) const override
- void [Print](#) (std::ostream &os) const override
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is, bool readvalues=true)
- bool [RemoveItemByIndex](#) (const [SizeType](#) index)
- void [SetLength](#) ([VL](#) length) override  
*Sets the actual SQ length.*
- void [SetLengthToUndefined](#) ()  
*Properly set the Sequence of [Item](#) to be undefined length.*
- void [SetNumberOfItems](#) ([SizeType](#) n)
- template<typename TDE, typename TSwap>  
std::ostream const & [Write](#) (std::ostream &os) const

### Public Member Functions inherited from [gdcm::Value](#)

- [Value](#) ()=default
- [~Value](#) () override=default

### Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

### Static Public Member Functions

- static [SmartPointer](#)< [SequenceOfItems](#) > [New](#) ()

### Public Attributes

- [ItemVector Items](#)  
*Vector of Sequence Items.*
- [VL SequenceLengthField](#)  
*Total length of the Sequence (or 0xffffffff if undefined).*

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::Value](#)

- virtual void [SetLengthOnly](#) (VL I)

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### 12.273.1 Detailed Description

Class to represent a Sequence Of Items.

(value representation : SQ)

- a [Value](#) Representation for Data Elements that contains a sequence of Data Sets.
- Sequence of [Item](#) allows for Nested Data Sets

See PS 3.5, 7.4.6 Data [Element Type](#) Within a Sequence

#### Note

SEQUENCE OF ITEMS (VALUE REPRESENTATION SQ) A [Value](#) Representation for Data Elements that contain a sequence of Data Sets. Sequence of Items allows for Nested Data Sets.

#### Examples

[DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSequenceUltrasound.cxx](#), and [ReadExplicitLengthSQIVR.cxx](#).

### 12.273.2 Member Typedef Documentation

#### 12.273.2.1 ConstIterator

```
typedef ItemVector::const_iterator gdcm::SequenceOfItems::ConstIterator
```

#### 12.273.2.2 ItemVector

```
typedef std::vector< Item > gdcm::SequenceOfItems::ItemVector
```

### 12.273.2.3 Iterator

```
typedef ItemVector::iterator gdcmm::SequenceOfItems::Iterator
```

### 12.273.2.4 SizeType

```
typedef ItemVector::size_type gdcmm::SequenceOfItems::SizeType
```

#### Examples

[DumpExamCard.cxx](#), and [DumpGEMSMovieGroup.cxx](#).

## 12.273.3 Constructor & Destructor Documentation

### 12.273.3.1 SequenceOfItems()

```
gdcmm::SequenceOfItems::SequenceOfItems () [inline]
```

constructor (UndefinedLength by default)

References [SequenceLengthField](#).

Referenced by [New\(\)](#), [operator=\(\)](#), and [operator==\(\)](#).

## 12.273.4 Member Function Documentation

### 12.273.4.1 AddItem()

```
void gdcmm::SequenceOfItems::AddItem (  
    Item const & item)
```

Appends an [Item](#) to the already added ones.

#### Examples

[Extracting\\_All\\_Resolution.cxx](#).

### 12.273.4.2 AddNewUndefinedLengthItem()

```
Item & gdcmm::SequenceOfItems::AddNewUndefinedLengthItem ()
```

Appends an [Item](#) to the already added ones.

**12.273.4.3 Begin() [1/2]**

```
Iterator gdcM::SequenceOfItems::Begin () [inline]
```

References [Items](#).

**12.273.4.4 Begin() [2/2]**

```
ConstIterator gdcM::SequenceOfItems::Begin () const [inline]
```

References [Items](#).

**12.273.4.5 Clear()**

```
void gdcM::SequenceOfItems::Clear () [override], [virtual]
```

remove all items within the sequence

Implements [gdcM::Value](#).

**12.273.4.6 ComputeLength()**

```
template<typename TDE>  
VL gdcM::SequenceOfItems::ComputeLength () const
```

**12.273.4.7 End() [1/2]**

```
Iterator gdcM::SequenceOfItems::End () [inline]
```

References [Items](#).

**12.273.4.8 End() [2/2]**

```
ConstIterator gdcM::SequenceOfItems::End () const [inline]
```

References [Items](#).

**12.273.4.9 FindDataElement()**

```
bool gdcM::SequenceOfItems::FindDataElement (  
    const Tag & t) const
```



#### 12.273.4.10 GetItem() [1/2]

```
Item & gdcm::SequenceOfItems::GetItem (
    SizeType position)
```

#### 12.273.4.11 GetItem() [2/2]

```
const Item & gdcm::SequenceOfItems::GetItem (
    SizeType position) const
```

#### Examples

[DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [ExtractEncryptedContent.cxx](#), and [GetSequenceUltrasound.cxx](#).

#### 12.273.4.12 GetLength()

```
VL gdcm::SequenceOfItems::GetLength () const [inline], [override], [virtual]
```

Returns the SQ length, as read from disk.

Implements [gdcm::Value](#).

References [SequenceLengthField](#).

Referenced by [Read\(\)](#).

#### 12.273.4.13 GetNumberOfItems()

```
SizeType gdcm::SequenceOfItems::GetNumberOfItems () const [inline]
```

#### Examples

[DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [ExtractEncryptedContent.cxx](#), and [GetSequenceUltrasound.cxx](#).

References [Items](#).

#### 12.273.4.14 IsEmpty()

```
bool gdcm::SequenceOfItems::IsEmpty () const [inline]
```

References [Items](#).

#### 12.273.4.15 IsUndefinedLength()

```
bool gdcm::SequenceOfItems::IsUndefinedLength () const [inline]
```

return if [Value](#) Length if of undefined length

References [SequenceLengthField](#).

#### 12.273.4.16 New()

```
SmartPointer< SequenceOfItems > gdcm::SequenceOfItems::New () [inline], [static]
```

Examples

[NewSequence.cs](#).

References [SequenceOfItems\(\)](#).

#### 12.273.4.17 operator=()

```
SequenceOfItems & gdcm::SequenceOfItems::operator= (
    const SequenceOfItems & val) [inline]
```

References [SequenceOfItems\(\)](#), [Items](#), and [SequenceLengthField](#).

#### 12.273.4.18 operator==()

```
bool gdcm::SequenceOfItems::operator== (
    const Value & val) const [inline], [override], [virtual]
```

Implements [gdcm::Value](#).

References [SequenceOfItems\(\)](#), [gdcm::Value::Value\(\)](#), [Items](#), and [SequenceLengthField](#).

#### 12.273.4.19 Print()

```
void gdcm::SequenceOfItems::Print (
    std::ostream & os) const [inline], [override], [virtual]
```

Reimplemented from [gdcm::Object](#).

References [Items](#), and [SequenceLengthField](#).

#### 12.273.4.20 Read()

```
template<typename TDE, typename TSwap>
std::istream & gdcm::SequenceOfItems::Read (
    std::istream & is,
    bool readvalues = true) [inline]
```

References [gdcm::Item::Clear\(\)](#), [gdcmDebugMacro](#), [gdcmWarningMacro](#), [gdcm::Exception::GetDescription\(\)](#), [GetLength\(\)](#), [gdcm::Item::GetNestedDataSet\(\)](#), [gdcm::DataElement::GetTag\(\)](#), [gdcm::DataElement::GetVL\(\)](#), [Items](#), [gdcm::Item::Read\(\)](#), [SequenceLengthField](#), and [gdcm::DataSet::Size\(\)](#).

#### 12.273.4.21 RemoveItemByIndex()

```
bool gdcm::SequenceOfItems::RemoveItemByIndex (
    const SizeType index)
```

Remove an [Item](#) as specified by its index, if index > size, false is returned Index starts at 1 not 0

#### 12.273.4.22 SetLength()

```
void gdcm::SequenceOfItems::SetLength (
    VL length) [inline], [override], [virtual]
```

Sets the actual SQ length.

Implements [gdcm::Value](#).

References [SequenceLengthField](#).

#### 12.273.4.23 SetLengthToUndefined()

```
void gdcm::SequenceOfItems::SetLengthToUndefined ()
```

Properly set the Sequence of [Item](#) to be undefined length.

#### 12.273.4.24 SetNumberOfItems()

```
void gdcm::SequenceOfItems::SetNumberOfItems (
    SizeType n) [inline]
```

References [Items](#).

### 12.273.4.25 Write()

```
template<typename TDE, typename TSwap>
std::ostream const & gdcM::SequenceOfItems::Write (
    std::ostream & os) const [inline]
```

References [Items](#), [SequenceLengthField](#), [gdcM::Tag::Write\(\)](#), and [gdcM::VL::Write\(\)](#).

## 12.273.5 Member Data Documentation

### 12.273.5.1 Items

[ItemVector](#) [gdcM::SequenceOfItems::Items](#)

Vector of Sequence Items.

Referenced by [Begin\(\)](#), [Begin\(\)](#), [End\(\)](#), [End\(\)](#), [GetNumberOfItems\(\)](#), [IsEmpty\(\)](#), [operator=\(\)](#), [operator==\(\)](#), [Print\(\)](#), [Read\(\)](#), [SetNumberOfItems\(\)](#), and [Write\(\)](#).

### 12.273.5.2 SequenceLengthField

[VL](#) [gdcM::SequenceOfItems::SequenceLengthField](#)

Total length of the Sequence (or 0xffffffff) if undefined.

Referenced by [SequenceOfItems\(\)](#), [GetLength\(\)](#), [IsUndefinedLength\(\)](#), [operator=\(\)](#), [operator==\(\)](#), [Print\(\)](#), [Read\(\)](#), [SetLength\(\)](#), and [Write\(\)](#).

The documentation for this class was generated from the following file:

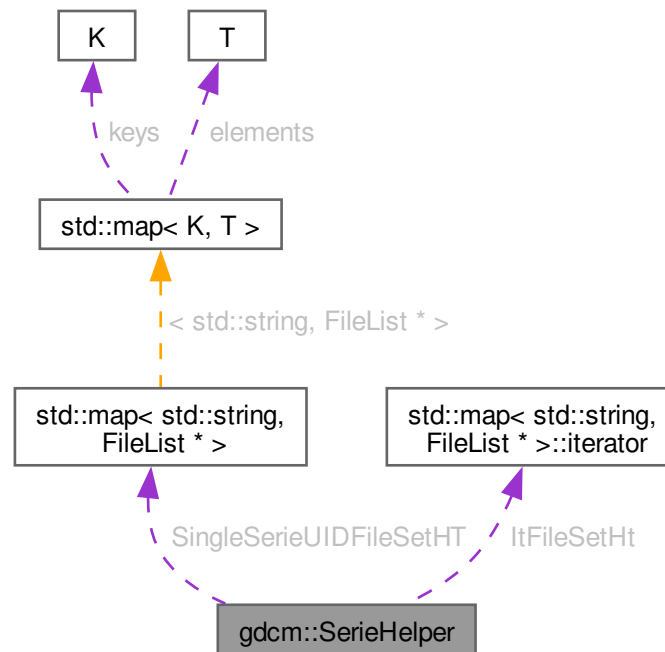
- [gdcMSequenceOfItems.h](#)

## 12.274 gdcM::SerieHelper Class Reference

[SerieHelper](#) DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.

```
#include <gdcMSerieHelper.h>
```

Collaboration diagram for gdcm::SerieHelper:



## Public Member Functions

- [SerieHelper](#) ()
- [~SerieHelper](#) ()
- void [AddRestriction](#) (const std::string &tag)
- void [AddRestriction](#) (uint16\_t group, uint16\_t elem, std::string const &value, int op)
- void [Clear](#) ()
- void [CreateDefaultUniqueSeriesIdentifier](#) ()
- std::string [CreateUniqueSeriesIdentifier](#) ([File](#) \*inFile)
- [FileList](#) \* [GetFirstSingleSerieUIDFileSet](#) ()
- [FileList](#) \* [GetNextSingleSerieUIDFileSet](#) ()
- void [OrderFileList](#) ([FileList](#) \*fileSet)
- void [SetDirectory](#) (std::string const &dir, bool recursive=false)
- void [SetLoadMode](#) (int)
- void [SetUseSeriesDetails](#) (bool useSeriesDetails)

## Protected Types

- using [Rule](#)
- typedef std::vector< [Rule](#) > [SerieRestrictions](#)
- typedef std::map< std::string, [FileList](#) \* > [SingleSerieUIDFileSetmap](#)

### Protected Member Functions

- bool [AddFile](#) ([FileWithName](#) &header)
- void [AddFileName](#) (std::string const &filename)
- void [AddRestriction](#) (const [Tag](#) &tag)
- bool [FileNameOrdering](#) ([FileList](#) \*fileList)
- bool [ImageNumberOrdering](#) ([FileList](#) \*fileList)
- bool [ImagePositionPatientOrdering](#) ([FileList](#) \*fileSet)
- bool [UserOrdering](#) ([FileList](#) \*fileSet)

### Protected Attributes

- [SingleSerieUIDFileSetmap::iterator](#) [ItFileSetHt](#)
- [SingleSerieUIDFileSetmap](#) [SingleSerieUIDFileSetHT](#)

## 12.274.1 Detailed Description

[SerieHelper](#) DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.

Instead see [ImageHelper](#) or [IPPSorter](#)

## 12.274.2 Member Typedef Documentation

### 12.274.2.1 Rule

```
using gdcml::SerieHelper::Rule [protected]
```

Initial value:

```
struct RuleStructure{
    uint16_t group;
    uint16_t elem;
    std::string value;
    int op;
}
```

### 12.274.2.2 SerieRestrictions

```
typedef std::vector<Rule> gdcml::SerieHelper::SerieRestrictions [protected]
```

### 12.274.2.3 SingleSerieUIDFileSetmap

```
typedef std::map<std::string, FileList *> gdcml::SerieHelper::SingleSerieUIDFileSetmap [protected]
```

## 12.274.3 Constructor & Destructor Documentation

### 12.274.3.1 SerieHelper()

```
gdcm::SerieHelper::SerieHelper ()
```

### 12.274.3.2 ~SerieHelper()

```
gdcm::SerieHelper::~~SerieHelper ()
```

## 12.274.4 Member Function Documentation

### 12.274.4.1 AddFile()

```
bool gdcm::SerieHelper::AddFile (
    FileWithName & header) [protected]
```

### 12.274.4.2 AddFileName()

```
void gdcm::SerieHelper::AddFileName (
    std::string const & filename) [protected]
```

### 12.274.4.3 AddRestriction() [1/3]

```
void gdcm::SerieHelper::AddRestriction (
    const std::string & tag)
```

### 12.274.4.4 AddRestriction() [2/3]

```
void gdcm::SerieHelper::AddRestriction (
    const Tag & tag) [protected]
```

### 12.274.4.5 AddRestriction() [3/3]

```
void gdcm::SerieHelper::AddRestriction (
    uint16_t group,
    uint16_t elem,
    std::string const & value,
    int op)
```

**12.274.4.6 Clear()**

```
void gdcm::SerieHelper::Clear ()
```

**12.274.4.7 CreateDefaultUniqueSeriesIdentifier()**

```
void gdcm::SerieHelper::CreateDefaultUniqueSeriesIdentifier ()
```

**12.274.4.8 CreateUniqueSeriesIdentifier()**

```
std::string gdcm::SerieHelper::CreateUniqueSeriesIdentifier (  
    File * inFile)
```

**12.274.4.9 FileNameOrdering()**

```
bool gdcm::SerieHelper::FileNameOrdering (  
    FileList * fileList) [protected]
```

**12.274.4.10 GetFirstSingleSerieUIDFileSet()**

```
FileList * gdcm::SerieHelper::GetFirstSingleSerieUIDFileSet ()
```

**12.274.4.11 GetNextSingleSerieUIDFileSet()**

```
FileList * gdcm::SerieHelper::GetNextSingleSerieUIDFileSet ()
```

**12.274.4.12 ImageNumberOrdering()**

```
bool gdcm::SerieHelper::ImageNumberOrdering (  
    FileList * fileList) [protected]
```

**12.274.4.13 ImagePositionPatientOrdering()**

```
bool gdcm::SerieHelper::ImagePositionPatientOrdering (  
    FileList * fileSet) [protected]
```

**12.274.4.14 OrderFileList()**

```
void gdcm::SerieHelper::OrderFileList (  
    FileList * fileSet)
```



#### 12.274.4.15 SetDirectory()

```
void gdcm::SerieHelper::SetDirectory (
    std::string const & dir,
    bool recursive = false)
```

#### 12.274.4.16 SetLoadMode()

```
void gdcm::SerieHelper::SetLoadMode (
    int ) [inline]
```

#### 12.274.4.17 SetUseSeriesDetails()

```
void gdcm::SerieHelper::SetUseSeriesDetails (
    bool useSeriesDetails)
```

#### 12.274.4.18 UserOrdering()

```
bool gdcm::SerieHelper::UserOrdering (
    FileList * fileSet) [protected]
```

### 12.274.5 Member Data Documentation

#### 12.274.5.1 ItFileSetHt

```
SingleSerieUIDFileSetmap::iterator gdcm::SerieHelper::ItFileSetHt [protected]
```

#### 12.274.5.2 SingleSerieUIDFileSetHT

```
SingleSerieUIDFileSetmap gdcm::SerieHelper::SingleSerieUIDFileSetHT [protected]
```

The documentation for this class was generated from the following file:

- [gdcmSerieHelper.h](#)

## 12.275 gdcm::Series Class Reference

[Series](#).

```
#include <gdcmSeries.h>
```

## Public Member Functions

- [Series](#) ()=default

### 12.275.1 Detailed Description

[Series](#).

### 12.275.2 Constructor & Destructor Documentation

#### 12.275.2.1 Series()

```
gdcm::Series::Series () [default]
```

The documentation for this class was generated from the following file:

- [gdcmSeries.h](#)

## 12.276 gdcm::network::ServiceClassApplicationInformation Class Reference

```
#include <gdcmServiceClassApplicationInformation.h>
```

## Public Member Functions

- [ServiceClassApplicationInformation](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetTuple](#) (uint8\_t levelofsupport, uint8\_t levelofdigitalsig, uint8\_t elementcoercion)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.276.1 Detailed Description

PS 3.4 [Table B.3-1](#) SERVICE-CLASS-APPLICATION-INFORMATION (A-ASSOCIATE-RQ)

### 12.276.2 Constructor & Destructor Documentation

#### 12.276.2.1 ServiceClassApplicationInformation()

```
gdcm::network::ServiceClassApplicationInformation::ServiceClassApplicationInformation ()
```

## 12.276.3 Member Function Documentation

### 12.276.3.1 Print()

```
void gdcm::network::ServiceClassApplicationInformation::Print (  
    std::ostream & os) const
```

### 12.276.3.2 Read()

```
std::istream & gdcm::network::ServiceClassApplicationInformation::Read (  
    std::istream & is)
```

### 12.276.3.3 SetTuple()

```
void gdcm::network::ServiceClassApplicationInformation::SetTuple (  
    uint8_t levelofsupport,  
    uint8_t levelofdigitalsig,  
    uint8_t elementcoercion)
```

### 12.276.3.4 Size()

```
size_t gdcm::network::ServiceClassApplicationInformation::Size () const
```

### 12.276.3.5 Write()

```
const std::ostream & gdcm::network::ServiceClassApplicationInformation::Write (  
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

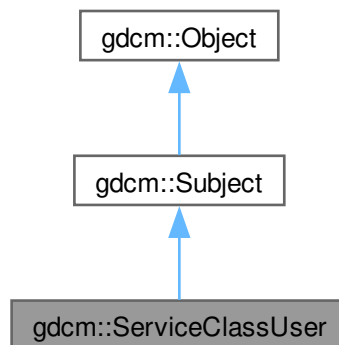
- [gdcmServiceClassApplicationInformation.h](#)

## 12.277 gdcmm::ServiceClassUser Class Reference

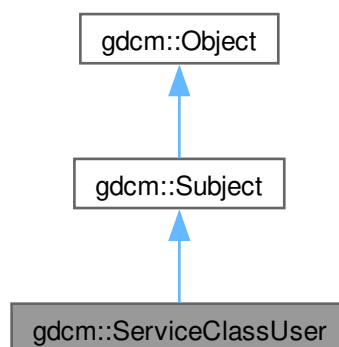
[ServiceClassUser](#).

```
#include <gdcmmServiceClassUser.h>
```

Inheritance diagram for gdcmm::ServiceClassUser:



Collaboration diagram for gdcmm::ServiceClassUser:



## Public Member Functions

- [ServiceClassUser](#) ()
- [ServiceClassUser](#) (const [ServiceClassUser](#) &)=delete
- [~ServiceClassUser](#) () override
- const char \* [GetAETitle](#) () const
- const char \* [GetCalledAETitle](#) () const
- double [GetTimeout](#) () const
- bool [InitializeConnection](#) ()
- bool [IsPresentationContextAccepted](#) (const [PresentationContext](#) &pc) const  
*Return if the passed in presentation was accepted during association negotiation.*
- void [operator=](#) (const [ServiceClassUser](#) &)=delete
- bool [SendEcho](#) ()  
*C-ECHO.*
- bool [SendFind](#) (const [BaseRootQuery](#) \*query, std::vector< [DataSet](#) > &retDatasets)  
*C-FIND a query, return result are in retDatasets.*
- bool [SendMove](#) (const [BaseRootQuery](#) \*query, const char \*outputdir)  
*Execute a C-MOVE, based on query, return files are written in outputdir.*
- bool [SendMove](#) (const [BaseRootQuery](#) \*query, std::vector< [DataSet](#) > &retDatasets)  
*Execute a C-MOVE, based on query, returned dataset are Implicit.*
- bool [SendMove](#) (const [BaseRootQuery](#) \*query, std::vector< [File](#) > &retFile)  
*Execute a C-MOVE, based on query, returned Files are stored in vector.*
- bool [SendStore](#) (const char \*filename)  
*Execute a C-STORE on file on disk, named filename.*
- bool [SendStore](#) ([DataSet](#) const &ds)  
*Execute a C-STORE on a DataSet, the transfer syntax used will be Implicit.*
- bool [SendStore](#) ([File](#) const &file)
- void [SetAETitle](#) (const char \*aetitle)  
*set calling ae title*
- void [SetCalledAETitle](#) (const char \*aetitle)  
*set called ae title*
- void [SetHostname](#) (const char \*hostname)  
*Set the name of the called hostname (hostname or IP address).*
- void [SetPort](#) (uint16\_t port)  
*Set port of remote host (called application).*
- void [SetPortSCP](#) (uint16\_t portscp)  
*Set the port for any incoming C-STORE-SCP operation (typically in a return of C-MOVE).*
- void [SetPresentationContexts](#) (std::vector< [PresentationContext](#) > const &pcs)  
*Set the Presentation Context used for the Association.*
- void [SetTimeout](#) (double t)  
*set/get Timeout*
- bool [StartAssociation](#) ()  
*Start the association. Need to call SetPresentationContexts before.*
- bool [StopAssociation](#) ()  
*Stop the running association.*

## Public Member Functions inherited from [gdcm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Static Public Member Functions

- static [SmartPointer](#)< [ServiceClassUser](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## 12.277.1 Detailed Description

[ServiceClassUser](#).

### Examples

[CStoreQtProgress.cxx](#).

## 12.277.2 Constructor & Destructor Documentation

### 12.277.2.1 ServiceClassUser() [1/2]

```
gdcm::ServiceClassUser::ServiceClassUser ()
```

Construct a SCU with default:

- hostname = localhost
- port = 104

Referenced by [ServiceClassUser\(\)](#), [New\(\)](#), and [operator=\(\)](#).

### 12.277.2.2 ~ServiceClassUser()

```
gdcm::ServiceClassUser::~~ServiceClassUser () [override]
```

### 12.277.2.3 ServiceClassUser() [2/2]

```
gdcm::ServiceClassUser::ServiceClassUser (  
    const ServiceClassUser & ) [delete]
```

References [ServiceClassUser\(\)](#).

## 12.277.3 Member Function Documentation

### 12.277.3.1 GetAETitle()

```
const char * gdcm::ServiceClassUser::GetAETitle () const
```

### 12.277.3.2 GetCalledAETitle()

```
const char * gdcm::ServiceClassUser::GetCalledAETitle () const
```

### 12.277.3.3 GetTimeout()

```
double gdcm::ServiceClassUser::GetTimeout () const
```

#### 12.277.3.4 InitializeConnection()

```
bool gdcm::ServiceClassUser::InitializeConnection ()
```

Will try to connect This will setup the actual timeout used during the whole connection time. Need to call SetTimeout first

##### Examples

[CStoreQtProgress.cxx](#).

#### 12.277.3.5 IsPresentationContextAccepted()

```
bool gdcm::ServiceClassUser::IsPresentationContextAccepted (  
    const PresentationContext & pc) const
```

Return if the passed in presentation was accepted during association negotiation.

#### 12.277.3.6 New()

```
SmartPointer< ServiceClassUser > gdcm::ServiceClassUser::New () [inline], [static]
```

for wrapped language: instantiate a reference counted object

References [ServiceClassUser\(\)](#).

#### 12.277.3.7 operator=()

```
void gdcm::ServiceClassUser::operator= (  
    const ServiceClassUser & ) [delete]
```

References [ServiceClassUser\(\)](#).

#### 12.277.3.8 SendEcho()

```
bool gdcm::ServiceClassUser::SendEcho ()
```

C-ECHO.

#### 12.277.3.9 SendFind()

```
bool gdcm::ServiceClassUser::SendFind (  
    const BaseRootQuery * query,  
    std::vector< DataSet > & retDatasets)
```

C-FIND a query, return result are in retDatasets.



**12.277.3.10 SendMove()** [1/3]

```
bool gdcmm::ServiceClassUser::SendMove (
    const BaseRootQuery * query,
    const char * outputdir)
```

Execute a C-MOVE, based on query, return files are written in outputdir.

**12.277.3.11 SendMove()** [2/3]

```
bool gdcmm::ServiceClassUser::SendMove (
    const BaseRootQuery * query,
    std::vector< DataSet > & retDatasets)
```

Execute a C-MOVE, based on query, returned dataset are Implicit.

**12.277.3.12 SendMove()** [3/3]

```
bool gdcmm::ServiceClassUser::SendMove (
    const BaseRootQuery * query,
    std::vector< File > & retFile)
```

Execute a C-MOVE, based on query, returned Files are stored in vector.

**12.277.3.13 SendStore()** [1/3]

```
bool gdcmm::ServiceClassUser::SendStore (
    const char * filename)
```

Execute a C-STORE on file on disk, named filename.

**Examples**

[CStoreQtProgress.cxx](#).

**12.277.3.14 SendStore()** [2/3]

```
bool gdcmm::ServiceClassUser::SendStore (
    DataSet const & ds)
```

Execute a C-STORE on a [DataSet](#), the transfer syntax used will be Implicit.

**12.277.3.15 SendStore()** [3/3]

```
bool gdcm::ServiceClassUser::SendStore (
    File const & file)
```

Execute a C-STORE on a [File](#), the transfer syntax used for the query is based on the file.

**12.277.3.16 SetAETitle()**

```
void gdcm::ServiceClassUser::SetAETitle (
    const char * aetitle)
```

set calling ae title

**12.277.3.17 SetCalledAETitle()**

```
void gdcm::ServiceClassUser::SetCalledAETitle (
    const char * aetitle)
```

set called ae title

**Examples**

[CStoreQtProgress.cxx](#).

**12.277.3.18 SetHostname()**

```
void gdcm::ServiceClassUser::SetHostname (
    const char * hostname)
```

Set the name of the called hostname (hostname or IP address).

**Examples**

[CStoreQtProgress.cxx](#).

**12.277.3.19 SetPort()**

```
void gdcm::ServiceClassUser::SetPort (
    uint16_t port)
```

Set port of remote host (called application).

**Examples**

[CStoreQtProgress.cxx](#).

### 12.277.3.20 SetPortSCP()

```
void gdcm::ServiceClassUser::SetPortSCP (
    uint16_t portscp)
```

Set the port for any incoming C-STORE-SCP operation (typically in a return of C-MOVE).

### 12.277.3.21 SetPresentationContexts()

```
void gdcm::ServiceClassUser::SetPresentationContexts (
    std::vector< PresentationContext > const & pcs)
```

Set the Presentation Context used for the Association.

#### Examples

[CStoreQtProgress.cxx](#).

### 12.277.3.22 SetTimeout()

```
void gdcm::ServiceClassUser::SetTimeout (
    double t)
```

set/get Timeout

#### Examples

[CStoreQtProgress.cxx](#).

### 12.277.3.23 StartAssociation()

```
bool gdcm::ServiceClassUser::StartAssociation ()
```

Start the association. Need to call SetPresentationContexts before.

#### Examples

[CStoreQtProgress.cxx](#).

### 12.277.3.24 StopAssociation()

```
bool gdcmm::ServiceClassUser::StopAssociation ()
```

Stop the running association.

#### Examples

[CStoreQtProgress.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmmServiceClassUser.h](#)

## 12.278 gdcmm::SHA1 Class Reference

Class for [SHA1](#).

```
#include <gdcmmSHA1.h>
```

### Public Member Functions

- [SHA1](#) ()
- [SHA1](#) (const [SHA1](#) &)=delete
- [~SHA1](#) ()
- void [operator=](#) (const [SHA1](#) &)=delete

### Static Public Member Functions

- static bool [Compute](#) (const char \*buffer, unsigned long buf\_len, char digest\_str[20 \*2+1])
- static bool [ComputeFile](#) (const char \*filename, char digest\_str[20 \*2+1])

### 12.278.1 Detailed Description

Class for [SHA1](#).

#### Warning

this class is able to pick from one implementation:

1. the one from OpenSSL (when GDCM\_USE\_SYSTEM\_OPENSSL is turned ON)

In all other cases it will return an error

## 12.278.2 Constructor & Destructor Documentation

### 12.278.2.1 SHA1() [1/2]

```
gdcm::SHA1::SHA1 ()
```

Referenced by [SHA1\(\)](#), and [operator=\(\)](#).

### 12.278.2.2 ~SHA1()

```
gdcm::SHA1::~~SHA1 ()
```

### 12.278.2.3 SHA1() [2/2]

```
gdcm::SHA1::SHA1 (  
    const SHA1 & ) [delete]
```

References [SHA1\(\)](#).

## 12.278.3 Member Function Documentation

### 12.278.3.1 Compute()

```
bool gdcm::SHA1::Compute (  
    const char * buffer,  
    unsigned long buf_len,  
    char digest_str[20 *2+1]) [static]
```

### 12.278.3.2 ComputeFile()

```
bool gdcm::SHA1::ComputeFile (  
    const char * filename,  
    char digest_str[20 *2+1]) [static]
```

### 12.278.3.3 operator=()

```
void gdcm::SHA1::operator= (  
    const SHA1 & ) [delete]
```

References [SHA1\(\)](#).

The documentation for this class was generated from the following file:

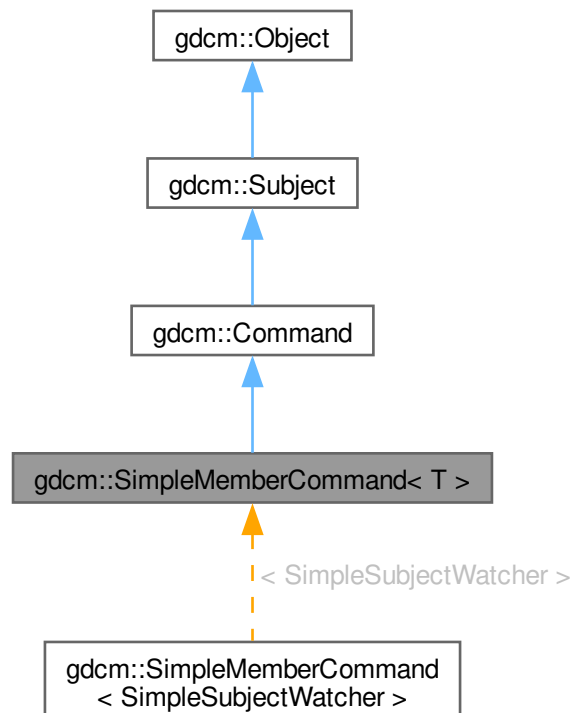
- [gdcmSHA1.h](#)

## 12.279 gdcM::SimpleMemberCommand< T > Class Template Reference

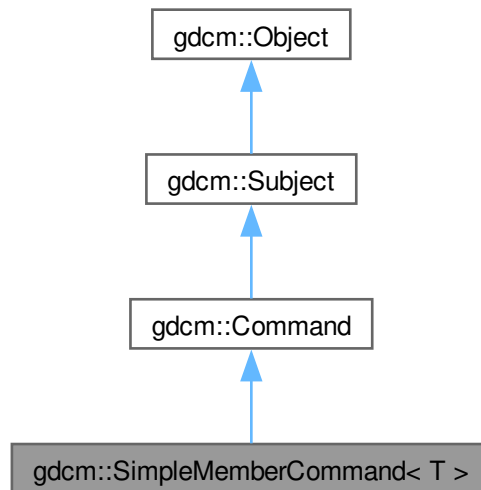
[Command](#) subclass that calls a pointer to a member function.

```
#include <gdcMCommand.h>
```

Inheritance diagram for gdcM::SimpleMemberCommand< T >:



Collaboration diagram for gdcm::SimpleMemberCommand< T >:



### Public Types

- typedef `SimpleMemberCommand Self`
- typedef `void(T::* TMemberFunctionPointer) ()`

### Public Member Functions

- `SimpleMemberCommand (const Self &)=delete`
- `void Execute (const Subject *, const Event &) override`
- `void Execute (Subject *, const Event &) override`
- `void operator= (const Self &)=delete`
- `void SetCallbackFunction (T *object, TMemberFunctionPointer memberFunction)`

### Public Member Functions inherited from `gdcm::Command`

- `Command (const Command &)=delete`
- `void operator= (const Command &)=delete`

### Public Member Functions inherited from [gdcm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

### Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

### Static Public Member Functions

- static [SmartPointer](#)< [SimpleMemberCommand](#) > [New](#) ()

### Protected Member Functions

- [SimpleMemberCommand](#) ()
- [~SimpleMemberCommand](#) () override=default

### Protected Member Functions inherited from [gdcm::Command](#)

- [Command](#) ()
- [~Command](#) () override

### Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### Protected Attributes

- [TMemberFunctionPointer](#) [m\\_MemberFunction](#)
- T \* [m\\_This](#)



## 12.279.1 Detailed Description

```
template<typename T>
class gdcmm::SimpleMemberCommand< T >
```

[Command](#) subclass that calls a pointer to a member function.

[SimpleMemberCommand](#) calls a pointer to a member function with no arguments.

## 12.279.2 Member Typedef Documentation

### 12.279.2.1 Self

```
template<typename T>
typedef SimpleMemberCommand gdcmm::SimpleMemberCommand< T >::Self
```

Standard class typedefs.

### 12.279.2.2 TMemberFunctionPointer

```
template<typename T>
typedef void(T::* gdcmm::SimpleMemberCommand< T >::TMemberFunctionPointer) ()
```

A method callback.

## 12.279.3 Constructor & Destructor Documentation

### 12.279.3.1 SimpleMemberCommand() [1/2]

```
template<typename T>
gdcmm::SimpleMemberCommand< T >::SimpleMemberCommand (
    const Self & ) [delete]
```

### 12.279.3.2 SimpleMemberCommand() [2/2]

```
template<typename T>
gdcmm::SimpleMemberCommand< T >::SimpleMemberCommand () [inline], [protected]
```

### 12.279.3.3 ~SimpleMemberCommand()

```
template<typename T>
gdcmm::SimpleMemberCommand< T >::~~SimpleMemberCommand () [override], [protected], [default]
```

## 12.279.4 Member Function Documentation

### 12.279.4.1 Execute() [1/2]

```
template<typename T>
void gdcm::SimpleMemberCommand< T >::Execute (
    const Subject * caller,
    const Event & event) [inline], [override], [virtual]
```

Abstract method that defines the action to be taken by the command. This variant is expected to be used when requests comes from a const [Object](#)

Implements [gdcm::Command](#).

### 12.279.4.2 Execute() [2/2]

```
template<typename T>
void gdcm::SimpleMemberCommand< T >::Execute (
    Subject * ,
    const Event & ) [inline], [override], [virtual]
```

Invoke the callback function.

Implements [gdcm::Command](#).

### 12.279.4.3 New()

```
template<typename T>
SmartPointer< SimpleMemberCommand > gdcm::SimpleMemberCommand< T >::New () [inline], [static]
```

Run-time type information (and related methods). Method for creation through the object factory.

### 12.279.4.4 operator=()

```
template<typename T>
void gdcm::SimpleMemberCommand< T >::operator= (
    const Self & ) [delete]
```

### 12.279.4.5 SetCallbackFunction()

```
template<typename T>
void gdcm::SimpleMemberCommand< T >::SetCallbackFunction (
    T * object,
    TMemberFunctionPointer memberFunction) [inline]
```

Specify the callback function.

## 12.279.5 Member Data Documentation

### 12.279.5.1 m\_MemberFunction

```
template<typename T>
TMemberFunctionPointer gdcm::SimpleMemberCommand< T >::m_MemberFunction [protected]
```

### 12.279.5.2 m\_This

```
template<typename T>
T* gdcm::SimpleMemberCommand< T >::m_This [protected]
```

The documentation for this class was generated from the following file:

- [gdcmCommand.h](#)

## 12.280 gdcm::SimpleSubjectWatcher Class Reference

[SimpleSubjectWatcher](#).

```
#include <gdcmSimpleSubjectWatcher.h>
```

### Public Member Functions

- [SimpleSubjectWatcher](#) (const SimpleSubjectWatcher &)=delete
- [SimpleSubjectWatcher](#) (Subject \*s, const char \*comment="")
- virtual [~SimpleSubjectWatcher](#) ()
- void [operator=](#) (const [SimpleSubjectWatcher](#) &)=delete

### Protected Member Functions

- virtual void [EndFilter](#) ()
- virtual void [ShowAbort](#) ()
- virtual void [ShowAnonymization](#) (Subject \*caller, const [Event](#) &evt)
- virtual void [ShowData](#) (Subject \*caller, const [Event](#) &evt)
- virtual void [ShowDataSet](#) (Subject \*caller, const [Event](#) &evt)
- virtual void [ShowFileName](#) (Subject \*caller, const [Event](#) &evt)
- virtual void [ShowIteration](#) ()
- virtual void [ShowProgress](#) (Subject \*caller, const [Event](#) &evt)
- virtual void [StartFilter](#) ()
- void [TestAbortOff](#) ()
- void [TestAbortOn](#) ()

## 12.280.1 Detailed Description

[SimpleSubjectWatcher](#).

This is a typical [Subject](#) Watcher class. It will observe all events.

### Examples

[BasicAnonymizer.cs](#), [CStoreQtProgress.cxx](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

## 12.280.2 Constructor & Destructor Documentation

### 12.280.2.1 SimpleSubjectWatcher() [1/2]

```
gdcmm::SimpleSubjectWatcher::SimpleSubjectWatcher (
    Subject * s,
    const char * comment = "")
```

Referenced by [SimpleSubjectWatcher\(\)](#), and [operator=\(\)](#).

### 12.280.2.2 ~SimpleSubjectWatcher()

```
virtual gdcmm::SimpleSubjectWatcher::~~SimpleSubjectWatcher () [virtual]
```

### 12.280.2.3 SimpleSubjectWatcher() [2/2]

```
gdcmm::SimpleSubjectWatcher::SimpleSubjectWatcher (
    const SimpleSubjectWatcher & ) [delete]
```

References [SimpleSubjectWatcher\(\)](#).

## 12.280.3 Member Function Documentation

### 12.280.3.1 EndFilter()

```
virtual void gdcmm::SimpleSubjectWatcher::EndFilter () [protected], [virtual]
```

### 12.280.3.2 operator=()

```
void gdcmm::SimpleSubjectWatcher::operator= (
    const SimpleSubjectWatcher & ) [delete]
```

References [SimpleSubjectWatcher\(\)](#).

### 12.280.3.3 ShowAbort()

```
virtual void gdcm::SimpleSubjectWatcher::ShowAbort () [protected], [virtual]
```

### 12.280.3.4 ShowAnonymization()

```
virtual void gdcm::SimpleSubjectWatcher::ShowAnonymization (  
    Subject * caller,  
    const Event & evt) [protected], [virtual]
```

### 12.280.3.5 ShowData()

```
virtual void gdcm::SimpleSubjectWatcher::ShowData (  
    Subject * caller,  
    const Event & evt) [protected], [virtual]
```

### 12.280.3.6 ShowDataSet()

```
virtual void gdcm::SimpleSubjectWatcher::ShowDataSet (  
    Subject * caller,  
    const Event & evt) [protected], [virtual]
```

### 12.280.3.7 ShowFileName()

```
virtual void gdcm::SimpleSubjectWatcher::ShowFileName (  
    Subject * caller,  
    const Event & evt) [protected], [virtual]
```

## Examples

[SimpleScanner.cxx](#).

### 12.280.3.8 ShowIteration()

```
virtual void gdcm::SimpleSubjectWatcher::ShowIteration () [protected], [virtual]
```

### 12.280.3.9 ShowProgress()

```
virtual void gdcm::SimpleSubjectWatcher::ShowProgress (  
    Subject * caller,  
    const Event & evt) [protected], [virtual]
```

### 12.280.3.10 StartFilter()

```
virtual void gdcm::SimpleSubjectWatcher::StartFilter () [protected], [virtual]
```

### 12.280.3.11 TestAbortOff()

```
void gdcm::SimpleSubjectWatcher::TestAbortOff () [protected]
```

### 12.280.3.12 TestAbortOn()

```
void gdcm::SimpleSubjectWatcher::TestAbortOn () [protected]
```

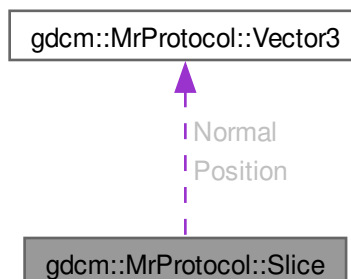
The documentation for this class was generated from the following file:

- [gdcmSimpleSubjectWatcher.h](#)

## 12.281 gdcm::MrProtocol::Slice Struct Reference

```
#include <gdcmMrProtocol.h>
```

Collaboration diagram for gdcm::MrProtocol::Slice:



### Public Attributes

- [Vector3 Normal](#)
- [Vector3 Position](#)

## 12.281.1 Member Data Documentation

### 12.281.1.1 Normal

`Vector3` `gdcm::MrProtocol::Slice::Normal`

### 12.281.1.2 Position

`Vector3` `gdcm::MrProtocol::Slice::Position`

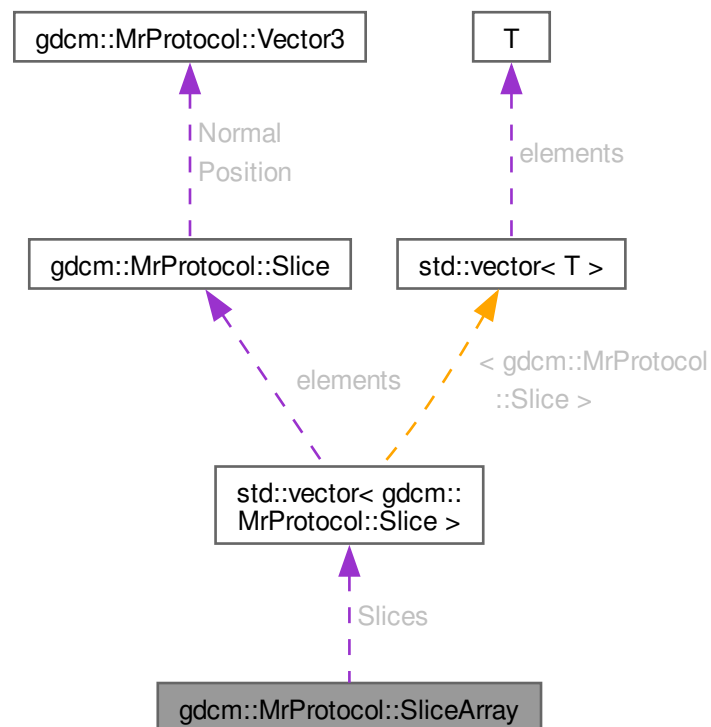
The documentation for this struct was generated from the following file:

- [gdcmMrProtocol.h](#)

## 12.282 gdcm::MrProtocol::SliceArray Struct Reference

```
#include <gdcmMrProtocol.h>
```

Collaboration diagram for `gdcm::MrProtocol::SliceArray`:



**Public Attributes**

- `std::vector< Slice > Slices`

**12.282.1 Member Data Documentation****12.282.1.1 Slices**

```
std::vector< Slice > gdcM::MrProtocol::SliceArray::Slices
```

The documentation for this struct was generated from the following file:

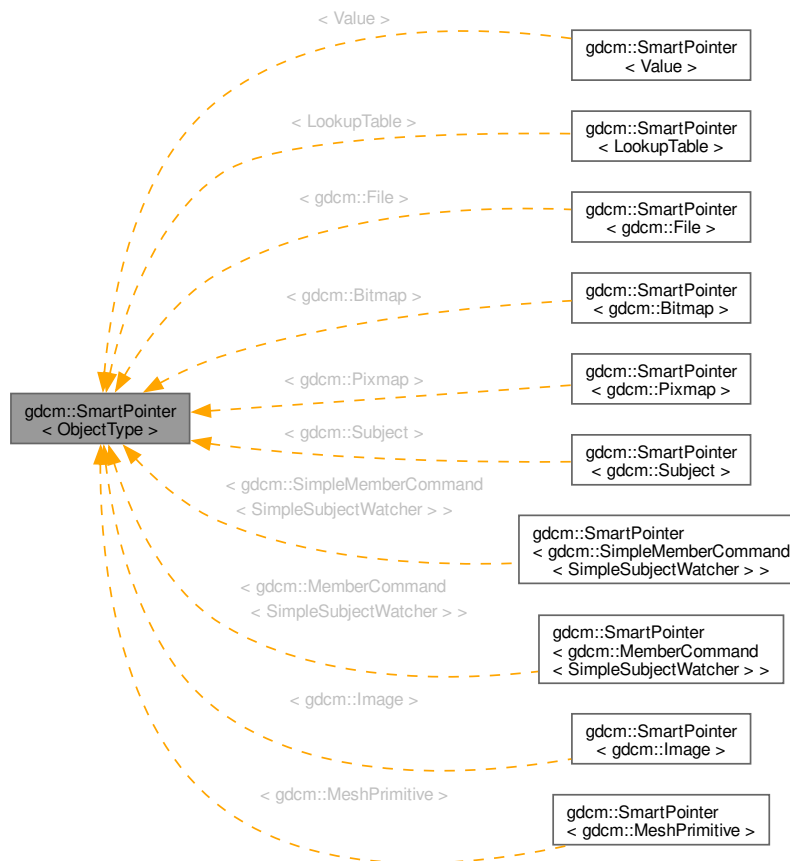
- [gdcMMrProtocol.h](#)

**12.283 `gdcM::SmartPointer< ObjectType >` Class Template Reference**

Class for Smart Pointer.

```
#include <gdcMSmartPointer.h>
```

Inheritance diagram for `gdcM::SmartPointer< ObjectType >`:





**Public Member Functions**

- [SmartPointer](#) ()
- [SmartPointer](#) (const SmartPointer< ObjectType > &p)
- [SmartPointer](#) (ObjectType \*p)
- [SmartPointer](#) (ObjectType const &p)
- [~SmartPointer](#) ()
- ObjectType \* [GetPointer](#) () const  
*Explicit function to retrieve the pointer.*
- [operator ObjectType \\*](#) () const  
*Return pointer to object.*
- ObjectType & [operator\\*](#) () const
- ObjectType \* [operator->](#) () const  
*Overload operator ->.*
- [SmartPointer](#) & [operator=](#) (ObjectType \*r)  
*Overload operator assignment.*
- [SmartPointer](#) & [operator=](#) (ObjectType const &r)
- [SmartPointer](#) & [operator=](#) ([SmartPointer](#) const &r)  
*Overload operator assignment.*

**12.283.1 Detailed Description**

```
template<class ObjectType>
class gdcmm::SmartPointer< ObjectType >
```

Class for Smart Pointer.

Will only work for subclass of [gdcmm::Object](#) See `tr1/shared_ptr` for a more general approach (not invasive) `#include <tr1/memory> { shared_ptr<Bla> b(new Bla); }`

**Note**

Class partly based on post by Bill Hubauer: <http://groups.google.com/group/comp.lang.c++.msg/173ddc38a827a930>

**See also**

<http://www.davethehat.com/articles/smarterp.htm>

and `itk::SmartPointer`

**Examples**

[CStoreQtProgress.cxx](#), [ChangeSequenceUltrasound.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_](#), [FixBrokenJ2K.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [SimpleScanner.cxx](#), [gdcmmrtionplan.cxx](#), and [gdcmmrtplan.cxx](#).

## 12.283.2 Constructor & Destructor Documentation

### 12.283.2.1 SmartPointer() [1/4]

```
template<class ObjectType>
gdcm::SmartPointer< ObjectType >::SmartPointer () [inline]
```

### 12.283.2.2 SmartPointer() [2/4]

```
template<class ObjectType>
gdcm::SmartPointer< ObjectType >::SmartPointer (
    const SmartPointer< ObjectType > & p) [inline]
```

### 12.283.2.3 SmartPointer() [3/4]

```
template<class ObjectType>
gdcm::SmartPointer< ObjectType >::SmartPointer (
    ObjectType * p) [inline]
```

### 12.283.2.4 SmartPointer() [4/4]

```
template<class ObjectType>
gdcm::SmartPointer< ObjectType >::SmartPointer (
    ObjectType const & p) [inline]
```

### 12.283.2.5 ~SmartPointer()

```
template<class ObjectType>
gdcm::SmartPointer< ObjectType >::~SmartPointer () [inline]
```

## 12.283.3 Member Function Documentation

### 12.283.3.1 GetPointer()

```
template<class ObjectType>
ObjectType * gdcm::SmartPointer< ObjectType >::GetPointer () const [inline]
```

Explicit function to retrieve the pointer.

### 12.283.3.2 operator ObjectType \*()

```
template<class ObjectType>
gdcmm::SmartPointer< ObjectType >::operator ObjectType * () const [inline]
```

Return pointer to object.

### 12.283.3.3 operator\*()

```
template<class ObjectType>
ObjectType & gdcmm::SmartPointer< ObjectType >::operator* () const [inline]
```

### 12.283.3.4 operator->()

```
template<class ObjectType>
ObjectType * gdcmm::SmartPointer< ObjectType >::operator-> () const [inline]
```

Overload operator ->.

### 12.283.3.5 operator=() [1/3]

```
template<class ObjectType>
SmartPointer & gdcmm::SmartPointer< ObjectType >::operator= (
    ObjectType * r) [inline]
```

Overload operator assignment.

### 12.283.3.6 operator=() [2/3]

```
template<class ObjectType>
SmartPointer & gdcmm::SmartPointer< ObjectType >::operator= (
    ObjectType const & r) [inline]
```

### 12.283.3.7 operator=() [3/3]

```
template<class ObjectType>
SmartPointer & gdcmm::SmartPointer< ObjectType >::operator= (
    SmartPointer< ObjectType > const & r) [inline]
```

Overload operator assignment.

Referenced by [gdcmm::SmartPointer< Value >::operator=\(\)](#), and [gdcmm::SmartPointer< Value >::operator=\(\)](#).

The documentation for this class was generated from the following files:

- [gdcmmObject.h](#)
- [gdcmmSmartPointer.h](#)

## 12.284 gdcm::network::SOPClassExtendedNegociationSub Class Reference

[SOPClassExtendedNegociationSub.](#)

```
#include <gdcmSOPClassExtendedNegociationSub.h>
```

### Public Member Functions

- [SOPClassExtendedNegociationSub](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetTuple](#) (const char \*uid, uint8\_t levelofsupport=3, uint8\_t levelofdigitalsig=0, uint8\_t elementcoercion=2)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.284.1 Detailed Description

[SOPClassExtendedNegociationSub.](#)

PS 3.7 [Table](#) D.3-11 SOP CLASS EXTENDED NEGOTIATION SUB-ITEM FIELDS (A-ASSOCIATE-RQ and A-↔ ASSOCIATE-AC)

### 12.284.2 Constructor & Destructor Documentation

#### 12.284.2.1 SOPClassExtendedNegociationSub()

```
gdcm::network::SOPClassExtendedNegociationSub::SOPClassExtendedNegociationSub ()
```

### 12.284.3 Member Function Documentation

#### 12.284.3.1 Print()

```
void gdcm::network::SOPClassExtendedNegociationSub::Print (
    std::ostream & os) const
```

#### 12.284.3.2 Read()

```
std::istream & gdcm::network::SOPClassExtendedNegociationSub::Read (
    std::istream & is)
```

### 12.284.3.3 SetTuple()

```
void gdcm::network::SOPClassExtendedNegociationSub::SetTuple (
    const char * uid,
    uint8_t levelofsupport = 3,
    uint8_t levelofdigitalsig = 0,
    uint8_t elementcoercion = 2)
```

### 12.284.3.4 Size()

```
size_t gdcm::network::SOPClassExtendedNegociationSub::Size () const
```

### 12.284.3.5 Write()

```
const std::ostream & gdcm::network::SOPClassExtendedNegociationSub::Write (
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

- [gdcmSOPClassExtendedNegociationSub.h](#)

## 12.285 gdcm::SOPClassUIDToIOD Class Reference

Class convert a class SOP Class UID into [IOD](#).

```
#include <gdcmSOPClassUIDToIOD.h>
```

### Public Types

- typedef const char \* [const](#)(SOPClassUIDToIODType)[2]

### Static Public Member Functions

- static [const](#) char \* [GetIOD](#) (UIDs [const](#) &uid)
- static [const](#) char \* [GetIODFromSOPClassUID](#) ([const](#) char \*sopclassuid)
- static unsigned int [GetNumberOfSOPClassToIOD](#) ()  
*Return the number of SOP Class UID listed internally.*
- static [const](#) char \* [GetSOPClassUIDFromIOD](#) ([const](#) char \*iod)
- static SOPClassUIDToIODType & [GetSOPClassUIDToIOD](#) (unsigned int i)
- static SOPClassUIDToIODType \* [GetSOPClassUIDToIODs](#) ()

### 12.285.1 Detailed Description

Class convert a class SOP Class UID into [IOD](#).

Reference PS 3.4 [Table B.5-1 STANDARD SOP CLASSES](#)

### 12.285.2 Member Typedef Documentation

#### 12.285.2.1 const

```
typedef const char * gdcm::SOPClassUIDToIOD::const (SOPClassUIDToIODType) [2]
```

### 12.285.3 Member Function Documentation

#### 12.285.3.1 GetIOD()

```
const char * gdcm::SOPClassUIDToIOD::GetIOD (
    UIDs const & uid) [static]
```

Return the associated [IOD](#) based on a SOP Class UID uid (there is a one-to-one mapping from SOP Class UID to matching [IOD](#))

#### Examples

[GenerateStandardSOPClasses.cxx](#).

#### 12.285.3.2 GetIODFromSOPClassUID()

```
const char * gdcm::SOPClassUIDToIOD::GetIODFromSOPClassUID (
    const char * sopclassuid) [static]
```

#### 12.285.3.3 GetNumberOfSOPClassToIOD()

```
unsigned int gdcm::SOPClassUIDToIOD::GetNumberOfSOPClassToIOD () [static]
```

Return the number of SOP Class UID listed internally.

#### 12.285.3.4 GetSOPClassUIDFromIOD()

```
const char * gdcm::SOPClassUIDToIOD::GetSOPClassUIDFromIOD (
    const char * iod) [static]
```

### 12.285.3.5 GetSOPClassUIDToIOD()

```
SOPClassUIDToIODType & gdcm::SOPClassUIDToIOD::GetSOPClassUIDToIOD (
    unsigned int i) [static]
```

### 12.285.3.6 GetSOPClassUIDToIODs()

```
SOPClassUIDToIODType * gdcm::SOPClassUIDToIOD::GetSOPClassUIDToIODs () [static]
```

The documentation for this class was generated from the following file:

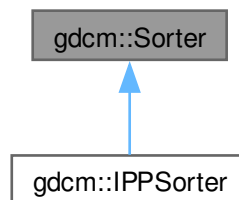
- [gdcmSOPClassUIDToIOD.h](#)

## 12.286 gdcm::Sorter Class Reference

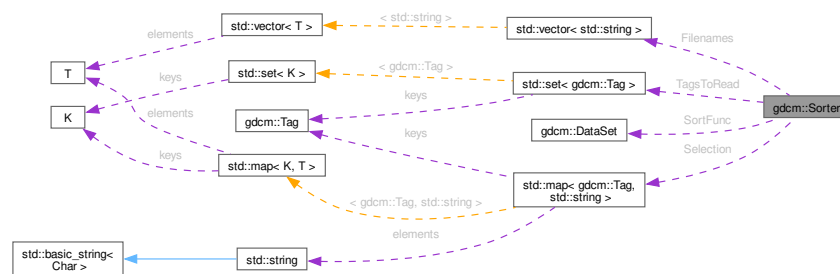
[Sorter.](#)

```
#include <gdcmSorter.h>
```

Inheritance diagram for gdcm::Sorter:



Collaboration diagram for gdcm::Sorter:



## Public Types

- typedef bool(\* [SortFunction](#)) ([DataSet](#) const &, [DataSet](#) const &)  
*Set the sort function which compares one dataset to the other.*

## Public Member Functions

- [Sorter](#) ()
- virtual [~Sorter](#) ()
- bool [AddSelect](#) ([Tag](#) const &tag, const char \*value)  
*UNSUPPORTED FOR NOW.*
- const std::vector< std::string > & [GetFileNames](#) () const
- void [Print](#) (std::ostream &os) const  
*Print.*
- void [SetSortFunction](#) ([SortFunction](#) f)
- void [SetTagsToRead](#) (std::set< [Tag](#) > const &tags)
- virtual bool [Sort](#) (std::vector< std::string > const &filenames)  
*Typically the output of [Directory::GetFileNames\(\)](#).*
- virtual bool [StableSort](#) (std::vector< std::string > const &filenames)

## Protected Types

- typedef std::map< [Tag](#), std::string > [SelectionMap](#)

## Protected Attributes

- std::vector< std::string > [FileNames](#)
- std::map< [Tag](#), std::string > [Selection](#)
- [SortFunction](#) [SortFunc](#)
- std::set< [Tag](#) > [TagsToRead](#)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Sorter](#) &s)

## 12.286.1 Detailed Description

[Sorter](#).

General class to do sorting using a custom function You simply need to provide a function of type: [Sorter::SortFunction](#)

### Warning

implementation details. For now there is no cache mechanism. Which means that every time you call Sort, all files specified as input parameter are *read*

### See also

[Scanner](#)

### Examples

[SortImage.cxx](#), [SortImage2.cs](#), and [VolumeSorter.cxx](#).



## 12.286.2 Member Typedef Documentation

### 12.286.2.1 SelectionMap

```
typedef std::map<Tag, std::string> gdcm::Sorter::SelectionMap [protected]
```

### 12.286.2.2 SortFunction

```
typedef bool(* gdcm::Sorter::SortFunction) (DataSet const &, DataSet const &)
```

Set the sort function which compares one dataset to the other.

## 12.286.3 Constructor & Destructor Documentation

### 12.286.3.1 Sorter()

```
gdcm::Sorter::Sorter ()
```

Referenced by [operator<<](#).

### 12.286.3.2 ~Sorter()

```
virtual gdcm::Sorter::~Sorter () [virtual]
```

## 12.286.4 Member Function Documentation

### 12.286.4.1 AddSelect()

```
bool gdcm::Sorter::AddSelect (
    Tag const & tag,
    const char * value)
```

UNSUPPORTED FOR NOW.

### 12.286.4.2 GetFileNames()

```
const std::vector< std::string > & gdcm::Sorter::GetFileNames () const [inline]
```

Return the list of filenames as sorted by the specific algorithm used. Empty by default (before [Sort\(\)](#) is called)

#### Examples

[Compute3DSpacing.cxx](#), [SortImage.cxx](#), [VolumeSorter.cxx](#), [gdcmorthoplanes.cxx](#), and [reslicesphere.cxx](#).

References [FileNames](#).

#### 12.286.4.3 Print()

```
void gdcm::Sorter::Print (
    std::ostream & os) const
```

Print.

##### Examples

[SortImage.cxx](#), [VolumeSorter.cxx](#), and [gdcmorthoplanes.cxx](#).

Referenced by [operator<<](#).

#### 12.286.4.4 SetSortFunction()

```
void gdcm::Sorter::SetSortFunction (
    SortFunction f)
```

##### Examples

[SortImage.cxx](#), [SortImage2.cs](#), and [VolumeSorter.cxx](#).

#### 12.286.4.5 SetTagsToRead()

```
void gdcm::Sorter::SetTagsToRead (
    std::set< Tag > const & tags)
```

Specify a set of tags to be read in during the sort procedure. By default this set is empty, in which case the entire image, including pixel data, is read in.

#### 12.286.4.6 Sort()

```
virtual bool gdcm::Sorter::Sort (
    std::vector< std::string > const & filenames) [virtual]
```

Typically the output of [Directory::GetFilenames\(\)](#).

Reimplemented in [gdcm::IPPSorter](#).

##### Examples

[SortImage.cxx](#).

### 12.286.4.7 StableSort()

```
virtual bool gdcmm::Sorter::StableSort (  
    std::vector< std::string > const & filenames) [virtual]
```

#### Examples

[SortImage.cxx](#), and [VolumeSorter.cxx](#).

## 12.286.5 Friends And Related Symbol Documentation

### 12.286.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const Sorter & s) [friend]
```

References [Sorter\(\)](#), and [Print\(\)](#).

## 12.286.6 Member Data Documentation

### 12.286.6.1 Filenames

```
std::vector<std::string> gdcmm::Sorter::Filenames [protected]
```

Referenced by [GetFilenames\(\)](#).

### 12.286.6.2 Selection

```
std::map<Tag, std::string> gdcmm::Sorter::Selection [protected]
```

### 12.286.6.3 SortFunc

```
SortFunction gdcmm::Sorter::SortFunc [protected]
```

### 12.286.6.4 TagsToRead

```
std::set<Tag> gdcmm::Sorter::TagsToRead [protected]
```

The documentation for this class was generated from the following file:

- [gdcmmSorter.h](#)

## 12.287 gdcm::Spacing Class Reference

Class for [Spacing](#).

```
#include <gdcmSpacing.h>
```

### Public Types

- enum [SpacingType](#) {  
    [DETECTOR](#) = 0 ,  
    [MAGNIFIED](#) ,  
    [CALIBRATED](#) ,  
    [UNKNOWN](#) }

### Public Member Functions

- [Spacing](#) ()
- [~Spacing](#) ()=default

### Static Public Member Functions

- static [Attribute](#)< 0x28, 0x34 > [ComputePixelAspectRatioFromPixelSpacing](#) (const [Attribute](#)< 0x28, 0x30 > &pixelspacing)

### 12.287.1 Detailed Description

Class for [Spacing](#).

It all began with a mail to WG6:

**Subject:** Imager Pixel [Spacing](#) vs Pixel [Spacing](#) **Body:** [Apologies for the duplicate post, namely to David Clunie & OFFIS team]

I have been trying to understand CP-586 in the following two cases:

On the one hand:

- DISCIMG/IMAGES/CRIMAGE taken from <http://dclunie.com/images/pixelspacingtestimages.zip>

And on the other hand:

- [http://gdcm.sourceforge.net/thingies/cr\\_pixelspacing.dcm](http://gdcm.sourceforge.net/thingies/cr_pixelspacing.dcm)

If I understand correctly the CP, one is required to use Pixel [Spacing](#) for measurement ('true size' print) instead of Imager Pixel [Spacing](#), since the two attributes are present and Pixel [Spacing](#) is different from Imager Pixel [Spacing](#).

If this is correct, then the test data DISCIMG/IMAGES/CRIMAGE is incorrect. If this is incorrect (ie. I need to use Imager Pixel [Spacing](#)), then the display of cr\_pixelspacing.dcm for measurement will be incorrect.

Could someone please let me know what am I missing here? I could not find any information in any header that would allow me to differentiate those.

Thank you for your time,

Ref: <http://lists.nema.org/scripts/lyris.pl?sub=488573&id=400720477>

See PS 3.3-2008, [Table C.7-11b](#) IMAGE PIXEL MACRO ATTRIBUTES

Ratio of the vertical size and horizontal size of the pixels in the image specified by a pair of integer values where the first value is the vertical pixel size, and the second value is the horizontal pixel size. Required if the aspect ratio values do not have a ratio of 1:1 and the physical pixel spacing is not specified by Pixel [Spacing](#) (0028,0030), or Imager Pixel [Spacing](#) (0018,1164) or Nominal Scanned Pixel [Spacing](#) (0018,2010), either for the entire [Image](#) or per-frame in a Functional Group [Macro](#). See C.7.6.3.1.7.

PS 3.3-2008 10.7.1.3 Pixel [Spacing Value](#) Order and Valid Values All pixel spacing related attributes shall have non-zero values, except when there is only a single row or column or pixel of data present, in which case the corresponding value may be zero.

Ref: [http://gdcm.sourceforge.net/wiki/index.php/Imager\\_Pixel\\_Spacing](http://gdcm.sourceforge.net/wiki/index.php/Imager_Pixel_Spacing)

## 12.287.2 Member Enumeration Documentation

### 12.287.2.1 SpacingType

```
enum gdcm::Spacing::SpacingType
```

#### Enumerator

DETECTOR	
MAGNIFIED	
CALIBRATED	
UNKNOWN	

## 12.287.3 Constructor & Destructor Documentation

### 12.287.3.1 Spacing()

```
gdcm::Spacing::Spacing ()
```

### 12.287.3.2 ~Spacing()

```
gdcM::Spacing::~Spacing () [default]
```

## 12.287.4 Member Function Documentation

### 12.287.4.1 ComputePixelAspectRatioFromPixelSpacing()

```
Attribute< 0x28, 0x34 > gdcM::Spacing::ComputePixelAspectRatioFromPixelSpacing (
    const Attribute< 0x28, 0x30 > & pixelspacing) [static]
```

The documentation for this class was generated from the following file:

- [gdcMSpacing.h](#)

## 12.288 gdcM::Spectroscopy Class Reference

[Spectroscopy](#) class.

```
#include <gdcMSpectroscopy.h>
```

### Public Member Functions

- [Spectroscopy](#) ()=default

### 12.288.1 Detailed Description

[Spectroscopy](#) class.

## 12.288.2 Constructor & Destructor Documentation

### 12.288.2.1 Spectroscopy()

```
gdcM::Spectroscopy::Spectroscopy () [default]
```

The documentation for this class was generated from the following file:

- [gdcMSpectroscopy.h](#)

## 12.289 gdcm::SplitMosaicFilter Class Reference

[SplitMosaicFilter](#) class.

```
#include <gdcmSplitMosaicFilter.h>
```

### Public Member Functions

- [SplitMosaicFilter](#) ()
- [~SplitMosaicFilter](#) ()
- bool [ComputeMOSAICDimensions](#) (unsigned int dims[3])
- bool [ComputeMOSAICImagePositionPatient](#) (double pos[3], const double ipp[6], const double dircos[6], const double pixelspacing[3], const unsigned int image\_dims[3], const unsigned int mosaic\_dims[3], bool inverted)  
*Extract the value for ImagePositionPatient.*
- bool [ComputeMOSAICSliceNormal](#) (double dims[3], bool &inverted)  
*Extract the value for SliceNormalVector (CSA header).*
- bool [ComputeMOSAICSlicePosition](#) (double pos[3], bool inverted)
- [File](#) & [GetFile](#) ()
- const [File](#) & [GetFile](#) () const
- [Image](#) & [GetImage](#) ()
- const [Image](#) & [GetImage](#) () const
- void [SetFile](#) (const [File](#) &f)
- void [SetImage](#) (const [Image](#) &image)
- bool [Split](#) ()  
*Split the SIEMENS MOSAIC image.*

### Static Public Member Functions

- static bool [GetAcquisitionSize](#) (unsigned int size[2], [DataSet](#) const &ds)  
*Get the Acquisition Matrix (non zero value):*
- static unsigned int [GetNumberOfImagesInMosaic](#) ([File](#) const &file)  
*Return the value for NumberOfImagesInMosaic, or compute it from Acquisition Size.*

### 12.289.1 Detailed Description

[SplitMosaicFilter](#) class.

Class to reshuffle bytes for a SIEMENS Mosaic image Siemens CSA [Image](#) Header CSA:= Common Siemens Architecture, sometimes also known as Common syngo Architecture

#### Warning

when private attributes are not found, the acquisition matrix is used to compute the NumberOfImagesInMosaic. This means trailing black slices will be considered in the volume (instead of discarded). CSA 0029,1010 is needed for correct NumberOfImagesInMosaic CSA 0029,1020 is needed to compute the correct origin without above info default are taken (may not be accurate).

## 12.289.2 Constructor & Destructor Documentation

### 12.289.2.1 SplitMosaicFilter()

```
gdcm::SplitMosaicFilter::SplitMosaicFilter ()
```

### 12.289.2.2 ~SplitMosaicFilter()

```
gdcm::SplitMosaicFilter::~~SplitMosaicFilter ()
```

## 12.289.3 Member Function Documentation

### 12.289.3.1 ComputeMOSAICDimensions()

```
bool gdcm::SplitMosaicFilter::ComputeMOSAICDimensions (
    unsigned int dims[3])
```

Compute the new dimensions according to private information stored in the MOSAIC header.

### 12.289.3.2 ComputeMOSAICImagePositionPatient()

```
bool gdcm::SplitMosaicFilter::ComputeMOSAICImagePositionPatient (
    double pos[3],
    const double ipp[6],
    const double dircos[6],
    const double pixelspacing[3],
    const unsigned int image_dims[3],
    const unsigned int mosaic_dims[3],
    bool inverted)
```

Extract the value for ImagePositionPatient.

### 12.289.3.3 ComputeMOSAICSliceNormal()

```
bool gdcm::SplitMosaicFilter::ComputeMOSAICSliceNormal (
    double dims[3],
    bool & inverted)
```

Extract the value for SliceNormal/Vector (CSA header).

### 12.289.3.4 ComputeMOSAICSlicePosition()

```
bool gdcm::SplitMosaicFilter::ComputeMOSAICSlicePosition (
    double pos[3],
    bool inverted)
```

Extract the value for ImagePositionPatient (requires inverted flag) Deprecated



### 12.289.3.5 GetAcquisitionSize()

```
bool gdcm::SplitMosaicFilter::GetAcquisitionSize (
    unsigned int size[2],
    DataSet const & ds) [static]
```

Get the Acquisition Matrix (non zero value):

### 12.289.3.6 GetFile() [1/2]

```
File & gdcm::SplitMosaicFilter::GetFile () [inline]
```

### 12.289.3.7 GetFile() [2/2]

```
const File & gdcm::SplitMosaicFilter::GetFile () const [inline]
```

### 12.289.3.8 GetImage() [1/2]

```
Image & gdcm::SplitMosaicFilter::GetImage () [inline]
```

### 12.289.3.9 GetImage() [2/2]

```
const Image & gdcm::SplitMosaicFilter::GetImage () const [inline]
```

### 12.289.3.10 GetNumberOfImagesInMosaic()

```
unsigned int gdcm::SplitMosaicFilter::GetNumberOfImagesInMosaic (
    File const & file) [static]
```

Return the value for NumberOfImagesInMosaic, or compute it from Acquisition Size.

### 12.289.3.11 SetFile()

```
void gdcm::SplitMosaicFilter::SetFile (
    const File & f) [inline]
```

### 12.289.3.12 SetImage()

```
void gdcm::SplitMosaicFilter::SetImage (
    const Image & image)
```

### 12.289.3.13 Split()

```
bool gdcM::SplitMosaicFilter::Split ()
```

Split the SIEMENS MOSAIC image.

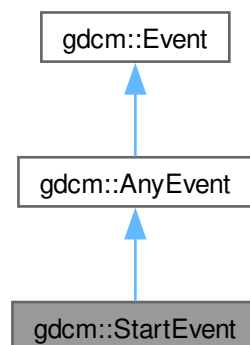
The documentation for this class was generated from the following file:

- [gdcMSplitMosaicFilter.h](#)

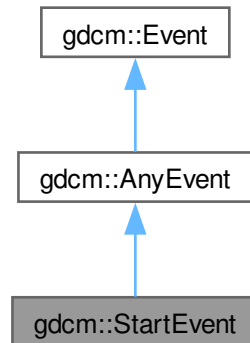
## 12.290 gdcM::StartEvent Class Reference

```
#include <gdcMEvent.h>
```

Inheritance diagram for gdcM::StartEvent:



Collaboration diagram for `gdcm::StartEvent`:



#### Additional Inherited Members

#### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()
- [Event](#) (const Event &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 12.291 `gdcm::static_assert_test< x >` Struct Template Reference

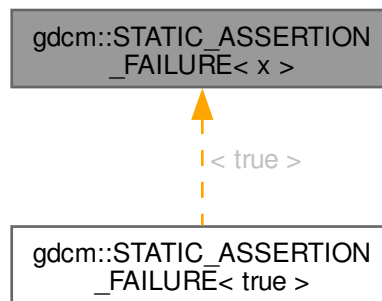
```
#include <gdcmStaticAssert.h>
```

The documentation for this struct was generated from the following file:

- [gdcmStaticAssert.h](#)

## 12.292 `gdcm::STATIC_ASSERTION_FAILURE< x >` Struct Template Reference

Inheritance diagram for `gdcm::STATIC_ASSERTION_FAILURE< x >`:



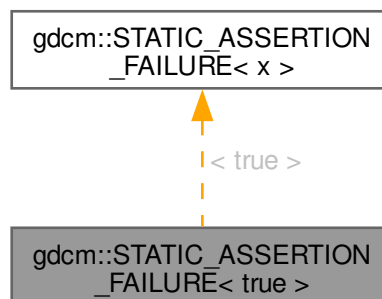
The documentation for this struct was generated from the following file:

- [gdcmStaticAssert.h](#)

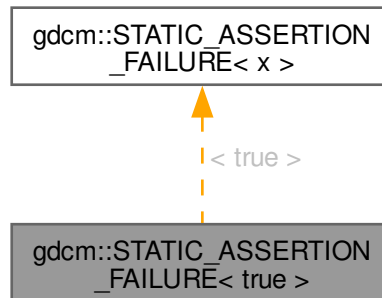
## 12.293 `gdcm::STATIC_ASSERTION_FAILURE< true >` Struct Reference

```
#include <gdcmStaticAssert.h>
```

Inheritance diagram for `gdcm::STATIC_ASSERTION_FAILURE< true >`:



Collaboration diagram for gdcm::STATIC\_ASSERTION\_FAILURE< true >:



## Public Types

- enum { `value` = 1 }

## 12.293.1 Member Enumeration Documentation

### 12.293.1.1 anonymous enum

anonymous enum

#### Enumerator

value	
-------	--

The documentation for this struct was generated from the following file:

- [gdcmStaticAssert.h](#)

## 12.294 gdcm::StreamImageReader Class Reference

[StreamImageReader](#).

```
#include <gdcmStreamImageReader.h>
```

## Public Member Functions

- [StreamImageReader](#) ()
- virtual [~StreamImageReader](#) ()
- bool [CanReadImage](#) () const
- void [DefinePixelExtent](#) (uint16\_t inXMin, uint16\_t inXMax, uint16\_t inYMin, uint16\_t inYMax, uint16\_t inZMin=0, uint16\_t inZMax=1)
- uint32\_t [DefineProperBufferLength](#) () const
- std::vector< unsigned int > [GetDimensionsValueForResolution](#) (unsigned int)
- [File](#) const & [GetFile](#) () const
- bool [Read](#) (char \*inReadBuffer, const std::size\_t &inBufferLength)
- virtual bool [ReadImageInformation](#) ()
- void [SetFileName](#) (const char \*inFileName)
- void [SetStream](#) (std::istream &inStream)

## 12.294.1 Detailed Description

[StreamImageReader](#).

### Note

its role is to convert the DICOM [DataSet](#) into a [Image](#) representation via an ITK streaming (ie, multithreaded) interface [Image](#) is different from [Pixmap](#) has it has a position and a direction in Space. Currently, this class is thread safe in that it can read a single extent in a single thread. Multiple versions can be used for multiple extents/threads.

### See also

[Image](#)

### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

## 12.294.2 Constructor & Destructor Documentation

### 12.294.2.1 StreamImageReader()

```
gdcm::StreamImageReader::StreamImageReader ()
```

### 12.294.2.2 ~StreamImageReader()

```
virtual gdcm::StreamImageReader::~~StreamImageReader () [virtual]
```

## 12.294.3 Member Function Documentation

### 12.294.3.1 CanReadImage()

```
bool gdcm::StreamImageReader::CanReadImage () const
```

Only RAW images are currently readable by the stream reader. As more streaming codecs are added, then this function will be updated to reflect those changes. Calling this function prior to reading will ensure that only streamable files are streamed. Make sure to call ReadImageInformation prior to calling this function.

#### Examples

[StreamImageReaderTest.cxx](#).

### 12.294.3.2 DefinePixelExtent()

```
void gdcm::StreamImageReader::DefinePixelExtent (
    uint16_t inXMin,
    uint16_t inXMax,
    uint16_t inYMin,
    uint16_t inYMax,
    uint16_t inZMin = 0,
    uint16_t inZMax = 1)
```

Defines an image extent for the Read function. DICOM states that an image can have no more than  $2^{16}$  pixels per edge (as of 2009) In this case, the pixel extents ignore the direction cosines entirely, and assumes that the origin of the image is at location 0,0 (regardless of the definition in space per the tags). So, if the first 100 pixels of the first row are to be read in, this function should be called with DefinePixelExtent(0, 100, 0, 1), regardless of pixel size or orientation.

#### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

### 12.294.3.3 DefineProperBufferLength()

```
uint32_t gdcm::StreamImageReader::DefineProperBufferLength () const
```

Paying attention to the pixel format and so forth, define the proper buffer length for the user. The return amount is in bytes. Call this function to determine the size of the char\* buffer that will need to be passed in to ReadImageSubregion(). If the return is 0, then that means that the pixel extent was not defined prior

#### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

#### 12.294.3.4 GetDimensionsValueForResolution()

```
std::vector< unsigned int > gdcM::StreamImageReader::GetDimensionsValueForResolution (
    unsigned int )
```

#### 12.294.3.5 GetFile()

```
File const & gdcM::StreamImageReader::GetFile () const
```

Returns the dataset read by ReadImageInformation Couple this with the [ImageHelper](#) to get statistics about the image, like pixel extent, to be able to initialize buffers for reading

##### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

#### 12.294.3.6 Read()

```
bool gdcM::StreamImageReader::Read (
    char * inReadBuffer,
    const std::size_t & inBufferLength)
```

Read the DICOM image. There are three reasons for failure:

1. The extent is not set
2. the conversion from char\* to std::ostream (internally) fails
3. the given buffer isn't large enough to accommodate the desired pixel extent. This method has been implemented to look similar to the metainageio in itk MUST have an extent defined, or else Read will return false. If no particular extent is required, use [ImageReader](#) instead.

##### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

#### 12.294.3.7 ReadImageInformation()

```
virtual bool gdcM::StreamImageReader::ReadImageInformation () [virtual]
```

Set the spacing and dimension information for the set filename. returns false if the file is not initialized or not an image, with the pixel (7fe0,0010) tag.

##### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).



### 12.294.3.8 SetFileName()

```
void gdcm::StreamImageReader::SetFileName (
    const char * inFileName)
```

One of either SetFileName or SetStream must be called prior to any other functions. These initialize an internal [Reader](#) class to be able to get non-pixel image information.

#### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

### 12.294.3.9 SetStream()

```
void gdcm::StreamImageReader::SetStream (
    std::istream & inStream)
```

The documentation for this class was generated from the following file:

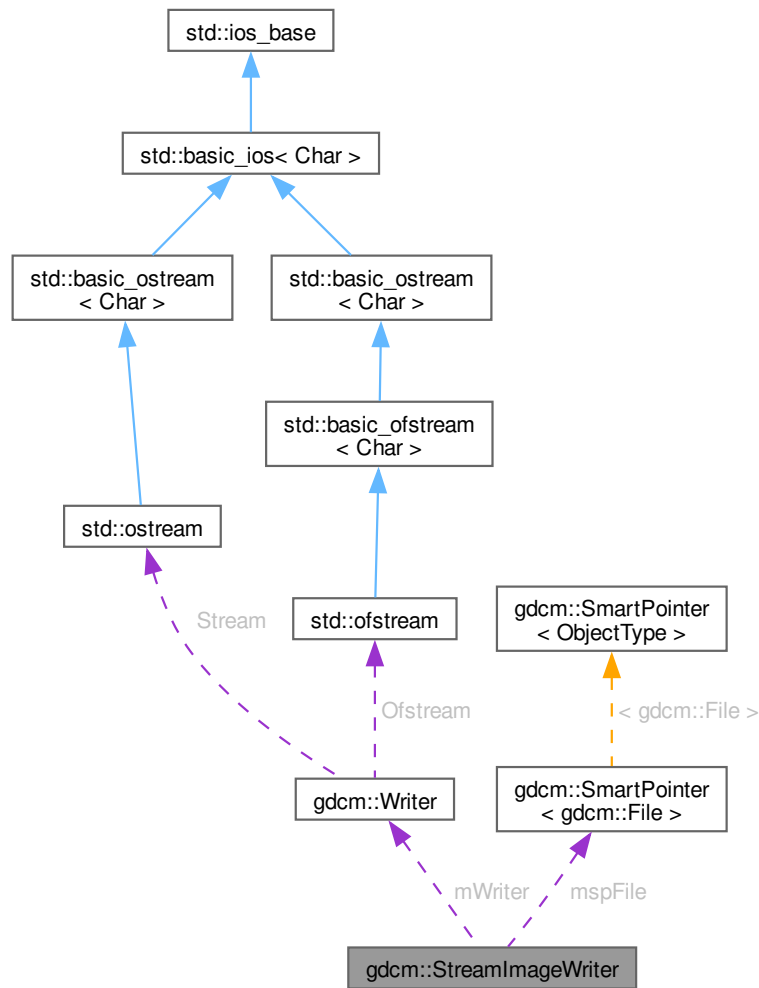
- [gdcmStreamImageReader.h](#)

## 12.295 gdcm::StreamImageWriter Class Reference

[StreamImageReader](#).

```
#include <gdcmStreamImageWriter.h>
```

Collaboration diagram for `gdcm::StreamImageWriter`:



## Public Member Functions

- [StreamImageWriter](#) ()
- virtual [~StreamImageWriter](#) ()
- bool [CanWriteFile](#) () const
- void [DefinePixelExtent](#) (uint16\_t inXMin, uint16\_t inXMax, uint16\_t inYMin, uint16\_t inYMax, uint16\_t inZMin=0, uint16\_t inZMax=1)
- uint32\_t [DefineProperBufferLength](#) ()
- void [SetFile](#) (const [File](#) &inFile)
- void [SetFileName](#) (const char \*inFileName)
- void [SetStream](#) (std::ostream &inStream)
- bool [Write](#) (void \*inWriteBuffer, const std::size\_t &inBufferLength)
- virtual bool [WriteImageInformation](#) ()

### Protected Member Functions

- virtual bool [WriteImageSubregionRAW](#) (char \*inWriteBuffer, const std::size\_t &inBufferLength)
- int [WriteRawHeader](#) ([RAWCodec](#) \*inCodec, std::ostream \*inStream)

### Protected Attributes

- int [mElementOffsets](#)
- int [mElementOffsets1](#)
- [SmartPointer< File >](#) [mspFile](#)
- [Writer](#) [mWriter](#)
- uint16\_t [mXMax](#)
- uint16\_t [mXMin](#)
- uint16\_t [mYMax](#)
- uint16\_t [mYMin](#)
- uint16\_t [mZMax](#)
- uint16\_t [mZMin](#)

## 12.295.1 Detailed Description

[StreamImageReader](#).

#### Note

its role is to convert the DICOM [DataSet](#) into a [Image](#) representation via an ITK streaming (ie, multithreaded) interface [Image](#) is different from [Pixmap](#) has it has a position and a direction in Space. Currently, this class is threadsafe in that it can read a single extent in a single thread. Multiple versions can be used for multiple extents/threads.

#### See also

[Image](#)

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

## 12.295.2 Constructor & Destructor Documentation

### 12.295.2.1 StreamImageWriter()

```
gdcm::StreamImageWriter::StreamImageWriter ()
```

### 12.295.2.2 ~StreamImageWriter()

```
virtual gdcm::StreamImageWriter::~~StreamImageWriter () [virtual]
```

## 12.295.3 Member Function Documentation

### 12.295.3.1 CanWriteFile()

```
bool gdcm::StreamImageWriter::CanWriteFile () const
```

This function determines if a file can even be written using the streaming writer unlike the reader, can be called before WriteImageInformation, but must be called after SetFile.

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), and [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#).

### 12.295.3.2 DefinePixelExtent()

```
void gdcm::StreamImageWriter::DefinePixelExtent (
    uint16_t inXMin,
    uint16_t inXMax,
    uint16_t inYMin,
    uint16_t inYMax,
    uint16_t inZMin = 0,
    uint16_t inZMax = 1)
```

Defines an image extent for the Read function. DICOM states that an image can have no more than  $2^{16}$  pixels per edge (as of 2009) In this case, the pixel extents ignore the direction cosines entirely, and assumes that the origin of the image is at location 0,0 (regardless of the definition in space per the tags). So, if the first 100 pixels of the first row are to be read in, this function should be called with DefinePixelExtent(0, 100, 0, 1), regardless of pixel size or orientation. 15 nov 2010: added z dimension, defaults to being 1 plane large

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 12.295.3.3 DefineProperBufferLength()

```
uint32_t gdcm::StreamImageWriter::DefineProperBufferLength ()
```

Paying attention to the pixel format and so forth, define the proper buffer length for the user. The return amount is in bytes. If the return is 0, then that means that the pixel extent was not defined prior this return is for RAW inputs which are then encoded by the writer, but are used to ensure that the writer gets the proper buffer size

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

#### 12.295.3.4 SetFile()

```
void gdcm::StreamImageWriter::SetFile (
    const File & inFile)
```

Set the image information to be written to disk that is everything but the pixel information: (7fe0,0010) PixelData

##### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

#### 12.295.3.5 SetFileName()

```
void gdcm::StreamImageWriter::SetFileName (
    const char * inFileName)
```

One of either SetFileName or SetStream must be called prior to any other functions. These initialize an internal [Reader](#) class to be able to get non-pixel image information.

#### 12.295.3.6 SetStream()

```
void gdcm::StreamImageWriter::SetStream (
    std::ostream & inStream)
```

##### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

#### 12.295.3.7 Write()

```
bool gdcm::StreamImageWriter::Write (
    void * inWriteBuffer,
    const std::size_t & inBufferLength)
```

Read the DICOM image. There are three reasons for failure:

1. The extent is not set
2. the conversion from void\* to std::ostream (internally) fails
3. the given buffer isn't large enough to accommodate the desired pixel extent. This method has been implemented to look similar to the metaimageio in itk MUST have an extent defined, or else Read will return false. If no particular extent is required, use [ImageReader](#) instead.

##### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 12.295.3.8 WriteImageInformation()

```
virtual bool gdcm::StreamImageWriter::WriteImageInformation () [virtual]
```

Write the header information to disk, and a bunch of zeros for the actual pixel information. Of course, if we're doing a non-compressed format, that works but if it's compressed, we have to force the ordering of chunks that are written.

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 12.295.3.9 WriteImageSubregionRAW()

```
virtual bool gdcm::StreamImageWriter::WriteImageSubregionRAW (
    char * inWriteBuffer,
    const std::size_t & inBufferLength) [protected], [virtual]
```

Using the min, max, etc set by DefinePixelExtent, this will fill the given buffer. Make sure to call DefinePixelExtent and to initialize the buffer with the amount given by DefineProperBufferLength prior to calling this. Reads by the RAW codec; other codecs are added once implemented.

### 12.295.3.10 WriteRawHeader()

```
int gdcm::StreamImageWriter::WriteRawHeader (
    RAWCodec * inCodec,
    std::ostream * inStream) [protected]
```

When writing a raw file, we know the full extent, and can just write the first 12 bytes out (the tag, the [VR](#), and the size). When we do compressed files, we'll do it in chunks, as described in 2009-3, part 5, Annex A, section 4. Pass the raw codec so that in the rare case of a bigendian explicit raw, the first 12 bytes written out should still be kosher. Returns -1 if there's any failure, or the complete offset (12 bytes) if it works. Those 12 bytes are then added to the position in order to determine where to write.

## 12.295.4 Member Data Documentation

### 12.295.4.1 mElementOffsets

```
int gdcm::StreamImageWriter::mElementOffsets [protected]
```

The result of WriteRawHeader (or another header, when that's implemented). This result is saved so that the first N bytes aren't constantly being rewritten for each chunk that's passed in. For compressed data, the offset table will require rewrites of data.

### 12.295.4.2 mElementOffsets1

```
int gdcm::StreamImageWriter::mElementOffsets1 [protected]
```

### 12.295.4.3 mspFile

`SmartPointer<File> gdcm::StreamImageWriter::mspFile` [protected]

### 12.295.4.4 mWriter

`Writer gdcm::StreamImageWriter::mWriter` [protected]

### 12.295.4.5 mXMax

`uint16_t gdcm::StreamImageWriter::mXMax` [protected]

### 12.295.4.6 mXMin

`uint16_t gdcm::StreamImageWriter::mXMin` [protected]

### 12.295.4.7 mYMax

`uint16_t gdcm::StreamImageWriter::mYMax` [protected]

### 12.295.4.8 mYMin

`uint16_t gdcm::StreamImageWriter::mYMin` [protected]

### 12.295.4.9 mZMax

`uint16_t gdcm::StreamImageWriter::mZMax` [protected]

### 12.295.4.10 mZMin

`uint16_t gdcm::StreamImageWriter::mZMin` [protected]

The documentation for this class was generated from the following file:

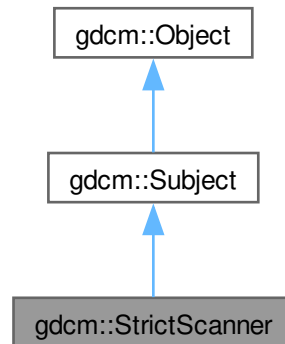
- [gdcmStreamImageWriter.h](#)

## 12.296 gdcm::StrictScanner Class Reference

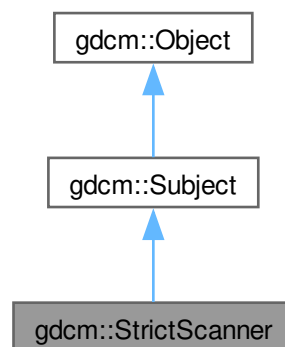
[StrictScanner](#).

```
#include <gdcmStrictScanner.h>
```

Inheritance diagram for gdcm::StrictScanner:



Collaboration diagram for gdcm::StrictScanner:



### Classes

- struct [ltstr](#)



## Public Types

- typedef MappingType::const\_iterator [ConstIterator](#)
- typedef std::map< const char \*, [TagToValue](#), [Itstr](#) > [MappingType](#)
- typedef std::map< [Tag](#), const char \* > [TagToValue](#)
- typedef TagToValue::value\_type [TagToValueValueType](#)
- typedef std::set< std::string > [ValuesType](#)

## Public Member Functions

- [StrictScanner](#) ()
- [~StrictScanner](#) () override
- void [AddPrivateTag](#) ([PrivateTag](#) const &t)
- void [AddSkipTag](#) ([Tag](#) const &t)  
*Add a tag that will need to be skipped. Those are root level skip tags.*
- void [AddTag](#) ([Tag](#) const &t)  
*Add a tag that will need to be read. Those are root level skip tags.*
- [ConstIterator](#) [Begin](#) () const
- void [ClearSkipTags](#) ()
- void [ClearTags](#) ()
- [ConstIterator](#) [End](#) () const
- [Directory::FileNamesType](#) [GetAllFileNamesFromTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- const char \* [GetFilenameFromTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- [Directory::FileNamesType](#) const & [GetFileNames](#) () const
- [Directory::FileNamesType](#) [GetKeys](#) () const
- [TagToValue](#) const & [GetMapping](#) (const char \*filename) const  
*Get the std::map mapping filenames to value for file 'filename'.*
- [TagToValue](#) const & [GetMappingFromTagToValue](#) ([Tag](#) const &t, const char \*value) const  
*See [GetFilenameFromTagToValue\(\)](#). This is simply [GetFilenameFromTagToValue](#) followed.*
- [MappingType](#) const & [GetMappings](#) () const  
*Mappings are the mapping from a particular tag to the map, mapping filename to value:*
- [Directory::FileNamesType](#) [GetOrderedValues](#) ([Tag](#) const &t) const
- const char \* [GetValue](#) (const char \*filename, [Tag](#) const &t) const
- [ValuesType](#) const & [GetValues](#) () const  
*Get all the values found (in lexicographic order).*
- [ValuesType](#) [GetValues](#) ([Tag](#) const &t) const  
*Get all the values found (in lexicographic order) associated with [Tag](#) 't'.*
- bool [IsKey](#) (const char \*filename) const
- void [Print](#) (std::ostream &os) const override  
*Print result.*
- void [PrintTable](#) (std::ostream &os) const
- bool [Scan](#) ([Directory::FileNamesType](#) const &filenames)  
*Start the scan !*

## Public Member Functions inherited from [gdcm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

## Static Public Member Functions

- static [SmartPointer](#)< [StrictScanner](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Protected Member Functions

- void [ProcessPublicTag](#) ([StringFilter](#) &sf, const char \*filename)

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [StrictScanner](#) &s)

## 12.296.1 Detailed Description

[StrictScanner](#).

This filter is meant for quickly browsing a [FileSet](#) (a set of files on disk). Special consideration are taken so as to read the minimum amount of information in each file in order to retrieve the user specified set of DICOM [Attribute](#).

This filter is dealing with both VRASCII and VRBINARY element, thanks to the help of [StringFilter](#)

### Warning

IMPORTANT In case of file where tags are not ordered (illegal as per DICOM specification), the output will be missing information

### Note

implementation details. All values are stored in a `std::set` of `std::string`. Then the address of the `cstring` underlying the `std::string` is used in the `std::map`.

This class implement the Subject/Observer pattern trigger the following events:

- [ProgressEvent](#)
- [StartEvent](#)
- [EndEvent](#)

### Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

## 12.296.2 Member Typedef Documentation

### 12.296.2.1 ConstIterator

```
typedef MappingType::const_iterator gdcm::StrictScanner::ConstIterator
```

### 12.296.2.2 MappingType

```
typedef std::map<const char *, TagToValue, ltstr> gdcm::StrictScanner::MappingType
```

### 12.296.2.3 TagToValue

```
typedef std::map<Tag, const char*> gdcM::StrictScanner::TagToValue
```

struct to map a filename to a value Implementation note: all std::map in this class will be using const char \* and not std::string since we are pointing to existing std::string (hold in a std::vector) this avoid an extra copy of the byte array. [Tag](#) are used as [Tag](#) class since sizeof(tag) <= sizeof(pointer)

#### Examples

[SimpleScanner.cxx](#).

### 12.296.2.4 TagToValueValueType

```
typedef TagToValue::value_type gdcM::StrictScanner::TagToValueValueType
```

### 12.296.2.5 ValueType

```
typedef std::set< std::string > gdcM::StrictScanner::ValueType
```

## 12.296.3 Constructor & Destructor Documentation

### 12.296.3.1 StrictScanner()

```
gdcM::StrictScanner::StrictScanner () [inline]
```

Referenced by [New\(\)](#), and [operator<<](#).

### 12.296.3.2 ~StrictScanner()

```
gdcM::StrictScanner::~~StrictScanner () [override]
```

## 12.296.4 Member Function Documentation

### 12.296.4.1 AddPrivateTag()

```
void gdcM::StrictScanner::AddPrivateTag (  
    PrivateTag const & t)
```

### 12.296.4.2 AddSkipTag()

```
void gdcmm::StrictScanner::AddSkipTag (  
    Tag const & t)
```

Add a tag that will need to be skipped. Those are root level skip tags.

### 12.296.4.3 AddTag()

```
void gdcmm::StrictScanner::AddTag (  
    Tag const & t)
```

Add a tag that will need to be read. Those are root level skip tags.

#### Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

### 12.296.4.4 Begin()

```
ConstIterator gdcmm::StrictScanner::Begin () const [inline]
```

### 12.296.4.5 ClearSkipTags()

```
void gdcmm::StrictScanner::ClearSkipTags ()
```

### 12.296.4.6 ClearTags()

```
void gdcmm::StrictScanner::ClearTags ()
```

### 12.296.4.7 End()

```
ConstIterator gdcmm::StrictScanner::End () const [inline]
```

### 12.296.4.8 GetAllFileNamesFromTagToValue()

```
Directory::FileNamesType gdcmm::StrictScanner::GetAllFileNamesFromTagToValue (  
    Tag const & t,  
    const char * valuref) const
```

Will loop over all files and return a vector of std::strings of filenames where value match the reference value 'valuref'

#### 12.296.4.9 GetFilenameFromTagToValue()

```
const char * gdcM::StrictScanner::GetFilenameFromTagToValue (
    Tag const & t,
    const char * valueref) const
```

Will loop over all files and return the first file where value match the reference value 'valueref'

#### 12.296.4.10 GetFileNames()

```
Directory::FileNamesType const & gdcM::StrictScanner::GetFileNames () const [inline]
```

#### 12.296.4.11 GetKeys()

```
Directory::FileNamesType gdcM::StrictScanner::GetKeys () const
```

Return the list of filename that are key in the internal map, which means those filename were properly parsed

#### 12.296.4.12 GetMapping()

```
TagToValue const & gdcM::StrictScanner::GetMapping (
    const char * filename) const
```

Get the std::map mapping filenames to value for file 'filename'.

#### Examples

[SimpleScanner.cxx](#).

#### 12.296.4.13 GetMappingFromTagToValue()

```
TagToValue const & gdcM::StrictScanner::GetMappingFromTagToValue (
    Tag const & t,
    const char * value) const
```

See [GetFilenameFromTagToValue\(\)](#). This is simply GetFilenameFromTagToValue followed.

#### 12.296.4.14 GetMappings()

```
MappingType const & gdcM::StrictScanner::GetMappings () const [inline]
```

Mappings are the mapping from a particular tag to the map, mapping filename to value:

#### 12.296.4.15 GetOrderedValues()

```
Directory::FilenameType gdcm::StrictScanner::GetOrderedValues (
    Tag const & t) const
```

Get all the values found (in a vector) associated with [Tag 't'](#) This function is identical to [GetValues](#), but is accessible from the wrapped layer (python, C#, java)

#### 12.296.4.16 GetValue()

```
const char * gdcm::StrictScanner::GetValue (
    const char * filename,
    Tag const & t) const
```

Retrieve the value found for tag: t associated with file: filename This is meant for a single short call. If multiple calls (multiple tags) should be done, prefer the [GetMapping](#) function, and then reuse the [TagToValue](#) hash table.

#### Warning

[Tag 't'](#) should have been added via [AddTag\(\)](#) prior to the [Scan\(\)](#) call !

#### 12.296.4.17 GetValues() [1/2]

```
ValueType const & gdcm::StrictScanner::GetValues () const [inline]
```

Get all the values found (in lexicographic order).

#### 12.296.4.18 GetValues() [2/2]

```
ValueType gdcm::StrictScanner::GetValues (
    Tag const & t) const
```

Get all the values found (in lexicographic order) associated with [Tag 't'](#).

#### 12.296.4.19 IsKey()

```
bool gdcm::StrictScanner::IsKey (
    const char * filename) const
```

Check if filename is a key in the Mapping table. returns true only if file can be found, which means the file was indeed a DICOM file that could be processed

#### Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

#### 12.296.4.20 New()

```
SmartPointer< StrictScanner > gdcmm::StrictScanner::New () [inline], [static]
```

for wrapped language: instantiate a reference counted object

##### Examples

[ScanDirectory.cs](#).

References [StrictScanner\(\)](#).

#### 12.296.4.21 Print()

```
void gdcmm::StrictScanner::Print (
    std::ostream & os) const [override], [virtual]
```

Print result.

Reimplemented from [gdcmm::Object](#).

Referenced by [operator<<](#).

#### 12.296.4.22 PrintTable()

```
void gdcmm::StrictScanner::PrintTable (
    std::ostream & os) const
```

#### 12.296.4.23 ProcessPublicTag()

```
void gdcmm::StrictScanner::ProcessPublicTag (
    StringFilter & sf,
    const char * filename) [protected]
```

#### 12.296.4.24 Scan()

```
bool gdcmm::StrictScanner::Scan (
    Directory::FileNamesType const & filenames)
```

Start the scan !

##### Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).



## 12.296.5 Friends And Related Symbol Documentation

### 12.296.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const StrictScanner & s) [friend]
```

References [StrictScanner\(\)](#), and [Print\(\)](#).

The documentation for this class was generated from the following file:

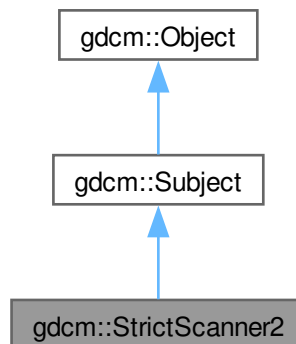
- [gdcmStrictScanner.h](#)

## 12.297 gdcm::StrictScanner2 Class Reference

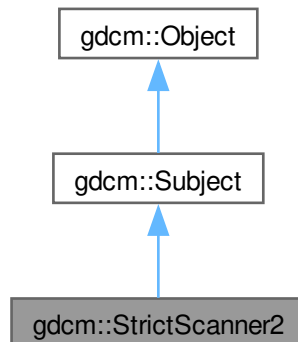
[StrictScanner2](#).

```
#include <gdcmStrictScanner2.h>
```

Inheritance diagram for gdcm::StrictScanner2:



Collaboration diagram for `gdcm::StrictScanner2`:



## Classes

- struct [Itstr](#)

## Public Types

- typedef `PrivateMappingType::const_iterator` [PrivateConstIterator](#)
- typedef `std::map< const char *, PrivateTagToValue, Itstr >` [PrivateMappingType](#)
- typedef `std::map< PrivateTag, const char * >` [PrivateTagToValue](#)
- typedef `PrivateTagToValue::value_type` [PrivateTagToValueValueType](#)
- typedef `PublicMappingType::const_iterator` [PublicConstIterator](#)
- typedef `std::map< const char *, PublicTagToValue, Itstr >` [PublicMappingType](#)
- typedef `std::map< Tag, const char * >` [PublicTagToValue](#)
- typedef `PublicTagToValue::value_type` [PublicTagToValueValueType](#)
- typedef `std::set< std::string >` [ValuesType](#)

## Public Member Functions

- [StrictScanner2](#) ()
- [~StrictScanner2](#) () override
- bool [AddPrivateTag](#) ([PrivateTag](#) const &pt)
- bool [AddPublicTag](#) ([Tag](#) const &t)  
*Add a tag that will need to be read. Those are root level tags.*
- bool [AddSkipTag](#) ([Tag](#) const &t)  
*Add a tag that will need to be skipped. Those are root level skip tags.*
- [PublicConstIterator](#) [Begin](#) () const
- void [ClearPrivateTags](#) ()
- void [ClearPublicTags](#) ()

- void [ClearSkipTags](#) ()
- [PublicConstIterator End](#) () const
- [Directory::FilenamesType GetAllFilenamesFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*valueref) const
- [Directory::FilenamesType GetAllFilenamesFromPublicTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- const char \* [GetFilenameFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*valueref) const
- const char \* [GetFilenameFromPublicTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- [Directory::FilenamesType](#) const & [GetFilenames](#) () const
  - Return the list of filenames.*
- [Directory::FilenamesType GetKeys](#) () const
- [PrivateTagToValue](#) const & [GetMappingFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*value) const
- [PublicTagToValue](#) const & [GetMappingFromPublicTagToValue](#) ([Tag](#) const &t, const char \*value) const
- [PrivateTagToValue](#) const & [GetPrivateMapping](#) (const char \*filename) const
- [PrivateMappingType](#) const & [GetPrivateMappings](#) () const
- [Directory::FilenamesType GetPrivateOrderedValues](#) ([PrivateTag](#) const &pt) const
- const char \* [GetPrivateValue](#) (const char \*filename, [PrivateTag](#) const &t) const
- [ValueType](#) [GetPrivateValues](#) ([PrivateTag](#) const &pt) const
- [PublicTagToValue](#) const & [GetPublicMapping](#) (const char \*filename) const
  - Get the std::map mapping filenames to value for file 'filename'.*
- [PublicMappingType](#) const & [GetPublicMappings](#) () const
- [Directory::FilenamesType GetPublicOrderedValues](#) ([Tag](#) const &t) const
- const char \* [GetPublicValue](#) (const char \*filename, [Tag](#) const &t) const
- [ValueType](#) [GetPublicValues](#) ([Tag](#) const &t) const
  - Get all the values found (in lexicographic order) associated with [Tag](#) 't'.*
- [ValueType](#) const & [GetValues](#) () const
  - Get all the values found (in lexicographic order).*
- bool [IsKey](#) (const char \*filename) const
- void [Print](#) (std::ostream &os) const override
  - Print result.*
- void [PrintTable](#) (std::ostream &os, bool header=false) const
  - Print result as CSV table.*
- [PrivateConstIterator PrivateBegin](#) () const
- [PrivateConstIterator PrivateEnd](#) () const
- bool [Scan](#) ([Directory::FilenamesType](#) const &filenames)
  - Start the scan !*

## Public Member Functions inherited from [gdcm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

## Static Public Member Functions

- static [SmartPointer](#)< [StrictScanner2](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Protected Member Functions

- void [ProcessPrivateTag](#) ([StringFilter](#) &sf, const char \*filename)
- void [ProcessPublicTag](#) ([StringFilter](#) &sf, const char \*filename)

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [StrictScanner2](#) &s)

## 12.297.1 Detailed Description

### [StrictScanner2](#).

This filter is meant for quickly browsing a [FileSet](#) (a set of files on disk). Special consideration are taken so as to read the minimum amount of information in each file in order to retrieve the user specified set of DICOM [Attribute](#).

This filter is dealing with both VRASCII and VRBINARY element, thanks to the help of [StringFilter](#)

### Warning

IMPORTANT In case of file where tags are not ordered (illegal as per DICOM specification), the output will be missing information

### Note

implementation details. All values are stored in a std::set of std::string. Then the address of the cstring underlying the std::string is used in the std::map.

This class implement the Subject/Observer pattern trigger the following events:

- [ProgressEvent](#)
- [StartEvent](#)
- [EndEvent](#)

## 12.297.2 Member Typedef Documentation

### 12.297.2.1 PrivateConstIterator

```
typedef PrivateMappingType::const_iterator gdcm::StrictScanner2::PrivateConstIterator
```

### 12.297.2.2 PrivateMappingType

```
typedef std::map<const char *, PrivateTagToValue, ltstr> gdcm::StrictScanner2::PrivateMappingType
```

### 12.297.2.3 PrivateTagToValue

```
typedef std::map<PrivateTag, const char *> gdcm::StrictScanner2::PrivateTagToValue
```

### 12.297.2.4 PrivateTagToValueValueType

```
typedef PrivateTagToValue::value_type gdcm::StrictScanner2::PrivateTagToValueValueType
```

### 12.297.2.5 PublicConstIterator

```
typedef PublicMappingType::const_iterator gdcm::StrictScanner2::PublicConstIterator
```

### 12.297.2.6 PublicMappingType

```
typedef std::map<const char *, PublicTagToValue, ltstr> gdcm::StrictScanner2::PublicMappingType
```

### 12.297.2.7 PublicTagToValue

```
typedef std::map<Tag, const char *> gdcm::StrictScanner2::PublicTagToValue
```

struct to map a filename to a value Implementation note: all std::map in this class will be using const char \* and not std::string since we are pointing to existing std::string (held in a std::vector) this avoid an extra copy of the byte array. [Tag](#) are used as [Tag](#) class since sizeof(tag) <= sizeof(pointer)

### 12.297.2.8 PublicTagToValueValueType

```
typedef PublicTagToValue::value_type gdcm::StrictScanner2::PublicTagToValueValueType
```

### 12.297.2.9 ValueType

```
typedef std::set<std::string> gdcm::StrictScanner2::ValueType
```

## 12.297.3 Constructor & Destructor Documentation

### 12.297.3.1 StrictScanner2()

```
gdcm::StrictScanner2::StrictScanner2 () [inline]
```

Referenced by [New\(\)](#), and [operator<<](#).

### 12.297.3.2 ~StrictScanner2()

```
gdcm::StrictScanner2::~~StrictScanner2 () [override]
```

## 12.297.4 Member Function Documentation

### 12.297.4.1 AddPrivateTag()

```
bool gdcm::StrictScanner2::AddPrivateTag (  
    PrivateTag const & pt)
```

### 12.297.4.2 AddPublicTag()

```
bool gdcm::StrictScanner2::AddPublicTag (  
    Tag const & t)
```

Add a tag that will need to be read. Those are root level tags.

### 12.297.4.3 AddSkipTag()

```
bool gdcm::StrictScanner2::AddSkipTag (  
    Tag const & t)
```

Add a tag that will need to be skipped. Those are root level skip tags.

### 12.297.4.4 Begin()

```
PublicConstIterator gdcm::StrictScanner2::Begin () const [inline]
```

#### 12.297.4.5 ClearPrivateTags()

```
void gdcm::StrictScanner2::ClearPrivateTags ()
```

#### 12.297.4.6 ClearPublicTags()

```
void gdcm::StrictScanner2::ClearPublicTags ()
```

#### 12.297.4.7 ClearSkipTags()

```
void gdcm::StrictScanner2::ClearSkipTags ()
```

#### 12.297.4.8 End()

```
PublicConstIterator gdcm::StrictScanner2::End () const [inline]
```

#### 12.297.4.9 GetAllFileNamesFromPrivateTagToValue()

```
Directory::FileNamesType gdcm::StrictScanner2::GetAllFileNamesFromPrivateTagToValue (  
    PrivateTag const & pt,  
    const char * valuref) const
```

#### 12.297.4.10 GetAllFileNamesFromPublicTagToValue()

```
Directory::FileNamesType gdcm::StrictScanner2::GetAllFileNamesFromPublicTagToValue (  
    Tag const & t,  
    const char * valuref) const
```

Will loop over all files and return a vector of std::strings of filenames where value match the reference value 'valuref'

#### 12.297.4.11 GetFilenameFromPrivateTagToValue()

```
const char * gdcm::StrictScanner2::GetFilenameFromPrivateTagToValue (  
    PrivateTag const & pt,  
    const char * valuref) const
```

#### 12.297.4.12 GetFilenameFromPublicTagToValue()

```
const char * gdcm::StrictScanner2::GetFilenameFromPublicTagToValue (  
    Tag const & t,  
    const char * valuref) const
```

Will loop over all files and return the first file where value match the reference value 'valuref'

**12.297.4.13 GetFilenames()**

```
Directory::FilenamesType const & gdc::StrictScanner2::GetFilenames () const [inline]
```

Return the list of filenames.

**12.297.4.14 GetKeys()**

```
Directory::FilenamesType gdc::StrictScanner2::GetKeys () const
```

Return the list of filename that are key in the internal map, which means those filename were properly parsed

**12.297.4.15 GetMappingFromPrivateTagToValue()**

```
PrivateTagToValue const & gdc::StrictScanner2::GetMappingFromPrivateTagToValue (  
    PrivateTag const & pt,  
    const char * value) const
```

**12.297.4.16 GetMappingFromPublicTagToValue()**

```
PublicTagToValue const & gdc::StrictScanner2::GetMappingFromPublicTagToValue (  
    Tag const & t,  
    const char * value) const
```

See GetFilenameFromTagToValue(). This is simply GetFilenameFromTagToValue followed

**12.297.4.17 GetPrivateMapping()**

```
PrivateTagToValue const & gdc::StrictScanner2::GetPrivateMapping (  
    const char * filename) const
```

**12.297.4.18 GetPrivateMappings()**

```
PrivateMappingType const & gdc::StrictScanner2::GetPrivateMappings () const [inline]
```

**12.297.4.19 GetPrivateOrderedValues()**

```
Directory::FilenamesType gdc::StrictScanner2::GetPrivateOrderedValues (  
    PrivateTag const & pt) const
```



#### 12.297.4.20 GetPrivateValue()

```
const char * gdcmm::StrictScanner2::GetPrivateValue (
    const char * filename,
    PrivateTag const & t) const
```

#### 12.297.4.21 GetPrivateValues()

```
ValuesType gdcmm::StrictScanner2::GetPrivateValues (
    PrivateTag const & pt) const
```

Get all the values found (in lexicographic order) associated with [PrivateTag](#) 'pt'

#### 12.297.4.22 GetPublicMapping()

```
PublicTagToValue const & gdcmm::StrictScanner2::GetPublicMapping (
    const char * filename) const
```

Get the std::map mapping filenames to value for file 'filename'.

#### 12.297.4.23 GetPublicMappings()

```
PublicMappingType const & gdcmm::StrictScanner2::GetPublicMappings () const [inline]
```

Mappings are the mapping from a particular tag to the map, mapping filename to value:

#### 12.297.4.24 GetPublicOrderedValues()

```
Directory::FileNamesType gdcmm::StrictScanner2::GetPublicOrderedValues (
    Tag const & t) const
```

Get all the values found (in a vector) associated with [Tag](#) 't' This function is identical to `GetValues`, but is accessible from the wrapped layer (python, C#, java)

#### 12.297.4.25 GetPublicValue()

```
const char * gdcmm::StrictScanner2::GetPublicValue (
    const char * filename,
    Tag const & t) const
```

Retrieve the value found for tag: t associated with file: filename This is meant for a single short call. If multiple calls (multiple tags) should be done, prefer the `GetMapping` function, and then reuse the `TagToValue` hash table.

#### Warning

[Tag](#) 't' should have been added via `AddTag()` prior to the `Scan()` call !

#### 12.297.4.26 GetPublicValues()

```
ValueType gdcM::StrictScanner2::GetPublicValues (
    Tag const & t) const
```

Get all the values found (in lexicographic order) associated with [Tag](#) 't'.

#### 12.297.4.27 GetValues()

```
ValueType const & gdcM::StrictScanner2::GetValues () const [inline]
```

Get all the values found (in lexicographic order).

#### 12.297.4.28 IsKey()

```
bool gdcM::StrictScanner2::IsKey (
    const char * filename) const
```

Check if filename is a key in the Mapping table. returns true only if file can be found, which means the file was indeed a DICOM file that could be processed

#### 12.297.4.29 New()

```
SmartPointer< StrictScanner2 > gdcM::StrictScanner2::New () [inline], [static]
```

for wrapped language: instantiate a reference counted object

References [StrictScanner2\(\)](#).

#### 12.297.4.30 Print()

```
void gdcM::StrictScanner2::Print (
    std::ostream & os) const [override], [virtual]
```

Print result.

Reimplemented from [gdcM::Object](#).

Referenced by [operator<<](#).

#### 12.297.4.31 PrintTable()

```
void gdcM::StrictScanner2::PrintTable (
    std::ostream & os,
    bool header = false) const
```

Print result as CSV table.

#### 12.297.4.32 PrivateBegin()

```
PrivateConstIterator gdcm::StrictScanner2::PrivateBegin () const [inline]
```

#### 12.297.4.33 PrivateEnd()

```
PrivateConstIterator gdcm::StrictScanner2::PrivateEnd () const [inline]
```

#### 12.297.4.34 ProcessPrivateTag()

```
void gdcm::StrictScanner2::ProcessPrivateTag (  
    StringFilter & sf,  
    const char * filename) [protected]
```

#### 12.297.4.35 ProcessPublicTag()

```
void gdcm::StrictScanner2::ProcessPublicTag (  
    StringFilter & sf,  
    const char * filename) [protected]
```

#### 12.297.4.36 Scan()

```
bool gdcm::StrictScanner2::Scan (  
    Directory::FileNamesType const & filenames)
```

Start the scan !

### 12.297.5 Friends And Related Symbol Documentation

#### 12.297.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const StrictScanner2 & s) [friend]
```

References [StrictScanner2\(\)](#), and [Print\(\)](#).

The documentation for this class was generated from the following file:

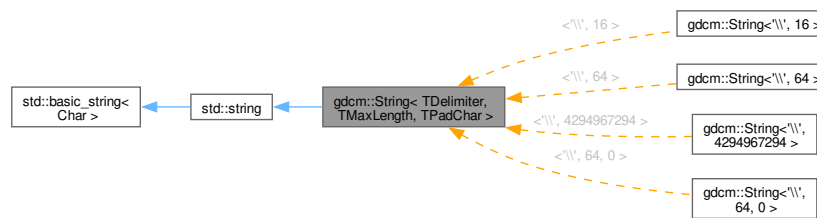
- [gdcmStrictScanner2.h](#)

## 12.298 `gdcm::String< TDelimiter, TMaxLength, TPadChar >` Class Template Reference

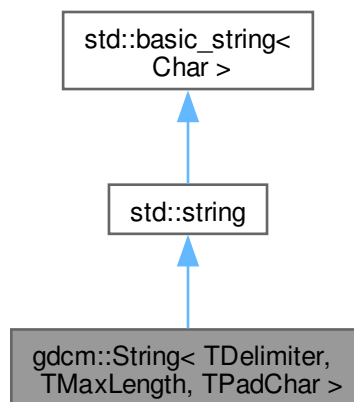
[String.](#)

```
#include <gdcmString.h>
```

Inheritance diagram for `gdcm::String< TDelimiter, TMaxLength, TPadChar >`:



Collaboration diagram for `gdcm::String< TDelimiter, TMaxLength, TPadChar >`:



### Public Types

- typedef `std::string::const_iterator` [const\\_iterator](#)
- typedef `std::string::const_reference` [const\\_reference](#)
- typedef `std::string::const_reverse_iterator` [const\\_reverse\\_iterator](#)
- typedef `std::string::difference_type` [difference\\_type](#)

- typedef std::string::iterator [iterator](#)
- typedef std::string::pointer [pointer](#)
- typedef std::string::reference [reference](#)
- typedef std::string::reverse\_iterator [reverse\\_iterator](#)
- typedef std::string::size\_type [size\\_type](#)
- typedef std::string::value\_type [value\\_type](#)

## Public Member Functions

- [String](#) ()  
*String constructors.*
- [String](#) (const std::string &s, [size\\_type](#) pos=0, [size\\_type](#) n=npos)
- [String](#) (const [value\\_type](#) \*s)
- [String](#) (const [value\\_type](#) \*s, [size\\_type](#) n)
- bool [IsValid](#) () const  
*return if string is valid*
- [operator const char \\*](#) () const  
*WARNING: Trailing \0 might be lost in this operation:*
- std::string [Trim](#) () const
- [gdcmm::String](#)< TDelimiter, TMaxLength, TPadChar > [Truncate](#) () const

## Static Public Member Functions

- static std::string [Trim](#) (const char \*input)

## 12.298.1 Detailed Description

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
class gdcmm::String< TDelimiter, TMaxLength, TPadChar >
```

[String](#).

### Note

TDelimiter template parameter is used to separate multiple [String](#) (VM1 >) TMaxLength is only a hint. No one actually respect the max length TPadChar is the string padding (0 or space)

## 12.298.2 Member Typedef Documentation

### 12.298.2.1 const\_iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::const_iterator gdcmm::String< TDelimiter, TMaxLength, TPadChar >::const_↵
iterator
```

### 12.298.2.2 const\_reference

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::const_reference gdcm::String< TDelimiter, TMaxLength, TPadChar >::const_↵
reference
```

### 12.298.2.3 const\_reverse\_iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::const_reverse_iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >↵
::const_reverse_iterator
```

### 12.298.2.4 difference\_type

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::difference_type gdcm::String< TDelimiter, TMaxLength, TPadChar >::difference↵
_type
```

### 12.298.2.5 iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >::iterator
```

### 12.298.2.6 pointer

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::pointer gdcm::String< TDelimiter, TMaxLength, TPadChar >::pointer
```

### 12.298.2.7 reference

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::reference gdcm::String< TDelimiter, TMaxLength, TPadChar >::reference
```

### 12.298.2.8 reverse\_iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::reverse_iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >::reverse↵
_iterator
```

### 12.298.2.9 size\_type

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::size_type gdcm::String< TDelimiter, TMaxLength, TPadChar >::size_type
```

### 12.298.2.10 value\_type

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::value_type gdcm::String< TDelimiter, TMaxLength, TPadChar >::value_type
```

## 12.298.3 Constructor & Destructor Documentation

### 12.298.3.1 String() [1/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String () [inline]
```

[String](#) constructors.

### 12.298.3.2 String() [2/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String (
    const value\_type * s) [inline]
```

### 12.298.3.3 String() [3/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String (
    const value\_type * s,
    size\_type n) [inline]
```

### 12.298.3.4 String() [4/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String (
    const std::string & s,
    size\_type pos = 0,
    size\_type n = npos) [inline]
```

## 12.298.4 Member Function Documentation

### 12.298.4.1 IsValid()

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
bool gdcm::String< TDelimiter, TMaxLength, TPadChar >::IsValid () const [inline]
```

return if string is valid

Referenced by [gdcm::String<"\\", 16 >::Truncate\(\)](#).

**12.298.4.2 operator const char \*()**

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::operator const char * () const [inline]
```

WARNING: Trailing \0 might be lost in this operation:

**12.298.4.3 Trim() [1/2]**

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
std::string gdcm::String< TDelimiter, TMaxLength, TPadChar >::Trim () const [inline]
```

Trim function is required to return a std::string object, otherwise we could not create a [gdcm::String](#) object with an odd number of bytes...

**12.298.4.4 Trim() [2/2]**

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
std::string gdcm::String< TDelimiter, TMaxLength, TPadChar >::Trim (
    const char * input) [inline], [static]
```

**12.298.4.5 Truncate()**

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar > gdcm::String< TDelimiter, TMaxLength, TPadChar
>::Truncate () const [inline]
```

The documentation for this class was generated from the following file:

- [gdcmString.h](#)

**12.299 gdcm::StringFilter Class Reference**

[StringFilter](#).

```
#include <gdcmStringFilter.h>
```



## Public Member Functions

- [StringFilter](#) ()
- [~StringFilter](#) ()
- bool [ExecuteQuery](#) (std::string const &query, std::string &value) const
- std::string [FromString](#) (const [Tag](#) &t, const char \*value, size\_t len)  
*Convert to string the char array defined by the pair (value,len).*
- [File](#) & [GetFile](#) ()
- const [File](#) & [GetFile](#) () const
- void [SetDicts](#) (const [Dicts](#) &dicts)  
*Allow user to pass in there own dicts.*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get File.*
- std::string [ToString](#) (const [DataElement](#) &de) const
- std::string [ToString](#) (const [PrivateTag](#) &t) const
- std::string [ToString](#) (const [Tag](#) &t) const  
*Directly from a Tag:*
- std::pair< std::string, std::string > [ToStringPair](#) (const [DataElement](#) &de) const
- std::pair< std::string, std::string > [ToStringPair](#) (const [Tag](#) &t) const  
*Directly from a Tag:*
- void [UseDictAlways](#) (bool)

## Protected Member Functions

- bool [ExecuteQuery](#) (std::string const &query, [DataSet](#) const &ds, std::string &value) const
- std::pair< std::string, std::string > [ToStringPair](#) (const [Tag](#) &t, [DataSet](#) const &ds) const

## 12.299.1 Detailed Description

[StringFilter](#).

[StringFilter](#) is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a [DataElement](#) into a string, typically this is a nice feature to have for wrapped language

### Examples

[DumpVisusChange.cxx](#), [ReadAndPrintAttributes.cxx](#), and [SimplePrintPatientName.cs](#).

## 12.299.2 Constructor & Destructor Documentation

### 12.299.2.1 StringFilter()

```
gdcm::StringFilter::StringFilter ()
```

### 12.299.2.2 ~StringFilter()

```
gdcmm::StringFilter::~~StringFilter ()
```

## 12.299.3 Member Function Documentation

### 12.299.3.1 ExecuteQuery() [1/2]

```
bool gdcmm::StringFilter::ExecuteQuery (
    std::string const & query,
    DataSet const & ds,
    std::string & value) const [protected]
```

### 12.299.3.2 ExecuteQuery() [2/2]

```
bool gdcmm::StringFilter::ExecuteQuery (
    std::string const & query,
    std::string & value) const
```

Execute the XPATH query to find a value (as string) return false when attribute is not found (or an error in the XPATH query) You need to make sure that your XPATH query is syntactically correct

### 12.299.3.3 FromString()

```
std::string gdcmm::StringFilter::FromString (
    const Tag & t,
    const char * value,
    size_t len)
```

Convert to string the char array defined by the pair (value,len).

### 12.299.3.4 GetFile() [1/2]

```
File & gdcmm::StringFilter::GetFile () [inline]
```

### 12.299.3.5 GetFile() [2/2]

```
const File & gdcmm::StringFilter::GetFile () const [inline]
```

### 12.299.3.6 SetDicts()

```
void gdcmm::StringFilter::SetDicts (
    const Dicts & dicts)
```

Allow user to pass in there own dicts.

### 12.299.3.7 SetFile()

```
void gdcm::StringFilter::SetFile (
    const File & f) [inline]
```

Set/Get [File](#).

#### Examples

[DumpVisusChange.cxx](#), [ReadAndPrintAttributes.cxx](#), and [SimplePrintPatientName.cs](#).

### 12.299.3.8 ToString() [1/3]

```
std::string gdcm::StringFilter::ToString (
    const DataElement & de) const
```

Convert to string the [ByteValue](#) contained in a [DataElement](#). The [DataElement](#) must be coming from the actual [DataSet](#) associated with [File](#) (see [SetFile](#)).

#### Examples

[DumpVisusChange.cxx](#), [ReadAndPrintAttributes.cxx](#), and [SimplePrintPatientName.cs](#).

### 12.299.3.9 ToString() [2/3]

```
std::string gdcm::StringFilter::ToString (
    const PrivateTag & t) const
```

### 12.299.3.10 ToString() [3/3]

```
std::string gdcm::StringFilter::ToString (
    const Tag & t) const
```

Directly from a [Tag](#):

### 12.299.3.11 ToStringPair() [1/3]

```
std::pair< std::string, std::string > gdcm::StringFilter::ToStringPair (
    const DataElement & de) const
```

Convert to string the [ByteValue](#) contained in a [DataElement](#) the returned elements are: pair.first : the name as found in the dictionary of [DataElement](#) pari.second : the value encoded into a string (US,UL...) are properly converted

#### Examples

[ReadAndPrintAttributes.cxx](#).

**12.299.3.12 ToStringPair() [2/3]**

```
std::pair< std::string, std::string > gdc::StringFilter::ToStringPair (
    const Tag & t) const
```

Directly from a [Tag](#):

**12.299.3.13 ToStringPair() [3/3]**

```
std::pair< std::string, std::string > gdc::StringFilter::ToStringPair (
    const Tag & t,
    DataSet const & ds) const [protected]
```

**12.299.3.14 UseDictAlways()**

```
void gdc::StringFilter::UseDictAlways (
    bool ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcStringFilter.h](#)

## 12.300 gdc::Study Class Reference

[Study](#).

```
#include <gdcStudy.h>
```

**Public Member Functions**

- [Study](#) ()=default

**12.300.1 Detailed Description**

[Study](#).

**12.300.2 Constructor & Destructor Documentation****12.300.2.1 Study()**

```
gdc::Study::Study () [default]
```

The documentation for this class was generated from the following file:

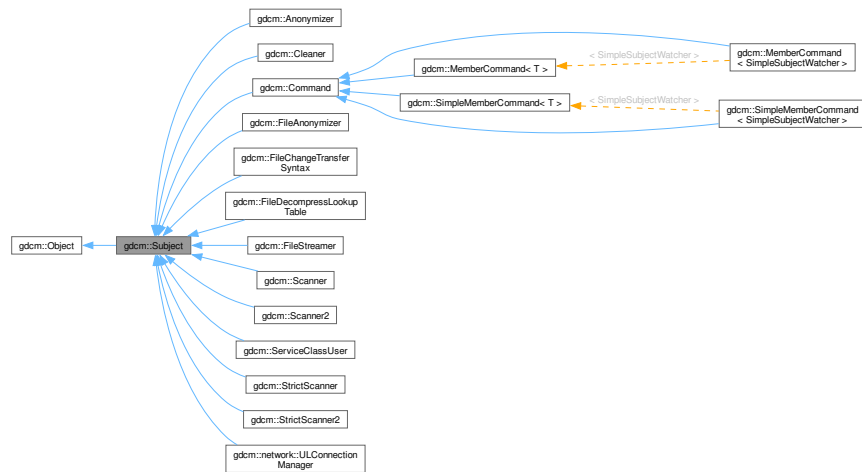
- [gdcStudy.h](#)

## 12.301 gdcmm::Subject Class Reference

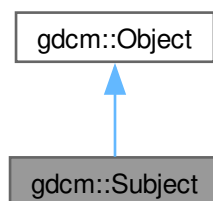
Subject.

```
#include <gdcmmSubject.h>
```

Inheritance diagram for gdcmm::Subject:



Collaboration diagram for gdcmm::Subject:



### Public Member Functions

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)

- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const Object &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### 12.301.1 Detailed Description

[Subject](#).

See also

[Command Event](#)

Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

### 12.301.2 Constructor & Destructor Documentation

#### 12.301.2.1 [Subject\(\)](#)

`gdcm::Subject::Subject ()`

Referenced by [gdcm::Command::Execute\(\)](#), and [gdcm::Command::Execute\(\)](#).

### 12.301.2.2 ~Subject()

```
gdcmm::Subject::~~Subject () [override]
```

## 12.301.3 Member Function Documentation

### 12.301.3.1 AddObserver() [1/2]

```
unsigned long gdcmm::Subject::AddObserver (
    const Event & event,
    Command * )
```

Allow people to add/remove/invoke observers (callbacks) to any GDCM object. This is an implementation of the subject/observer design pattern. An observer is added by specifying an event to respond to and an [gdcmm::Command](#) to execute. It returns an unsigned long tag which can be used later to remove the event or retrieve the command. The memory for the [Command](#) becomes the responsibility of this object, so don't pass the same instance of a command to two different objects

### 12.301.3.2 AddObserver() [2/2]

```
unsigned long gdcmm::Subject::AddObserver (
    const Event & event,
    Command * ) const
```

### 12.301.3.3 GetCommand()

```
Command * gdcmm::Subject::GetCommand (
    unsigned long tag)
```

Get the command associated with the given tag. NOTE: This returns a pointer to a [Command](#), but it is safe to assign this to a [Command::Pointer](#). Since [Command](#) inherits from [LightObject](#), at this point in the code, only a pointer or a reference to the [Command](#) can be used.

### 12.301.3.4 HasObserver()

```
bool gdcmm::Subject::HasObserver (
    const Event & event) const
```

Return true if an observer is registered for this event.

### 12.301.3.5 InvokeEvent() [1/2]

```
void gdcmm::Subject::InvokeEvent (
    const Event & )
```

Call Execute on all the Commands observing this event id.

### 12.301.3.6 InvokeEvent() [2/2]

```
void gdcM::Subject::InvokeEvent (
    const Event & ) const
```

Call Execute on all the Commands observing this event id. The actions triggered by this call doesn't modify this object.

### 12.301.3.7 RemoveAllObservers()

```
void gdcM::Subject::RemoveAllObservers ()
```

Remove all observers .

### 12.301.3.8 RemoveObserver()

```
void gdcM::Subject::RemoveObserver (
    unsigned long tag)
```

Remove the observer with this tag value.

The documentation for this class was generated from the following file:

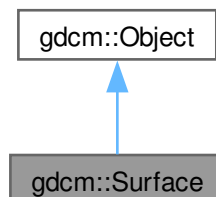
- [gdcMSubject.h](#)

## 12.302 gdcM::Surface Class Reference

This class defines a SURFACE IE.

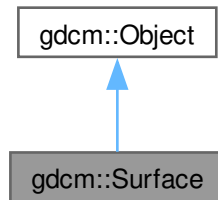
```
#include <gdcMSurface.h>
```

Inheritance diagram for gdcM::Surface:





Collaboration diagram for gdcm::Surface:



### Public Types

- enum `STATES` {  
`NO` = 0 ,  
`YES` ,  
`UNKNOWN` ,  
`STATES_END` }
- enum `VIEWType` {  
`SURFACE` = 0 ,  
`WIREFRAME` ,  
`POINTS` ,  
`VIEWType_END` }

*Enumeration for Recommended Presentation [Type](#).*

### Public Member Functions

- `Surface` ()
- `~Surface` () override
- `SegmentHelper::BasicCodedEntry` & `GetAlgorithmFamily` ()
- `SegmentHelper::BasicCodedEntry` const & `GetAlgorithmFamily` () const
- const char \* `GetAlgorithmName` () const
- const char \* `GetAlgorithmVersion` () const
- const float \* `GetAxisOfRotation` () const
- const float \* `GetCenterOfRotation` () const
- `STATES` `GetFiniteVolume` () const
- `STATES` `GetManifold` () const
- float `GetMaximumPointDistance` () const
- float `GetMeanPointDistance` () const
- `MeshPrimitive` & `GetMeshPrimitive` ()
- `MeshPrimitive` const & `GetMeshPrimitive` () const
- unsigned long `GetNumberOfSurfacePoints` () const
- unsigned long `GetNumberOfVectors` () const
- `DataElement` & `GetPointCoordinatesData` ()

- const [DataElement](#) & [GetPointCoordinatesData](#) () const
- const float \* [GetPointPositionAccuracy](#) () const
- const float \* [GetPointsBoundingBoxCoordinates](#) () const
- [SegmentHelper::BasicCodedEntry](#) & [GetProcessingAlgorithm](#) ()
- [SegmentHelper::BasicCodedEntry](#) const & [GetProcessingAlgorithm](#) () const
- const unsigned short \* [GetRecommendedDisplayCIELabValue](#) () const
- unsigned short [GetRecommendedDisplayCIELabValue](#) (const unsigned int idx) const
- unsigned short [GetRecommendedDisplayGrayscaleValue](#) () const
- float [GetRecommendedPresentationOpacity](#) () const
- [VIEWType](#) [GetRecommendedPresentationType](#) () const
- const char \* [GetSurfaceComments](#) () const
- unsigned long [GetSurfaceNumber](#) () const
- bool [GetSurfaceProcessing](#) () const
- const char \* [GetSurfaceProcessingDescription](#) () const
- float [GetSurfaceProcessingRatio](#) () const
- const float \* [GetVectorAccuracy](#) () const
- [DataElement](#) & [GetVectorCoordinateData](#) ()
- const [DataElement](#) & [GetVectorCoordinateData](#) () const
- unsigned short [GetVectorDimensionality](#) () const
- void [SetAlgorithmFamily](#) ([SegmentHelper::BasicCodedEntry](#) const &BSE)
- void [SetAlgorithmName](#) (const char \*str)
- void [SetAlgorithmVersion](#) (const char \*str)
- void [SetAxisOfRotation](#) (const float \*axis)
- void [SetCenterOfRotation](#) (const float \*center)
- void [SetFiniteVolume](#) ([STATES](#) state)
- void [SetManifold](#) ([STATES](#) state)
- void [SetMaximumPointDistance](#) (float maximum)
- void [SetMeanPointDistance](#) (float average)
- void [SetMeshPrimitive](#) ([MeshPrimitive](#) &mp)
- void [SetNumberOfSurfacePoints](#) (const unsigned long nb)
- void [SetNumberOfVectors](#) (const unsigned long nb)
- void [SetPointCoordinatesData](#) ([DataElement](#) const &de)
- void [SetPointPositionAccuracy](#) (const float \*accuracies)
- void [SetPointsBoundingBoxCoordinates](#) (const float \*coordinates)
- void [SetProcessingAlgorithm](#) ([SegmentHelper::BasicCodedEntry](#) const &BSE)
- void [SetRecommendedDisplayCIELabValue](#) (const std::vector< unsigned short > &vl)
- void [SetRecommendedDisplayCIELabValue](#) (const unsigned short vl, const unsigned int idx=0)
- void [SetRecommendedDisplayCIELabValue](#) (const unsigned short vl[3])
- void [SetRecommendedDisplayGrayscaleValue](#) (const unsigned short vl)
- void [SetRecommendedPresentationOpacity](#) (const float opacity)
- void [SetRecommendedPresentationType](#) ([VIEWType](#) type)
- void [SetSurfaceComments](#) (const char \*comment)
- void [SetSurfaceNumber](#) (const unsigned long nb)
- void [SetSurfaceProcessing](#) (bool b)
- void [SetSurfaceProcessingDescription](#) (const char \*description)
- void [SetSurfaceProcessingRatio](#) (const float ratio)
- void [SetVectorAccuracy](#) (const float \*accuracy)
- void [SetVectorCoordinateData](#) ([DataElement](#) const &de)
- void [SetVectorDimensionality](#) (const unsigned short dim)

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Static Public Member Functions

- static [STATES](#) [GetSTATES](#) (const char \*state)
- static const char \* [GetSTATESString](#) ([STATES](#) state)
- static [VIEWType](#) [GetVIEWType](#) (const char \*type)
- static const char \* [GetVIEWTypeString](#) ([VIEWType](#) type)

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### 12.302.1 Detailed Description

This class defines a SURFACE IE.

This members are taken from required surface mesh module attributes.

See also

PS 3.3 A.1.2.18 , A.57 and C.27

### 12.302.2 Member Enumeration Documentation

#### 12.302.2.1 STATES

```
enum gdcm::Surface::STATES
```

#### Enumerator

NO	
----	--

YES	
UNKNOWN	
STATES_END	

### 12.302.2.2 VIEWType

enum `gdcm::Surface::VIEWType`

Enumeration for Recommended Presentation [Type](#).

See also

Tag(0x0066, 0x000D) and PS 3.3 C.27.1.1.3

#### Enumerator

SURFACE	
WIREFRAME	
POINTS	
VIEWType_END	

## 12.302.3 Constructor & Destructor Documentation

### 12.302.3.1 Surface()

```
gdcm::Surface::Surface ()
```

### 12.302.3.2 ~Surface()

```
gdcm::Surface::~~Surface () [override]
```

## 12.302.4 Member Function Documentation

### 12.302.4.1 GetAlgorithmFamily() [1/2]

```
SegmentHelper::BasicCodedEntry & gdcm::Surface::GetAlgorithmFamily ()
```

#### 12.302.4.2 GetAlgorithmFamily() [2/2]

```
SegmentHelper::BasicCodedEntry const & gdcm::Surface::GetAlgorithmFamily () const
```

#### 12.302.4.3 GetAlgorithmName()

```
const char * gdcm::Surface::GetAlgorithmName () const
```

#### 12.302.4.4 GetAlgorithmVersion()

```
const char * gdcm::Surface::GetAlgorithmVersion () const
```

#### 12.302.4.5 GetAxisOfRotation()

```
const float * gdcm::Surface::GetAxisOfRotation () const
```

##### Note

Pointer is null if undefined

#### 12.302.4.6 GetCenterOfRotation()

```
const float * gdcm::Surface::GetCenterOfRotation () const
```

##### Note

Pointer is null if undefined

#### 12.302.4.7 GetFiniteVolume()

```
STATES gdcm::Surface::GetFiniteVolume () const
```

#### 12.302.4.8 GetManifold()

```
STATES gdcm::Surface::GetManifold () const
```

#### 12.302.4.9 GetMaximumPointDistance()

```
float gdcm::Surface::GetMaximumPointDistance () const
```

**12.302.4.10 GetMeanPointDistance()**

```
float gdcM::Surface::GetMeanPointDistance () const
```

**12.302.4.11 GetMeshPrimitive() [1/2]**

```
MeshPrimitive & gdcM::Surface::GetMeshPrimitive ()
```

**12.302.4.12 GetMeshPrimitive() [2/2]**

```
MeshPrimitive const & gdcM::Surface::GetMeshPrimitive () const
```

**12.302.4.13 GetNumberOfSurfacePoints()**

```
unsigned long gdcM::Surface::GetNumberOfSurfacePoints () const
```

**12.302.4.14 GetNumberOfVectors()**

```
unsigned long gdcM::Surface::GetNumberOfVectors () const
```

**12.302.4.15 GetPointCoordinatesData() [1/2]**

```
DataElement & gdcM::Surface::GetPointCoordinatesData ()
```

**12.302.4.16 GetPointCoordinatesData() [2/2]**

```
const DataElement & gdcM::Surface::GetPointCoordinatesData () const
```

**12.302.4.17 GetPointPositionAccuracy()**

```
const float * gdcM::Surface::GetPointPositionAccuracy () const
```

**Note**

Pointer is null if undefined

**12.302.4.18 GetPointsBoundingBoxCoordinates()**

```
const float * gdcm::Surface::GetPointsBoundingBoxCoordinates () const
```

**Note**

Pointer is null if undefined

**12.302.4.19 GetProcessingAlgorithm() [1/2]**

```
SegmentHelper::BasicCodedEntry & gdcm::Surface::GetProcessingAlgorithm ()
```

**12.302.4.20 GetProcessingAlgorithm() [2/2]**

```
SegmentHelper::BasicCodedEntry const & gdcm::Surface::GetProcessingAlgorithm () const
```

**12.302.4.21 GetRecommendedDisplayCIELabValue() [1/2]**

```
const unsigned short * gdcm::Surface::GetRecommendedDisplayCIELabValue () const
```

**12.302.4.22 GetRecommendedDisplayCIELabValue() [2/2]**

```
unsigned short gdcm::Surface::GetRecommendedDisplayCIELabValue (  
    const unsigned int idx) const
```

**12.302.4.23 GetRecommendedDisplayGrayscaleValue()**

```
unsigned short gdcm::Surface::GetRecommendedDisplayGrayscaleValue () const
```

**12.302.4.24 GetRecommendedPresentationOpacity()**

```
float gdcm::Surface::GetRecommendedPresentationOpacity () const
```

**12.302.4.25 GetRecommendedPresentationType()**

```
VIEWType gdcm::Surface::GetRecommendedPresentationType () const
```

**12.302.4.26 GetSTATES()**

```
STATES gdcM::Surface::GetSTATES (
    const char * state) [static]
```

**12.302.4.27 GetSTATESString()**

```
const char * gdcM::Surface::GetSTATESString (
    STATES state) [static]
```

**12.302.4.28 GetSurfaceComments()**

```
const char * gdcM::Surface::GetSurfaceComments () const
```

**12.302.4.29 GetSurfaceNumber()**

```
unsigned long gdcM::Surface::GetSurfaceNumber () const
```

**12.302.4.30 GetSurfaceProcessing()**

```
bool gdcM::Surface::GetSurfaceProcessing () const
```

**12.302.4.31 GetSurfaceProcessingDescription()**

```
const char * gdcM::Surface::GetSurfaceProcessingDescription () const
```

**12.302.4.32 GetSurfaceProcessingRatio()**

```
float gdcM::Surface::GetSurfaceProcessingRatio () const
```

**12.302.4.33 GetVectorAccuracy()**

```
const float * gdcM::Surface::GetVectorAccuracy () const
```

**12.302.4.34 GetVectorCoordinateData() [1/2]**

```
DataElement & gdcM::Surface::GetVectorCoordinateData ()
```



**12.302.4.35 GetVectorCoordinateData() [2/2]**

```
const DataElement & gdcm::Surface::GetVectorCoordinateData () const
```

**12.302.4.36 GetVectorDimensionality()**

```
unsigned short gdcm::Surface::GetVectorDimensionality () const
```

**12.302.4.37 GetVIEWType()**

```
VIEWType gdcm::Surface::GetVIEWType (  
    const char * type) [static]
```

**12.302.4.38 GetVIEWTypeString()**

```
const char * gdcm::Surface::GetVIEWTypeString (  
    VIEWType type) [static]
```

**12.302.4.39 SetAlgorithmFamily()**

```
void gdcm::Surface::SetAlgorithmFamily (  
    SegmentHelper::BasicCodedEntry const & BSE)
```

**12.302.4.40 SetAlgorithmName()**

```
void gdcm::Surface::SetAlgorithmName (  
    const char * str)
```

**12.302.4.41 SetAlgorithmVersion()**

```
void gdcm::Surface::SetAlgorithmVersion (  
    const char * str)
```

**12.302.4.42 SetAxisOfRotation()**

```
void gdcm::Surface::SetAxisOfRotation (  
    const float * axis)
```

**12.302.4.43 SetCenterOfRotation()**

```
void gdcM::Surface::SetCenterOfRotation (
    const float * center)
```

**12.302.4.44 SetFiniteVolume()**

```
void gdcM::Surface::SetFiniteVolume (
    STATES state)
```

**12.302.4.45 SetManifold()**

```
void gdcM::Surface::SetManifold (
    STATES state)
```

**12.302.4.46 SetMaximumPointDistance()**

```
void gdcM::Surface::SetMaximumPointDistance (
    float maximum)
```

**12.302.4.47 SetMeanPointDistance()**

```
void gdcM::Surface::SetMeanPointDistance (
    float average)
```

**12.302.4.48 SetMeshPrimitive()**

```
void gdcM::Surface::SetMeshPrimitive (
    MeshPrimitive & mp)
```

References [gdcM::Object::SmartPointer](#).

**12.302.4.49 SetNumberOfSurfacePoints()**

```
void gdcM::Surface::SetNumberOfSurfacePoints (
    const unsigned long nb)
```

**12.302.4.50 SetNumberOfVectors()**

```
void gdcM::Surface::SetNumberOfVectors (
    const unsigned long nb)
```

**12.302.4.51 SetPointCoordinatesData()**

```
void gdcm::Surface::SetPointCoordinatesData (
    DataElement const & de)
```

**12.302.4.52 SetPointPositionAccuracy()**

```
void gdcm::Surface::SetPointPositionAccuracy (
    const float * accuracies)
```

**12.302.4.53 SetPointsBoundingBoxCoordinates()**

```
void gdcm::Surface::SetPointsBoundingBoxCoordinates (
    const float * coordinates)
```

**12.302.4.54 SetProcessingAlgorithm()**

```
void gdcm::Surface::SetProcessingAlgorithm (
    SegmentHelper::BasicCodedEntry const & BSE)
```

**12.302.4.55 SetRecommendedDisplayCIELabValue() [1/3]**

```
void gdcm::Surface::SetRecommendedDisplayCIELabValue (
    const std::vector< unsigned short > & vl)
```

**12.302.4.56 SetRecommendedDisplayCIELabValue() [2/3]**

```
void gdcm::Surface::SetRecommendedDisplayCIELabValue (
    const unsigned short vl,
    const unsigned int idx = 0)
```

**12.302.4.57 SetRecommendedDisplayCIELabValue() [3/3]**

```
void gdcm::Surface::SetRecommendedDisplayCIELabValue (
    const unsigned short vl[3])
```

**12.302.4.58 SetRecommendedDisplayGrayscaleValue()**

```
void gdcm::Surface::SetRecommendedDisplayGrayscaleValue (
    const unsigned short vl)
```

**12.302.4.59 SetRecommendedPresentationOpacity()**

```
void gdcm::Surface::SetRecommendedPresentationOpacity (
    const float opacity)
```

**12.302.4.60 SetRecommendedPresentationType()**

```
void gdcm::Surface::SetRecommendedPresentationType (
    VIEWType type)
```

**12.302.4.61 SetSurfaceComments()**

```
void gdcm::Surface::SetSurfaceComments (
    const char * comment)
```

**12.302.4.62 SetSurfaceNumber()**

```
void gdcm::Surface::SetSurfaceNumber (
    const unsigned long nb)
```

**12.302.4.63 SetSurfaceProcessing()**

```
void gdcm::Surface::SetSurfaceProcessing (
    bool b)
```

**12.302.4.64 SetSurfaceProcessingDescription()**

```
void gdcm::Surface::SetSurfaceProcessingDescription (
    const char * description)
```

**12.302.4.65 SetSurfaceProcessingRatio()**

```
void gdcm::Surface::SetSurfaceProcessingRatio (
    const float ratio)
```

**12.302.4.66 SetVectorAccuracy()**

```
void gdcm::Surface::SetVectorAccuracy (
    const float * accuracy)
```

**12.302.4.67 SetVectorCoordinateData()**

```
void gdcm::Surface::SetVectorCoordinateData (
    DataElement const & de)
```

**12.302.4.68 SetVectorDimensionality()**

```
void gdcm::Surface::SetVectorDimensionality (
    const unsigned short dim)
```

The documentation for this class was generated from the following file:

- [gdcmSurface.h](#)

**12.303 gdcm::SurfaceHelper Class Reference**

[SurfaceHelper](#).

```
#include <gdcmSurfaceHelper.h>
```

**Public Types**

- typedef std::vector< unsigned short > [ColorArray](#)

**Static Public Member Functions**

- template<typename U>  
static std::vector< float > [RecommendedDisplayCIELabToRGB](#) (const [ColorArray](#) &CIELab, const U range←  
Max=255)  
*Convert a DICOM CIE-Lab (after reading) color into RGB.*
- template<typename T, typename U>  
static std::vector< T > [RecommendedDisplayCIELabToRGB](#) (const [ColorArray](#) &CIELab, const U range←  
Max=255)  
*Convert a DICOM CIE-Lab (after reading) color into RGB.*
- template<typename T, typename U>  
static [ColorArray](#) [RGBToRecommendedDisplayCIELab](#) (const std::vector< T > &RGB, const U rangeMax=255)  
*Convert a RGB color into DICOM CIE-Lab (ready to write).*
- template<typename T, typename U>  
static unsigned short [RGBToRecommendedDisplayGrayscale](#) (const std::vector< T > &RGB, const U range←  
Max=255)  
*Convert a RGB color into DICOM grayscale (ready to write).*

### 12.303.1 Detailed Description

[SurfaceHelper](#).

Helper class for [Surface](#) object

### 12.303.2 Member Typedef Documentation

#### 12.303.2.1 ColorArray

```
typedef std::vector< unsigned short > gdc::SurfaceHelper::ColorArray
```

### 12.303.3 Member Function Documentation

#### 12.303.3.1 RecommendedDisplayCIELabToRGB() [1/2]

```
template<typename U>
std::vector< float > gdc::SurfaceHelper::RecommendedDisplayCIELabToRGB (
    const ColorArray & CIELab,
    const U rangeMax = 255) [static]
```

Convert a DICOM CIE-Lab (after reading) color into RGB.

See also

PS 3.3 C.10.7.1.1

#### Parameters

<i>CIELab</i>	DICOM CIE-Lab array.
<i>rangeMax</i>	Max value of the RGB range.

#### Template Parameters

<i>U</i>	<a href="#">Type</a> of rangeMax value.
----------	---

References [RecommendedDisplayCIELabToRGB\(\)](#).

### 12.303.3.2 RecommendedDisplayCIELabToRGB() [2/2]

```
template<typename T, typename U>
std::vector< T > gdcm::SurfaceHelper::RecommendedDisplayCIELabToRGB (
    const ColorArray & CIELab,
    const U rangeMax = 255) [static]
```

Convert a DICOM CIE-Lab (after reading) color into RGB.

See also

PS 3.3 C.10.7.1.1

#### Parameters

<i>CIELab</i>	DICOM CIE-Lab array.
<i>rangeMax</i>	Max value of the RGB range.

#### Template Parameters

<i>T</i>	<a href="#">Type</a> of CIELab components.
<i>U</i>	<a href="#">Type</a> of rangeMax value.

Referenced by [RecommendedDisplayCIELabToRGB\(\)](#).

### 12.303.3.3 RGBToRecommendedDisplayCIELab()

```
template<typename T, typename U>
SurfaceHelper::ColorArray gdcm::SurfaceHelper::RGBToRecommendedDisplayCIELab (
    const std::vector< T > & RGB,
    const U rangeMax = 255) [static]
```

Convert a RGB color into DICOM CIE-Lab (ready to write).

See also

PS 3.3 C.10.7.1.1

#### Parameters

<i>RGB</i>	RGB array.
<i>rangeMax</i>	Max value of the RGB range.

**Template Parameters**

<i>T</i>	Type of RGB components.
<i>U</i>	Type of rangeMax value.

**12.303.3.4 RGBToRecommendedDisplayGrayscale()**

```
template<typename T, typename U>
unsigned short gdcM::SurfaceHelper::RGBToRecommendedDisplayGrayscale (
    const std::vector< T > & RGB,
    const U rangeMax = 255) [static]
```

Convert a RGB color into DICOM grayscale (ready to write).

See also

PS 3.3 C.27.1 tag(0062,000C)

**Parameters**

<i>RGB</i>	RGB array.
<i>rangeMax</i>	Max value of the RGB range.

**Template Parameters**

<i>T</i>	Type of RGB components.
<i>U</i>	Type of rangeMax value.

The documentation for this class was generated from the following file:

- [gdcMSurfaceHelper.h](#)

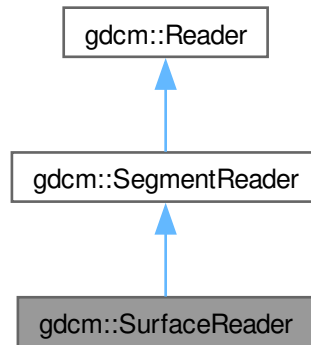
**12.304 gdcM::SurfaceReader Class Reference**

This class defines a SURFACE IE reader.

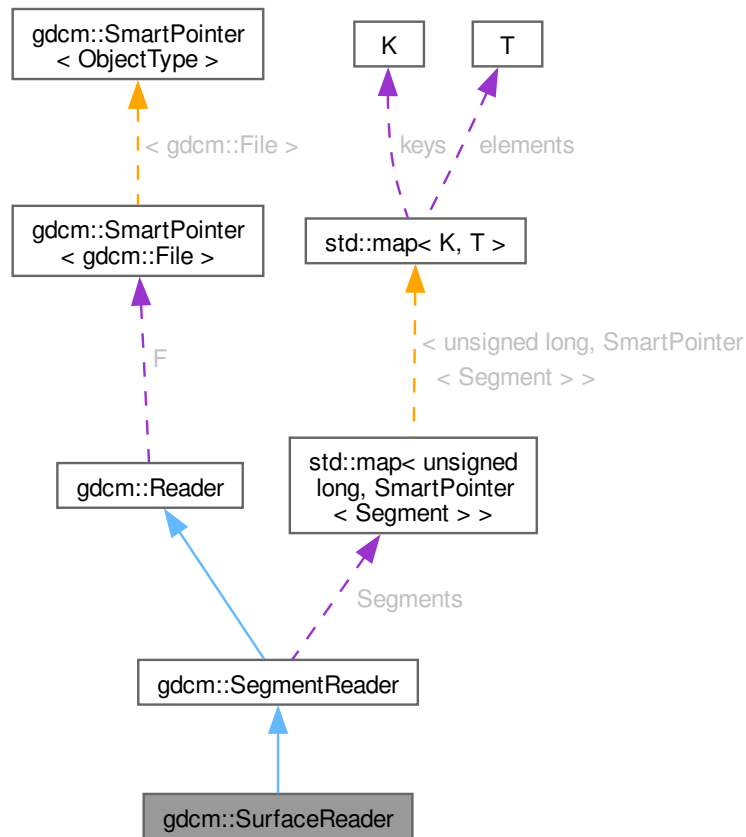
```
#include <gdcMSurfaceReader.h>
```



Inheritance diagram for gdcm::SurfaceReader:



Collaboration diagram for `gdcm::SurfaceReader`:



### Public Member Functions

- [SurfaceReader](#) ()
  - [~SurfaceReader](#) () override
  - unsigned long [GetNumberOfSurfaces](#) () const
  - bool [Read](#) () override
- Read.*

### Public Member Functions inherited from [gdcm::SegmentReader](#)

- [SegmentReader](#) ()
- [~SegmentReader](#) () override
- [SegmentVector](#) [GetSegments](#) ()
- [SegmentVector](#) [GetSegments](#) () const

## Public Member Functions inherited from [gdcm::Reader](#)

- [Reader](#) ()
- virtual [~Reader](#) ()
- bool [CanRead](#) () const
- [File](#) & [GetFile](#) ()  
*Set/Get File.*
- const [File](#) & [GetFile](#) () const  
*Set/Get File.*
- size\_t [GetStreamCurrentPosition](#) () const
- bool [ReadSelectedPrivateTags](#) (std::set< [PrivateTag](#) > const &ptags, bool readvalues=true)  
*Will only read the specified selected private tags.*
- bool [ReadSelectedTags](#) (std::set< [Tag](#) > const &tags, bool readvalues=true)  
*Will only read the specified selected tags.*
- bool [ReadUpToTag](#) (const [Tag](#) &tag, std::set< [Tag](#) > const &skiptags=std::set< [Tag](#) >())
- void [SetFile](#) ([File](#) &file)  
*Set/Get File.*
- void [SetFileName](#) (const char \*filename\_native)
- void [SetStream](#) (std::istream &input\_stream)  
*Set the open-ed stream directly.*

## Protected Member Functions

- bool [ReadPointMacro](#) ([SmartPointer](#)< [Surface](#) > surface, const [DataSet](#) &surfaceDS)
- bool [ReadSurface](#) (const [Item](#) &surfaceItem, const unsigned long idx)
- bool [ReadSurfaces](#) ()

## Protected Member Functions inherited from [gdcm::SegmentReader](#)

- bool [ReadSegment](#) (const [Item](#) &segmentItem, const unsigned int idx)
- bool [ReadSegments](#) ()

## Protected Member Functions inherited from [gdcm::Reader](#)

- std::istream \* [GetStreamPtr](#) () const
- bool [ReadDataSet](#) ()
- bool [ReadMetaInformation](#) ()
- bool [ReadPreamble](#) ()

## Additional Inherited Members

## Public Types inherited from [gdcm::SegmentReader](#)

- typedef std::vector< [SmartPointer](#)< [Segment](#) > > [SegmentVector](#)

### Protected Types inherited from [gdcm::SegmentReader](#)

- typedef std::map< unsigned long, [SmartPointer](#)< [Segment](#) > > [SegmentMap](#)

### Protected Attributes inherited from [gdcm::SegmentReader](#)

- [SegmentMap](#) Segments

### Protected Attributes inherited from [gdcm::Reader](#)

- [SmartPointer](#)< [File](#) > F

## 12.304.1 Detailed Description

This class defines a SURFACE IE reader.

It reads surface mesh module attributes.

See also

PS 3.3 A.1.2.18 , A.57 and C.27

## 12.304.2 Constructor & Destructor Documentation

### 12.304.2.1 SurfaceReader()

```
gdcm::SurfaceReader::SurfaceReader ()
```

### 12.304.2.2 ~SurfaceReader()

```
gdcm::SurfaceReader::~~SurfaceReader () [override]
```

## 12.304.3 Member Function Documentation

### 12.304.3.1 GetNumberOfSurfaces()

```
unsigned long gdcm::SurfaceReader::GetNumberOfSurfaces () const
```

### 12.304.3.2 Read()

```
bool gdcm::SurfaceReader::Read () [override], [virtual]
```

Read.

Reimplemented from [gdcm::SegmentReader](#).

### 12.304.3.3 ReadPointMacro()

```
bool gdcm::SurfaceReader::ReadPointMacro (
    SmartPointer< Surface > surface,
    const DataSet & surfaceDS) [protected]
```

### 12.304.3.4 ReadSurface()

```
bool gdcm::SurfaceReader::ReadSurface (
    const Item & surfaceItem,
    const unsigned long idx) [protected]
```

### 12.304.3.5 ReadSurfaces()

```
bool gdcm::SurfaceReader::ReadSurfaces () [protected]
```

The documentation for this class was generated from the following file:

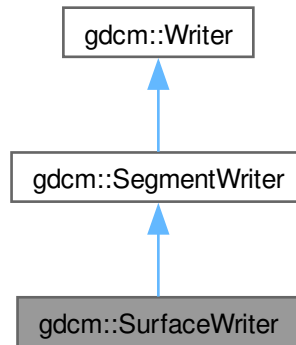
- [gdcmSurfaceReader.h](#)

## 12.305 gdcm::SurfaceWriter Class Reference

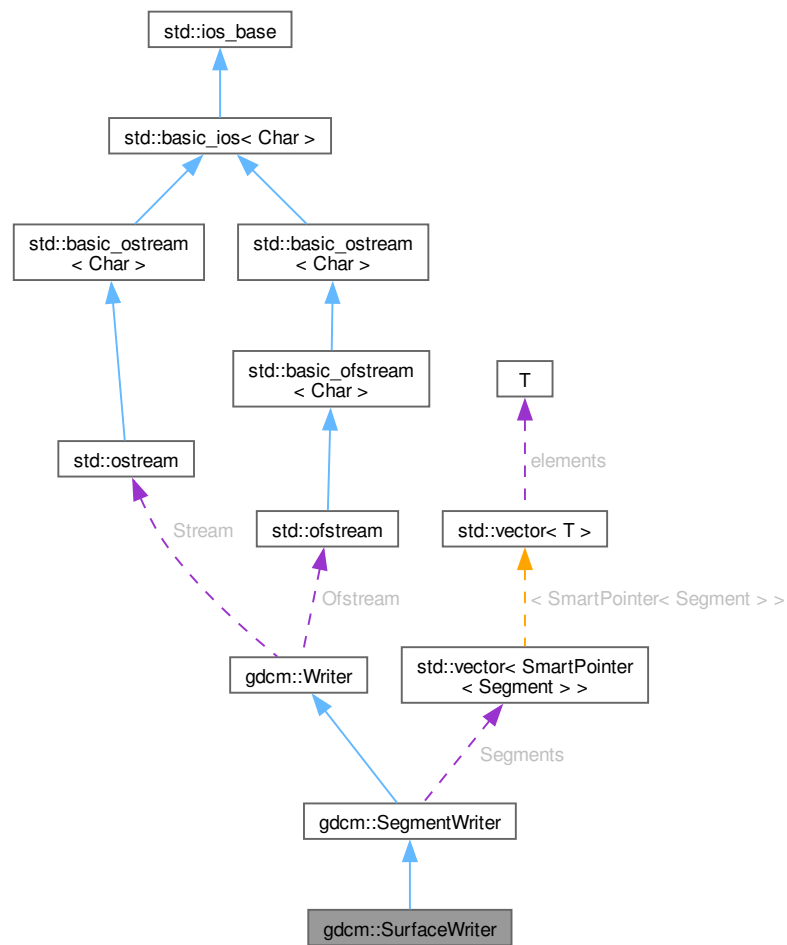
This class defines a SURFACE IE writer.

```
#include <gdcmSurfaceWriter.h>
```

Inheritance diagram for `gdcm::SurfaceWriter`:



Collaboration diagram for gdcm::SurfaceWriter:



## Public Member Functions

- [SurfaceWriter](#) ()
  - [~SurfaceWriter](#) () override
  - unsigned long [GetNumberOfSurfaces](#) ()
  - void [SetNumberOfSurfaces](#) (const unsigned long nb)
  - bool [Write](#) () override
- Write.*

## Public Member Functions inherited from [gdcm::SegmentWriter](#)

- [SegmentWriter](#) ()
- [~SegmentWriter](#) () override

- void [AddSegment](#) ([SmartPointer](#)< [Segment](#) > segment)
- unsigned int [GetNumberOfSegments](#) () const
- [SmartPointer](#)< [Segment](#) > [GetSegment](#) (const unsigned int idx=0) const
- [SegmentVector](#) & [GetSegments](#) ()
- const [SegmentVector](#) & [GetSegments](#) () const
- void [SetNumberOfSegments](#) (const unsigned int size)
- void [SetSegments](#) ([SegmentVector](#) &segments)

## Public Member Functions inherited from [gdcm::Writer](#)

- [Writer](#) ()
- virtual [~Writer](#) ()
- void [CheckFileMetaInformationOff](#) ()
- void [CheckFileMetaInformationOn](#) ()
- [File](#) & [GetFile](#) ()
- void [SetCheckFileMetaInformation](#) (bool b)  
*Undocumented function, do not use (= leave default).*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get the DICOM file ([DataSet](#) + Header).*
- void [SetFileName](#) (const char \*filename\_native)  
*Set the filename of DICOM file to write:*
- void [SetStream](#) (std::ostream &output\_stream)  
*Set user ostream buffer.*

## Protected Member Functions

- void [ComputeNumberOfSurfaces](#) ()
- bool [PrepareWrite](#) ()
- bool [PrepareWritePointMacro](#) ([SmartPointer](#)< [Surface](#) > surface, [DataSet](#) &surfaceDS, const [TransferSyntax](#) &ts)

## Protected Member Functions inherited from [gdcm::SegmentWriter](#)

- bool [PrepareWrite](#) ()

## Protected Member Functions inherited from [gdcm::Writer](#)

- bool [GetCheckFileMetaInformation](#) () const
- std::ostream \* [GetStreamPtr](#) () const
- void [SetWriteDataSetOnly](#) (bool b)

## Protected Attributes

- unsigned long [NumberOfSurfaces](#)



## Protected Attributes inherited from [gdcm::SegmentWriter](#)

- [SegmentVector](#) Segments

## Protected Attributes inherited from [gdcm::Writer](#)

- std::ofstream \* [Ofstream](#)
- std::ostream \* [Stream](#)

## Additional Inherited Members

## Public Types inherited from [gdcm::SegmentWriter](#)

- typedef std::vector< [SmartPointer](#)< [Segment](#) > > [SegmentVector](#)

### 12.305.1 Detailed Description

This class defines a SURFACE IE writer.

It writes surface mesh module attributes.

See also

PS 3.3 A.1.2.18 , A.57 and C.27

### 12.305.2 Constructor & Destructor Documentation

#### 12.305.2.1 SurfaceWriter()

```
gdcm::SurfaceWriter::SurfaceWriter ()
```

#### 12.305.2.2 ~SurfaceWriter()

```
gdcm::SurfaceWriter::~~SurfaceWriter () [override]
```

### 12.305.3 Member Function Documentation

#### 12.305.3.1 ComputeNumberOfSurfaces()

```
void gdcm::SurfaceWriter::ComputeNumberOfSurfaces () [protected]
```

### 12.305.3.2 GetNumberOfSurfaces()

```
unsigned long gdcM::SurfaceWriter::GetNumberOfSurfaces ()
```

### 12.305.3.3 PrepareWrite()

```
bool gdcM::SurfaceWriter::PrepareWrite () [protected]
```

### 12.305.3.4 PrepareWritePointMacro()

```
bool gdcM::SurfaceWriter::PrepareWritePointMacro (  
    SmartPointer< Surface > surface,  
    DataSet & surfaceDS,  
    const TransferSyntax & ts) [protected]
```

### 12.305.3.5 SetNumberOfSurfaces()

```
void gdcM::SurfaceWriter::SetNumberOfSurfaces (  
    const unsigned long nb)
```

### 12.305.3.6 Write()

```
bool gdcM::SurfaceWriter::Write () [override], [virtual]
```

Write.

Reimplemented from [gdcM::SegmentWriter](#).

## 12.305.4 Member Data Documentation

### 12.305.4.1 NumberOfSurfaces

```
unsigned long gdcM::SurfaceWriter::NumberOfSurfaces [protected]
```

The documentation for this class was generated from the following file:

- [gdcMSurfaceWriter.h](#)

## 12.306 gdcM::SwapCode Class Reference

[SwapCode](#) representation.

```
#include <gdcMSwapCode.h>
```

## Public Types

- enum [SwapCodeType](#) {  
    [Unknown](#) = 0 ,  
    [LittleEndian](#) = 1234 ,  
    [BigEndian](#) = 4321 ,  
    [BadLittleEndian](#) = 3412 ,  
    [BadBigEndian](#) = 2143 }

## Public Member Functions

- [SwapCode](#) ([SwapCodeType](#) sc=[Unknown](#))
- [operator SwapCode::SwapCodeType](#) () const

## Static Public Member Functions

- static const char \* [GetSwapCodeString](#) ([SwapCode](#) const &sc)

## Static Protected Member Functions

- static int [GetIndex](#) ([SwapCode](#) const &sc)

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [SwapCode](#) &sc)

## 12.306.1 Detailed Description

[SwapCode](#) representation.

### Examples

[TestByteSwap.cxx](#).

## 12.306.2 Member Enumeration Documentation

### 12.306.2.1 SwapCodeType

```
enum gdcm::SwapCode::SwapCodeType
```

## Enumerator

---

Unknown	
LittleEndian	
BigEndian	
BadLittleEndian	
BadBigEndian	

### 12.306.3 Constructor & Destructor Documentation

#### 12.306.3.1 SwapCode()

```
gdcmm::SwapCode::SwapCode (
    SwapCodeType sc = Unknown) [inline]
```

References [Unknown](#).

Referenced by [GetIndex\(\)](#), [GetSwapCodeString\(\)](#), and [operator<<](#).

### 12.306.4 Member Function Documentation

#### 12.306.4.1 GetIndex()

```
int gdcmm::SwapCode::GetIndex (
    SwapCode const & sc) [static], [protected]
```

References [SwapCode\(\)](#).

#### 12.306.4.2 GetSwapCodeString()

```
const char * gdcmm::SwapCode::GetSwapCodeString (
    SwapCode const & sc) [static]
```

References [SwapCode\(\)](#), and [operator<<](#).

Referenced by [operator<<](#).

#### 12.306.4.3 operator SwapCode::SwapCodeType()

```
gdcmm::SwapCode::operator SwapCode::SwapCodeType () const [inline]
```

## 12.306.5 Friends And Related Symbol Documentation

### 12.306.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const SwapCode & sc) [friend]
```

References [SwapCode\(\)](#), and [GetSwapCodeString\(\)](#).

Referenced by [GetSwapCodeString\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmSwapCode.h](#)

## 12.307 gdcm::SwapperDoOp Class Reference

```
#include <gdcmSwapper.h>
```

### Static Public Member Functions

- `template<typename T>`  
static T [Swap](#) (T val)
- `template<typename T>`  
static void [SwapArray](#) (T \*array, size\_t n)

## 12.307.1 Member Function Documentation

### 12.307.1.1 Swap()

```
template<typename T>
T gdcm::SwapperDoOp::Swap (
    T val) [static]
```

Referenced by [gdcm::Item::Read\(\)](#), and [SwapArray\(\)](#).

### 12.307.1.2 SwapArray()

```
template<typename T>
void gdcm::SwapperDoOp::SwapArray (
    T * array,
    size_t n) [inline], [static]
```

References [Swap\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmSwapper.h](#)

## 12.308 gdcm::SwapperNoOp Class Reference

```
#include <gdcmSwapper.h>
```

### Static Public Member Functions

- `template<typename T>`  
`static T Swap (T val)`
- `template<typename T>`  
`static void SwapArray (T *, size_t)`

### 12.308.1 Detailed Description

#### Examples

[DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), and [ReadExplicitLengthSQIVR.cxx](#).

### 12.308.2 Member Function Documentation

#### 12.308.2.1 Swap()

```
template<typename T>
T gdcm::SwapperNoOp::Swap (
    T val) [inline], [static]
```

Referenced by [gdcm::EncodingImplementation< VR::VRBINARY >::Write\(\)](#).

#### 12.308.2.2 SwapArray()

```
template<typename T>
void gdcm::SwapperNoOp::SwapArray (
    T * ,
    size_t ) [inline], [static]
```

Referenced by [gdcm::EncodingImplementation< VR::VRBINARY >::Read\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmSwapper.h](#)

## 12.309 gdcm::System Class Reference

Class to do system operation.

```
#include <gdcmSystem.h>
```

## Static Public Member Functions

- static std::wstring [ConvertToUNC](#) (const char \*utf8path)
- static bool [DeleteDirectory](#) (const char \*source)  
*remove a directory named source*
- static size\_t [EncodeBytes](#) (char \*out, const unsigned char \*data, int size)
- static bool [FileExists](#) (const char \*filename)  
*Check whether the specified file exist on the system.*
- static bool [FileIsDirectory](#) (const char \*name)  
*Check whether the file specified is a directory:*
- static bool [FileIsSymlink](#) (const char \*name)  
*Check whether name is a symlink.*
- static size\_t [FileSize](#) (const char \*filename)
- static time\_t [FileTime](#) (const char \*filename)
- static bool [FormatDateTime](#) (char date[22], time\_t t, long milliseconds=0)
- static bool [GetCurrentDateTime](#) (char date[22])
- static const char \* [GetCurrentModuleFileName](#) ()
- static const char \* [GetCurrentProcessFileName](#) ()
- static const char \* [GetCurrentResourcesDirectory](#) ()
- static const char \* [GetCWD](#) ()
- static bool [GetHostName](#) (char hostname[255])
- static const char \* [GetLastError](#) ()  
*Return the last error.*
- static const char \* [GetLocaleCharset](#) ()  
*return locale charmap*
- static const char \* [GetTimezoneOffsetFromUTC](#) ()
- static bool [MakeDirectory](#) (const char \*path)  
*Create a directory name path.*
- static bool [ParseDateTime](#) (time\_t &timep, const char date[22])  
*Parse a date stored as ASCII text into a time\_t structured (discard millisecond if any).*
- static bool [ParseDateTime](#) (time\_t &timep, long &milliseconds, const char date[22])
- static bool [RemoveFile](#) (const char \*source)  
*remove a file named source*
- static int [StrCaseCmp](#) (const char \*s1, const char \*s2)  
*consistent func for C99 spec of strcasecmp/strncasecmp*
- static int [StrNCaseCmp](#) (const char \*s1, const char \*s2, size\_t n)
- static char \* [StrSep](#) (char \*\*stringp, const char \*delim)
- static char \* [StrTokR](#) (char \*ptr, const char \*sep, char \*\*end)  
*strtok\_r*

## Static Protected Member Functions

- static bool [GetPermissions](#) (const char \*file, unsigned short &mode)  
*NOT THREAD SAFE.*
- static bool [SetPermissions](#) (const char \*file, unsigned short mode)

## 12.309.1 Detailed Description

Class to do system operation.

OS independent functionalities

### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CompressLossyJPEG.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [DumpCSA.cs](#), [ExtractEncapsulatedFile.cs](#), [ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), [FileAnonymize.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FileStreaming.cs](#), [GetArray.cs](#), [MetaImageMD5Activiz.cs](#), [MpegVideoInfo.cs](#), [ReformatFile.cs](#), [RescaleImage.cs](#), [ScanDirectory.cs](#), [SimplePrint.cs](#), and [StandardizeFiles.cs](#).

## 12.309.2 Member Function Documentation

### 12.309.2.1 ConvertToUNC()

```
std::wstring gdcm::System::ConvertToUNC (
    const char * utf8path) [static]
```

When needed convert a PATH into a UNC equivalent. This allow transparent support for path longer than MAX\_PATH. Only on \_MSC\_VER compiler, return empty string otherwise.

### 12.309.2.2 DeleteDirectory()

```
bool gdcm::System::DeleteDirectory (
    const char * source) [static]
```

remove a directory named source

### 12.309.2.3 EncodeBytes()

```
size_t gdcm::System::EncodeBytes (
    char * out,
    const unsigned char * data,
    int size) [static]
```

Used internally by the [UIDGenerator](#) class to convert a uuid tape to a DICOM [VR:UI](#) type

### 12.309.2.4 FileExists()

```
bool gdcm::System::FileExists (
    const char * filename) [static]
```

Check whether the specified file exist on the system.

### Examples

[DumpVisusChange.cxx](#), [EncapsulateFileInRawData.cxx](#), [MagnifyFile.cxx](#), and [gdcmorthoplanes.cxx](#).



### 12.309.2.5 FileIsDirectory()

```
bool gdcm::System::FileIsDirectory (
    const char * name) [static]
```

Check whether the file specified is a directory:

#### Examples

[DumpVisusChange.cxx](#), [gdcmorthoplanes.cxx](#), and [threadgdcm.cxx](#).

### 12.309.2.6 FileIsSymlink()

```
bool gdcm::System::FileIsSymlink (
    const char * name) [static]
```

Check whether name is a symlink.

### 12.309.2.7 FileSize()

```
size_t gdcm::System::FileSize (
    const char * filename) [static]
```

Return the filesize. 0 if file does not exist.

#### Warning

you need to use FileExists to differentiate between empty file and missing file.

for very large size file and on system where size\_t is not appropriate to store off\_t value the function will return 0.

#### Examples

[CheckBigEndianBug.cxx](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [EncapsulateFileInRawData.cxx](#), and [SimpleScanner.cxx](#).

### 12.309.2.8 FileTime()

```
time_t gdcm::System::FileTime (
    const char * filename) [static]
```

Return the time of last modification of file 0 if the file does not exist

### 12.309.2.9 FormatDateTime()

```
bool gdcM::System::FormatDateTime (
    char date[22],
    time_t t,
    long milliseconds = 0) [static]
```

format as ASCII text a time\_t with milliseconds See [VR::DT](#) from DICOM PS 3.5 milliseconds is in the range [0, 999999]

### 12.309.2.10 GetCurrentDateTime()

```
bool gdcM::System::GetCurrentDateTime (
    char date[22]) [static]
```

Return the current data time, and format it as ASCII text. This is simply a call to gettimeofday + FormatDateTime, since WIN32 do not have an implementation for gettimeofday, this is more portable. The call time(0) is not precise for our resolution

#### Examples

[TemplateEmptyImage.cxx](#).

### 12.309.2.11 GetCurrentModuleFileName()

```
const char * gdcM::System::GetCurrentModuleFileName () [static]
```

Return the directory the current module is located: NOT THREAD SAFE

### 12.309.2.12 GetCurrentProcessFileName()

```
const char * gdcM::System::GetCurrentProcessFileName () [static]
```

Return the directory the current process (executable) is located: NOT THREAD SAFE

### 12.309.2.13 GetCurrentResourcesDirectory()

```
const char * gdcM::System::GetCurrentResourcesDirectory () [static]
```

On some system (Apple) return the path to the current bundled 'Resources' directory NOT THREAD SAFE

### 12.309.2.14 GetCWD()

```
const char * gdcM::System::GetCWD () [static]
```

Return current working directory Warning: if current working path is too long (>2048 bytes) the call will fail and call will return NULL NOT THREAD SAFE

#### 12.309.2.15 GetHostName()

```
bool gdcmm::System::GetHostName (
    char hostname[255]) [static]
```

Retrieve the hostname, only the first 255 byte are copied. This may come handy to specify the Station Name

#### 12.309.2.16 GetLastSystemError()

```
const char * gdcmm::System::GetLastSystemError () [static]
```

Return the last error.

#### 12.309.2.17 GetLocaleCharset()

```
const char * gdcmm::System::GetLocaleCharset () [static]
```

return locale charmap

#### 12.309.2.18 GetPermissions()

```
bool gdcmm::System::GetPermissions (
    const char * file,
    unsigned short & mode) [static], [protected]
```

NOT THREAD SAFE.

#### 12.309.2.19 GetTimezoneOffsetFromUTC()

```
const char * gdcmm::System::GetTimezoneOffsetFromUTC () [static]
```

Return the value for Timezone Offset From UTC as string.

##### Warning

not thread safe

#### 12.309.2.20 MakeDirectory()

```
bool gdcmm::System::MakeDirectory (
    const char * path) [static]
```

Create a directory name path.

**12.309.2.21 ParseDateTime()** [1/2]

```
bool gdcmm::System::ParseDateTime (
    time_t & timep,
    const char date[22]) [static]
```

Parse a date stored as ASCII text into a `time_t` structured (discard millisecond if any).

**12.309.2.22 ParseDateTime()** [2/2]

```
bool gdcmm::System::ParseDateTime (
    time_t & timep,
    long & milliseconds,
    const char date[22]) [static]
```

Parse a date stored as ASCII text into a `time_t` structured and millisecond

See also

[FormatDateTime](#)

**12.309.2.23 RemoveFile()**

```
bool gdcmm::System::RemoveFile (
    const char * source) [static]
```

remove a file named `source`

**12.309.2.24 SetPermissions()**

```
bool gdcmm::System::SetPermissions (
    const char * file,
    unsigned short mode) [static], [protected]
```

**12.309.2.25 StrCaseCmp()**

```
int gdcmm::System::StrCaseCmp (
    const char * s1,
    const char * s2) [static]
```

consistent func for C99 spec of `strcasecmp/strncasecmp`

### 12.309.2.26 StrNCaseCmp()

```
int gdcm::System::StrNCaseCmp (
    const char * s1,
    const char * s2,
    size_t n) [static]
```

#### Precondition

`n != 0`

### 12.309.2.27 StrSep()

```
char * gdcm::System::StrSep (
    char ** stringp,
    const char * delim) [static]
```

strsep param stringp is passed by pointer, it may be modified, you'll need to make a copy, in case you want to free the memory pointed at

### 12.309.2.28 StrTokR()

```
char * gdcm::System::StrTokR (
    char * ptr,
    const char * sep,
    char ** end) [static]
```

strtok\_r

The documentation for this class was generated from the following file:

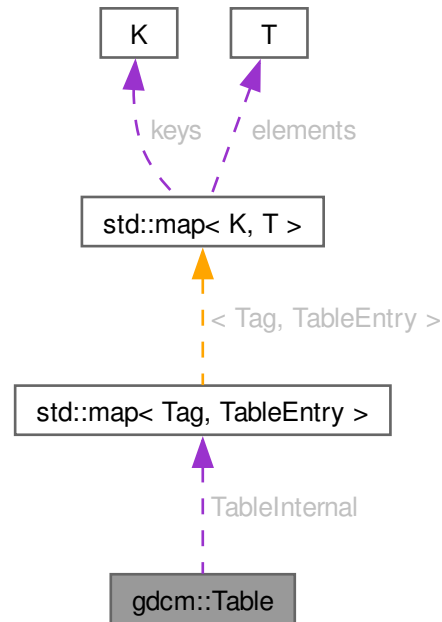
- [gdcmSystem.h](#)

## 12.310 gdcm::Table Class Reference

[Table](#).

```
#include <gdcmTable.h>
```

Collaboration diagram for `gdcmm::Table`:



## Public Types

- typedef `std::map< Tag, TableEntry >` [MapTableEntry](#)

## Public Member Functions

- [Table](#) ()=default
- [Table](#) (const [Table](#) &\_val)=delete
- [~Table](#) ()=default
- const [TableEntry](#) & [GetTableEntry](#) (const [Tag](#) &tag) const
- void [InsertEntry](#) ([Tag](#) const &tag, [TableEntry](#) const &te)
- [Table](#) & [operator=](#) (const [Table](#) &\_val)=delete

## Public Attributes

- [MapTableEntry](#) [TableInternal](#)

## Friends

- `std::ostream & operator<< (std::ostream &_os, const Table &_val)`

## 12.310.1 Detailed Description

[Table](#).

## 12.310.2 Member Typedef Documentation

### 12.310.2.1 MapTableEntry

```
typedef std::map<Tag, TableEntry> gdcmm::Table::MapTableEntry
```

## 12.310.3 Constructor & Destructor Documentation

### 12.310.3.1 Table() [1/2]

```
gdcmm::Table::Table () [default]
```

Referenced by [Table\(\)](#), [operator<<](#), and [operator=\(\)](#).

### 12.310.3.2 ~Table()

```
gdcmm::Table::~~Table () [default]
```

### 12.310.3.3 Table() [2/2]

```
gdcmm::Table::Table (  
    const Table & _val) [delete]
```

References [Table\(\)](#).

## 12.310.4 Member Function Documentation

### 12.310.4.1 GetTableEntry()

```
const TableEntry & gdcmm::Table::GetTableEntry (  
    const Tag & tag) const [inline]
```

References [GetTableEntry\(\)](#), and [TableInternal](#).

Referenced by [GetTableEntry\(\)](#).

#### 12.310.4.2 InsertEntry()

```
void gdcM::Table::InsertEntry (
    Tag const & tag,
    TableEntry const & te) [inline]
```

References [TableInternal](#).

#### 12.310.4.3 operator=()

```
Table & gdcM::Table::operator= (
    const Table & _val) [delete]
```

References [Table\(\)](#).

### 12.310.5 Friends And Related Symbol Documentation

#### 12.310.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Table & _val) [friend]
```

References [Table\(\)](#).

### 12.310.6 Member Data Documentation

#### 12.310.6.1 TableInternal

```
MapTableEntry gdcM::Table::TableInternal
```

Referenced by [GetTableEntry\(\)](#), and [InsertEntry\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMTable.h](#)

## 12.311 gdcM::TableEntry Class Reference

[TableEntry](#).

```
#include <gdcMTableEntry.h>
```



### Public Member Functions

- [TableEntry](#) (const char \*attribute=nullptr, [Type](#) const &type=[Type](#)(), const char \*des=nullptr)
- [~TableEntry](#) ()=default

### 12.311.1 Detailed Description

[TableEntry](#).

### 12.311.2 Constructor & Destructor Documentation

#### 12.311.2.1 TableEntry()

```
gdcm::TableEntry::TableEntry (  
    const char * attribute = nullptr,  
    Type const & type = Type(),  
    const char * des = nullptr) [inline]
```

#### 12.311.2.2 ~TableEntry()

```
gdcm::TableEntry::~~TableEntry () [default]
```

The documentation for this class was generated from the following file:

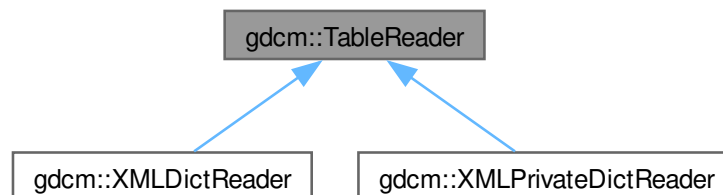
- [gdcmTableEntry.h](#)

## 12.312 gdcm::TableReader Class Reference

Class for representing a [TableReader](#).

```
#include <gdcmTableReader.h>
```

Inheritance diagram for gdcm::TableReader:



## Public Member Functions

- [TableReader](#) ([Defs](#) &defs)
- virtual [~TableReader](#) ()=default
- virtual void [CharacterDataHandler](#) (const char \*data, int length)
- virtual void [EndElement](#) (const char \*name)
- const [Defs](#) & [GetDefs](#) () const
- const char \* [GetFilename](#) ()
- void [HandleIOD](#) (const char \*\*atts)
- void [HandleIODEntry](#) (const char \*\*atts)
- void [HandleMacro](#) (const char \*\*atts)
- void [HandleMacroEntry](#) (const char \*\*atts)
- void [HandleMacroEntryDescription](#) (const char \*\*atts)
- void [HandleModule](#) (const char \*\*atts)
- void [HandleModuleEntry](#) (const char \*\*atts)
- void [HandleModuleEntryDescription](#) (const char \*\*atts)
- void [HandleModuleInclude](#) (const char \*\*atts)
- int [Read](#) ()
- void [SetFilename](#) (const char \*filename)
- virtual void [StartElement](#) (const char \*name, const char \*\*atts)

### 12.312.1 Detailed Description

Class for representing a [TableReader](#).

#### Note

This class is an empty shell meant to be derived

### 12.312.2 Constructor & Destructor Documentation

#### 12.312.2.1 [TableReader\(\)](#)

```
gdcmm::TableReader::TableReader (
    Defs & defs) [inline]
```

#### 12.312.2.2 [~TableReader\(\)](#)

```
virtual gdcmm::TableReader::~~TableReader () [virtual], [default]
```

## 12.312.3 Member Function Documentation

### 12.312.3.1 CharacterDataHandler()

```
virtual void gdcm::TableReader::CharacterDataHandler (  
    const char * data,  
    int length) [virtual]
```

Reimplemented in [gdcm::XMLDictReader](#), and [gdcm::XMLPrivateDictReader](#).

### 12.312.3.2 EndElement()

```
virtual void gdcm::TableReader::EndElement (  
    const char * name) [virtual]
```

Reimplemented in [gdcm::XMLDictReader](#), and [gdcm::XMLPrivateDictReader](#).

### 12.312.3.3 GetDefs()

```
const Defs & gdcm::TableReader::GetDefs () const [inline]
```

### 12.312.3.4 GetFilename()

```
const char * gdcm::TableReader::GetFilename () [inline]
```

### 12.312.3.5 HandleIOD()

```
void gdcm::TableReader::HandleIOD (  
    const char ** atts)
```

### 12.312.3.6 HandleIODEntry()

```
void gdcm::TableReader::HandleIODEntry (  
    const char ** atts)
```

### 12.312.3.7 HandleMacro()

```
void gdcm::TableReader::HandleMacro (  
    const char ** atts)
```

**12.312.3.8 HandleMacroEntry()**

```
void gdcm::TableReader::HandleMacroEntry (
    const char ** atts)
```

**12.312.3.9 HandleMacroEntryDescription()**

```
void gdcm::TableReader::HandleMacroEntryDescription (
    const char ** atts)
```

**12.312.3.10 HandleModule()**

```
void gdcm::TableReader::HandleModule (
    const char ** atts)
```

**12.312.3.11 HandleModuleEntry()**

```
void gdcm::TableReader::HandleModuleEntry (
    const char ** atts)
```

**12.312.3.12 HandleModuleEntryDescription()**

```
void gdcm::TableReader::HandleModuleEntryDescription (
    const char ** atts)
```

**12.312.3.13 HandleModuleInclude()**

```
void gdcm::TableReader::HandleModuleInclude (
    const char ** atts)
```

**12.312.3.14 Read()**

```
int gdcm::TableReader::Read ()
```

**12.312.3.15 SetFilename()**

```
void gdcm::TableReader::SetFilename (
    const char * filename) [inline]
```

**12.312.3.16 StartElement()**

```
virtual void gdcm::TableReader::StartElement (
    const char * name,
    const char ** atts) [virtual]
```

Reimplemented in [gdcm::XMLDictReader](#), and [gdcm::XMLPrivateDictReader](#).

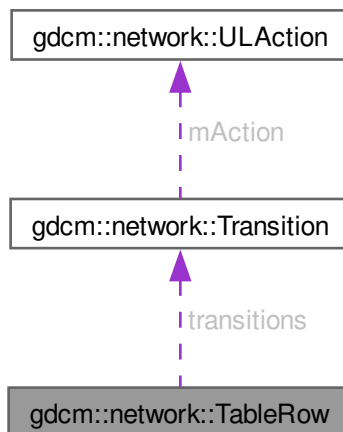
The documentation for this class was generated from the following file:

- [gdcmTableReader.h](#)

**12.313 gdcm::network::TableRow Class Reference**

```
#include <gdcmULTransitionTable.h>
```

Collaboration diagram for gdcm::network::TableRow:

**Public Member Functions**

- [TableRow](#) ()
- [~TableRow](#) ()

**Public Attributes**

- [Transition](#) \* [transitions](#) [`cMaxStateID`]

## 12.313.1 Constructor & Destructor Documentation

### 12.313.1.1 TableRow()

```
gdcm::network::TableRow::TableRow () [inline]
```

References [gdcm::network::cMaxStateID](#), and [transitions](#).

### 12.313.1.2 ~TableRow()

```
gdcm::network::TableRow::~TableRow () [inline]
```

References [gdcm::network::cMaxStateID](#), and [transitions](#).

## 12.313.2 Member Data Documentation

### 12.313.2.1 transitions

```
Transition* gdcm::network::TableRow::transitions[cMaxStateID]
```

Referenced by [TableRow\(\)](#), and [~TableRow\(\)](#).

The documentation for this class was generated from the following file:

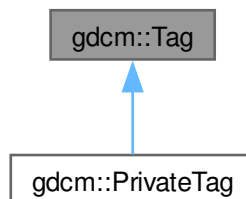
- [gdcmULTransitionTable.h](#)

## 12.314 gdcm::Tag Class Reference

Class to represent a DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#)).

```
#include <gdcmTag.h>
```

Inheritance diagram for gdcm::Tag:



## Public Member Functions

- [Tag](#) (const Tag &\_val)
- [Tag](#) (uint16\_t group, uint16\_t element)  
*Constructor with 2\*uint16\_t.*
- [Tag](#) (uint32\_t tag=0)  
*Constructor with 1\*uint32\_t Prefer the ctor that takes two uint16\_t.*
- uint16\_t [GetElement](#) () const  
*Returns the 'Element number' of the given Tag.*
- uint32\_t [GetElementTag](#) () const  
*Returns the full tag value of the given Tag.*
- uint16\_t [GetGroup](#) () const  
*Returns the 'Group number' of the given Tag.*
- uint32\_t [GetLength](#) () const  
*return the length of tag (read: size on disk)*
- [Tag](#) [GetPrivateCreator](#) () const  
*Return the Private Creator Data Element tag of a private data element.*
- bool [IsGroupLength](#) () const  
*return whether the tag correspond to a group length tag:*
- bool [IsGroupXX](#) (const Tag &t) const  
*e.g 6002,3000 belong to groupXX: 6000,3000*
- bool [IsIllegal](#) () const  
*return if the tag is considered to be an illegal tag*
- bool [IsPrivate](#) () const
- bool [IsPrivateCreator](#) () const
- bool [IsPublic](#) () const
- bool [operator!=](#) (const Tag &\_val) const
- bool [operator<](#) (const Tag &\_val) const
- bool [operator<=](#) (const Tag &t2) const
- Tag & [operator=](#) (const Tag &\_val)
- bool [operator==](#) (const Tag &\_val) const
- uint16\_t & [operator\[\]](#) (const unsigned int &\_id)  
*Returns the Group or Element of the given Tag, depending on id (0/1).*
- const uint16\_t & [operator\[\]](#) (const unsigned int &\_id) const  
*Returns the Group or Element of the given Tag, depending on id (0/1).*
- std::string [PrintAsContinuousString](#) () const
- std::string [PrintAsContinuousUpperCaseString](#) () const  
*Same as PrintAsContinuousString, but hexadecimal [a-f] are printed using upper case.*
- std::string [PrintAsPipeSeparatedString](#) () const
- template<typename TSwap>  
std::istream & [Read](#) (std::istream &is)  
*Read a tag from binary representation.*
- bool [ReadFromCommaSeparatedString](#) (const char \*str)
- bool [ReadFromContinuousString](#) (const char \*str)
- bool [ReadFromPipeSeparatedString](#) (const char \*str)
- void [SetElement](#) (uint16\_t element)  
*Sets the 'Element number' of the given Tag.*
- void [SetElementTag](#) (uint16\_t group, uint16\_t element)

- Sets the 'Group number' & 'Element number' of the given [Tag](#).*
  - void [SetElementTag](#) (uint32\_t tag)
    - Sets the full tag value of the given [Tag](#).*
  - void [SetGroup](#) (uint16\_t group)
    - Sets the 'Group number' of the given [Tag](#).*
  - void [SetPrivateCreator](#) ([Tag](#) const &t)
    - Set private creator:*
  - template<typename TSwap>
 const std::ostream & [Write](#) (std::ostream &os) const
    - Write a tag in binary rep.*

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Tag](#) &\_val)
- std::istream & [operator>>](#) (std::istream &\_is, [Tag](#) &\_val)

## 12.314.1 Detailed Description

Class to represent a DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#)).

Basically an uint32\_t which can also be expressed as two uint16\_t (group and element)

## Note

DATA ELEMENT TAG: A unique identifier for a Data [Element](#) composed of an ordered pair of numbers (a Group Number followed by an [Element](#) Number). GROUP NUMBER: The first number in the ordered pair of numbers that makes up a Data [Element Tag](#). ELEMENT NUMBER: The second number in the ordered pair of numbers that makes up a Data [Element Tag](#).

## Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [EncapsulateFileInRawData.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileAnonymize.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenAllIVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [PatchFile.cxx](#), [PublicDict.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ScanDirectory.cs](#), [SimpleScanner.cxx](#), [SortImage.cxx](#), [StreamImageReaderTest.cxx](#), [TraverseModules.cxx](#), [VolumeSorter.cxx](#), [gdcmrtpionplan.cxx](#), [gdcmrtpplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).



## 12.314.2 Constructor & Destructor Documentation

### 12.314.2.1 Tag() [1/3]

```
gdcmm::Tag::Tag (
    uint16_t group,
    uint16_t element) [inline]
```

Constructor with 2\*uint16\_t.

Referenced by [gdcmm::PrivateTag::PrivateTag\(\)](#), [gdcmm::PrivateTag::PrivateTag\(\)](#), [Tag\(\)](#), [GetPrivateCreator\(\)](#), [IsGroupXX\(\)](#), [gdcmm::PrivateTag::operator!=\(\)](#), [operator!=\(\)](#), [operator<\(\)](#), [operator<<\(\)](#), [operator<=\(\)](#), [operator=\(\)](#), [gdcmm::PrivateTag::operator==\(\)](#), [operator==\(\)](#), [operator>>\(\)](#), and [SetPrivateCreator\(\)](#).

### 12.314.2.2 Tag() [2/3]

```
gdcmm::Tag::Tag (
    uint32_t tag = 0) [inline]
```

Constructor with 1\*uint32\_t Prefer the ctor that takes two uint16\_t.

References [SetElementTag\(\)](#), and [tag](#).

### 12.314.2.3 Tag() [3/3]

```
gdcmm::Tag::Tag (
    const Tag & _val) [inline]
```

References [Tag\(\)](#), and [tag](#).

## 12.314.3 Member Function Documentation

### 12.314.3.1 GetElement()

```
uint16_t gdcmm::Tag::GetElement () const [inline]
```

Returns the 'Element number' of the given [Tag](#).

#### Examples

[DuplicatePCDE.cxx](#), and [PublicDict.cxx](#).

Referenced by [gdcmm::PrivateTag::PrivateTag\(\)](#), [gdcmm::DataSet::ComputeGroupLength\(\)](#), [GetPrivateCreator\(\)](#), [IsGroupLength\(\)](#), [IsGroupXX\(\)](#), [IsIllegal\(\)](#), [IsPrivateCreator\(\)](#), [gdcmm::PrivateDict::PrintXML\(\)](#), [gdcmm::SequenceOfFragments::ReadValue\(\)](#), and [SetPrivateCreator\(\)](#).

### 12.314.3.2 GetElementTag()

```
uint32_t gdcm::Tag::GetElementTag () const [inline]
```

Returns the full tag value of the given [Tag](#).

Referenced by [gdcm::PrivateTag::operator!=\(\)](#), [gdcm::PrivateTag::operator!=\(\)](#), [gdcm::PrivateTag::operator=\(\)](#), [gdcm::PrivateTag::operator==\(\)](#), and [gdcm::PrivateTag::operator==\(\)](#).

### 12.314.3.3 GetGroup()

```
uint16_t gdcm::Tag::GetGroup () const [inline]
```

Returns the 'Group number' of the given [Tag](#).

#### Examples

[DuplicatePCDE.cxx](#), and [GenAllVR.cxx](#).

Referenced by [gdcm::DataSet::ComputeGroupLength\(\)](#), [gdcm::CommandDataSet::Insert\(\)](#), [gdcm::DataSet::Insert\(\)](#), [gdcm::FileMetaInformation::Insert\(\)](#), [IsGroupXX\(\)](#), [IsIllegal\(\)](#), [gdcm::PrivateDict::PrintXML\(\)](#), [gdcm::SequenceOfFragments::ReadValue\(\)](#), and [SetPrivateCreator\(\)](#).

### 12.314.3.4 GetLength()

```
uint32_t gdcm::Tag::GetLength () const [inline]
```

return the length of tag (read: size on disk)

### 12.314.3.5 GetPrivateCreator()

```
Tag gdcm::Tag::GetPrivateCreator () const [inline]
```

Return the Private Creator Data [Element](#) tag of a private data element.

References [Tag\(\)](#), [GetElement\(\)](#), [IsPrivate\(\)](#), [IsPrivateCreator\(\)](#), and [SetElement\(\)](#).

### 12.314.3.6 IsGroupLength()

```
bool gdcm::Tag::IsGroupLength () const [inline]
```

return whether the tag correspond to a group length tag:

References [GetElement\(\)](#).

### 12.314.3.7 IsGroupXX()

```
bool gdcmm::Tag::IsGroupXX (
    const Tag & t) const [inline]
```

e.g 6002,3000 belong to groupXX: 6000,3000

References [Tag\(\)](#), [GetElement\(\)](#), [GetGroup\(\)](#), and [IsPrivate\(\)](#).

### 12.314.3.8 IsIllegal()

```
bool gdcmm::Tag::IsIllegal () const [inline]
```

return if the tag is considered to be an illegal tag

References [GetElement\(\)](#), [GetGroup\(\)](#), and [IsPrivate\(\)](#).

### 12.314.3.9 IsPrivate()

```
bool gdcmm::Tag::IsPrivate () const [inline]
```

PRIVATE DATA ELEMENT: Additional Data [Element](#), defined by an implementor, to communicate information that is not contained in Standard Data Elements. Private Data elements have odd Group Numbers.

#### Examples

[DuplicatePCDE.cxx](#).

References [IsPublic\(\)](#).

Referenced by [GetPrivateCreator\(\)](#), [IsGroupXX\(\)](#), [IsIllegal\(\)](#), [IsPrivateCreator\(\)](#), and [SetPrivateCreator\(\)](#).

### 12.314.3.10 IsPrivateCreator()

```
bool gdcmm::Tag::IsPrivateCreator () const [inline]
```

Returns if tag is a Private Creator (xxxx,00yy), where xxxx is odd number and yy in [0x10,0xFF]

#### Examples

[DuplicatePCDE.cxx](#).

References [GetElement\(\)](#), and [IsPrivate\(\)](#).

Referenced by [GetPrivateCreator\(\)](#).

### 12.314.3.11 IsPublic()

```
bool gdcm::Tag::IsPublic () const [inline]
```

STANDARD DATA ELEMENT: A Data [Element](#) defined in the DICOM Standard, and therefore listed in the DICOM Data [Element](#) Dictionary in PS 3.6. Is the [Tag](#) from the Public dict...well the implementation is buggy it does not prove the element is indeed in the dict...

Referenced by [IsPrivate\(\)](#).

### 12.314.3.12 operator"!="()

```
bool gdcm::Tag::operator!= (
    const Tag & _val) const [inline]
```

References [Tag\(\)](#), and [tag](#).

### 12.314.3.13 operator<()

```
bool gdcm::Tag::operator< (
    const Tag & _val) const [inline]
```

DICOM Standard expects the Data [Element](#) to be sorted by Tags All other comparison can be constructed from this one and operator ==

References [Tag\(\)](#), [tag](#), and [tags](#).

### 12.314.3.14 operator<=()

```
bool gdcm::Tag::operator<= (
    const Tag & t2) const [inline]
```

References [Tag\(\)](#).

### 12.314.3.15 operator=()

```
Tag & gdcm::Tag::operator= (
    const Tag & _val) [inline]
```

References [Tag\(\)](#), and [tag](#).

### 12.314.3.16 operator==(())

```
bool gdcm::Tag::operator==(
    const Tag & _val) const [inline]
```

References [Tag\(\)](#), and [tag](#).

**12.314.3.17 operator[]()** [1/2]

```
uint16_t & gdcmm::Tag::operator[] (
    const unsigned int & _id) [inline]
```

Returns the Group or [Element](#) of the given [Tag](#), depending on id (0/1).

**12.314.3.18 operator[]()** [2/2]

```
const uint16_t & gdcmm::Tag::operator[] (
    const unsigned int & _id) const [inline]
```

Returns the Group or [Element](#) of the given [Tag](#), depending on id (0/1).

**12.314.3.19 PrintAsContinuousString()**

```
std::string gdcmm::Tag::PrintAsContinuousString () const
```

Print tag value with no separating comma: eg. tag = "12345678" It comes in useful when reading tag values from XML file(in NativeDICOMModel)

**12.314.3.20 PrintAsContinuousUpperCaseString()**

```
std::string gdcmm::Tag::PrintAsContinuousUpperCaseString () const
```

Same as PrintAsContinuousString, but hexadecimal [a-f] are printed using upper case.

**12.314.3.21 PrintAsPipeSeparatedString()**

```
std::string gdcmm::Tag::PrintAsPipeSeparatedString () const
```

Print as a pipe separated string (GDCM 1.x compat only). Do not use in newer code

See also

[ReadFromPipeSeparatedString](#)

**12.314.3.22 Read()**

```
template<typename TSwap>
std::istream & gdcmm::Tag::Read (
    std::istream & is) [inline]
```

Read a tag from binary representation.

### 12.314.3.23 ReadFromCommaSeparatedString()

```
bool gdcM::Tag::ReadFromCommaSeparatedString (
    const char * str)
```

Read from a comma separated string. This is a highly user oriented function, the string should be formatted as ← : 1234,5678 to specify the tag (0x1234,0x5678) The notation comes from the DICOM standard, and is handy to use from a command line program

### 12.314.3.24 ReadFromContinuousString()

```
bool gdcM::Tag::ReadFromContinuousString (
    const char * str)
```

Read From XML formatted tag value eg. tag = "12345678" It comes in useful when reading tag values from XML file(in NativeDICOMModel)

### 12.314.3.25 ReadFromPipeSeparatedString()

```
bool gdcM::Tag::ReadFromPipeSeparatedString (
    const char * str)
```

Read from a pipe separated string (GDCM 1.x compat only). Do not use in newer code

See also

[ReadFromCommaSeparatedString](#)

### 12.314.3.26 SetElement()

```
void gdcM::Tag::SetElement (
    uint16_t element) [inline]
```

Sets the '[Element](#) number' of the given [Tag](#).

Examples

[DuplicatePCDE.cxx](#), and [PublicDict.cxx](#).

Referenced by [gdcM::PrivateTag::PrivateTag\(\)](#), [gdcM::PrivateTag::PrivateTag\(\)](#), [GetPrivateCreator\(\)](#), [operator>>](#), and [SetPrivateCreator\(\)](#).

**12.314.3.27 SetElementTag()** [1/2]

```
void gdcm::Tag::SetElementTag (
    uint16_t group,
    uint16_t element) [inline]
```

Sets the 'Group number' & 'Element number' of the given [Tag](#).

Referenced by [Tag\(\)](#), and [gdcm::PrivateTag::operator=\(\)](#).

**12.314.3.28 SetElementTag()** [2/2]

```
void gdcm::Tag::SetElementTag (
    uint32_t tag) [inline]
```

Sets the full tag value of the given [Tag](#).

References [tag](#).

**12.314.3.29 SetGroup()**

```
void gdcm::Tag::SetGroup (
    uint16_t group) [inline]
```

Sets the 'Group number' of the given [Tag](#).

Referenced by [operator>>](#), and [SetPrivateCreator\(\)](#).

**12.314.3.30 SetPrivateCreator()**

```
void gdcm::Tag::SetPrivateCreator (
    Tag const & t) [inline]
```

Set private creator:

**Examples**

[DuplicatePCDE.cxx](#).

References [Tag\(\)](#), [GetElement\(\)](#), [GetGroup\(\)](#), [IsPrivate\(\)](#), [SetElement\(\)](#), and [SetGroup\(\)](#).

**12.314.3.31 Write()**

```
template<typename TSwap>
const std::ostream & gdcm::Tag::Write (
    std::ostream & os) const [inline]
```

Write a tag in binary rep.

Referenced by [gdcm::Item::Write\(\)](#), [gdcm::SequenceOfFragments::Write\(\)](#), and [gdcm::SequenceOfItems::Write\(\)](#).

## 12.314.4 Friends And Related Symbol Documentation

### 12.314.4.1 `operator<<`

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const Tag & _val) [friend]
```

References [Tag\(\)](#).

### 12.314.4.2 `operator>>`

```
std::istream & operator>> (  
    std::istream & _is,  
    Tag & _val) [friend]
```

References [Tag\(\)](#), [SetElement\(\)](#), and [SetGroup\(\)](#).

## 12.314.5 Member Data Documentation

### 12.314.5.1 `bytes`

```
char gdcM::Tag::bytes[4]
```

### 12.314.5.2 `tag`

```
uint32_t gdcM::Tag::tag
```

Referenced by [Tag\(\)](#), [Tag\(\)](#), [operator!=\(\)](#), [operator<\(\)](#), [operator=\(\)](#), [operator==\(\)](#), and [SetElementTag\(\)](#).

### 12.314.5.3 `tags`

```
uint16_t gdcM::Tag::tags[2]
```

Referenced by [operator<\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMTag.h](#)



## 12.315 gdcm::TagPath Class Reference

class to handle a path of tag.

```
#include <gdcmTagPath.h>
```

### Public Member Functions

- [TagPath](#) ()
- [~TagPath](#) ()
- bool [ConstructFromString](#) (const char \*path)
- bool [ConstructFromTagList](#) ([Tag](#) const \*l, unsigned int n)  
*Construct from a list of tags.*
- void [Print](#) (std::ostream &) const
- bool [Push](#) ([Tag](#) const &t)
- bool [Push](#) (unsigned int itemnum)

### Static Public Member Functions

- static bool [IsValid](#) (const char \*path)  
*Return if path is valid or not.*

### 12.315.1 Detailed Description

class to handle a path of tag.

Any Resemblance to Existing XPath is Purely Coincidental [ftp://medical.nema.org/medical/dicom/supps/sup118←\\_pc.pdf](ftp://medical.nema.org/medical/dicom/supps/sup118/_pc.pdf)

### 12.315.2 Constructor & Destructor Documentation

#### 12.315.2.1 TagPath()

```
gdcm::TagPath::TagPath ()
```

#### 12.315.2.2 ~TagPath()

```
gdcm::TagPath::~~TagPath ()
```

### 12.315.3 Member Function Documentation

#### 12.315.3.1 ConstructFromString()

```
bool gdcM::TagPath::ConstructFromString (
    const char * path)
```

"/0018,0018/"... No space allowed, comma is use to separate tag group from tag element and slash is used to separate tag return false if invalid

#### 12.315.3.2 ConstructFromTagList()

```
bool gdcM::TagPath::ConstructFromTagList (
    Tag const * l,
    unsigned int n)
```

Construct from a list of tags.

#### 12.315.3.3 IsValid()

```
bool gdcM::TagPath::IsValid (
    const char * path) [static]
```

Return if path is valid or not.

#### 12.315.3.4 Print()

```
void gdcM::TagPath::Print (
    std::ostream & ) const
```

#### 12.315.3.5 Push() [1/2]

```
bool gdcM::TagPath::Push (
    Tag const & t)
```

#### 12.315.3.6 Push() [2/2]

```
bool gdcM::TagPath::Push (
    unsigned int itemnum)
```

The documentation for this class was generated from the following file:

- [gdcMTagPath.h](#)

## 12.316 gdcm::Testing Class Reference

class for testing

```
#include <gdcmTesting.h>
```

### Public Types

- typedef const char \*const (\* [MD5DataImagesType](#))[2]
- typedef const char \*const (\* [MediaStorageDataFilesType](#))[2]  
*return the table that map the media storage (as string) of a filename (gdcmData)*

### Public Member Functions

- [Testing](#) ()=default
- [~Testing](#) ()=default
- void [Print](#) (std::ostream &os=std::cout)  
*Print.*

### Static Public Member Functions

- static bool [ComputeFileMD5](#) (const char \*filename, char digest\_str[33])
- static bool [ComputeMD5](#) (const char \*buffer, size\_t buf\_len, char digest\_str[33])
- static const char \* [GetDataExtraRoot](#) ()  
*Return the GDCM DATA EXTRA ROOT.*
- static const char \* [GetDataRoot](#) ()  
*Return the GDCM DATA ROOT.*
- static const char \* [GetFileName](#) (unsigned int file)
- static const char \*const \* [GetFileNames](#) ()  
*return the table of fullpath to gdcmData DICOM files:*
- static int [GetLossyFlagFromFile](#) (const char \*filepath)
- static const char \*const \* [GetMD5DataImage](#) (unsigned int file)
- static [MD5DataImagesType](#) [GetMD5DataImages](#) ()
- static const char \* [GetMD5FromBrokenFile](#) (const char \*filepath)
- static const char \* [GetMD5FromFile](#) (const char \*filepath)
- static const char \*const \* [GetMediaStorageDataFile](#) (unsigned int file)
- static [MediaStorageDataFilesType](#) [GetMediaStorageDataFiles](#) ()
- static const char \* [GetMediaStorageFromFile](#) (const char \*filepath)
- static unsigned int [GetNumberOfFileNames](#) ()
- static unsigned int [GetNumberOfMD5DataImages](#) ()
- static unsigned int [GetNumberOfMediaStorageDataFiles](#) ()
- static const char \* [GetPixelSpacingDataRoot](#) ()  
*Return the GDCM PIXEL SPACING DATA ROOT (See David Clunie website for dataset).*
- static std::streamoff [GetSelectedPrivateGroupOffsetFromFile](#) (const char \*filepath)
- static std::streamoff [GetSelectedTagsOffsetFromFile](#) (const char \*filepath)
- static const char \* [GetSourceDirectory](#) ()
- static std::streamoff [GetStreamOffsetFromFile](#) (const char \*filepath)

- static const char \* [GetTempDirectory](#) (const char \*subdir=nullptr)
- static const wchar\_t \* [GetTempDirectoryW](#) (const wchar\_t \*subdir=nullptr)  
*NOT THREAD SAFE.*
- static const char \* [GetTempFilename](#) (const char \*filename, const char \*subdir=nullptr)  
*NOT THREAD SAFE.*
- static const wchar\_t \* [GetTempFilenameW](#) (const wchar\_t \*filename, const wchar\_t \*subdir=nullptr)  
*NOT THREAD SAFE.*

### 12.316.1 Detailed Description

class for testing

this class is used for the nightly regression system for GDCM It makes heavily use of md5 computation

See also

[gdcm::MD5](#) class for md5 computation

### 12.316.2 Member Typedef Documentation

#### 12.316.2.1 MD5DataImagesType

```
typedef const char* const (* gdcm::Testing::MD5DataImagesType) [2]
```

return the table that map the md5 (as in md5sum) of the Pixel Data associated to a filename

#### 12.316.2.2 MediaStorageDataFileType

```
typedef const char* const (* gdcm::Testing::MediaStorageDataFileType) [2]
```

return the table that map the media storage (as string) of a filename (gdcmData)

### 12.316.3 Constructor & Destructor Documentation

#### 12.316.3.1 Testing()

```
gdcm::Testing::Testing () [default]
```

#### 12.316.3.2 ~Testing()

```
gdcm::Testing::~~Testing () [default]
```

## 12.316.4 Member Function Documentation

### 12.316.4.1 ComputeFileMD5()

```
bool gdcm::Testing::ComputeFileMD5 (
    const char * filename,
    char digest_str[33]) [static]
```

#### Examples

[MetalImageMD5Activiz.cs](#).

### 12.316.4.2 ComputeMD5()

```
bool gdcm::Testing::ComputeMD5 (
    const char * buffer,
    size_t buf_len,
    char digest_str[33]) [static]
```

[MD5](#) stuff digest\_str needs to be at least : strlen = [2\*16+1]; string will be \0 padded. (md5 are 32 bytes long) [Testing](#) is not meant to be shipped with an installed GDCM release, always prefer the [gdcm::MD5](#) API when doing md5 computation.

### 12.316.4.3 GetDataExtraRoot()

```
const char * gdcm::Testing::GetDataExtraRoot () [static]
```

Return the GDCM DATA EXTRA ROOT.

#### Examples

[DiscriminateVolume.cxx](#), [VolumeSorter.cxx](#), and [reslicesphere.cxx](#).

### 12.316.4.4 GetDataRoot()

```
const char * gdcm::Testing::GetDataRoot () [static]
```

Return the GDCM DATA ROOT.

#### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), and [MagnifyFile.cxx](#).

#### 12.316.4.5 GetFileName()

```
const char * gdcM::Testing::GetFileName (
    unsigned int file) [static]
```

##### Examples

[MetaImageMD5Activiz.cs](#).

#### 12.316.4.6 GetFileNames()

```
const char *const * gdcM::Testing::GetFileNames () [static]
```

return the table of fullpath to gdcMData DICOM files:

##### Examples

[TestReader.cxx](#).

#### 12.316.4.7 GetLossyFlagFromFile()

```
int gdcM::Testing::GetLossyFlagFromFile (
    const char * filepath) [static]
```

Return the lossy flag of the given filename -1 -> Error 0 -> Lossless 1 -> Lossy

#### 12.316.4.8 GetMD5DataImage()

```
const char *const * gdcM::Testing::GetMD5DataImage (
    unsigned int file) [static]
```

#### 12.316.4.9 GetMD5DataImages()

```
MD5DataImagesType gdcM::Testing::GetMD5DataImages () [static]
```

#### 12.316.4.10 GetMD5FromBrokenFile()

```
const char * gdcM::Testing::GetMD5FromBrokenFile (
    const char * filepath) [static]
```

Return what should have been the md5 of file 'filepath' This is based on current GDCM implementation to decipher a broken DICOM file.

**12.316.4.11 GetMD5FromFile()**

```
const char * gdcm::Testing::GetMD5FromFile (
    const char * filepath) [static]
```

**12.316.4.12 GetMediaStorageDataFile()**

```
const char *const * gdcm::Testing::GetMediaStorageDataFile (
    unsigned int file) [static]
```

**12.316.4.13 GetMediaStorageDataFiles()**

```
MediaStorageDataFilesType gdcm::Testing::GetMediaStorageDataFiles () [static]
```

**12.316.4.14 GetMediaStorageFromFile()**

```
const char * gdcm::Testing::GetMediaStorageFromFile (
    const char * filepath) [static]
```

**Examples**

[MetaImageMD5Activiz.cs](#), and [TestReader.cxx](#).

**12.316.4.15 GetNumberOfFileNames()**

```
unsigned int gdcm::Testing::GetNumberOfFileNames () [static]
```

**Examples**

[MetaImageMD5Activiz.cs](#).

**12.316.4.16 GetNumberOfMD5DataImages()**

```
unsigned int gdcm::Testing::GetNumberOfMD5DataImages () [static]
```

**12.316.4.17 GetNumberOfMediaStorageDataFiles()**

```
unsigned int gdcm::Testing::GetNumberOfMediaStorageDataFiles () [static]
```

#### 12.316.4.18 GetPixelSpacingDataRoot()

```
const char * gdcM::Testing::GetPixelSpacingDataRoot () [static]
```

Return the GDCM PIXEL SPACING DATA ROOT (See David Clunie website for dataset).

#### 12.316.4.19 GetSelectedPrivateGroupOffsetFromFile()

```
std::streamoff gdcM::Testing::GetSelectedPrivateGroupOffsetFromFile (  
    const char * filepath) [static]
```

Return the offset just after private attribute (0009,0010,"GEMS\_IDEN\_01") if found. Otherwise the offset of the next attribute -1 if not found

#### 12.316.4.20 GetSelectedTagsOffsetFromFile()

```
std::streamoff gdcM::Testing::GetSelectedTagsOffsetFromFile (  
    const char * filepath) [static]
```

Return the offset just after Pixel Data Length (7fe0,0000) if found. Otherwise the offset of the very first pixel cell in Pixel Data -1 if not found

#### 12.316.4.21 GetSourceDirectory()

```
const char * gdcM::Testing::GetSourceDirectory () [static]
```

#### 12.316.4.22 GetStreamOffsetFromFile()

```
std::streamoff gdcM::Testing::GetStreamOffsetFromFile (  
    const char * filepath) [static]
```

Return the offset of the very first pixel cell in the PixelData -1 if not found

#### 12.316.4.23 GetTempDirectory()

```
const char * gdcM::Testing::GetTempDirectory (  
    const char * subdir = nullptr) [static]
```

NOT THREAD SAFE Returns the temp directory as used in testing needing to output data:

#### Examples

[MetalImageMD5Activiz.cs](#).



#### 12.316.4.24 GetTempDirectoryW()

```
const wchar_t * gdcm::Testing::GetTempDirectoryW (  
    const wchar_t * subdir = nullptr) [static]
```

NOT THREAD SAFE.

#### 12.316.4.25 GetTempFilename()

```
const char * gdcm::Testing::GetTempFilename (  
    const char * filename,  
    const char * subdir = nullptr) [static]
```

NOT THREAD SAFE.

#### Examples

[MetaImageMD5Activiz.cs](#).

#### 12.316.4.26 GetTempFilenameW()

```
const wchar_t * gdcm::Testing::GetTempFilenameW (  
    const wchar_t * filename,  
    const wchar_t * subdir = nullptr) [static]
```

NOT THREAD SAFE.

#### 12.316.4.27 Print()

```
void gdcm::Testing::Print (  
    std::ostream & os = std::cout)
```

Print.

The documentation for this class was generated from the following file:

- [gdcmTesting.h](#)

## 12.317 gdcm::Trace Class Reference

[Trace](#).

```
#include <gdcmTrace.h>
```

## Public Member Functions

- [Trace](#) ()
- [~Trace](#) ()

## Static Public Member Functions

- static void [DebugOff](#) ()
- static void [DebugOn](#) ()
- static void [ErrorOff](#) ()
- static void [ErrorOn](#) ()
- static bool [GetDebugFlag](#) ()
- static std::ostream & [GetDebugStream](#) ()
- static bool [GetErrorFlag](#) ()
- static std::ostream & [GetErrorStream](#) ()
- static std::ostream & [GetStream](#) ()
- static bool [GetWarningFlag](#) ()
- static std::ostream & [GetWarningStream](#) ()
- static void [SetDebug](#) (bool debug)  
*Turn debug messages on (default: false).*
- static void [SetDebugStream](#) (std::ostream &os)  
*Explicitly set the stream which receive Debug messages:*
- static void [SetError](#) (bool debug)  
*Turn error messages on (default: true).*
- static void [SetErrorStream](#) (std::ostream &os)  
*Explicitly set the stream which receive Error messages:*
- static void [SetStream](#) (std::ostream &os)
- static void [SetStreamToFile](#) (const char \*filename)
- static void [SetWarning](#) (bool debug)  
*Turn warning messages on (default: true).*
- static void [SetWarningStream](#) (std::ostream &os)  
*Explicitly set the stream which receive Warning messages:*
- static void [WarningOff](#) ()
- static void [WarningOn](#) ()

## 12.317.1 Detailed Description

### [Trace](#).

Debug / Warning and Error are encapsulated in this class by default the [Trace](#) class will redirect any debug/warning/error to std::cerr. Unless SetStream was specified with another (open) stream or SetStreamToFile was specified to a writable file on the system.

### Warning

All string messages are removed during compilation time when compiled with CMAKE\_BUILD\_TYPE being set to either:

- Release
- MinSizeRel It is recommended to compile with RelWithDebInfo and/or Debug during prototyping of applications.

### Examples

[DecompressJPEGFile.cs](#).

## 12.317.2 Constructor & Destructor Documentation

### 12.317.2.1 Trace()

```
gdcm::Trace::Trace ()
```

### 12.317.2.2 ~Trace()

```
gdcm::Trace::~~Trace ()
```

## 12.317.3 Member Function Documentation

### 12.317.3.1 DebugOff()

```
void gdcm::Trace::DebugOff () [static]
```

#### Examples

[MetalImageMD5Activiz.cs](#), and [TestReader.cxx](#).

### 12.317.3.2 DebugOn()

```
void gdcm::Trace::DebugOn () [static]
```

#### Examples

[CreateFakePET.cxx](#), [DecompressJPEGFile.cs](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 12.317.3.3 ErrorOff()

```
void gdcm::Trace::ErrorOff () [static]
```

#### Examples

[MetalImageMD5Activiz.cs](#).

### 12.317.3.4 ErrorOn()

```
void gdcm::Trace::ErrorOn () [static]
```

#### 12.317.3.5 GetDebugFlag()

```
bool gdcmm::Trace::GetDebugFlag () [static]
```

#### 12.317.3.6 GetDebugStream()

```
std::ostream & gdcmm::Trace::GetDebugStream () [static]
```

#### 12.317.3.7 GetErrorFlag()

```
bool gdcmm::Trace::GetErrorFlag () [static]
```

#### 12.317.3.8 GetErrorStream()

```
std::ostream & gdcmm::Trace::GetErrorStream () [static]
```

#### 12.317.3.9 GetStream()

```
std::ostream & gdcmm::Trace::GetStream () [static]
```

#### 12.317.3.10 GetWarningFlag()

```
bool gdcmm::Trace::GetWarningFlag () [static]
```

#### 12.317.3.11 GetWarningStream()

```
std::ostream & gdcmm::Trace::GetWarningStream () [static]
```

#### 12.317.3.12 SetDebug()

```
void gdcmm::Trace::SetDebug (  
    bool debug) [static]
```

Turn debug messages on (default: false).

#### Examples

[DumpToSQLITE3.cxx](#).

### 12.317.3.13 SetDebugStream()

```
void gdcmm::Trace::SetDebugStream (
    std::ostream & os) [static]
```

Explicitly set the stream which receive Debug messages:

### 12.317.3.14 SetError()

```
void gdcmm::Trace::SetError (
    bool debug) [static]
```

Turn error messages on (default: true).

### 12.317.3.15 SetErrorStream()

```
void gdcmm::Trace::SetErrorStream (
    std::ostream & os) [static]
```

Explicitly set the stream which receive Error messages:

#### Examples

[CStoreQtProgress.cxx](#).

### 12.317.3.16 SetStream()

```
void gdcmm::Trace::SetStream (
    std::ostream & os) [static]
```

Explicitly set the ostream for [gdcmm::Trace](#) to report to This will set the DebugStream, WarningStream and ErrorStream at once:

### 12.317.3.17 SetStreamToFile()

```
void gdcmm::Trace::SetStreamToFile (
    const char * filename) [static]
```

Explicitly set the filename for [gdcmm::Trace](#) to report to The file will be created (it will not append to existing file)

### 12.317.3.18 SetWarning()

```
void gdcM::Trace::SetWarning (
    bool debug) [static]
```

Turn warning messages on (default: true).

#### Examples

[DumpToSQLITE3.cxx](#).

### 12.317.3.19 SetWarningStream()

```
void gdcM::Trace::SetWarningStream (
    std::ostream & os) [static]
```

Explicitly set the stream which receive Warning messages:

### 12.317.3.20 WarningOff()

```
void gdcM::Trace::WarningOff () [static]
```

#### Examples

[MetalImageMD5Activiz.cs](#), and [TestReader.cxx](#).

### 12.317.3.21 WarningOn()

```
void gdcM::Trace::WarningOn () [static]
```

#### Examples

[Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

The documentation for this class was generated from the following file:

- [gdcMTrace.h](#)

## 12.318 gdcM::TransferSyntax Class Reference

Class to manipulate Transfer Syntax.

```
#include <gdcMTransferSyntax.h>
```

## Public Types

- enum [NegociatedType](#) {  
    [Unknown](#) = 0 ,  
    [Explicit](#) ,  
    [Implicit](#) }
- enum [TSType](#) {  
    [ImplicitVRLittleEndian](#) = 0 ,  
    [ImplicitVRBigEndianPrivateGE](#) ,  
    [ExplicitVRLittleEndian](#) ,  
    [DeflatedExplicitVRLittleEndian](#) ,  
    [ExplicitVRBigEndian](#) ,  
    [JPEGBaselineProcess1](#) ,  
    [JPEGExtendedProcess2\\_4](#) ,  
    [JPEGExtendedProcess3\\_5](#) ,  
    [JPEGSpectralSelectionProcess6\\_8](#) ,  
    [JPEGFullProgressionProcess10\\_12](#) ,  
    [JPEGLosslessProcess14](#) ,  
    [JPEGLosslessProcess14\\_1](#) ,  
    [JPEGLSLossless](#) ,  
    [JPEGLSNearLossless](#) ,  
    [JPEG2000Lossless](#) ,  
    [JPEG2000](#) ,  
    [JPEG2000Part2Lossless](#) ,  
    [JPEG2000Part2](#) ,  
    [RLELossless](#) ,  
    [MPEG2MainProfile](#) ,  
    [ImplicitVRBigEndianACRNEMA](#) ,  
    [WeirdPapryus](#) ,  
    [CT\\_private\\_ELE](#) ,  
    [JPIPReferenced](#) ,  
    [MPEG2MainProfileHighLevel](#) ,  
    [MPEG4AVCH264HighProfileLevel4\\_1](#) ,  
    [MPEG4AVCH264BDcompatibleHighProfileLevel4\\_1](#) ,  
    [TS\\_END](#) }

## Public Member Functions

- [TransferSyntax](#) ([TSType](#) type=[ImplicitVRLittleEndian](#))
- bool [CanStoreLossy](#) () const
- [NegociatedType](#) [GetNegociatedType](#) () const
- const char \* [GetString](#) () const
- [SwapCode](#) [GetSwapCode](#) () const
- bool [IsEncapsulated](#) () const
- bool [IsEncoded](#) () const
- bool [IsExplicit](#) () const
- bool [IsImplicit](#) () const
- bool [IsLossless](#) () const
- bool [IsLossy](#) () const
- bool [IsValid](#) () const
- [operator TSType](#) () const

### Static Public Member Functions

- static const char \* [GetTSSString](#) (TSType ts)
- static TSType [GetTSType](#) (const char \*str)

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [TransferSyntax](#) &ts)

## 12.318.1 Detailed Description

Class to manipulate Transfer Syntax.

### Note

TRANSFER SYNTAX (Standard and Private): A set of encoding rules that allow Application Entities to unambiguously negotiate the encoding techniques (e.g., Data [Element](#) structure, byte ordering, compression) they are able to support, thereby allowing these Application Entities to communicate.

**Todo** : The implementation is completely retarded -> see [gdcm::UIDs](#) for a replacement We need: IsSupported We need preprocess of raw/xml file We need GetFullName()

Need a notion of Private Syntax. As defined in PS 3.5. Section 9.2

### See also

[UIDs](#)

### Examples

[BasicImageAnonymizer.cs](#), [CompressLossyJPEG.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [GetJPEGSamplePrecision.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [MpegVideoInfo.cs](#), and [StandardizeFiles.cs](#).

## 12.318.2 Member Enumeration Documentation

### 12.318.2.1 NegotiatedType

```
enum gdcm::TransferSyntax::NegociatedType
```

### Enumerator

Unknown	
---------	--



Explicit	
Implicit	

### 12.318.2.2 TSType

enum `gdcm::TransferSyntax::TSType`

#### Enumerator

ImplicitVRLittleEndian	
ImplicitVRBigEndianPrivateGE	
ExplicitVRLittleEndian	
DeflatedExplicitVRLittleEndian	
ExplicitVRBigEndian	
JPEGBaselineProcess1	
JPEGExtendedProcess2_4	
JPEGExtendedProcess3_5	
JPEGSpectralSelectionProcess6_8	
JPEGFullProgressionProcess10_12	
JPEGLosslessProcess14	
JPEGLosslessProcess14_1	
JPEGLSLossless	
JPEGLSNearLossless	
JPEG2000Lossless	
JPEG2000	
JPEG2000Part2Lossless	
JPEG2000Part2	
RLELossless	
MPEG2MainProfile	
ImplicitVRBigEndianACRNEMA	
WeirdPapryus	
CT_private_ELE	
JPIPReferenced	
MPEG2MainProfileHighLevel	
MPEG4AVCH264HighProfileLevel4_1	

MPEG4AVCH264BDcompatibleHighProfileLevel4↔ _1	
TS_END	

### Examples

[BasicImageAnonymizer.cs](#), [CompressLossyJPEG.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [MpegVideoInfo.cs](#), and [StandardizeFiles.cs](#).

## 12.318.3 Constructor & Destructor Documentation

### 12.318.3.1 TransferSyntax()

```
gdcmm::TransferSyntax::TransferSyntax (
    TSType type = ImplicitVRLittleEndian) [inline]
```

References [ImplicitVRLittleEndian](#).

Referenced by [operator<<](#).

## 12.318.4 Member Function Documentation

### 12.318.4.1 CanStoreLossy()

```
bool gdcmm::TransferSyntax::CanStoreLossy () const
```

return true if TransFer Syntax Allow storing of Lossy Pixel Data

### 12.318.4.2 GetNegociatedType()

```
NegotiatedType gdcmm::TransferSyntax::GetNegociatedType () const
```

### 12.318.4.3 GetString()

```
const char * gdcmm::TransferSyntax::GetString () const [inline]
```

References [GetTSString\(\)](#).

### 12.318.4.4 GetSwapCode()

```
SwapCode gdcmm::TransferSyntax::GetSwapCode () const
```

**Deprecated** Return the [SwapCode](#) associated with the Transfer Syntax. Be careful with the special GE private syntax the [DataSet](#) is written in little endian but the Pixel Data is in Big Endian.

#### 12.318.4.5 GetTSString()

```
const char * gdcm::TransferSyntax::GetTSString (
    TSType ts) [static]
```

##### Examples

[LargeVRDSExplicit.cxx](#).

Referenced by [GetString\(\)](#), and [operator<<](#).

#### 12.318.4.6 GetTSType()

```
TSType gdcm::TransferSyntax::GetTSType (
    const char * str) [static]
```

#### 12.318.4.7 IsEncapsulated()

```
bool gdcm::TransferSyntax::IsEncapsulated () const
```

##### Examples

[ExtractIconFromFile.cxx](#).

#### 12.318.4.8 IsEncoded()

```
bool gdcm::TransferSyntax::IsEncoded () const
```

#### 12.318.4.9 IsExplicit()

```
bool gdcm::TransferSyntax::IsExplicit () const
```

#### 12.318.4.10 IsImplicit()

```
bool gdcm::TransferSyntax::IsImplicit () const
```

#### 12.318.4.11 IsLossless()

```
bool gdcm::TransferSyntax::IsLossless () const
```

Return true if the transfer syntax algorithm is a lossless algorithm

**12.318.4.12 IsLossy()**

```
bool gdcm::TransferSyntax::IsLossy () const
```

Return true if the transfer syntax algorithm is a lossy algorithm

**12.318.4.13 IsValid()**

```
bool gdcm::TransferSyntax::IsValid () const [inline]
```

References [TS\\_END](#).

**12.318.4.14 operator TSType()**

```
gdcm::TransferSyntax::operator TSType () const [inline]
```

**12.318.5 Friends And Related Symbol Documentation****12.318.5.1 operator<<**

```
std::ostream & operator<< (
    std::ostream & os,
    const TransferSyntax & ts) [friend]
```

References [TransferSyntax\(\)](#), and [GetTSString\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmTransferSyntax.h](#)

**12.319 gdcm::network::TransferSyntaxSub Class Reference**

[TransferSyntaxSub](#).

```
#include <gdcmTransferSyntaxSub.h>
```

**Public Member Functions**

- [TransferSyntaxSub \(\)](#)
- const char \* [GetName \(\)](#) const
- bool [operator==](#) (const [TransferSyntaxSub](#) &ts) const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetName](#) (const char \*name)
- void [SetNameFromUID](#) (UIDs::TSName tsname)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

## 12.319.1 Detailed Description

[TransferSyntaxSub](#).

[Table](#) 9-15 TRANSFER SYNTAX SUB-ITEM FIELDS

TODO what is the goal of :

[Table](#) 9-19 TRANSFER SYNTAX SUB-ITEM FIELDS

## 12.319.2 Constructor & Destructor Documentation

### 12.319.2.1 TransferSyntaxSub()

```
gdcm::network::TransferSyntaxSub::TransferSyntaxSub ()
```

Referenced by [operator==\(\(\)\)](#).

## 12.319.3 Member Function Documentation

### 12.319.3.1 GetName()

```
const char * gdcm::network::TransferSyntaxSub::GetName () const [inline]
```

### 12.319.3.2 operator==(())

```
bool gdcm::network::TransferSyntaxSub::operator== (
    const TransferSyntaxSub & ts) const [inline]
```

References [TransferSyntaxSub\(\)](#).

### 12.319.3.3 Print()

```
void gdcm::network::TransferSyntaxSub::Print (
    std::ostream & os) const
```

### 12.319.3.4 Read()

```
std::istream & gdcm::network::TransferSyntaxSub::Read (
    std::istream & is)
```

**12.319.3.5 SetName()**

```
void gdcmm::network::TransferSyntaxSub::SetName (
    const char * name)
```

**12.319.3.6 SetNameFromUID()**

```
void gdcmm::network::TransferSyntaxSub::SetNameFromUID (
    UIDs::TSName tname)
```

**12.319.3.7 Size()**

```
size_t gdcmm::network::TransferSyntaxSub::Size () const
```

**12.319.3.8 Write()**

```
const std::ostream & gdcmm::network::TransferSyntaxSub::Write (
    std::ostream & os) const
```

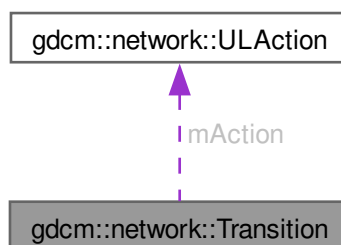
The documentation for this class was generated from the following file:

- [gdcmmTransferSyntaxSub.h](#)

**12.320 gdcmm::network::Transition Struct Reference**

```
#include <gdcmmULTransitionTable.h>
```

Collaboration diagram for gdcmm::network::Transition:



## Public Member Functions

- [Transition](#) ()
- [Transition](#) (int inEndState, [ULAction](#) \*inAction)
- [~Transition](#) ()

## Static Public Member Functions

- static [Transition](#) \* [MakeNew](#) (int inEndState, [ULAction](#) \*inAction)

## Public Attributes

- [ULAction](#) \* [mAction](#)
- int [mEnd](#)

## 12.320.1 Constructor & Destructor Documentation

### 12.320.1.1 [Transition](#)() [1/2]

```
gdcm::network::Transition::Transition () [inline]
```

References [gdcm::network::eStaDoesNotExist](#), [mAction](#), and [mEnd](#).

Referenced by [MakeNew\(\)](#).

### 12.320.1.2 [~Transition](#)()

```
gdcm::network::Transition::~~Transition () [inline]
```

References [mAction](#).

### 12.320.1.3 [Transition](#)() [2/2]

```
gdcm::network::Transition::Transition (  
    int inEndState,  
    ULAction * inAction) [inline]
```

References [mAction](#), and [mEnd](#).

## 12.320.2 Member Function Documentation

### 12.320.2.1 MakeNew()

```
Transition * gdcmm::network::Transition::MakeNew (
    int inEndState,
    ULAAction * inAction) [inline], [static]
```

References [Transition\(\)](#).

## 12.320.3 Member Data Documentation

### 12.320.3.1 mAction

```
ULAAction* gdcmm::network::Transition::mAction
```

Referenced by [Transition\(\)](#), [Transition\(\)](#), and [~Transition\(\)](#).

### 12.320.3.2 mEnd

```
int gdcmm::network::Transition::mEnd
```

Referenced by [Transition\(\)](#), and [Transition\(\)](#).

The documentation for this struct was generated from the following file:

- [gdcmmULTransitionTable.h](#)

## 12.321 gdcmm::Type Class Reference

[Type](#).

```
#include <gdcmmType.h>
```

### Public Types

- enum [TypeType](#) {  
    [T1](#) = 0 ,  
    [T1C](#) ,  
    [T2](#) ,  
    [T2C](#) ,  
    [T3](#) ,  
    [UNKNOWN](#) }



## Public Member Functions

- [Type](#) ([TypeType](#) type=[UNKNOWN](#))
- [operator TypeType](#) () const

## Static Public Member Functions

- static const char \* [GetTypeString](#) ([TypeType](#) type)
- static [TypeType GetTypeType](#) (const char \*type)

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [Type](#) &vr)

## 12.321.1 Detailed Description

[Type](#).

### Note

PS 3.5 7.4 DATA ELEMENT TYPE 7.4.1 TYPE 1 REQUIRED DATA ELEMENTS 7.4.2 TYPE 1C CONDITIONAL DATA ELEMENTS 7.4.3 TYPE 2 REQUIRED DATA ELEMENTS 7.4.4 TYPE 2C CONDITIONAL DATA ELEMENTS 7.4.5 TYPE 3 OPTIONAL DATA ELEMENTS

The intent of [Type](#) 2 Data Elements is to allow a zero length to be conveyed when the operator or application does not know its value or has a specific reason for not specifying its value. It is the intent that the device should support these Data Elements.

### Examples

[TraverseModules.cxx](#).

## 12.321.2 Member Enumeration Documentation

### 12.321.2.1 TypeType

```
enum gdcm::Type::TypeType
```

#### Enumerator

T1	
T1C	
T2	

T2C	
T3	
UNKNOWN	

### 12.321.3 Constructor & Destructor Documentation

#### 12.321.3.1 Type()

```
gdcM::Type::Type (
    TypeType type = UNKNOWN) [inline]
```

References [UNKNOWN](#).

Referenced by [operator<<](#).

### 12.321.4 Member Function Documentation

#### 12.321.4.1 GetTypeString()

```
const char * gdcM::Type::GetTypeString (
    TypeType type) [static]
```

Referenced by [operator<<](#).

#### 12.321.4.2 GetTypeType()

```
TypeType gdcM::Type::GetTypeType (
    const char * type) [static]
```

Referenced by [gdcM::ModuleEntry::ModuleEntry\(\)](#).

#### 12.321.4.3 operator TypeType()

```
gdcM::Type::operator TypeType () const [inline]
```

### 12.321.5 Friends And Related Symbol Documentation

#### 12.321.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const Type & vr) [friend]
```

References [Type\(\)](#), and [GetTypeString\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMType.h](#)

## 12.322 gdcm::UI Struct Reference

```
#include <gdcmVR.h>
```

### Public Attributes

- char [Internal](#) [64+1]

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [UI](#) &\_val)

## 12.322.1 Friends And Related Symbol Documentation

### 12.322.1.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const UI & _val) [friend]
```

References [Internal](#).

## 12.322.2 Member Data Documentation

### 12.322.2.1 Internal

```
char gdcm::UI::Internal[64+1]
```

Referenced by [operator<<](#).

The documentation for this struct was generated from the following file:

- [gdcmVR.h](#)

## 12.323 gdcm::UIDGenerator Class Reference

Class for generating unique UID.

```
#include <gdcmUIDGenerator.h>
```

## Public Member Functions

- [UIDGenerator](#) ()  
*By default the root of a UID is a GDCM Root...*
- const char \* [Generate](#) ()

## Static Public Member Functions

- static const char \* [GetGDCMUID](#) ()  
*Return the default (GDCM) root UID:*
- static const char \* [GetRoot](#) ()
- static bool [IsValid](#) (const char \*uid)
- static void [SetRoot](#) (const char \*root)

## Static Protected Member Functions

- static bool [GenerateUUID](#) (unsigned char \*uuid\_data)

### 12.323.1 Detailed Description

Class for generating unique UID.

When constructing a [Series](#) or [Study](#) UID, user *has* to keep around the UID, otherwise the UID Generator will simply forget the value and create a new UID.

#### Examples

[CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [ManipulateFile.cs](#), [MpegVideoInfo.cs](#), [ReformatFile.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), and [uid\\_unique.cxx](#).

### 12.323.2 Constructor & Destructor Documentation

#### 12.323.2.1 UIDGenerator()

```
gdcmm::UIDGenerator::UIDGenerator () [inline]
```

By default the root of a UID is a GDCM Root...

## 12.323.3 Member Function Documentation

### 12.323.3.1 Generate()

```
const char * gdcm::UIDGenerator::Generate ()
```

Internally uses a std::string, so two calls have the same pointer ! save into a std::string In summary do not write code like that: `const char *uid1 = uid.Generate(); const char *uid2 = uid.Generate();` since `uid1 == uid2`

#### Examples

[CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [ManipulateFile.cs](#), [ReformatFile.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), and [uid\\_unique.cxx](#).

### 12.323.3.2 GenerateUUID()

```
bool gdcm::UIDGenerator::GenerateUUID (
    unsigned char * uuid_data) [static], [protected]
```

### 12.323.3.3 GetGDCMUID()

```
const char * gdcm::UIDGenerator::GetGDCMUID () [static]
```

Return the default (GDCM) root UID:

### 12.323.3.4 GetRoot()

```
const char * gdcm::UIDGenerator::GetRoot () [static]
```

#### Examples

[ReformatFile.cs](#), and [StandardizeFiles.cs](#).

### 12.323.3.5 IsValid()

```
bool gdcm::UIDGenerator::IsValid (
    const char * uid) [static]
```

Find out if the string is a valid UID or not

**Todo** : Move that in DataStructureAndEncoding (see FileMetaInformation::CheckFileMetaInformation)

### 12.323.3.6 SetRoot()

```
void gdcmm::UIDGenerator::SetRoot (
    const char * root) [static]
```

The current implementation in GDCM make use of the UUID implementation (RFC 4122) and has been successfully been tested for a root of size 26 bytes. Any longer root should work (the [Generate\(\)](#) function will return a string), but will truncate the high bits of the 128bits UUID until the generated string fits on 64 bits. The authors disclaims any responsablility for guaranteeing uniqueness of [UIDs](#) when the root is longer than 26 bytes.

#### Examples

[ReformatFile.cs](#), [StandardizeFiles.cs](#), and [uid\\_unique.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmmUIDGenerator.h](#)

## 12.324 gdcmm::UIDs Class Reference

all known uids

```
#include <gdcmmUIDs.h>
```

### Public Types

- typedef const char \*const (\* [TransferSyntaxStringsType](#))[2]
- enum [TSName](#) {
  - [VerificationSOPClass](#) = 1 ,
  - [ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM](#) = 2 ,
  - [ExplicitVRLittleEndian](#) = 3 ,
  - [DeflatedExplicitVRLittleEndian](#) = 4 ,
  - [ExplicitVRBigEndian](#) = 5 ,
  - [JPEGBaselineProcess1DefaultTransferSyntaxforLossyJPEG8BitImageCompression](#) = 6 ,
  - [JPEGExtendedProcess24DefaultTransferSyntaxforLossyJPEG12BitImageCompressionProcess4only](#) = 7 ,
  - [JPEGExtendedProcess35Retired](#) = 8 ,
  - [JPEGSpectralSelectionNonHierarchicalProcess68Retired](#) = 9 ,
  - [JPEGSpectralSelectionNonHierarchicalProcess79Retired](#) = 10 ,
  - [JPEGFullProgressionNonHierarchicalProcess1012Retired](#) = 11 ,
  - [JPEGFullProgressionNonHierarchicalProcess1113Retired](#) = 12 ,
  - [JPEGLosslessNonHierarchicalProcess14](#) = 13 ,
  - [JPEGLosslessNonHierarchicalProcess15Retired](#) = 14 ,
  - [JPEGExtendedHierarchicalProcess1618Retired](#) = 15 ,
  - [JPEGExtendedHierarchicalProcess1719Retired](#) = 16 ,
  - [JPEGSpectralSelectionHierarchicalProcess2022Retired](#) = 17 ,
  - [JPEGSpectralSelectionHierarchicalProcess2123Retired](#) = 18 ,
  - [JPEGFullProgressionHierarchicalProcess2426Retired](#) = 19 ,
  - [JPEGFullProgressionHierarchicalProcess2527Retired](#) = 20 ,
  - [JPEGLosslessHierarchicalProcess28Retired](#) = 21 ,

JPEGLosslessHierarchicalProcess29Retired = 22 ,  
JPEGLosslessNonHierarchicalFirstOrderPredictionProcess14SelectionValue1DefaultTransferSyntaxforLosslessJPEGImageCompression = 23 ,  
JPEGLSLosslessImageCompression = 24 ,  
JPEGLSLossyNearLosslessImageCompression = 25 ,  
JPEG2000ImageCompressionLosslessOnly = 26 ,  
JPEG2000ImageCompression = 27 ,  
JPEG2000Part2MulticomponentImageCompressionLosslessOnly = 28 ,  
JPEG2000Part2MulticomponentImageCompression = 29 ,  
JPIPReferenced = 30 ,  
JPIPReferencedDeflate = 31 ,  
MPEG2MainProfileMainLevel = 32 ,  
RLELossless = 33 ,  
RFC2557MIMEencapsulation = 34 ,  
XMLEncoding = 35 ,  
MediaStorageDirectoryStorage = 36 ,  
TalairachBrainAtlasFrameofReference = 37 ,  
SPM2T1FrameofReference = 38 ,  
SPM2T2FrameofReference = 39 ,  
SPM2PDFFrameofReference = 40 ,  
SPM2EPIFrameofReference = 41 ,  
SPM2FILT1FrameofReference = 42 ,  
SPM2PETFrameofReference = 43 ,  
SPM2TRANSMFrameofReference = 44 ,  
SPM2SPECTFrameofReference = 45 ,  
SPM2GRAYFrameofReference = 46 ,  
SPM2WHITEFrameofReference = 47 ,  
SPM2CSFFFrameofReference = 48 ,  
SPM2BRAINMASKFrameofReference = 49 ,  
SPM2AVG305T1FrameofReference = 50 ,  
SPM2AVG152T1FrameofReference = 51 ,  
SPM2AVG152T2FrameofReference = 52 ,  
SPM2AVG152PDFFrameofReference = 53 ,  
SPM2SINGLESUBJT1FrameofReference = 54 ,  
ICBM452T1FrameofReference = 55 ,  
ICBMSingleSubjectMRIFrameofReference = 56 ,  
BasicStudyContentNotificationSOPClassRetired = 57 ,  
StorageCommitmentPushModelSOPClass = 58 ,  
StorageCommitmentPushModelSOPInstance = 59 ,  
StorageCommitmentPullModelSOPClassRetired = 60 ,  
StorageCommitmentPullModelSOPInstanceRetired = 61 ,  
ProceduralEventLoggingSOPClass = 62 ,  
ProceduralEventLoggingSOPInstance = 63 ,  
SubstanceAdministrationLoggingSOPClass = 64 ,  
SubstanceAdministrationLoggingSOPInstance = 65 ,  
DICOMUIDRegistry = 66 ,  
DICOMControlledTerminology = 67 ,  
DICOMApplicationContextName = 68 ,  
DetachedPatientManagementSOPClassRetired = 69 ,  
DetachedPatientManagementMetaSOPClassRetired = 70 ,  
DetachedVisitManagementSOPClassRetired = 71 ,  
DetachedStudyManagementSOPClassRetired = 72 ,  
StudyComponentManagementSOPClassRetired = 73 ,  
ModalityPerformedProcedureStepSOPClass = 74 ,

ModalityPerformedProcedureStepRetrieveSOPClass = 75 ,  
ModalityPerformedProcedureStepNotificationSOPClass = 76 ,  
DetachedResultsManagementSOPClassRetired = 77 ,  
DetachedResultsManagementMetaSOPClassRetired = 78 ,  
DetachedStudyManagementMetaSOPClassRetired = 79 ,  
DetachedInterpretationManagementSOPClassRetired = 80 ,  
StorageServiceClass = 81 ,  
BasicFilmSessionSOPClass = 82 ,  
BasicFilmBoxSOPClass = 83 ,  
BasicGrayscaleImageBoxSOPClass = 84 ,  
BasicColorImageBoxSOPClass = 85 ,  
ReferencedImageBoxSOPClassRetired = 86 ,  
BasicGrayscalePrintManagementMetaSOPClass = 87 ,  
ReferencedGrayscalePrintManagementMetaSOPClassRetired = 88 ,  
PrintJobSOPClass = 89 ,  
BasicAnnotationBoxSOPClass = 90 ,  
PrinterSOPClass = 91 ,  
PrinterConfigurationRetrievalSOPClass = 92 ,  
PrinterSOPInstance = 93 ,  
PrinterConfigurationRetrievalSOPInstance = 94 ,  
BasicColorPrintManagementMetaSOPClass = 95 ,  
ReferencedColorPrintManagementMetaSOPClassRetired = 96 ,  
VOILUTBoxSOPClass = 97 ,  
PresentationLUTSOPClass = 98 ,  
ImageOverlayBoxSOPClassRetired = 99 ,  
BasicPrintImageOverlayBoxSOPClassRetired = 100 ,  
PrintQueueSOPInstanceRetired = 101 ,  
PrintQueueManagementSOPClassRetired = 102 ,  
StoredPrintStorageSOPClassRetired = 103 ,  
HardcopyGrayscaleImageStorageSOPClassRetired = 104 ,  
HardcopyColorImageStorageSOPClassRetired = 105 ,  
PullPrintRequestSOPClassRetired = 106 ,  
PullStoredPrintManagementMetaSOPClassRetired = 107 ,  
MediaCreationManagementSOPClassUID = 108 ,  
ComputedRadiographyImageStorage = 109 ,  
DigitalXRayImageStorageForPresentation = 110 ,  
DigitalXRayImageStorageForProcessing = 111 ,  
DigitalMammographyXRayImageStorageForPresentation = 112 ,  
DigitalMammographyXRayImageStorageForProcessing = 113 ,  
DigitalIntraoralXRayImageStorageForPresentation = 114 ,  
DigitalIntraoralXRayImageStorageForProcessing = 115 ,  
CTImageStorage = 116 ,  
EnhancedCTImageStorage = 117 ,  
UltrasoundMultiframeImageStorageRetired = 118 ,  
UltrasoundMultiframeImageStorage = 119 ,  
MRIImageStorage = 120 ,  
EnhancedMRIImageStorage = 121 ,  
MRSpectroscopyStorage = 122 ,  
NuclearMedicineImageStorageRetired = 123 ,  
UltrasoundImageStorageRetired = 124 ,  
UltrasoundImageStorage = 125 ,  
SecondaryCaptureImageStorage = 126 ,  
MultiframeSingleBitSecondaryCaptureImageStorage = 127 ,  
MultiframeGrayscaleByteSecondaryCaptureImageStorage = 128 ,



[MultiframeGrayscaleWordSecondaryCaptureImageStorage](#) = 129 ,  
[MultiframeTrueColorSecondaryCaptureImageStorage](#) = 130 ,  
[StandaloneOverlayStorageRetired](#) = 131 ,  
[StandaloneCurveStorageRetired](#) = 132 ,  
[WaveformStorageTrialRetired](#) = 133 ,  
[ECG12leadWaveformStorage](#) = 134 ,  
[GeneralECGWaveformStorage](#) = 135 ,  
[AmbulatoryECGWaveformStorage](#) = 136 ,  
[HemodynamicWaveformStorage](#) = 137 ,  
[CardiacElectrophysiologyWaveformStorage](#) = 138 ,  
[BasicVoiceAudioWaveformStorage](#) = 139 ,  
[StandaloneModalityLUTStorageRetired](#) = 140 ,  
[StandaloneVOILUTStorageRetired](#) = 141 ,  
[GrayscaleSoftcopyPresentationStateStorageSOPClass](#) = 142 ,  
[ColorSoftcopyPresentationStateStorageSOPClass](#) = 143 ,  
[PseudoColorSoftcopyPresentationStateStorageSOPClass](#) = 144 ,  
[BlendingSoftcopyPresentationStateStorageSOPClass](#) = 145 ,  
[XRayAngiographicImageStorage](#) = 146 ,  
[EnhancedXAImageStorage](#) = 147 ,  
[XRayRadiofluoroscopicImageStorage](#) = 148 ,  
[EnhancedXRFIImageStorage](#) = 149 ,  
[XRay3DAngiographicImageStorage](#) = 150 ,  
[XRay3DCraniofacialImageStorage](#) = 151 ,  
[XRayAngiographicBiPlaneImageStorageRetired](#) = 152 ,  
[NuclearMedicineImageStorage](#) = 153 ,  
[RawDataStorage](#) = 154 ,  
[SpatialRegistrationStorage](#) = 155 ,  
[SpatialFiducialsStorage](#) = 156 ,  
[DeformableSpatialRegistrationStorage](#) = 157 ,  
[SegmentationStorage](#) = 158 ,  
[RealWorldValueMappingStorage](#) = 159 ,  
[VLImageStorageTrialRetired](#) = 160 ,  
[VLMultiframeImageStorageTrialRetired](#) = 161 ,  
[VLEndoscopicImageStorage](#) = 162 ,  
[VideoEndoscopicImageStorage](#) = 163 ,  
[VLMicroscopicImageStorage](#) = 164 ,  
[VideoMicroscopicImageStorage](#) = 165 ,  
[VLSlideCoordinatesMicroscopicImageStorage](#) = 166 ,  
[VLPhotographicImageStorage](#) = 167 ,  
[VideoPhotographicImageStorage](#) = 168 ,  
[OphthalmicPhotography8BitImageStorage](#) = 169 ,  
[OphthalmicPhotography16BitImageStorage](#) = 170 ,  
[StereometricRelationshipStorage](#) = 171 ,  
[OphthalmicTomographyImageStorage](#) = 172 ,  
[TextSRStorageTrialRetired](#) = 173 ,  
[AudioSRStorageTrialRetired](#) = 174 ,  
[DetailSRStorageTrialRetired](#) = 175 ,  
[ComprehensiveSRStorageTrialRetired](#) = 176 ,  
[BasicTextSRStorage](#) = 177 ,  
[EnhancedSRStorage](#) = 178 ,  
[ComprehensiveSRStorage](#) = 179 ,  
[ProcedureLogStorage](#) = 180 ,  
[MammographyCADSRStorage](#) = 181 ,  
[KeyObjectSelectionDocumentStorage](#) = 182 ,

ChestCADSRStorage = 183 ,  
XRayRadiationDoseSRStorage = 184 ,  
EncapsulatedPDFStorage = 185 ,  
EncapsulatedCDASStorage = 186 ,  
PositronEmissionTomographyImageStorage = 187 ,  
StandalonePETCurveStorageRetired = 188 ,  
RTImageStorage = 189 ,  
RTDoseStorage = 190 ,  
RTStructureSetStorage = 191 ,  
RTBeamsTreatmentRecordStorage = 192 ,  
RTPlanStorage = 193 ,  
RTBrachyTreatmentRecordStorage = 194 ,  
RTTreatmentSummaryRecordStorage = 195 ,  
RTIonPlanStorage = 196 ,  
RTIonBeamsTreatmentRecordStorage = 197 ,  
PatientRootQueryRetrieveInformationModelFIND = 198 ,  
PatientRootQueryRetrieveInformationModelMOVE = 199 ,  
PatientRootQueryRetrieveInformationModelGET = 200 ,  
StudyRootQueryRetrieveInformationModelFIND = 201 ,  
StudyRootQueryRetrieveInformationModelMOVE = 202 ,  
StudyRootQueryRetrieveInformationModelGET = 203 ,  
PatientStudyOnlyQueryRetrieveInformationModelFINDRetired = 204 ,  
PatientStudyOnlyQueryRetrieveInformationModelMOVERetired = 205 ,  
PatientStudyOnlyQueryRetrieveInformationModelGETRetired = 206 ,  
ModalityWorklistInformationModelFIND = 207 ,  
GeneralPurposeWorklistInformationModelFIND = 208 ,  
GeneralPurposeScheduledProcedureStepSOPClass = 209 ,  
GeneralPurposePerformedProcedureStepSOPClass = 210 ,  
GeneralPurposeWorklistManagementMetaSOPClass = 211 ,  
InstanceAvailabilityNotificationSOPClass = 212 ,  
RTBeamsDeliveryInstructionStorageSupplement74FrozenDraft = 213 ,  
RTConventionalMachineVerificationSupplement74FrozenDraft = 214 ,  
RTIonMachineVerificationSupplement74FrozenDraft = 215 ,  
UnifiedWorklistandProcedureStepServiceClass = 216 ,  
UnifiedProcedureStepPushSOPClass = 217 ,  
UnifiedProcedureStepWatchSOPClass = 218 ,  
UnifiedProcedureStepPullSOPClass = 219 ,  
UnifiedProcedureStepEventSOPClass = 220 ,  
UnifiedWorklistandProcedureStepSOPInstance = 221 ,  
GeneralRelevantPatientInformationQuery = 222 ,  
BreastImagingRelevantPatientInformationQuery = 223 ,  
CardiacRelevantPatientInformationQuery = 224 ,  
HangingProtocolStorage = 225 ,  
HangingProtocolInformationModelFIND = 226 ,  
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ProductCharacteristicsQuerySOPClass = 228 ,  
SubstanceApprovalQuerySOPClass = 229 ,  
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dicomDescription = 231 ,  
dicomManufacturer = 232 ,  
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[dicomDeviceSerialNumber](#) = 254 ,  
[dicomInstitutionName](#) = 255 ,  
[dicomInstitutionAddress](#) = 256 ,  
[dicomInstitutionDepartmentName](#) = 257 ,  
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[dicomSupportedCharacterSet](#) = 260 ,  
[dicomConfigurationRoot](#) = 261 ,  
[dicomDevicesRoot](#) = 262 ,  
[dicomUniqueAETitlesRegistryRoot](#) = 263 ,  
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[dicomNetworkAE](#) = 265 ,  
[dicomNetworkConnection](#) = 266 ,  
[dicomUniqueAETitle](#) = 267 ,  
[dicomTransferCapability](#) = 268 ,  
[VLWholeSlideMicroscopyImageStorage](#) = 269 ,  
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[PET20StepColorPaletteSOPInstance](#) = 281 ,  
[SpringColorPaletteSOPInstance](#) = 282 ,  
[SummerColorPaletteSOPInstance](#) = 283 ,  
[FallColorPaletteSOPInstance](#) = 284 ,  
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[RespiratoryWaveformStorage](#) = 301 ,  
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[MPEG4AVCH\\_264HighProfileLevel4\\_2For3DVideo](#) = 305 ,  
[MPEG4AVCH\\_264StereoHighProfileLevel4\\_2](#) = 306 ,  
[HEVCH\\_265MainProfileLevel5\\_1](#) = 307 ,  
[HEVCH\\_265Main10ProfileLevel5\\_1](#) = 308 ,  
[HotIronColorPaletteSOPInstance](#) = 309 ,  
[CompositingPlanarMPRVolumetricPresentationStateStorage](#) = 310 ,  
[AdvancedBlendingPresentationStateStorage](#) = 311 ,  
[VolumeRenderingVolumetricPresentationStateStorage](#) = 312 ,  
[SegmentedVolumeRenderingVolumetricPresentationStateStorage](#) = 313 ,  
[MultipleVolumeRenderingVolumetricPresentationStateStorage](#) = 314 ,  
[Null0](#) = 315 ,  
[BreastProjectionXRayImageStorageForPresentation](#) = 316 ,  
[BreastProjectionXRayImageStorageForProcessing](#) = 317 ,  
[IntravascularOpticalCoherenceTomographyImageStorageForPresentation](#) = 318 ,  
[IntravascularOpticalCoherenceTomographyImageStorageForProcessing](#) = 319 ,  
[ParametricMapStorage](#) = 320 ,  
[Null1](#) = 321 ,  
[TractographyResultsStorage](#) = 322 ,  
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[SurfaceScanPointCloudStorage](#) = 324 ,  
[WideFieldOphthalmicPhotographyStereographicProjectionImageStorage](#) = 325 ,  
[WideFieldOphthalmicPhotography3DCoordinatesImageStorage](#) = 326 ,  
[OphthalmicOpticalCoherenceTomographyEnFacelImageStorage](#) = 327 ,  
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[IntraocularLensCalculationsStorage](#) = 336 ,  
[MacularGridThicknessandVolumeReportStorage](#) = 337 ,  
[OphthalmicVisualFieldStaticPerimetryMeasurementsStorage](#) = 338 ,  
[OphthalmicThicknessMapStorage](#) = 339 ,  
[CornealTopographyMapStorage](#) = 340 ,  
[Comprehensive3DSRStorage](#) = 341 ,  
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[RadiopharmaceuticalRadiationDoseSRStorage](#) = 343 ,  
[ColonCADSRStorage](#) = 344 ,

ImplantationPlanSRStorage = 345 ,  
AcquisitionContextSRStorage = 346 ,  
SimplifiedAdultEchoSRStorage = 347 ,  
PatientRadiationDoseSRStorage = 348 ,  
PlannedImagingAgentAdministrationSRStorage = 349 ,  
PerformedImagingAgentAdministrationSRStorage = 350 ,  
ContentAssessmentResultsStorage = 351 ,  
EncapsulatedSTLStorage = 352 ,  
EnhancedPETImageStorage = 353 ,  
BasicStructuredDisplayStorage = 354 ,  
CTDefinedProcedureProtocolStorage = 355 ,  
CTPerformedProcedureProtocolStorage = 356 ,  
ProtocolApprovalStorage = 357 ,  
ProtocolApprovalInformationModelFIND = 358 ,  
ProtocolApprovalInformationModelMOVE = 359 ,  
ProtocolApprovalInformationModelGET = 360 ,  
RTPhysicianIntentStorage = 361 ,  
RTSegmentAnnotationStorage = 362 ,  
DICOSCTImageStorage = 363 ,  
DICOSDigitalXRayImageStorageForPresentation = 364 ,  
DICOSDigitalXRayImageStorageForProcessing = 365 ,  
DICOSThreatDetectionReportStorage = 366 ,  
DICOS2DAITStorage = 367 ,  
DICOS3DAITStorage = 368 ,  
DICOSQuadrupoleResonanceQRStorage = 369 ,  
EddyCurrentImageStorage = 370 ,  
EddyCurrentMultiframeImageStorage = 371 ,  
CompositeInstanceRootRetrieveMOVE = 372 ,  
CompositeInstanceRootRetrieveGET = 373 ,  
CompositeInstanceRetrieveWithoutBulkDataGET = 374 ,  
DefinedProcedureProtocolInformationModelFIND = 375 ,  
DefinedProcedureProtocolInformationModelMOVE = 376 ,  
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UPSFilteredGlobalSubscriptionSOPInstance = 378 ,  
UnifiedWorklistandProcedureStepServiceClass1 = 379 ,  
UnifiedProcedureStepPushSOPClass1 = 380 ,  
UnifiedProcedureStepWatchSOPClass1 = 381 ,  
UnifiedProcedureStepPullSOPClass1 = 382 ,  
UnifiedProcedureStepEventSOPClass1 = 383 ,  
RTBeamsDeliveryInstructionStorage = 384 ,  
RTConventionalMachineVerification = 385 ,  
RTIonMachineVerification = 386 ,  
RTBrachyApplicationSetupDeliveryInstructionStorage = 387 ,  
HangingProtocolInformationModelGET = 388 ,  
ColorPaletteStorage = 389 ,  
ColorPaletteQueryRetrieveInformationModelFIND = 390 ,  
ColorPaletteQueryRetrieveInformationModelMOVE = 391 ,  
ColorPaletteQueryRetrieveInformationModelGET = 392 ,  
GenericImplantTemplateStorage = 393 ,  
GenericImplantTemplateInformationModelFIND = 394 ,  
GenericImplantTemplateInformationModelMOVE = 395 ,  
GenericImplantTemplateInformationModelGET = 396 ,  
ImplantAssemblyTemplateStorage = 397 ,  
ImplantAssemblyTemplateInformationModelFIND = 398 ,

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ImplantAssemblyTemplateInformationModelGET = 400 ,
ImplantTemplateGroupStorage = 401 ,
ImplantTemplateGroupInformationModelFIND = 402 ,
ImplantTemplateGroupInformationModelMOVE = 403 ,
ImplantTemplateGroupInformationModelGET = 404 ,
NativeDICOMModel = 405 ,
AbstractMultiDimensionalImageModel = 406 ,
DICOMContentMappingResource = 407 ,
EnhancedMRColorImageStorage = 408 ,
UniversalCoordinatedTime = 409 }

```

- [enum TSType](#) {
  - [uid\\_1\\_2\\_840\\_10008\\_1\\_1](#) = 1 ,
  - [uid\\_1\\_2\\_840\\_10008\\_1\\_2](#) = 2 ,
  - [uid\\_1\\_2\\_840\\_10008\\_1\\_2\\_1](#) = 3 ,
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uid_1_2_840_10008_5_1_4_1_1_9_5_1 = 300 ,
uid_1_2_840_10008_5_1_4_1_1_9_6_1 = 301 ,
uid_1_2_840_10008_5_1_4_1_1_11_5 = 302 ,
uid_1_2_840_10008_5_1_4_1_1_11_6 = 303 ,
uid_1_2_840_10008_1_2_4_104 = 304 ,
uid_1_2_840_10008_1_2_4_105 = 305 ,
uid_1_2_840_10008_1_2_4_106 = 306 ,
uid_1_2_840_10008_1_2_4_107 = 307 ,
uid_1_2_840_10008_1_2_4_108 = 308 ,
uid_1_2_840_10008_1_5_1 = 309 ,
uid_1_2_840_10008_5_1_4_1_1_11_7 = 310 ,
uid_1_2_840_10008_5_1_4_1_1_11_8 = 311 ,
uid_1_2_840_10008_5_1_4_1_1_11_9 = 312 ,
```

```
uid_1_2_840_10008_5_1_4_1_1_11_10 = 313 ,  
uid_1_2_840_10008_5_1_4_1_1_11_11 = 314 ,  
uid_1_2_840_10008_5_1_4_1_1_12_77 = 315 ,  
uid_1_2_840_10008_5_1_4_1_1_13_1_4 = 316 ,  
uid_1_2_840_10008_5_1_4_1_1_13_1_5 = 317 ,  
uid_1_2_840_10008_5_1_4_1_1_14_1 = 318 ,  
uid_1_2_840_10008_5_1_4_1_1_14_2 = 319 ,  
uid_1_2_840_10008_5_1_4_1_1_30 = 320 ,  
uid_1_2_840_10008_5_1_4_1_1_40 = 321 ,  
uid_1_2_840_10008_5_1_4_1_1_66_6 = 322 ,  
uid_1_2_840_10008_5_1_4_1_1_68_1 = 323 ,  
uid_1_2_840_10008_5_1_4_1_1_68_2 = 324 ,  
uid_1_2_840_10008_5_1_4_1_1_77_1_5_5 = 325 ,  
uid_1_2_840_10008_5_1_4_1_1_77_1_5_6 = 326 ,  
uid_1_2_840_10008_5_1_4_1_1_77_1_5_7 = 327 ,  
uid_1_2_840_10008_5_1_4_1_1_77_1_5_8 = 328 ,  
uid_1_2_840_10008_5_1_4_1_1_78_1 = 329 ,  
uid_1_2_840_10008_5_1_4_1_1_78_2 = 330 ,  
uid_1_2_840_10008_5_1_4_1_1_78_3 = 331 ,  
uid_1_2_840_10008_5_1_4_1_1_78_4 = 332 ,  
uid_1_2_840_10008_5_1_4_1_1_78_5 = 333 ,  
uid_1_2_840_10008_5_1_4_1_1_78_6 = 334 ,  
uid_1_2_840_10008_5_1_4_1_1_78_7 = 335 ,  
uid_1_2_840_10008_5_1_4_1_1_78_8 = 336 ,  
uid_1_2_840_10008_5_1_4_1_1_79_1 = 337 ,  
uid_1_2_840_10008_5_1_4_1_1_80_1 = 338 ,  
uid_1_2_840_10008_5_1_4_1_1_81_1 = 339 ,  
uid_1_2_840_10008_5_1_4_1_1_82_1 = 340 ,  
uid_1_2_840_10008_5_1_4_1_1_88_34 = 341 ,  
uid_1_2_840_10008_5_1_4_1_1_88_35 = 342 ,  
uid_1_2_840_10008_5_1_4_1_1_88_68 = 343 ,  
uid_1_2_840_10008_5_1_4_1_1_88_69 = 344 ,  
uid_1_2_840_10008_5_1_4_1_1_88_70 = 345 ,  
uid_1_2_840_10008_5_1_4_1_1_88_71 = 346 ,  
uid_1_2_840_10008_5_1_4_1_1_88_72 = 347 ,  
uid_1_2_840_10008_5_1_4_1_1_88_73 = 348 ,  
uid_1_2_840_10008_5_1_4_1_1_88_74 = 349 ,  
uid_1_2_840_10008_5_1_4_1_1_88_75 = 350 ,  
uid_1_2_840_10008_5_1_4_1_1_90_1 = 351 ,  
uid_1_2_840_10008_5_1_4_1_1_104_3 = 352 ,  
uid_1_2_840_10008_5_1_4_1_1_130 = 353 ,  
uid_1_2_840_10008_5_1_4_1_1_131 = 354 ,  
uid_1_2_840_10008_5_1_4_1_1_200_1 = 355 ,  
uid_1_2_840_10008_5_1_4_1_1_200_2 = 356 ,  
uid_1_2_840_10008_5_1_4_1_1_200_3 = 357 ,  
uid_1_2_840_10008_5_1_4_1_1_200_4 = 358 ,  
uid_1_2_840_10008_5_1_4_1_1_200_5 = 359 ,  
uid_1_2_840_10008_5_1_4_1_1_200_6 = 360 ,  
uid_1_2_840_10008_5_1_4_1_1_481_10 = 361 ,  
uid_1_2_840_10008_5_1_4_1_1_481_11 = 362 ,  
uid_1_2_840_10008_5_1_4_1_1_501_1 = 363 ,  
uid_1_2_840_10008_5_1_4_1_1_501_2_1 = 364 ,  
uid_1_2_840_10008_5_1_4_1_1_501_2_2 = 365 ,  
uid_1_2_840_10008_5_1_4_1_1_501_3 = 366 ,
```

```

uid_1_2_840_10008_5_1_4_1_1_501_4 = 367 ,
uid_1_2_840_10008_5_1_4_1_1_501_5 = 368 ,
uid_1_2_840_10008_5_1_4_1_1_501_6 = 369 ,
uid_1_2_840_10008_5_1_4_1_1_601_1 = 370 ,
uid_1_2_840_10008_5_1_4_1_1_601_2 = 371 ,
uid_1_2_840_10008_5_1_4_1_2_4_2 = 372 ,
uid_1_2_840_10008_5_1_4_1_2_4_3 = 373 ,
uid_1_2_840_10008_5_1_4_1_2_5_3 = 374 ,
uid_1_2_840_10008_5_1_4_20_1 = 375 ,
uid_1_2_840_10008_5_1_4_20_2 = 376 ,
uid_1_2_840_10008_5_1_4_20_3 = 377 ,
uid_1_2_840_10008_5_1_4_34_5_1 = 378 ,
uid_1_2_840_10008_5_1_4_34_6 = 379 ,
uid_1_2_840_10008_5_1_4_34_6_1 = 380 ,
uid_1_2_840_10008_5_1_4_34_6_2 = 381 ,
uid_1_2_840_10008_5_1_4_34_6_3 = 382 ,
uid_1_2_840_10008_5_1_4_34_6_4 = 383 ,
uid_1_2_840_10008_5_1_4_34_7 = 384 ,
uid_1_2_840_10008_5_1_4_34_8 = 385 ,
uid_1_2_840_10008_5_1_4_34_9 = 386 ,
uid_1_2_840_10008_5_1_4_34_10 = 387 ,
uid_1_2_840_10008_5_1_4_38_4 = 388 ,
uid_1_2_840_10008_5_1_4_39_1 = 389 ,
uid_1_2_840_10008_5_1_4_39_2 = 390 ,
uid_1_2_840_10008_5_1_4_39_3 = 391 ,
uid_1_2_840_10008_5_1_4_39_4 = 392 ,
uid_1_2_840_10008_5_1_4_43_1 = 393 ,
uid_1_2_840_10008_5_1_4_43_2 = 394 ,
uid_1_2_840_10008_5_1_4_43_3 = 395 ,
uid_1_2_840_10008_5_1_4_43_4 = 396 ,
uid_1_2_840_10008_5_1_4_44_1 = 397 ,
uid_1_2_840_10008_5_1_4_44_2 = 398 ,
uid_1_2_840_10008_5_1_4_44_3 = 399 ,
uid_1_2_840_10008_5_1_4_44_4 = 400 ,
uid_1_2_840_10008_5_1_4_45_1 = 401 ,
uid_1_2_840_10008_5_1_4_45_2 = 402 ,
uid_1_2_840_10008_5_1_4_45_3 = 403 ,
uid_1_2_840_10008_5_1_4_45_4 = 404 ,
uid_1_2_840_10008_7_1_1 = 405 ,
uid_1_2_840_10008_7_1_2 = 406 ,
uid_1_2_840_10008_8_1_1 = 407 ,
uid_1_2_840_10008_5_1_4_1_1_4_3 = 408 ,
uid_1_2_840_10008_15_1_1 = 409 }

```

## Public Member Functions

- const char \* [GetName](#) () const
- const char \* [GetString](#) () const
- [operator TSType](#) () const
- bool [SetFromUID](#) (const char \*str)

### Static Public Member Functions

- static unsigned int [GetNumberOfTransferSyntaxStrings](#) ()
- static const char \*const \* [GetTransferSyntaxString](#) (unsigned int ts)
- static [TransferSyntaxStringsType](#) [GetTransferSyntaxStrings](#) ()
- static const char \* [GetUIDName](#) (unsigned int ts)
- static const char \* [GetUIDString](#) (unsigned int ts)

## 12.324.1 Detailed Description

all known uids

### Examples

[GenerateStandardSOPClasses.cxx](#).

## 12.324.2 Member Typedef Documentation

### 12.324.2.1 TransferSyntaxStringsType

```
typedef const char* const(* gdcmm::UIDs::TransferSyntaxStringsType)[2]
```

## 12.324.3 Member Enumeration Documentation

### 12.324.3.1 TSName

```
enum gdcmm::UIDs::TSName
```

### 12.324.3.2 TSType

```
enum gdcmm::UIDs::TSType
```

## 12.324.4 Member Function Documentation

### 12.324.4.1 GetName()

```
const char * gdcmm::UIDs::GetName () const
```

When object is Initialize function return the well known name associated with uid return NULL when not initialized

### Examples

[GenerateStandardSOPClasses.cxx](#).

Referenced by [gdcmm::operator<<\(\)](#).

#### 12.324.4.2 GetNumberOfTransferSyntaxStrings()

```
unsigned int gdcm::UIDs::GetNumberOfTransferSyntaxStrings () [static]
```

#### 12.324.4.3 GetString()

```
const char * gdcm::UIDs::GetString () const
```

When object is Initialize function return the uid return NULL when not initialized

#### Examples

[GenerateStandardSOPClasses.cxx](#).

Referenced by [gdcm::operator<<\(\)](#).

#### 12.324.4.4 GetTransferSyntaxString()

```
const char *const * gdcm::UIDs::GetTransferSyntaxString (
    unsigned int ts) [static]
```

#### 12.324.4.5 GetTransferSyntaxStrings()

```
TransferSyntaxStringsType gdcm::UIDs::GetTransferSyntaxStrings () [static]
```

#### 12.324.4.6 GetUIDName()

```
const char * gdcm::UIDs::GetUIDName (
    unsigned int ts) [static]
```

#### 12.324.4.7 GetUIDString()

```
const char * gdcm::UIDs::GetUIDString (
    unsigned int ts) [static]
```

#### 12.324.4.8 operator TType()

```
gdcm::UIDs::operator TType () const [inline]
```

#### 12.324.4.9 SetFromUID()

```
bool gdcml::UIDs::SetFromUID (
    const char * str)
```

Initialize object from a string (a uid number) return false on error, and internal state is set to 0

##### Examples

[GenerateStandardSOPClasses.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmlUIDs.h](#)

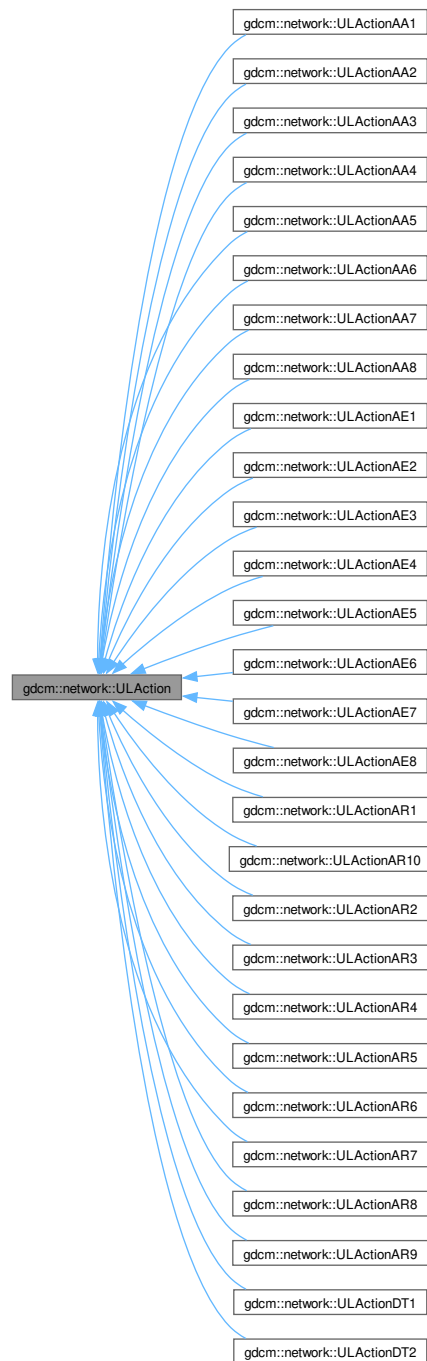
### 12.325 gdcml::network::ULAction Class Reference

[ULAction](#).

```
#include <gdcmlULAction.h>
```



Inheritance diagram for gdcn::network::ULAction:



## Public Member Functions

- [ULAction](#) ()=default

- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete
- virtual [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaiting←  
ForEvent, [EEventID](#) &outRaisedEvent)=0

### 12.325.1 Detailed Description

#### [ULAction](#).

A [ULConnection](#) in a given [ULState](#) can perform certain [ULActions](#). This base class provides the interface for running those [ULActions](#) on a given [ULConnection](#).

Essentially, the [ULConnectionManager](#) will take this object, determined from the current [ULState](#) of the [ULConnection](#), and pass the [ULConnection](#) object to the [ULAction](#). The [ULAction](#) will then invoke whatever necessary commands are required by a given action.

The result of a [ULAction](#) is a [ULEvent](#) (ie, what happened as a result of the action).

This [ULEvent](#) is passed to the [ULState](#), so that the transition to the next state can occur.

Actions are associated with Payloads – be those filestreams, AETitles to establish connections, whatever. The actual parameters that the user will pass via an action will come through a Payload object, which should, in itself, be some [gdcmm](#)-based object (but not all objects can be payloads; sending a single dataelement as a payload isn't meaningful). As such, each action has its own particular payload.

For the sake of keeping files together, both the particular payload class and the action class will be defined in the same header file. Payloads should JUST be data (or streams), NO METHODS.

Some actions perform changes that should raise events on the local system, and some actions perform changes that will require waiting for events from the remote system.

Therefore, this base action has been modified so that those events are set by each action. When the event loop runs an action, it will then test to see if a local event was raised by the action, and if so, perform the appropriate subsequent action. If the action requires waiting for a response from the remote system, then the event loop will sit there (presumably with the [ARTIM](#) timer running) and wait for a response from the remote system. Once a response is obtained, then the the rest of the state transitions can happen.

### 12.325.2 Constructor & Destructor Documentation

#### 12.325.2.1 [ULAction](#)() [1/2]

```
gdcmm::network::ULAction::ULAction () [default]
```

Referenced by [ULAction\(\)](#), and [operator=\(\)](#).

#### 12.325.2.2 [~ULAction](#)()

```
virtual gdcmm::network::ULAction::~~ULAction () [virtual], [default]
```

### 12.325.2.3 ULAction() [2/2]

```
gdcm::network::ULAction::ULAction (
    const ULAction & inAction) [delete]
```

References [ULAction\(\)](#).

## 12.325.3 Member Function Documentation

### 12.325.3.1 operator=()

```
void gdcm::network::ULAction::operator= (
    const ULAction & ) [delete]
```

References [ULAction\(\)](#).

### 12.325.3.2 PerformAction()

```
virtual EStateID gdcm::network::ULAction::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [pure virtual]
```

Implemented in [gdcm::network::ULActionAA1](#), [gdcm::network::ULActionAA2](#), [gdcm::network::ULActionAA3](#), [gdcm::network::ULActionAA4](#), [gdcm::network::ULActionAA5](#), [gdcm::network::ULActionAA6](#), [gdcm::network::ULActionAA7](#), [gdcm::network::ULActionAA8](#), [gdcm::network::ULActionAE1](#), [gdcm::network::ULActionAE2](#), [gdcm::network::ULActionAE3](#), [gdcm::network::ULActionAE4](#), [gdcm::network::ULActionAE5](#), [gdcm::network::ULActionAE6](#), [gdcm::network::ULActionAE7](#), [gdcm::network::ULActionAE8](#), [gdcm::network::ULActionAR10](#), [gdcm::network::ULActionAR1](#), [gdcm::network::ULActionAR2](#), [gdcm::network::ULActionAR3](#), [gdcm::network::ULActionAR4](#), [gdcm::network::ULActionAR5](#), [gdcm::network::ULActionAR6](#), [gdcm::network::ULActionAR7](#), [gdcm::network::ULActionAR8](#), [gdcm::network::ULActionAR9](#), [gdcm::network::ULActionDT1](#), and [gdcm::network::ULActionDT2](#).

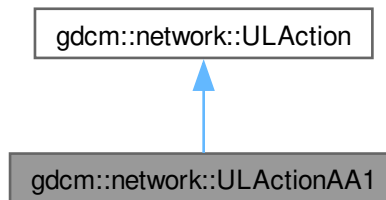
The documentation for this class was generated from the following file:

- [gdcmULAction.h](#)

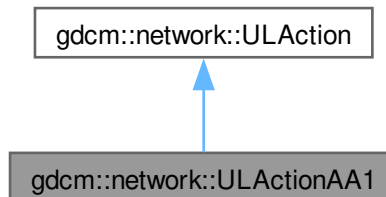
## 12.326 gdcmm::network::ULActionAA1 Class Reference

```
#include <gdcmmULActionAA.h>
```

Inheritance diagram for gdcmm::network::ULActionAA1:



Collaboration diagram for gdcmm::network::ULActionAA1:



### Public Member Functions

- `EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent)` override

### Public Member Functions inherited from gdcmm::network::ULAction

- `ULAction ()`=default
- `ULAction (const ULAction &inAction)`=delete
- virtual `~ULAction ()`=default
- void `operator= (const ULAction &)`=delete

## 12.326.1 Member Function Documentation

### 12.326.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA1::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

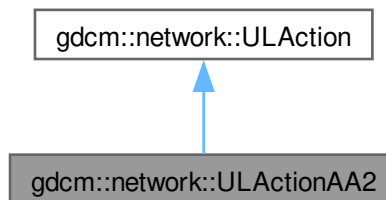
The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

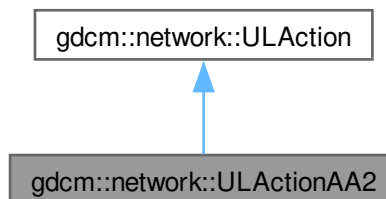
## 12.327 gdcm::network::ULActionAA2 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA2:



Collaboration diagram for gdcm::network::ULActionAA2:



## Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.327.1 Member Function Documentation

### 12.327.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA2::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

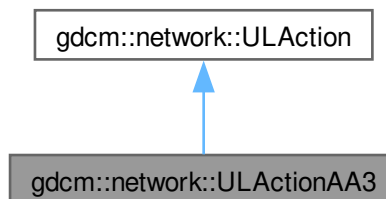
The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

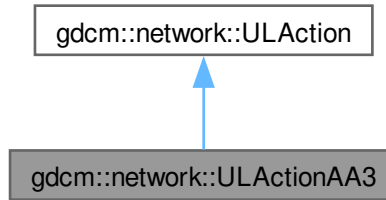
## 12.328 gdcm::network::ULActionAA3 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for [gdcm::network::ULActionAA3](#):



Collaboration diagram for gdcm::network::ULActionAA3:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingFor↵  
Event, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.328.1 Member Function Documentation

### 12.328.1.1 PerformAction()

```

EStateID gdcm::network::ULActionAA3::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
  
```

Implements [gdcm::network::ULAction](#).

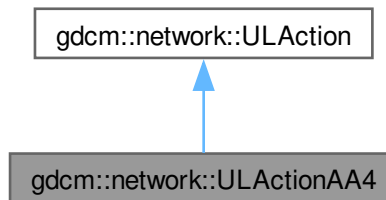
The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

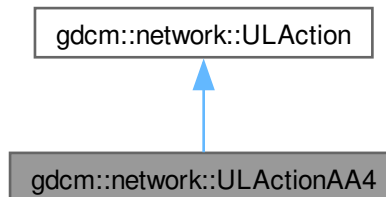
## 12.329 gdcm::network::ULActionAA4 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA4:



Collaboration diagram for gdcm::network::ULActionAA4:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete



## 12.329.1 Member Function Documentation

### 12.329.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA4::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

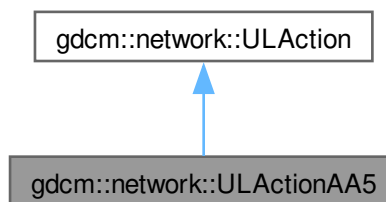
The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

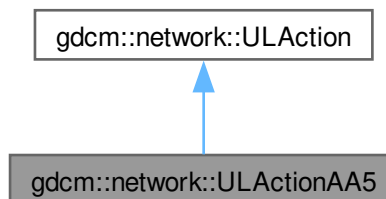
## 12.330 gdcm::network::ULActionAA5 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA5:



Collaboration diagram for gdcm::network::ULActionAA5:



## Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.330.1 Member Function Documentation

### 12.330.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA5::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

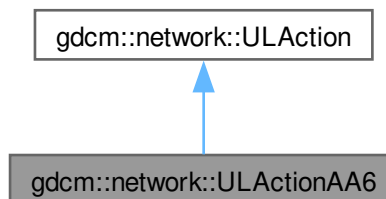
The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

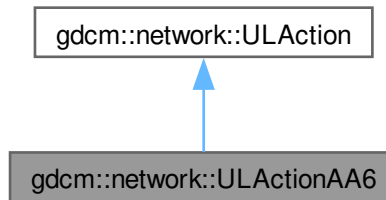
## 12.331 gdcm::network::ULActionAA6 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for [gdcm::network::ULActionAA6](#):



Collaboration diagram for gdcm::network::ULActionAA6:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingFor↵  
Event, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.331.1 Member Function Documentation

### 12.331.1.1 PerformAction()

```

EStateID gdcm::network::ULActionAA6::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
  
```

Implements [gdcm::network::ULAction](#).

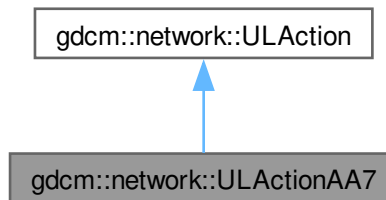
The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

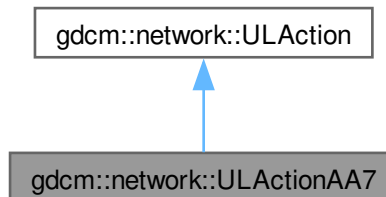
## 12.332 gdcm::network::ULActionAA7 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA7:



Collaboration diagram for gdcm::network::ULActionAA7:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.332.1 Member Function Documentation

### 12.332.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA7::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

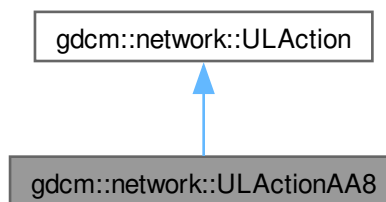
The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

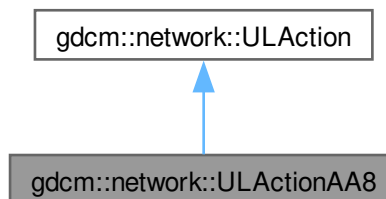
## 12.333 gdcm::network::ULActionAA8 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA8:



Collaboration diagram for gdcm::network::ULActionAA8:



## Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.333.1 Member Function Documentation

### 12.333.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA8::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

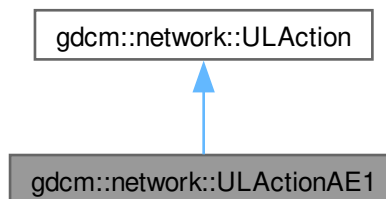
The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

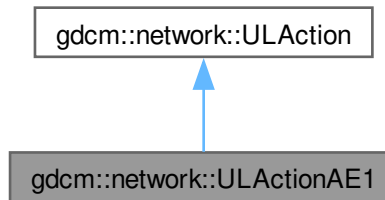
## 12.334 gdcm::network::ULActionAE1 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for [gdcm::network::ULActionAE1](#):



Collaboration diagram for gdcm::network::ULActionAE1:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.334.1 Member Function Documentation

### 12.334.1.1 PerformAction()

```

EStateID gdcm::network::ULActionAE1::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
  
```

Implements [gdcm::network::ULAction](#).

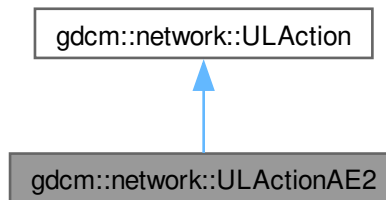
The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

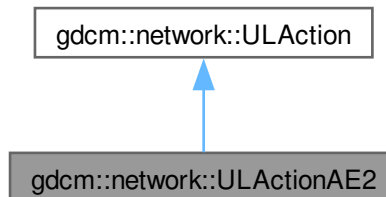
## 12.335 gdcmm::network::ULActionAE2 Class Reference

```
#include <gdcmmULActionAE.h>
```

Inheritance diagram for gdcmm::network::ULActionAE2:



Collaboration diagram for gdcmm::network::ULActionAE2:



### Public Member Functions

- `EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent)` override

### Public Member Functions inherited from gdcmm::network::ULAction

- `ULAction ()`=default
- `ULAction (const ULAction &inAction)`=delete
- virtual `~ULAction ()`=default
- void `operator= (const ULAction &)`=delete



## 12.335.1 Member Function Documentation

### 12.335.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE2::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

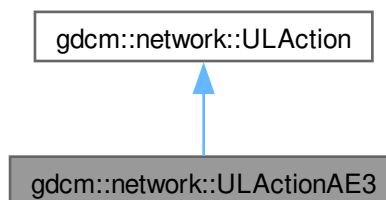
The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

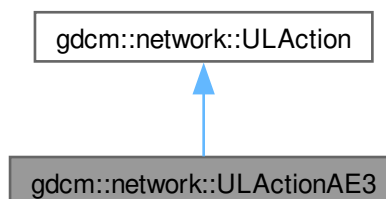
## 12.336 gdcm::network::ULActionAE3 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE3:



Collaboration diagram for gdcm::network::ULActionAE3:



## Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.336.1 Member Function Documentation

### 12.336.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE3::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

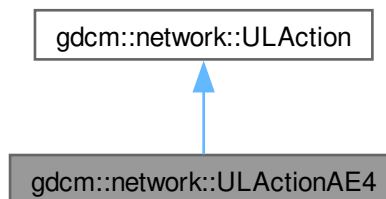
The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

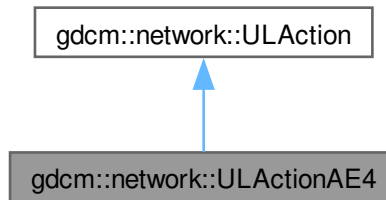
## 12.337 gdcm::network::ULActionAE4 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for [gdcm::network::ULActionAE4](#):



Collaboration diagram for gdcm::network::ULActionAE4:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.337.1 Member Function Documentation

### 12.337.1.1 PerformAction()

```

EStateID gdcm::network::ULActionAE4::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
  
```

Implements [gdcm::network::ULAction](#).

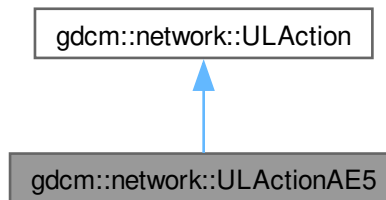
The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

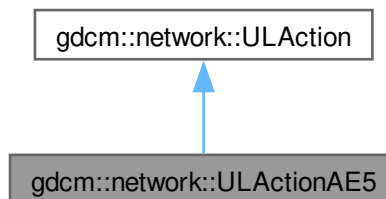
## 12.338 gdcmm::network::ULActionAE5 Class Reference

```
#include <gdcmmULActionAE.h>
```

Inheritance diagram for gdcmm::network::ULActionAE5:



Collaboration diagram for gdcmm::network::ULActionAE5:



### Public Member Functions

- `EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent)` override

### Public Member Functions inherited from gdcmm::network::ULAction

- `ULAction ()`=default
- `ULAction (const ULAction &inAction)`=delete
- virtual `~ULAction ()`=default
- void `operator= (const ULAction &)=delete`

## 12.338.1 Member Function Documentation

### 12.338.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE5::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

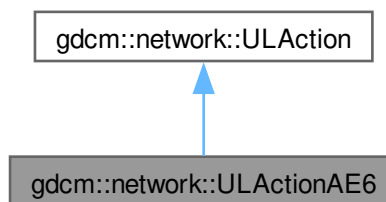
The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

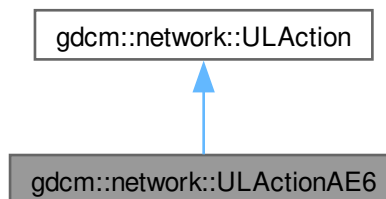
## 12.339 gdcm::network::ULActionAE6 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE6:



Collaboration diagram for gdcm::network::ULActionAE6:



## Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.339.1 Member Function Documentation

### 12.339.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE6::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

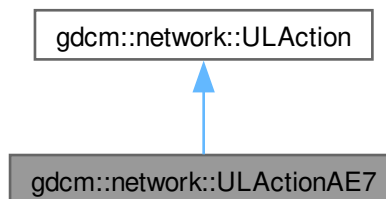
The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

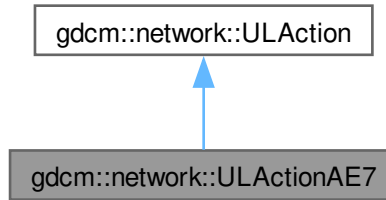
## 12.340 gdcm::network::ULActionAE7 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for [gdcm::network::ULActionAE7](#):



Collaboration diagram for gdcm::network::ULActionAE7:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.340.1 Member Function Documentation

### 12.340.1.1 PerformAction()

```

EStateID gdcm::network::ULActionAE7::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
  
```

Implements [gdcm::network::ULAction](#).

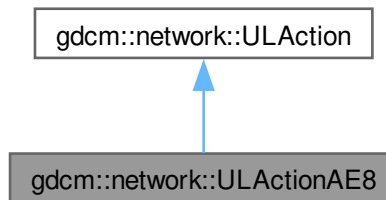
The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

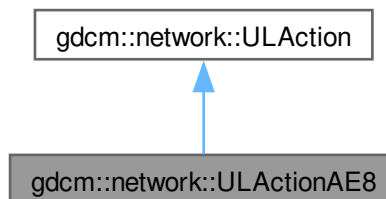
## 12.341 gdcmm::network::ULActionAE8 Class Reference

```
#include <gdcmmULActionAE.h>
```

Inheritance diagram for gdcmm::network::ULActionAE8:



Collaboration diagram for gdcmm::network::ULActionAE8:



### Public Member Functions

- `EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent)` override

### Public Member Functions inherited from gdcmm::network::ULAction

- `ULAction ()`=default
- `ULAction (const ULAction &inAction)`=delete
- virtual `~ULAction ()`=default
- void `operator= (const ULAction &)=delete`



## 12.341.1 Member Function Documentation

### 12.341.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE8::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

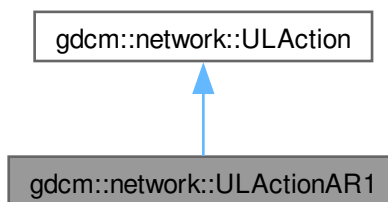
The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

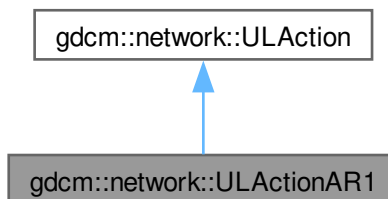
## 12.342 gdcm::network::ULActionAR1 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR1:



Collaboration diagram for gdcm::network::ULActionAR1:



## Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.342.1 Member Function Documentation

### 12.342.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR1::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

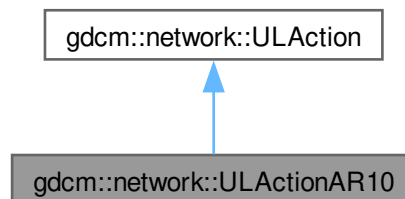
The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

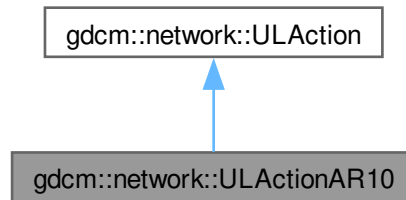
## 12.343 gdcm::network::ULActionAR10 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for [gdcm::network::ULActionAR10](#):



Collaboration diagram for gdcm::network::ULActionAR10:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.343.1 Member Function Documentation

### 12.343.1.1 PerformAction()

```

EStateID gdcm::network::ULActionAR10::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
  
```

Implements [gdcm::network::ULAction](#).

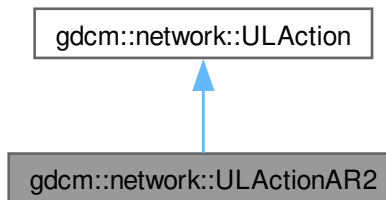
The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

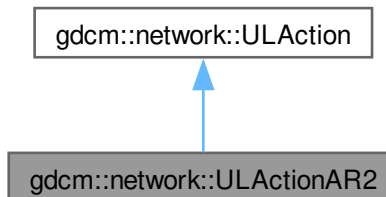
## 12.344 gdcmm::network::ULActionAR2 Class Reference

```
#include <gdcmmULActionAR.h>
```

Inheritance diagram for gdcmm::network::ULActionAR2:



Collaboration diagram for gdcmm::network::ULActionAR2:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcmm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.344.1 Member Function Documentation

### 12.344.1.1 PerformAction()

```
EStateID gdcmm::network::ULActionAR2::PerformAction (  
    Subject * s,  
    ULEvent & inEvent,  
    ULConnection & inConnection,  
    bool & outWaitingForEvent,  
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcmm::network::ULAction](#).

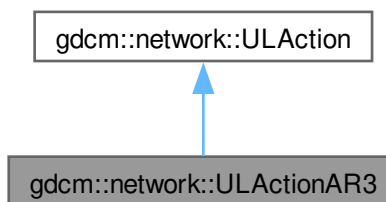
The documentation for this class was generated from the following file:

- [gdcmmULActionAR.h](#)

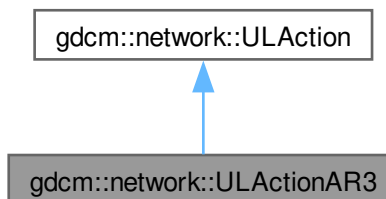
## 12.345 gdcmm::network::ULActionAR3 Class Reference

```
#include <gdcmmULActionAR.h>
```

Inheritance diagram for gdcmm::network::ULActionAR3:



Collaboration diagram for gdcmm::network::ULActionAR3:



## Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.345.1 Member Function Documentation

### 12.345.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR3::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

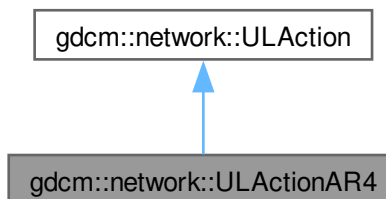
The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

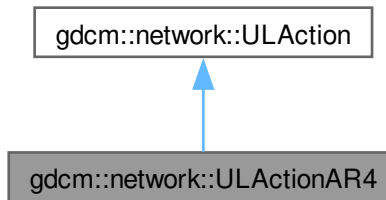
## 12.346 gdcm::network::ULActionAR4 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for [gdcm::network::ULActionAR4](#):



Collaboration diagram for gdcm::network::ULActionAR4:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.346.1 Member Function Documentation

### 12.346.1.1 PerformAction()

```

EStateID gdcm::network::ULActionAR4::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
  
```

Implements [gdcm::network::ULAction](#).

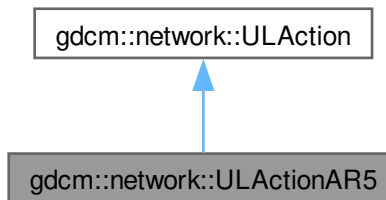
The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

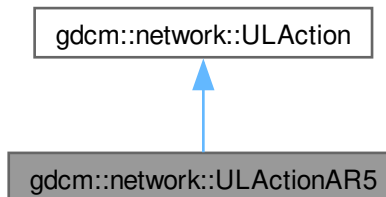
## 12.347 gdcmm::network::ULActionAR5 Class Reference

```
#include <gdcmmULActionAR.h>
```

Inheritance diagram for gdcmm::network::ULActionAR5:



Collaboration diagram for gdcmm::network::ULActionAR5:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcmm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete



## 12.347.1 Member Function Documentation

### 12.347.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR5::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

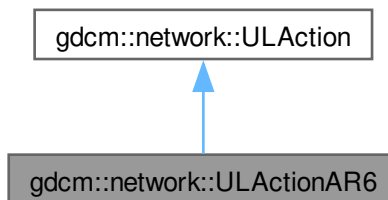
The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

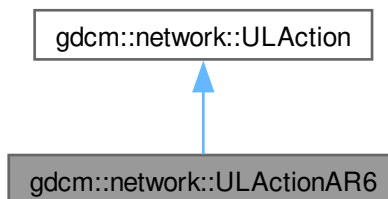
## 12.348 gdcm::network::ULActionAR6 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR6:



Collaboration diagram for gdcm::network::ULActionAR6:



## Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.348.1 Member Function Documentation

### 12.348.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR6::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

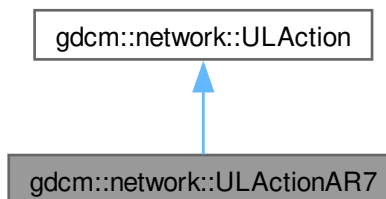
The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

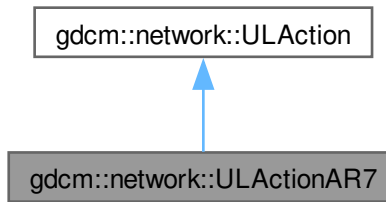
## 12.349 gdcm::network::ULActionAR7 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for [gdcm::network::ULActionAR7](#):



Collaboration diagram for gdcm::network::ULActionAR7:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.349.1 Member Function Documentation

### 12.349.1.1 PerformAction()

```

EStateID gdcm::network::ULActionAR7::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
  
```

Implements [gdcm::network::ULAction](#).

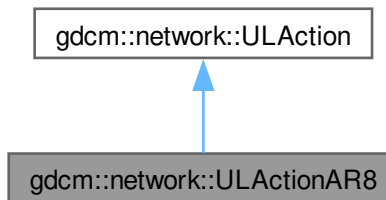
The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

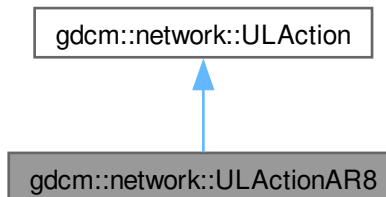
## 12.350 gdcmm::network::ULActionAR8 Class Reference

```
#include <gdcmmULActionAR.h>
```

Inheritance diagram for gdcmm::network::ULActionAR8:



Collaboration diagram for gdcmm::network::ULActionAR8:



### Public Member Functions

- `EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent) override`

### Public Member Functions inherited from gdcmm::network::ULAction

- `ULAction ()=default`
- `ULAction (const ULAction &inAction)=delete`
- `virtual ~ULAction ()=default`
- `void operator= (const ULAction &)=delete`

## 12.350.1 Member Function Documentation

### 12.350.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR8::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

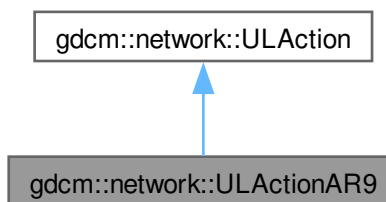
The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

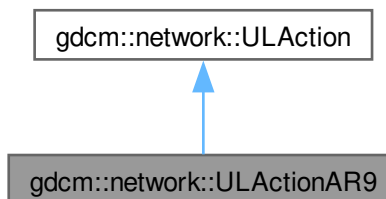
## 12.351 gdcm::network::ULActionAR9 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR9:



Collaboration diagram for gdcm::network::ULActionAR9:



## Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.351.1 Member Function Documentation

### 12.351.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR9::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

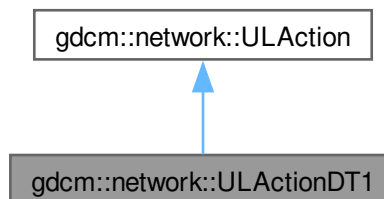
The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

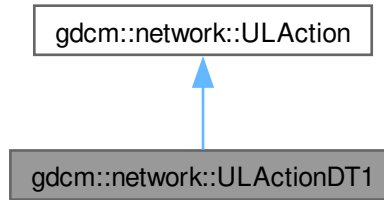
## 12.352 gdcm::network::ULActionDT1 Class Reference

```
#include <gdcmULActionDT.h>
```

Inheritance diagram for [gdcm::network::ULActionDT1](#):



Collaboration diagram for gdcm::network::ULActionDT1:



### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingFor↵  
Event, [EEventID](#) &outRaisedEvent) override

### Public Member Functions inherited from [gdcm::network::ULAction](#)

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete

## 12.352.1 Member Function Documentation

### 12.352.1.1 PerformAction()

```

EStateID gdcm::network::ULActionDT1::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
  
```

Implements [gdcm::network::ULAction](#).

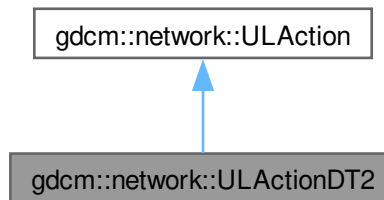
The documentation for this class was generated from the following file:

- [gdcmULActionDT.h](#)

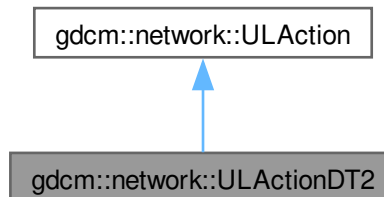
## 12.353 gdcm::network::ULActionDT2 Class Reference

```
#include <gdcmULActionDT.h>
```

Inheritance diagram for gdcm::network::ULActionDT2:



Collaboration diagram for gdcm::network::ULActionDT2:



### Public Member Functions

- `EStateID PerformAction (Subject *s, ULEvent &inEvent, ULConnection &inConnection, bool &outWaitingForEvent, EEventID &outRaisedEvent)` override

### Public Member Functions inherited from `gdcm::network::ULAction`

- `ULAction ()`=default
- `ULAction (const ULAction &inAction)`=delete
- virtual `~ULAction ()`=default
- void `operator= (const ULAction &)=delete`



## 12.353.1 Member Function Documentation

### 12.353.1.1 PerformAction()

```
EStateID gdcm::network::ULActionDT2::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

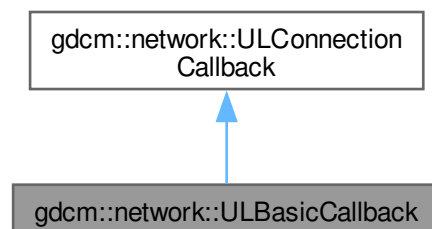
- [gdcmULActionDT.h](#)

## 12.354 gdcm::network::ULBasicCallback Class Reference

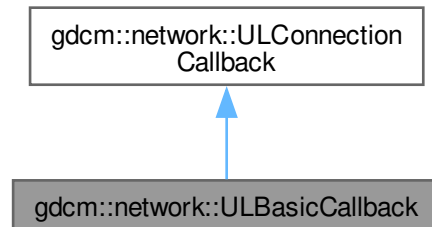
[ULBasicCallback](#).

```
#include <gdcmULBasicCallback.h>
```

Inheritance diagram for `gdcm::network::ULBasicCallback`:



Collaboration diagram for `gdcm::network::ULBasicCallback`:



### Public Member Functions

- `ULBasicCallback()` = default
- `~ULBasicCallback()` override = default
- `std::vector< DataSet > const & GetDataSets()` const
- `std::vector< DataSet > const & GetResponses()` const
- `void HandleDataSet(const DataSet &inDataSet)` override
- `void HandleResponse(const DataSet &inDataSet)` override

### Public Member Functions inherited from `gdcm::network::ULConnectionCallback`

- `ULConnectionCallback()`
- `virtual ~ULConnectionCallback()` = default
- `bool DataSetHandles()` const
- `void ResetHandledDataSet()`
- `void SetImplicitFlag(const bool imp)`

### Additional Inherited Members

### Protected Member Functions inherited from `gdcm::network::ULConnectionCallback`

- `void DataSetHandled()`

### Protected Attributes inherited from `gdcm::network::ULConnectionCallback`

- `bool mImplicit`

## 12.354.1 Detailed Description

[ULBasicCallback](#).

This is the most basic of callbacks for how the [ULConnectionManager](#) handles incoming datasets. DataSets are just concatenated to the mDataSets vector, and the result can be pulled out of the vector by later code. Alternatives to this method include progress updates, saving to disk, etc. This class is NOT THREAD SAFE. Access the dataset vector after the entire set of datasets has been returned by the [ULConnectionManager](#).

## 12.354.2 Constructor & Destructor Documentation

### 12.354.2.1 ULBasicCallback()

```
gdcm::network::ULBasicCallback::ULBasicCallback () [default]
```

### 12.354.2.2 ~ULBasicCallback()

```
gdcm::network::ULBasicCallback::~~ULBasicCallback () [override], [default]
```

## 12.354.3 Member Function Documentation

### 12.354.3.1 GetDataSets()

```
std::vector< DataSet > const & gdcm::network::ULBasicCallback::GetDataSets () const
```

### 12.354.3.2 GetResponses()

```
std::vector< DataSet > const & gdcm::network::ULBasicCallback::GetResponses () const
```

### 12.354.3.3 HandleDataSet()

```
void gdcm::network::ULBasicCallback::HandleDataSet (  
    const DataSet & inDataSet) [override], [virtual]
```

Implements [gdcm::network::ULConnectionCallback](#).

### 12.354.3.4 HandleResponse()

```
void gdcm::network::ULBasicCallback::HandleResponse (  
    const DataSet & inDataSet) [override], [virtual]
```

Implements [gdcm::network::ULConnectionCallback](#).

The documentation for this class was generated from the following file:

- [gdcmULBasicCallback.h](#)

## 12.355 gdcm::network::ULConnection Class Reference

[ULConnection](#).

```
#include <gdcmULConnection.h>
```

### Public Member Functions

- [ULConnection](#) (const [ULConnection](#) &)=delete
- [ULConnection](#) (const [ULConnectionInfo](#) &inUserInformation)
- virtual [~ULConnection](#) ()
- void [AddAcceptedPresentationContext](#) (const [PresentationContextAC](#) &inPC)
- [PresentationContextRQ FindContext](#) (const [DataElement](#) &de) const
- std::vector< [PresentationContextAC](#) > & [GetAcceptedPresentationContexts](#) ()
- std::vector< [PresentationContextAC](#) > const & [GetAcceptedPresentationContexts](#) () const
- const [ULConnectionInfo](#) & [GetConnectionInfo](#) () const
- uint32\_t [GetMaxPDUSize](#) () const
- const [PresentationContextAC](#) \* [GetPresentationContextACByID](#) (uint8\_t id) const
- uint8\_t [GetPresentationContextIDFromPresentationContext](#) ([PresentationContextRQ](#) const &pc) const  
*return 0 upon error*
- const [PresentationContextRQ](#) \* [GetPresentationContextRQByID](#) (uint8\_t id) const
- std::vector< [PresentationContextRQ](#) > const & [GetPresentationContexts](#) () const
- std::iostream \* [GetProtocol](#) ()
- [EStateID](#) [GetState](#) () const
- [ARTIMTimer](#) & [GetTimer](#) ()
- bool [InitializeConnection](#) ()  
*used to establish scu connections*
- bool [InitializeIncomingConnection](#) ()  
*used to establish scp connections*
- void [operator=](#) (const [ULConnection](#) &)=delete
- void [SetMaxPDUSize](#) (uint32\_t inSize)
- void [SetPresentationContexts](#) (const std::vector< [PresentationContext](#) > &inContexts)
- void [SetPresentationContexts](#) (const std::vector< [PresentationContextRQ](#) > &inContexts)
- void [SetState](#) (const [EStateID](#) &inState)
- void [StopProtocol](#) ()

### Friends

- class [ULActionAE6](#)
- class [ULConnectionManager](#)

## 12.355.1 Detailed Description

[ULConnection](#).

This is the class that contains the socket to another machine, and passes data through itself, as well as maintaining a sense of state.

The [ULConnectionManager](#) tells the [ULConnection](#) what data can actually be sent.

This class is done this way so that it can be eventually be replaced with a [ULSecureConnection](#), if such a protocol is warranted, so that all data that passes through can be managed through a secure connection. For now, this class provides a simple pass-through mechanism to the socket itself.

So, for instance, a [gdcm](#) object will be passes to this object, and it will then get passed along the connection, if that connection is in the proper state to do so.

For right now, this class is not directly intended to be inherited from, but the potential for future [ULSecureConnection](#) warrants the addition, rather than having everything be managed from within the [ULConnectionManager](#) (or this class) without a wrapper.

## 12.355.2 Constructor & Destructor Documentation

### 12.355.2.1 [ULConnection\(\)](#) [1/2]

```
gdcm::network::ULConnection::ULConnection (
    const ULConnectionInfo & inUserInformation)
```

Referenced by [ULConnection\(\)](#), and [operator=\(\)](#).

### 12.355.2.2 [~ULConnection\(\)](#)

```
virtual gdcm::network::ULConnection::~~ULConnection () [virtual]
```

### 12.355.2.3 [ULConnection\(\)](#) [2/2]

```
gdcm::network::ULConnection::ULConnection (
    const ULConnection & ) [delete]
```

References [ULConnection\(\)](#).

## 12.355.3 Member Function Documentation

### 12.355.3.1 [AddAcceptedPresentationContext\(\)](#)

```
void gdcm::network::ULConnection::AddAcceptedPresentationContext (
    const PresentationContextAC & inPC)
```

### 12.355.3.2 FindContext()

```
PresentationContextRQ gdcM::network::ULConnection::FindContext (
    const DataElement & de) const
```

### 12.355.3.3 GetAcceptedPresentationContexts() [1/2]

```
std::vector< PresentationContextAC > & gdcM::network::ULConnection::GetAcceptedPresentation←
Contexts ()
```

### 12.355.3.4 GetAcceptedPresentationContexts() [2/2]

```
std::vector< PresentationContextAC > const & gdcM::network::ULConnection::GetAcceptedPresentation←
Contexts () const
```

### 12.355.3.5 GetConnectionInfo()

```
const ULConnectionInfo & gdcM::network::ULConnection::GetConnectionInfo () const
```

### 12.355.3.6 GetMaxPDUSize()

```
uint32_t gdcM::network::ULConnection::GetMaxPDUSize () const
```

### 12.355.3.7 GetPresentationContextACByID()

```
const PresentationContextAC * gdcM::network::ULConnection::GetPresentationContextACByID (
    uint8_t id) const
```

### 12.355.3.8 GetPresentationContextIDFromPresentationContext()

```
uint8_t gdcM::network::ULConnection::GetPresentationContextIDFromPresentationContext (
    PresentationContextRQ const & pc) const
```

return 0 upon error

### 12.355.3.9 GetPresentationContextRQByID()

```
const PresentationContextRQ * gdcM::network::ULConnection::GetPresentationContextRQByID (
    uint8_t id) const
```

### 12.355.3.10 GetPresentationContexts()

```
std::vector< PresentationContextRQ > const & gdcmm::network::ULConnection::GetPresentationContexts  
( ) const
```

### 12.355.3.11 GetProtocol()

```
std::iostream * gdcmm::network::ULConnection::GetProtocol ( )
```

### 12.355.3.12 GetState()

```
EStateID gdcmm::network::ULConnection::GetState ( ) const
```

### 12.355.3.13 GetTimer()

```
ARTIMTimer & gdcmm::network::ULConnection::GetTimer ( )
```

### 12.355.3.14 InitializeConnection()

```
bool gdcmm::network::ULConnection::InitializeConnection ( )
```

used to establish scu connections

### 12.355.3.15 InitializeIncomingConnection()

```
bool gdcmm::network::ULConnection::InitializeIncomingConnection ( )
```

used to establish scp connections

### 12.355.3.16 operator=()

```
void gdcmm::network::ULConnection::operator= (   
    const ULConnection & ) [delete]
```

References [ULConnection\(\)](#).

### 12.355.3.17 SetMaxPDUSize()

```
void gdcmm::network::ULConnection::SetMaxPDUSize (   
    uint32_t inSize)
```

**12.355.3.18 SetPresentationContexts() [1/2]**

```
void gdcmm::network::ULConnection::SetPresentationContexts (
    const std::vector< PresentationContext > & inContexts)
```

**12.355.3.19 SetPresentationContexts() [2/2]**

```
void gdcmm::network::ULConnection::SetPresentationContexts (
    const std::vector< PresentationContextRQ > & inContexts)
```

**12.355.3.20 SetState()**

```
void gdcmm::network::ULConnection::SetState (
    const EStateID & inState)
```

**12.355.3.21 StopProtocol()**

```
void gdcmm::network::ULConnection::StopProtocol ()
```

**12.355.4 Friends And Related Symbol Documentation****12.355.4.1 ULActionAE6**

```
friend class ULActionAE6 [friend]
```

References [ULActionAE6](#).

Referenced by [ULActionAE6](#).

**12.355.4.2 ULConnectionManager**

```
friend class ULConnectionManager [friend]
```

References [ULConnectionManager](#).

Referenced by [ULConnectionManager](#).

The documentation for this class was generated from the following file:

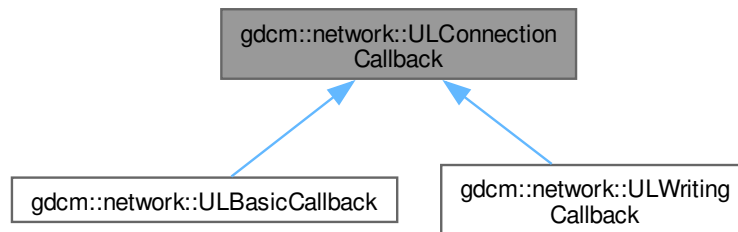
- [gdcmmULConnection.h](#)



## 12.356 gdcm::network::ULConnectionCallback Class Reference

```
#include <gdcmULConnectionCallback.h>
```

Inheritance diagram for gdcm::network::ULConnectionCallback:



### Public Member Functions

- [ULConnectionCallback](#) ()
- virtual [~ULConnectionCallback](#) ()=default
- bool [DataSetHandles](#) () const
- virtual void [HandleDataSet](#) (const [DataSet](#) &inDataSet)=0
- virtual void [HandleResponse](#) (const [DataSet](#) &inDataSet)=0
- void [ResetHandledDataSet](#) ()
- void [SetImplicitFlag](#) (const bool imp)

### Protected Member Functions

- void [DataSetHandled](#) ()

### Protected Attributes

- bool [mImplicit](#)

### 12.356.1 Detailed Description

When a dataset comes back from a query/move/etc, the result can either be stored entirely in memory, or could be stored on disk. This class provides a mechanism to indicate what the [ULConnectionManager](#) should do with datasets that are produced through query results. The [ULConnectionManager](#) will call the `HandleDataSet` function during the course of receiving datasets. Particular implementations should fill in what that function does, including updating progress, etc. NOTE: since cmove requires that multiple event loops be employed, the callback function MUST set `mHandledDataSet` to true. otherwise, the cmove event loop handler will not know data was received, and proceed to end the loop prematurely.

## 12.356.2 Constructor & Destructor Documentation

### 12.356.2.1 ULConnectionCallback()

```
gdcm::network::ULConnectionCallback::ULConnectionCallback () [inline]
```

References [mImplicit](#).

### 12.356.2.2 ~ULConnectionCallback()

```
virtual gdcm::network::ULConnectionCallback::~~ULConnectionCallback () [virtual], [default]
```

## 12.356.3 Member Function Documentation

### 12.356.3.1 DataSetHandled()

```
void gdcm::network::ULConnectionCallback::DataSetHandled () [inline], [protected]
```

### 12.356.3.2 DataSetHandles()

```
bool gdcm::network::ULConnectionCallback::DataSetHandles () const [inline]
```

### 12.356.3.3 HandleDataSet()

```
virtual void gdcm::network::ULConnectionCallback::HandleDataSet (  
    const DataSet & inDataSet) [pure virtual]
```

Implemented in [gdcm::network::ULBasicCallback](#), and [gdcm::network::ULWritingCallback](#).

### 12.356.3.4 HandleResponse()

```
virtual void gdcm::network::ULConnectionCallback::HandleResponse (  
    const DataSet & inDataSet) [pure virtual]
```

Implemented in [gdcm::network::ULBasicCallback](#), and [gdcm::network::ULWritingCallback](#).

### 12.356.3.5 ResetHandledDataSet()

```
void gdcm::network::ULConnectionCallback::ResetHandledDataSet () [inline]
```

### 12.356.3.6 SetImplicitFlag()

```
void gdcm::network::ULConnectionCallback::SetImplicitFlag (
    const bool imp) [inline]
```

References [mImplicit](#).

## 12.356.4 Member Data Documentation

### 12.356.4.1 mImplicit

```
bool gdcm::network::ULConnectionCallback::mImplicit [protected]
```

Referenced by [ULConnectionCallback\(\)](#), and [SetImplicitFlag\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmULConnectionCallback.h](#)

## 12.357 gdcm::network::ULConnectionInfo Class Reference

[ULConnectionInfo](#).

```
#include <gdcmULConnectionInfo.h>
```

### Public Member Functions

- [ULConnectionInfo](#) ()
- const char \* [GetCalledAETitle](#) () const
- std::string [GetCalledComputerName](#) () const
- unsigned long [GetCalledIPAddress](#) () const
- int [GetCalledIPPort](#) () const
- const char \* [GetCallingAETitle](#) () const
- unsigned long [GetMaxPDULength](#) () const
- bool [Initialize](#) ([UserInfo](#) const &inUserInfo, const char \*inCalledAETitle, const char \*inCallingAETitle, unsigned long inCalledIPAddress, int inCalledIPPort, std::string inCalledComputerName)
- void [SetMaxPDULength](#) (unsigned long inMaxPDULength)

### 12.357.1 Detailed Description

[ULConnectionInfo](#).

this class contains all the information about a particular connection as established by the user. That is, it's: User Information Calling AE Title Called AE Title IP address/computer name IP Port A connection must be established with this information, that's subsequently placed into various primitives for actual communication.

## 12.357.2 Constructor & Destructor Documentation

### 12.357.2.1 ULConnectionInfo()

```
gdcmm::network::ULConnectionInfo::ULConnectionInfo ()
```

## 12.357.3 Member Function Documentation

### 12.357.3.1 GetCalledAETitle()

```
const char * gdcmm::network::ULConnectionInfo::GetCalledAETitle () const
```

### 12.357.3.2 GetCalledComputerName()

```
std::string gdcmm::network::ULConnectionInfo::GetCalledComputerName () const
```

### 12.357.3.3 GetCalledIPAddress()

```
unsigned long gdcmm::network::ULConnectionInfo::GetCalledIPAddress () const
```

### 12.357.3.4 GetCalledIPPort()

```
int gdcmm::network::ULConnectionInfo::GetCalledIPPort () const
```

### 12.357.3.5 GetCallingAETitle()

```
const char * gdcmm::network::ULConnectionInfo::GetCallingAETitle () const
```

### 12.357.3.6 GetMaxPDULength()

```
unsigned long gdcmm::network::ULConnectionInfo::GetMaxPDULength () const
```

### 12.357.3.7 Initialize()

```
bool gdcmm::network::ULConnectionInfo::Initialize (  
    UserInformation const & inUserInformation,  
    const char * inCalledAETitle,  
    const char * inCallingAETitle,  
    unsigned long inCalledIPAddress,  
    int inCalledIPPort,  
    std::string inCalledComputerName)
```

### 12.357.3.8 SetMaxPDULength()

```
void gdcm::network::ULConnectionInfo::SetMaxPDULength (
    unsigned long inMaxPDULength)
```

The documentation for this class was generated from the following file:

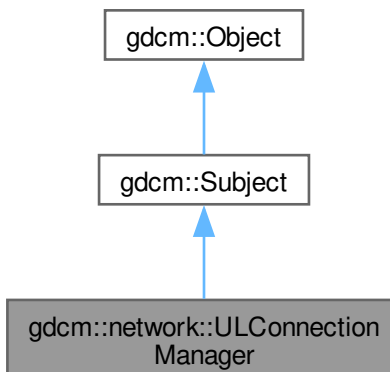
- [gdcmULConnectionInfo.h](#)

## 12.358 gdcm::network::ULConnectionManager Class Reference

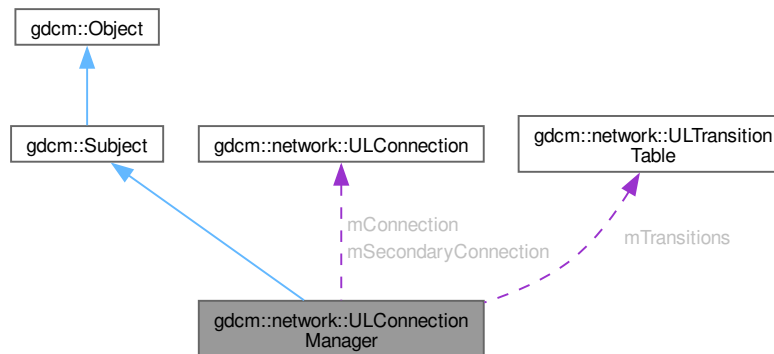
[ULConnectionManager](#).

```
#include <gdcmULConnectionManager.h>
```

Inheritance diagram for gdcm::network::ULConnectionManager:



Collaboration diagram for `gdcn::network::ULConnectionManager`:



## Public Member Functions

- [ULConnectionManager](#) ()
- [~ULConnectionManager](#) () override
- bool [BreakConnection](#) (const double &inTimeout)
- void [BreakConnectionNow](#) ()
- bool [EstablishConnection](#) (const std::string &inAETitle, const std::string &inConnectAETitle, const std::string &inComputerName, long inIPAddress, uint16\_t inConnectPort, double inTimeout, std::vector< [PresentationContext](#) > const &pcVector)
- bool [EstablishConnectionMove](#) (const std::string &inAETitle, const std::string &inConnectAETitle, const std::string &inComputerName, long inIPAddress, uint16\_t inConnectPort, double inTimeout, uint16\_t inReturnPort, std::vector< [PresentationContext](#) > const &pcVector)
- std::vector< [PresentationDataValue](#) > [SendEcho](#) ()
- std::vector< [DataSet](#) > [SendFind](#) (const [BaseRootQuery](#) \*inRootQuery)
- void [SendFind](#) (const [BaseRootQuery](#) \*inRootQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendMove](#) (const [BaseRootQuery](#) \*inRootQuery)
- bool [SendMove](#) (const [BaseRootQuery](#) \*inRootQuery, [ULConnectionCallback](#) \*inCallback)  
*return false upon error*
- std::vector< [DataSet](#) > [SendNAction](#) (const [BaseQuery](#) \*inQuery)
- void [SendNAction](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendNCreate](#) (const [BaseQuery](#) \*inQuery)
- void [SendNCreate](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendNDelete](#) (const [BaseQuery](#) \*inQuery)
- void [SendNDelete](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendNEventReport](#) (const [BaseQuery](#) \*inQuery)
- void [SendNEventReport](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendNGet](#) (const [BaseQuery](#) \*inQuery)
- void [SendNGet](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendNSet](#) (const [BaseQuery](#) \*inQuery)
- void [SendNSet](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendStore](#) (const [File](#) &file, std::istream \*pStream=nullptr, std::streampos dataSetOffset=0)

- void [SendStore](#) (const [File](#) &file, [ULConnectionCallback](#) \*inCallback, std::istream \*pStream=nullptr, std::streampos dataSetOffset=0)  
*callback based API*

### Public Member Functions inherited from [gdcm::Subject](#)

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

### Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

### Protected Member Functions

- [ULConnectionManager](#) (const [ULConnectionManager](#) &inCM)
- [EStateID](#) [RunEventLoop](#) ([ULEvent](#) &inEvent, [ULConnection](#) \*inWhichConnection, [ULConnectionCallback](#) \*inCallback, const bool &startWaiting)
- [EStateID](#) [RunMoveEventLoop](#) ([ULEvent](#) &inEvent, [ULConnectionCallback](#) \*inCallback)

### Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### Protected Attributes

- [ULConnection](#) \* [mConnection](#)
- [ULConnection](#) \* [mSecondaryConnection](#)
- [ULTransitionTable](#) [mTransitions](#)

## 12.358.1 Detailed Description

[ULConnectionManager](#).

The [ULConnectionManager](#) performs actions on the [ULConnection](#) given inputs from the user and from the state of what's going on around the connection (ie, timeouts of the ARTIM timer, responses from the peer across the connection, etc).

Its inputs are ULEvents, and it performs ULActions.

## 12.358.2 Constructor & Destructor Documentation

### 12.358.2.1 ULConnectionManager() [1/2]

```
gdcmm::network::ULConnectionManager::ULConnectionManager (
    const ULConnectionManager & inCM) [protected]
```

References [ULConnectionManager\(\)](#).

Referenced by [ULConnectionManager\(\)](#).

### 12.358.2.2 ULConnectionManager() [2/2]

```
gdcmm::network::ULConnectionManager::ULConnectionManager ()
```

### 12.358.2.3 ~ULConnectionManager()

```
gdcmm::network::ULConnectionManager::~~ULConnectionManager () [override]
```

## 12.358.3 Member Function Documentation

### 12.358.3.1 BreakConnection()

```
bool gdcmm::network::ULConnectionManager::BreakConnection (
    const double & inTimeout)
```

### 12.358.3.2 BreakConnectionNow()

```
void gdcmm::network::ULConnectionManager::BreakConnectionNow ()
```



### 12.358.3.3 EstablishConnection()

```
bool gdcm::network::ULConnectionManager::EstablishConnection (
    const std::string & inAETitle,
    const std::string & inConnectAETitle,
    const std::string & inComputerName,
    long inIPAddress,
    uint16_t inConnectPort,
    double inTimeout,
    std::vector< PresentationContext > const & pcVector)
```

returns true if a connection of the given AETitle (ie, 'this' program) is able to connect to the given AETitle and Port in a certain amount of time providing the connection type will establish the proper exchange syntax with a server; if a different functionality is required, a different connection should be established. returns false if the connection type is 'move'— have to give a return port for move to work as specified.

### 12.358.3.4 EstablishConnectionMove()

```
bool gdcm::network::ULConnectionManager::EstablishConnectionMove (
    const std::string & inAETitle,
    const std::string & inConnectAETitle,
    const std::string & inComputerName,
    long inIPAddress,
    uint16_t inConnectPort,
    double inTimeout,
    uint16_t inReturnPort,
    std::vector< PresentationContext > const & pcVector)
```

returns true for above reasons, but contains the special 'move' port

### 12.358.3.5 RunEventLoop()

```
EStateID gdcm::network::ULConnectionManager::RunEventLoop (
    ULEvent & inEvent,
    ULConnection * inWhichConnection,
    ULConnectionCallback * inCallback,
    const bool & startWaiting) [protected]
```

### 12.358.3.6 RunMoveEventLoop()

```
EStateID gdcm::network::ULConnectionManager::RunMoveEventLoop (
    ULEvent & inEvent,
    ULConnectionCallback * inCallback) [protected]
```

### 12.358.3.7 SendEcho()

```
std::vector< PresentationDataValue > gdcm::network::ULConnectionManager::SendEcho ()
```

**12.358.3.8 SendFind()** [1/2]

```
std::vector< DataSet > gdc::network::ULConnectionManager::SendFind (
    const BaseRootQuery * inRootQuery)
```

**12.358.3.9 SendFind()** [2/2]

```
void gdc::network::ULConnectionManager::SendFind (
    const BaseRootQuery * inRootQuery,
    ULConnectionCallback * inCallback)
```

**12.358.3.10 SendMove()** [1/2]

```
std::vector< DataSet > gdc::network::ULConnectionManager::SendMove (
    const BaseRootQuery * inRootQuery)
```

**12.358.3.11 SendMove()** [2/2]

```
bool gdc::network::ULConnectionManager::SendMove (
    const BaseRootQuery * inRootQuery,
    ULConnectionCallback * inCallback)
```

return false upon error

**12.358.3.12 SendNAction()** [1/2]

```
std::vector< DataSet > gdc::network::ULConnectionManager::SendNAction (
    const BaseQuery * inQuery)
```

**12.358.3.13 SendNAction()** [2/2]

```
void gdc::network::ULConnectionManager::SendNAction (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback)
```

**12.358.3.14 SendNCreate()** [1/2]

```
std::vector< DataSet > gdc::network::ULConnectionManager::SendNCreate (
    const BaseQuery * inQuery)
```

**12.358.3.15 SendNCreate() [2/2]**

```
void gdcm::network::ULConnectionManager::SendNCreate (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback)
```

**12.358.3.16 SendNDelete() [1/2]**

```
std::vector< DataSet > gdcm::network::ULConnectionManager::SendNDelete (
    const BaseQuery * inQuery)
```

**12.358.3.17 SendNDelete() [2/2]**

```
void gdcm::network::ULConnectionManager::SendNDelete (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback)
```

**12.358.3.18 SendNEventReport() [1/2]**

```
std::vector< DataSet > gdcm::network::ULConnectionManager::SendNEventReport (
    const BaseQuery * inQuery)
```

**12.358.3.19 SendNEventReport() [2/2]**

```
void gdcm::network::ULConnectionManager::SendNEventReport (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback)
```

**12.358.3.20 SendNGet() [1/2]**

```
std::vector< DataSet > gdcm::network::ULConnectionManager::SendNGet (
    const BaseQuery * inQuery)
```

**12.358.3.21 SendNGet() [2/2]**

```
void gdcm::network::ULConnectionManager::SendNGet (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback)
```

**12.358.3.22 SendNSet() [1/2]**

```
std::vector< DataSet > gdcm::network::ULConnectionManager::SendNSet (
    const BaseQuery * inQuery)
```

### 12.358.3.23 SendNSet() [2/2]

```
void gdcmm::network::ULConnectionManager::SendNSet (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback)
```

### 12.358.3.24 SendStore() [1/2]

```
std::vector< DataSet > gdcmm::network::ULConnectionManager::SendStore (
    const File & file,
    std::istream * pStream = nullptr,
    std::streampos dataSetOffset = 0)
```

### 12.358.3.25 SendStore() [2/2]

```
void gdcmm::network::ULConnectionManager::SendStore (
    const File & file,
    ULConnectionCallback * inCallback,
    std::istream * pStream = nullptr,
    std::streampos dataSetOffset = 0)
```

callback based API

## 12.358.4 Member Data Documentation

### 12.358.4.1 mConnection

```
ULConnection* gdcmm::network::ULConnectionManager::mConnection [protected]
```

### 12.358.4.2 mSecondaryConnection

```
ULConnection* gdcmm::network::ULConnectionManager::mSecondaryConnection [protected]
```

### 12.358.4.3 mTransitions

```
ULTransitionTable gdcmm::network::ULConnectionManager::mTransitions [protected]
```

The documentation for this class was generated from the following file:

- [gdcmmULConnectionManager.h](#)

## 12.359 gdcm::network::ULEvent Class Reference

[ULEvent.](#)

```
#include <gdcmULEvent.h>
```

### Public Member Functions

- [ULEvent](#) (const [EEventID](#) &inEventID, [BasePDU](#) \*inBasePDU, std::istream \*iStream=nullptr, std::streampos posDataSet=0)
- [ULEvent](#) (const [EEventID](#) &inEventID, std::vector< [BasePDU](#) \* > inBasePDU, std::istream \*iStream=nullptr, std::streampos posDataSet=0)
- [~ULEvent](#) ()
- std::streampos [GetDataSetPos](#) () const
- [EEventID](#) [GetEvent](#) () const
- std::istream \* [GetIStream](#) () const
- std::vector< [BasePDU](#) \* > const & [GetPDUs](#) () const
- void [SetEvent](#) (const [EEventID](#) &inEvent)
- void [SetPDU](#) (std::vector< [BasePDU](#) \* > const &inPDU)

### 12.359.1 Detailed Description

[ULEvent.](#)

base class for network events.

An event consists of the event ID and the data associated with that event.

Note that once a PDU is created, it is now the responsibility of the associated event to destroy it!

### 12.359.2 Constructor & Destructor Documentation

#### 12.359.2.1 ULEvent() [1/2]

```
gdcm::network::ULEvent::ULEvent (
    const EEventID & inEventID,
    std::vector< BasePDU * > inBasePDU,
    std::istream * iStream = nullptr,
    std::streampos posDataSet = 0) [inline]
```

#### 12.359.2.2 ULEvent() [2/2]

```
gdcm::network::ULEvent::ULEvent (
    const EEventID & inEventID,
    BasePDU * inBasePDU,
    std::istream * iStream = nullptr,
    std::streampos posDataSet = 0) [inline]
```

**12.359.2.3 ~UEvent()**

```
gdcm::network::UEvent::~~UEvent () [inline]
```

**12.359.3 Member Function Documentation****12.359.3.1 GetDataSetPos()**

```
std::streampos gdcm::network::UEvent::GetDataSetPos () const [inline]
```

**12.359.3.2 GetEvent()**

```
EEventID gdcm::network::UEvent::GetEvent () const [inline]
```

**12.359.3.3 GetIStream()**

```
std::istream * gdcm::network::UEvent::GetIStream () const [inline]
```

**12.359.3.4 GetPDUs()**

```
std::vector< BasePDU * > const & gdcm::network::UEvent::GetPDUs () const [inline]
```

**12.359.3.5 SetEvent()**

```
void gdcm::network::UEvent::SetEvent (
    const EEventID & inEvent) [inline]
```

**12.359.3.6 SetPDU()**

```
void gdcm::network::UEvent::SetPDU (
    std::vector< BasePDU * > const & inPDU) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmUEvent.h](#)

**12.360 gdcm::network::ULTransitionTable Class Reference**

[ULTransitionTable](#) The transition table of all the UEvents, new ULActions, and ULStates.

```
#include <gdcmULTransitionTable.h>
```

## Public Member Functions

- [ULTransitionTable](#) ()
- void [HandleEvent](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) const
- void [PrintTable](#) () const

### 12.360.1 Detailed Description

[ULTransitionTable](#) The transition table of all the ULEvents, new ULActions, and ULStates.

Based roughly on the solutions in player2.cpp in the boost examples and this so question: <http://stackoverflow.com/questions/1647631/c-state-machine-design>

The transition table is constructed of TableRows. Each row is based on an event, and an event handler in the TransitionTable object takes a given event, and then finds the given row.

Then, given the current state of the connection, determines the appropriate action to take and then the state to transition to next.

### 12.360.2 Constructor & Destructor Documentation

#### 12.360.2.1 ULTransitionTable()

```
gdcmm::network::ULTransitionTable::ULTransitionTable ()
```

### 12.360.3 Member Function Documentation

#### 12.360.3.1 HandleEvent()

```
void gdcmm::network::ULTransitionTable::HandleEvent (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent) const
```

#### 12.360.3.2 PrintTable()

```
void gdcmm::network::ULTransitionTable::PrintTable () const
```

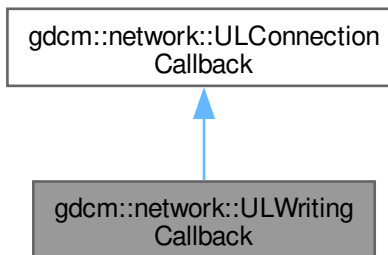
The documentation for this class was generated from the following file:

- [gdcmmULTransitionTable.h](#)

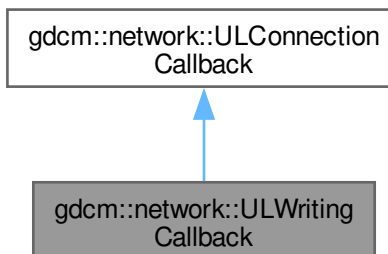
## 12.361 gdcm::network::ULWritingCallback Class Reference

```
#include <gdcmULWritingCallback.h>
```

Inheritance diagram for gdcm::network::ULWritingCallback:



Collaboration diagram for gdcm::network::ULWritingCallback:



### Public Member Functions

- [ULWritingCallback](#) ()=default
- [~ULWritingCallback](#) () override=default
- void [HandleDataSet](#) (const [DataSet](#) &inDataSet) override
- void [HandleResponse](#) (const [DataSet](#) &inDataSet) override
- void [SetDirectory](#) (const std::string &inDirectoryName)  
*provide the directory into which all files are written.*



## Public Member Functions inherited from [gdcm::network::ULConnectionCallback](#)

- [ULConnectionCallback](#) ()
- virtual [~ULConnectionCallback](#) ()=default
- bool [DataSetHandles](#) () const
- void [ResetHandledDataSet](#) ()
- void [SetImplicitFlag](#) (const bool imp)

## Additional Inherited Members

## Protected Member Functions inherited from [gdcm::network::ULConnectionCallback](#)

- void [DataSetHandled](#) ()

## Protected Attributes inherited from [gdcm::network::ULConnectionCallback](#)

- bool [mImplicit](#)

## 12.361.1 Constructor & Destructor Documentation

### 12.361.1.1 ULWritingCallback()

```
gdcm::network::ULWritingCallback::ULWritingCallback () [default]
```

### 12.361.1.2 ~ULWritingCallback()

```
gdcm::network::ULWritingCallback::~~ULWritingCallback () [override], [default]
```

## 12.361.2 Member Function Documentation

### 12.361.2.1 HandleDataSet()

```
void gdcm::network::ULWritingCallback::HandleDataSet (  
    const DataSet & inDataSet) [override], [virtual]
```

Implements [gdcm::network::ULConnectionCallback](#).

### 12.361.2.2 HandleResponse()

```
void gdcm::network::ULWritingCallback::HandleResponse (  
    const DataSet & inDataSet) [override], [virtual]
```

Implements [gdcm::network::ULConnectionCallback](#).

### 12.361.2.3 SetDirectory()

```
void gdcmm::network::ULWritingCallback::SetDirectory (
    const std::string & inDirectoryName) [inline]
```

provide the directory into which all files are written.

The documentation for this class was generated from the following file:

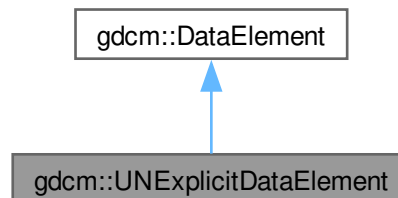
- [gdcmmULWritingCallback.h](#)

## 12.362 gdcmm::UNExplicitDataElement Class Reference

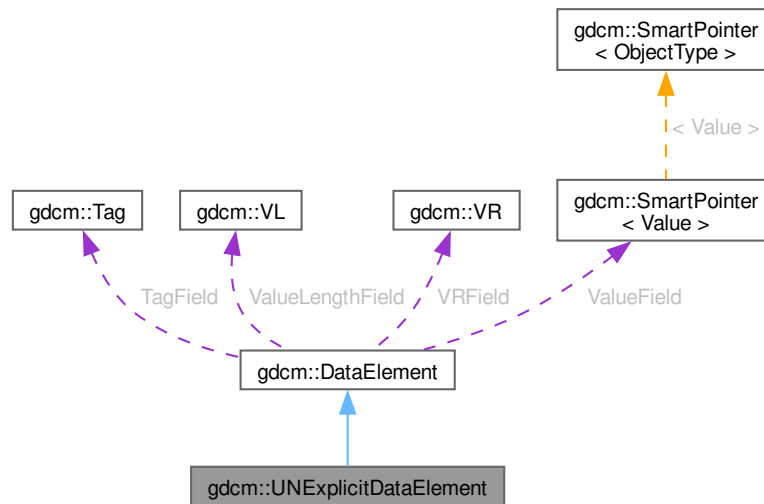
Class to read/write a [DataElement](#) as UNExplicit Data [Element](#).

```
#include <gdcmmUNExplicitDataElement.h>
```

Inheritance diagram for gdcmm::UNExplicitDataElement:



Collaboration diagram for gdcm::UNExplicitDataElement:



## Public Member Functions

- [VL GetLength](#) () const
- template<typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap>  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)

## Public Member Functions inherited from [gdcm::DataElement](#)

- [DataElement](#) (const DataElement &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()  
*Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()  
*Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE>  
[VL GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const

- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const  
*Get Tag.*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const  
*Set/Get Value (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const  
*Get VL.*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const  
*Check if Data Element is empty.*
- bool [IsUndefinedLength](#) () const  
*return if Value Length if of undefined length*
- bool [operator](#)< (const [DataElement](#) &de) const
- [DataElement](#) & [operator](#)= (const [DataElement](#) &)=default
- bool [operator](#)== (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>  
[std::istream](#) & [Read](#) ([std::istream](#) &is)
- template<typename TDE, typename TSwap>  
[std::istream](#) & [ReadOrSkip](#) ([std::istream](#) &is, [std::set](#)< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
[std::istream](#) & [ReadPreValue](#) ([std::istream](#) &is, [std::set](#)< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
[std::istream](#) & [ReadValue](#) ([std::istream](#) &is, [std::set](#)< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
[std::istream](#) & [ReadValueWithLength](#) ([std::istream](#) &is, [VL](#) &length, [std::set](#)< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
[std::istream](#) & [ReadWithLength](#) ([std::istream](#) &is, [VL](#) &length)
- void [SetByteValue](#) (const char \*array, [VL](#) length)
- void [SetTag](#) (const [Tag](#) &t)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVL](#) (const [VL](#) &vl)
- void [SetVLToUndefined](#) ()
- void [SetVR](#) ([VR](#) const &vr)
- template<typename TDE, typename TSwap>  
const [std::ostream](#) & [Write](#) ([std::ostream](#) &os) const

### Additional Inherited Members

### Protected Types inherited from [gdcm::DataElement](#)

- typedef [SmartPointer](#)< [Value](#) > [ValuePtr](#)

### Protected Member Functions inherited from [gdcm::DataElement](#)

- void [SetValueFieldLength](#) ([VL](#) vl, bool readvalues)

## Protected Attributes inherited from [gdcm::DataElement](#)

- [Tag](#) TagField
- [ValuePtr](#) ValueField
- [VL](#) ValueLengthField
- [VR](#) VRField

### 12.362.1 Detailed Description

Class to read/write a [DataElement](#) as UNExplicit Data [Element](#).

#### Note

bla

### 12.362.2 Member Function Documentation

#### 12.362.2.1 GetLength()

```
VL gdcm::UNExplicitDataElement::GetLength () const
```

#### 12.362.2.2 Read()

```
template<typename TSwap>
std::istream & gdcm::UNExplicitDataElement::Read (
    std::istream & is)
```

#### 12.362.2.3 ReadPreValue()

```
template<typename TSwap>
std::istream & gdcm::UNExplicitDataElement::ReadPreValue (
    std::istream & is)
```

#### 12.362.2.4 ReadValue()

```
template<typename TSwap>
std::istream & gdcm::UNExplicitDataElement::ReadValue (
    std::istream & is,
    bool readvalues = true)
```

### 12.362.2.5 ReadWithLength()

```
template<typename TSwap>
std::istream & gdcM::UNExplicitDataElement::ReadWithLength (
    std::istream & is,
    VL & length)
```

The documentation for this class was generated from the following file:

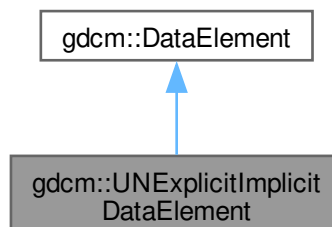
- [gdcMUNExplicitDataElement.h](#)

## 12.363 gdcM::UNExplicitImplicitDataElement Class Reference

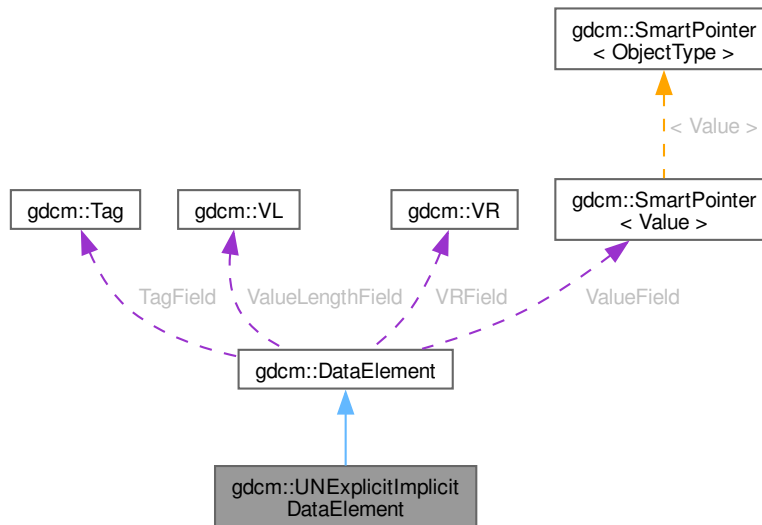
Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).

```
#include <gdcMUNExplicitImplicitDataElement.h>
```

Inheritance diagram for gdcM::UNExplicitImplicitDataElement:



Collaboration diagram for gdcm::UNExplicitImplicitDataElement:



## Public Member Functions

- [VL GetLength](#) () const
- template<typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is)

## Public Member Functions inherited from [gdcm::DataElement](#)

- [DataElement](#) (const DataElement &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()  
*Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()  
*Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE>  
[VL GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const
- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const

- *Get [Tag](#).*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const
- *Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const
- *Get [VL](#).*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const
- *Check if Data [Element](#) is empty.*
- bool [IsUndefinedLength](#) () const
- *return if [Value](#) Length if of undefined length*
- bool [operator](#)< (const [DataElement](#) &de) const
- [DataElement](#) & [operator](#)= (const [DataElement](#) &)=default
- bool [operator](#)== (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TDE, typename TSwap>  
std::istream & [ReadOrSkip](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadValueWithLength](#) (std::istream &is, [VL](#) &length, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)
- void [SetByteValue](#) (const char \*array, [VL](#) length)
- void [SetTag](#) (const [Tag](#) &t)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVL](#) (const [VL](#) &vl)
- void [SetVLToUndefined](#) ()
- void [SetVR](#) ([VR](#) const &vr)
- template<typename TDE, typename TSwap>  
const std::ostream & [Write](#) (std::ostream &os) const

### Additional Inherited Members

### Protected Types inherited from [gdcm::DataElement](#)

- typedef [SmartPointer](#)< [Value](#) > [ValuePtr](#)

### Protected Member Functions inherited from [gdcm::DataElement](#)

- void [SetValueFieldLength](#) ([VL](#) vl, bool readvalues)



## Protected Attributes inherited from [gdcm::DataElement](#)

- [Tag TagField](#)
- [ValuePtr ValueField](#)
- [VL ValueLengthField](#)
- [VR VRField](#)

### 12.363.1 Detailed Description

Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).

This class gather two known bugs:

1. GDCM 1.2.0 would rewrite [VR](#)=UN [Value](#) Length on 2 bytes instead of 4 bytes
2. GDCM 1.2.0 would also rewrite [DataElement](#) as Implicit when the [VR](#) would not be known this would only happen in some very rare cases. gdcm 2.X design could handle bug #1 or #2 exclusively, this class can now handle file which have both issues. See: [gdcmData/TheralysGDCM120Bug.dcm](#)

### 12.363.2 Member Function Documentation

#### 12.363.2.1 GetLength()

```
VL gdcm::UNExplicitImplicitDataElement::GetLength () const
```

#### 12.363.2.2 Read()

```
template<typename TSwap>
std::istream & gdcm::UNExplicitImplicitDataElement::Read (
    std::istream & is)
```

#### 12.363.2.3 ReadPreValue()

```
template<typename TSwap>
std::istream & gdcm::UNExplicitImplicitDataElement::ReadPreValue (
    std::istream & is)
```

#### 12.363.2.4 ReadValue()

```
template<typename TSwap>
std::istream & gdcm::UNExplicitImplicitDataElement::ReadValue (
    std::istream & is)
```

The documentation for this class was generated from the following file:

- [gdcmUNExplicitImplicitDataElement.h](#)

## 12.364 gdcm::Unpacker12Bits Class Reference

Pack/Unpack 12 bits pixel into 16bits.

```
#include <gdcmUnpacker12Bits.h>
```

### Static Public Member Functions

- static bool [Pack](#) (char \*out, const char \*in, size\_t n)
- static bool [Unpack](#) (char \*out, const char \*in, size\_t n)

### 12.364.1 Detailed Description

Pack/Unpack 12 bits pixel into 16bits.

- You can only pack an even number of 16bits, which means a multiple of 4 (expressed in bytes)
- You can only unpack a multiple of 3 bytes

This class has no purpose in general purpose DICOM implementation. However to be able to cope with some early ACR-NEMA file generated by a well-known private vendor, one would need to unpack 12bits Stored Pixel [Value](#) into a more standard 16bits Stored Pixel [Value](#).

See also

[Rescaler](#)

### 12.364.2 Member Function Documentation

#### 12.364.2.1 Pack()

```
bool gdcm::Unpacker12Bits::Pack (  
    char * out,  
    const char * in,  
    size_t n) [static]
```

Pack an array of 16bits where all values are 12bits into a pack form. n is the length in bytes of array in, out will be a fake 8bits array of size  $(n / 2) * 3$

### 12.364.2.2 Unpack()

```
bool gdcm::Unpacker12Bits::Unpack (
    char * out,
    const char * in,
    size_t n) [static]
```

Unpack an array of 'packed' 12bits data into a more conventional 16bits array. n is the length in bytes of array in, out will be a 16bits array of size  $(n / 3) * 2$

The documentation for this class was generated from the following file:

- [gdcmUnpacker12Bits.h](#)

## 12.365 gdcm::Usage Class Reference

[Usage.](#)

```
#include <gdcmUsage.h>
```

### Public Types

- enum [UsageType](#) {  
    [Mandatory](#) ,  
    [Conditional](#) ,  
    [UserOption](#) ,  
    [Invalid](#) }

### Public Member Functions

- [Usage](#) ([UsageType](#) type=[Invalid](#))
- [operator UsageType](#) () const

### Static Public Member Functions

- static const char \* [GetUsageString](#) ([UsageType](#) type)
- static [UsageType](#) [GetUsageType](#) (const char \*type)

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [Usage](#) &vr)

## 12.365.1 Detailed Description

Usage.

### Note

A.1.3 IOD Module Table and Functional Group Macro Table This Section of each IOD defines in a tabular form the Modules comprising the IOD. The following information must be specified for each Module in the table:

- The name of the Module or Functional Group
  - A reference to the Section in Annex C which defines the Module or Functional Group
  - The usage of the Module or Functional Group; whether it is:
    - Mandatory (see A.1.3.1) , abbreviated M
    - Conditional (see A.1.3.2) , abbreviated C
    - User Option (see A.1.3.3) , abbreviated U
- The Modules referenced are defined in Annex C. A.1.3.1 MANDATORY MODULES For each IOD, Mandatory Modules shall be supported per the definitions, semantics and requirements defined in Annex C.

A.1.3.2 CONDITIONAL MODULES Conditional Modules are Mandatory Modules if specific conditions are met. If the specified conditions are not met, this Module shall not be supported; that is, no information defined in that Module shall be sent. A.1.3.3 USER OPTION MODULES User Option Modules may or may not be supported. If an optional Module is supported, the Attribute Types specified in the Modules in Annex C shall be supported.

## 12.365.2 Member Enumeration Documentation

### 12.365.2.1 UsageType

```
enum gdcm::Usage::UsageType
```

#### Enumerator

Mandatory	
Conditional	
UserOption	
Invalid	

## 12.365.3 Constructor & Destructor Documentation

### 12.365.3.1 Usage()

```
gdcm::Usage::Usage (
    UsageType type = Invalid) [inline]
```

References [Invalid](#).

Referenced by [operator<<](#).

## 12.365.4 Member Function Documentation

### 12.365.4.1 GetUsageString()

```
const char * gdcm::Usage::GetUsageString (  
    UsageType type) [static]
```

Referenced by [operator<<](#).

### 12.365.4.2 GetUsageType()

```
UsageType gdcm::Usage::GetUsageType (  
    const char * type) [static]
```

### 12.365.4.3 operator UsageType()

```
gdcm::Usage::operator UsageType () const [inline]
```

## 12.365.5 Friends And Related Symbol Documentation

### 12.365.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & os,  
    const Usage & vr) [friend]
```

References [Usage\(\)](#), and [GetUsageString\(\)](#).

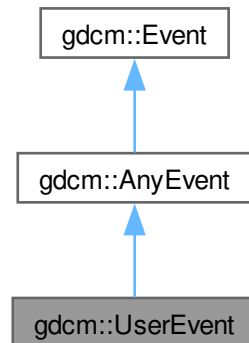
The documentation for this class was generated from the following file:

- [gdcmUsage.h](#)

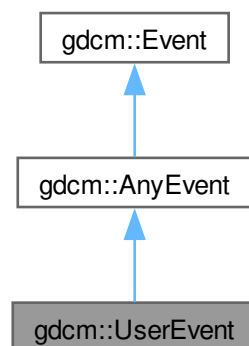
## 12.366 gdcm::UserEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::UserEvent:



Collaboration diagram for gdcm::UserEvent:



### Additional Inherited Members

### Public Member Functions inherited from [gdcm::Event](#)

- [Event](#) ()

- [Event](#) (const Event &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 12.367 gdcm::network::UserInformation Class Reference

[UserInformation](#).

```
#include <gdcmUserInformation.h>
```

### Public Member Functions

- [UserInformation](#) ()
- [UserInformation](#) (const UserInformation &)=delete
- [~UserInformation](#) ()
- void [AddRoleSelectionSub](#) ([RoleSelectionSub](#) const &r)
- void [AddSOPClassExtendedNegociationSub](#) ([SOPClassExtendedNegociationSub](#) const &s)
- [MaximumLengthSub](#) & [GetMaximumLengthSub](#) ()
- const [MaximumLengthSub](#) & [GetMaximumLengthSub](#) () const
- [UserInformation](#) & [operator=](#) (const [UserInformation](#) &)
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 12.367.1 Detailed Description

[UserInformation](#).

[Table](#) 9-16 USER INFORMATION ITEM FIELDS

TODO what is the goal of :

[Table](#) 9-20 USER INFORMATION ITEM FIELDS

## 12.367.2 Constructor & Destructor Documentation

### 12.367.2.1 `UserInfoation()` [1/2]

```
gdcm::network::UserInfoation::UserInfoation ()
```

Referenced by [UserInfoation\(\)](#), and [operator=\(\)](#).

### 12.367.2.2 `~UserInfoation()`

```
gdcm::network::UserInfoation::~~UserInfoation ()
```

### 12.367.2.3 `UserInfoation()` [2/2]

```
gdcm::network::UserInfoation::UserInfoation (  
    const UserInfoation & ) [delete]
```

References [UserInfoation\(\)](#).

## 12.367.3 Member Function Documentation

### 12.367.3.1 `AddRoleSelectionSub()`

```
void gdcm::network::UserInfoation::AddRoleSelectionSub (  
    RoleSelectionSub const & r)
```

### 12.367.3.2 `AddSOPClassExtendedNegociationSub()`

```
void gdcm::network::UserInfoation::AddSOPClassExtendedNegociationSub (  
    SOPClassExtendedNegociationSub const & s)
```

### 12.367.3.3 `GetMaximumLengthSub()` [1/2]

```
MaximumLengthSub & gdcm::network::UserInfoation::GetMaximumLengthSub () [inline]
```

### 12.367.3.4 `GetMaximumLengthSub()` [2/2]

```
const MaximumLengthSub & gdcm::network::UserInfoation::GetMaximumLengthSub () const [inline]
```



### 12.367.3.5 operator=()

```
UserInformation & gdcm::network::UserInformation::operator= (
    const UserInformation & )
```

References [UserInformation\(\)](#).

### 12.367.3.6 Print()

```
void gdcm::network::UserInformation::Print (
    std::ostream & os) const
```

### 12.367.3.7 Read()

```
std::istream & gdcm::network::UserInformation::Read (
    std::istream & is)
```

### 12.367.3.8 Size()

```
size_t gdcm::network::UserInformation::Size () const
```

### 12.367.3.9 Write()

```
const std::ostream & gdcm::network::UserInformation::Write (
    std::ostream & os) const
```

The documentation for this class was generated from the following file:

- [gdcmUserInformation.h](#)

## 12.368 gdcm::UUIDGenerator Class Reference

Class for generating unique UUID.

```
#include <gdcmUUIDGenerator.h>
```

### Public Member Functions

- const char \* [Generate](#) ()

### Static Public Member Functions

- static bool [IsValid](#) (const char \*uid)  
*Find out if the string is a valid UUID or not.*

## 12.368.1 Detailed Description

Class for generating unique UUID.

generate DCE 1.1 uid

## 12.368.2 Member Function Documentation

### 12.368.2.1 Generate()

```
const char * gdcmm::UUIDGenerator::Generate ()
```

Return the generated uuid NOT THREAD SAFE

### 12.368.2.2 IsValid()

```
bool gdcmm::UUIDGenerator::IsValid (  
    const char * uid) [static]
```

Find out if the string is a valid UUID or not.

The documentation for this class was generated from the following file:

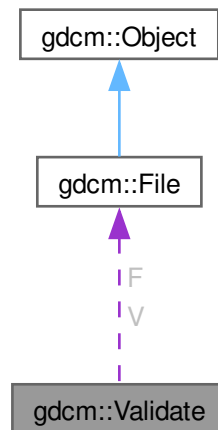
- [gdcmmUUIDGenerator.h](#)

## 12.369 gdcmm::Validate Class Reference

[Validate](#) class.

```
#include <gdcmmValidate.h>
```

Collaboration diagram for gdcm::Validate:



### Public Member Functions

- [Validate](#) ()
- [~Validate](#) ()
- const [File](#) & [GetValidatedFile](#) ()
- void [SetFile](#) ([File](#) const &f)
- void [Validation](#) ()

### Protected Attributes

- const [File](#) \* [F](#)
- [File](#) [V](#)

## 12.369.1 Detailed Description

[Validate](#) class.

## 12.369.2 Constructor & Destructor Documentation

### 12.369.2.1 Validate()

```
gdcm::Validate::Validate ()
```

### 12.369.2.2 ~Validate()

```
gdcm::Validate::~~Validate ()
```

## 12.369.3 Member Function Documentation

### 12.369.3.1 GetValidatedFile()

```
const File & gdcm::Validate::GetValidatedFile () [inline]
```

References [V](#).

### 12.369.3.2 SetFile()

```
void gdcm::Validate::SetFile (  
    File const & f) [inline]
```

References [F](#).

### 12.369.3.3 Validation()

```
void gdcm::Validate::Validation ()
```

## 12.369.4 Member Data Documentation

### 12.369.4.1 F

```
const File* gdcm::Validate::F [protected]
```

Referenced by [SetFile\(\)](#).

### 12.369.4.2 V

```
File gdcm::Validate::V [protected]
```

Referenced by [GetValidatedFile\(\)](#).

The documentation for this class was generated from the following file:

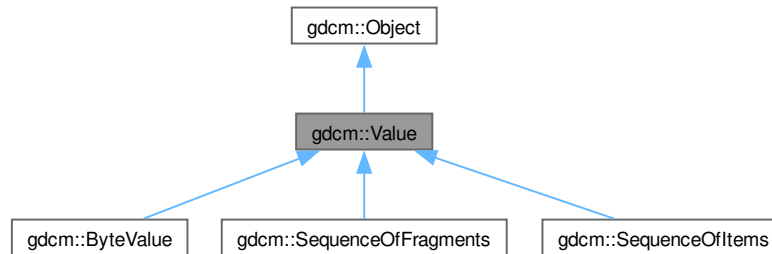
- [gdcmValidate.h](#)

## 12.370 gdcm::Value Class Reference

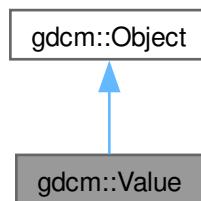
Class to represent the value of a Data [Element](#).

```
#include <gdcmValue.h>
```

Inheritance diagram for gdcm::Value:



Collaboration diagram for gdcm::Value:



### Public Member Functions

- `Value()` = default
- `~Value()` override = default
- virtual void `Clear()` = 0
- virtual `VL GetLength()` const = 0
- virtual bool `operator==` (const `Value` &val) const = 0
- virtual void `SetLength` (`VL` l) = 0

## Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)  
*Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

## Protected Member Functions

- virtual void [SetLengthOnly](#) (VL l)

## Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

## Friends

- class [DataElement](#)

## 12.370.1 Detailed Description

Class to represent the value of a Data [Element](#).

### Note

VALUE: A component of a [Value](#) Field. A [Value](#) Field may consist of one or more of these components.

## 12.370.2 Constructor & Destructor Documentation

### 12.370.2.1 Value()

```
gdcm::Value::Value () [default]
```

Referenced by [gdcm::ByteValue::operator==\(\)](#), [gdcm::SequenceOfFragments::operator==\(\)](#), [gdcm::SequenceOfItems::operator==\(\)](#), and [operator==\(\)](#).

### 12.370.2.2 ~Value()

```
gdcm::Value::~~Value () [override], [default]
```

## 12.370.3 Member Function Documentation

### 12.370.3.1 Clear()

```
virtual void gdcm::Value::Clear () [pure virtual]
```

Implemented in [gdcm::ByteValue](#), [gdcm::SequenceOfFragments](#), and [gdcm::SequenceOfItems](#).

### 12.370.3.2 GetLength()

```
virtual VL gdcm::Value::GetLength () const [pure virtual]
```

Implemented in [gdcm::ByteValue](#), [gdcm::SequenceOfFragments](#), and [gdcm::SequenceOfItems](#).

Referenced by [gdcm::DataSet::InsertDataElement\(\)](#), and [gdcm::DataElement::SetValue\(\)](#).

### 12.370.3.3 operator==( )

```
virtual bool gdcm::Value::operator== (
    const Value & val) const [pure virtual]
```

Implemented in [gdcm::ByteValue](#), [gdcm::SequenceOfFragments](#), and [gdcm::SequenceOfItems](#).

References [Value\(\)](#).

### 12.370.3.4 SetLength()

```
virtual void gdcm::Value::SetLength (
    VL l) [pure virtual]
```

Implemented in [gdcm::ByteValue](#), [gdcm::SequenceOfFragments](#), and [gdcm::SequenceOfItems](#).

### 12.370.3.5 SetLengthOnly()

```
virtual void gdcm::Value::SetLengthOnly (
    VL l) [protected], [virtual]
```

Reimplemented in [gdcm::ByteValue](#).

## 12.370.4 Friends And Related Symbol Documentation

### 12.370.4.1 DataElement

```
friend class DataElement [friend]
```

References [DataElement](#).

Referenced by [DataElement](#).

The documentation for this class was generated from the following file:

- [gdcmlValue.h](#)

## 12.371 gdcml::ValueIO< TDE, TSwap, TType > Class Template Reference

Class to dispatch template calls.

```
#include <gdcmlValueIO.h>
```

### Static Public Member Functions

- static std::istream & [Read](#) (std::istream &is, [Value](#) &v, bool readvalues)
- static const std::ostream & [Write](#) (std::ostream &os, const [Value](#) &v)

### 12.371.1 Detailed Description

```
template<typename TDE, typename TSwap, typename TType = uint8_t>
class gdcml::ValueIO< TDE, TSwap, TType >
```

Class to dispatch template calls.

## 12.371.2 Member Function Documentation

### 12.371.2.1 Read()

```
template<typename TDE, typename TSwap, typename TType = uint8_t>
std::istream & gdcml::ValueIO< TDE, TSwap, TType >::Read (
    std::istream & is,
    Value & v,
    bool readvalues) [static]
```



### 12.371.2.2 Write()

```
template<typename TDE, typename TSwap, typename TType = uint8_t>
const std::ostream & gdcM::ValueIO< TDE, TSwap, TType >::Write (
    std::ostream & os,
    const Value & v) [static]
```

The documentation for this class was generated from the following file:

- [gdcMValueIO.h](#)

## 12.372 gdcM::MrProtocol::Vector3 Struct Reference

```
#include <gdcMMrProtocol.h>
```

### Public Attributes

- double [dCor](#)
- double [dSag](#)
- double [dTra](#)

### 12.372.1 Member Data Documentation

#### 12.372.1.1 dCor

```
double gdcM::MrProtocol::Vector3::dCor
```

#### 12.372.1.2 dSag

```
double gdcM::MrProtocol::Vector3::dSag
```

#### 12.372.1.3 dTra

```
double gdcM::MrProtocol::Vector3::dTra
```

The documentation for this struct was generated from the following file:

- [gdcMMrProtocol.h](#)

## 12.373 gdcm::Version Class Reference

major/minor and build version

```
#include <gdcmVersion.h>
```

### Public Member Functions

- [Version](#) ()=default
- [~Version](#) ()=default
- void [Print](#) (std::ostream &os=std::cout) const

### Static Public Member Functions

- static int [GetBuildVersion](#) ()
- static int [GetMajorVersion](#) ()
- static int [GetMinorVersion](#) ()
- static const char \* [GetVersion](#) ()

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Version](#) &v)

### 12.373.1 Detailed Description

major/minor and build version

### 12.373.2 Constructor & Destructor Documentation

#### 12.373.2.1 Version()

```
gdcm::Version::Version () [default]
```

Referenced by [operator<<](#).

#### 12.373.2.2 ~Version()

```
gdcm::Version::~~Version () [default]
```

## 12.373.3 Member Function Documentation

### 12.373.3.1 GetBuildVersion()

```
int gdcm::Version::GetBuildVersion () [static]
```

### 12.373.3.2 GetMajorVersion()

```
int gdcm::Version::GetMajorVersion () [static]
```

### 12.373.3.3 GetMinorVersion()

```
int gdcm::Version::GetMinorVersion () [static]
```

### 12.373.3.4 GetVersion()

```
const char * gdcm::Version::GetVersion () [static]
```

### 12.373.3.5 Print()

```
void gdcm::Version::Print (  
    std::ostream & os = std::cout) const
```

Referenced by [operator<<](#).

## 12.373.4 Friends And Related Symbol Documentation

### 12.373.4.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const Version & v) [friend]
```

References [Version\(\)](#), and [Print\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmVersion.h](#)

## 12.374 gdcm::VL Class Reference

Value Length.

```
#include <gdcmVL.h>
```

### Public Types

- typedef uint32\_t [Type](#)

### Public Member Functions

- [VL](#) (uint32\_t vl=0)
- [VL GetLength](#) () const
- bool [IsOdd](#) () const  
*Return whether or not the [VL](#) is odd or not.*
- bool [IsUndefined](#) () const
- [operator uint32\\_t](#) () const
- [VL & operator++](#) ()
- [VL operator++](#) (int)
- [VL & operator+=](#) ([VL](#) const &vl)  
*+= operator*
- template<typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [Read16](#) (std::istream &is)
- void [SetToUndefined](#) ()
- template<typename TSwap>  
const std::ostream & [Write](#) (std::ostream &os) const
- template<typename TSwap>  
const std::ostream & [Write16](#) (std::ostream &os) const

### Static Public Member Functions

- static uint16\_t [GetVL16Max](#) ()
- static uint32\_t [GetVL32Max](#) ()

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [VL](#) &vl)

## 12.374.1 Detailed Description

[Value](#) Length.

### Warning

this is a 4bytes value ! Do not try to use it for 2bytes value length

### Examples

[BasicImageAnonymizer.cs](#), [DecompressImage.cs](#), [ReadAndDumpDICOMDIR2.cxx](#), and [rle2img.cxx](#).

## 12.374.2 Member Typedef Documentation

### 12.374.2.1 Type

```
typedef uint32_t gdcm::VL::Type
```

## 12.374.3 Constructor & Destructor Documentation

### 12.374.3.1 VL()

```
gdcm::VL::VL (  
    uint32_t vl = 0) [inline]
```

Referenced by [GetLength\(\)](#), [operator++\(\)](#), [operator++\(\)](#), [operator+=\(\)](#), and [operator<<](#).

## 12.374.4 Member Function Documentation

### 12.374.4.1 GetLength()

```
VL gdcm::VL::GetLength () const [inline]
```

### Examples

[ReadAndDumpDICOMDIR2.cxx](#).

References [VL\(\)](#).

Referenced by [gdcm::FileMetaInformation::GetFullLength\(\)](#), and [gdcm::Item::Write\(\)](#).

#### 12.374.4.2 GetVL16Max()

```
uint16_t gdcm::VL::GetVL16Max () [inline], [static]
```

#### 12.374.4.3 GetVL32Max()

```
uint32_t gdcm::VL::GetVL32Max () [inline], [static]
```

#### 12.374.4.4 IsOdd()

```
bool gdcm::VL::IsOdd () const [inline]
```

Return whether or not the [VL](#) is odd or not.

References [IsUndefined\(\)](#).

Referenced by [Write\(\)](#), and [Write16\(\)](#).

#### 12.374.4.5 IsUndefined()

```
bool gdcm::VL::IsUndefined () const [inline]
```

Referenced by [IsOdd\(\)](#).

#### 12.374.4.6 operator uint32\_t()

```
gdcm::VL::operator uint32_t () const [inline]
```

#### 12.374.4.7 operator++() [1/2]

```
VL & gdcm::VL::operator++ () [inline]
```

References [VL\(\)](#).

#### 12.374.4.8 operator++() [2/2]

```
VL gdcm::VL::operator++ (  
    int ) [inline]
```

References [VL\(\)](#).

#### 12.374.4.9 operator+=()

```
VL & gdcm::VL::operator+= (
    VL const & vl) [inline]
```

+= operator

References [VL\(\)](#).

#### 12.374.4.10 Read()

```
template<typename TSwap>
std::istream & gdcm::VL::Read (
    std::istream & is) [inline]
```

#### 12.374.4.11 Read16()

```
template<typename TSwap>
std::istream & gdcm::VL::Read16 (
    std::istream & is) [inline]
```

#### 12.374.4.12 SetToUndefined()

```
void gdcm::VL::SetToUndefined () [inline]
```

#### 12.374.4.13 Write()

```
template<typename TSwap>
const std::ostream & gdcm::VL::Write (
    std::ostream & os) const [inline]
```

References [IsOdd\(\)](#).

Referenced by [gdcm::Fragment::Write\(\)](#), [gdcm::Item::Write\(\)](#), [gdcm::SequenceOfFragments::Write\(\)](#), and [gdcm::SequenceOfItems::Write\(\)](#).

#### 12.374.4.14 Write16()

```
template<typename TSwap>
const std::ostream & gdcm::VL::Write16 (
    std::ostream & os) const [inline]
```

References [IsOdd\(\)](#).

## 12.374.5 Friends And Related Symbol Documentation

### 12.374.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const VL & vl) [friend]
```

References [VL\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmVL.h](#)

## 12.375 gdcm::VM Class Reference

**Value** Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.

```
#include <gdcmVM.h>
```

### Public Types

- enum [VMType](#) {
  - [VM0](#) = 0 ,
  - [VM1](#) = 1 ,
  - [VM2](#) = 2 ,
  - [VM3](#) = 4 ,
  - [VM4](#) = 8 ,
  - [VM5](#) = 16 ,
  - [VM6](#) = 32 ,
  - [VM8](#) = 64 ,
  - [VM9](#) = 128 ,
  - [VM10](#) = 256 ,
  - [VM12](#) = 512 ,
  - [VM16](#) = 1024 ,
  - [VM18](#) = 2048 ,
  - [VM24](#) = 4096 ,
  - [VM28](#) = 8192 ,
  - [VM32](#) = 16384 ,
  - [VM35](#) = 32768 ,
  - [VM99](#) = 65536 ,
  - [VM256](#) = 131072 ,
  - [VM1\\_2](#) = VM1 | VM2 ,
  - [VM1\\_3](#) = VM1 | VM2 | VM3 ,
  - [VM1\\_4](#) = VM1 | VM2 | VM3 | VM4 ,
  - [VM1\\_5](#) = VM1 | VM2 | VM3 | VM4 | VM5 ,
  - [VM1\\_8](#) = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 ,
  - [VM1\\_32](#) = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 ,



```

VM1_99 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 ,
VM1_n = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM2_2n = VM2 | VM4 | VM6 | VM8 | VM16 | VM24 | VM32 | VM256 ,
VM2_n = VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM3_4 = VM3 | VM4 ,
VM3_3n = VM3 | VM6 | VM9 | VM24 | VM99 | VM256 ,
VM3_n = VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM4_4n = VM4 | VM16 | VM24 | VM32 | VM256 ,
VM6_6n = VM6 | VM12 | VM18 | VM24 ,
VM6_n = VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM7_7n ,
VM30_30n ,
VM47_47n ,
VM_END = VM1_n + 1 }

```

### Public Member Functions

- [VM](#) ([VMType](#) type=[VM0](#))
- bool [Compatible](#) ([VM](#) const &vm) const
- unsigned int [GetLength](#) () const
- [operator VMType](#) () const

### Static Public Member Functions

- static size\_t [GetNumberOfElementsFromArray](#) (const char \*array, size\_t length)
- static const char \* [GetVMString](#) ([VMType](#) vm)
- static [VMType](#) [GetVMType](#) (const char \*vm)
- static [VMType](#) [GetVMTypeFromLength](#) (size\_t length, unsigned int size)
- static bool [IsValid](#) (int vm1, [VMType](#) vm2)

### Static Protected Member Functions

- static unsigned int [GetIndex](#) ([VMType](#) vm)

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [VM](#) &vm)

## 12.375.1 Detailed Description

**Value** Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.

Some private dict define some more: 4-4n 1-4 1-5 256 9 3-4

even more:

7-7n 10 18 12 35 47\_47n 30\_30n 28

6-6n

## 12.375.2 Member Enumeration Documentation

### 12.375.2.1 VMType

enum [gdcM::VM::VMType](#)

#### Enumerator

VM0	
VM1	
VM2	
VM3	
VM4	
VM5	
VM6	
VM8	
VM9	
VM10	
VM12	
VM16	
VM18	
VM24	
VM28	
VM32	
VM35	
VM99	
VM256	
VM1_2	
VM1_3	
VM1_4	
VM1_5	
VM1_8	
VM1_32	
VM1_99	
VM1_n	
VM2_2n	

VM2_n	
VM3_4	
VM3_3n	
VM3_n	
VM4_4n	
VM6_6n	
VM6_n	
VM7_7n	
VM30_30n	
VM47_47n	
VM_END	

## 12.375.3 Constructor & Destructor Documentation

### 12.375.3.1 VM()

```
gdcmm::VM::VM (
    VMType type = VM0) [inline]
```

References [VM0](#).

Referenced by [Compatible\(\)](#), [GetLength\(\)](#), and [operator<<](#).

## 12.375.4 Member Function Documentation

### 12.375.4.1 Compatible()

```
bool gdcmm::VM::Compatible (
    VM const & vm) const
```

WARNING: Implementation deficiency The Compatible function is poorly implemented, the reference vm should be coming from the dictionary, while the passed in value is the value guess from the file.

References [VM\(\)](#).

### 12.375.4.2 GetIndex()

```
unsigned int gdcmm::VM::GetIndex (
    VMType vm) [static], [protected]
```

#### 12.375.4.3 GetLength()

```
unsigned int gdcm::VM::GetLength () const
```

References [VM\(\)](#), and [operator<<](#).

#### 12.375.4.4 GetNumberOfElementsFromArray()

```
size_t gdcm::VM::GetNumberOfElementsFromArray (
    const char * array,
    size_t length) [static]
```

#### 12.375.4.5 GetVMString()

```
const char * gdcm::VM::GetVMString (
    VMType vm) [static]
```

Return the string as written in the official DICOM dict from a custom enum type

Referenced by [operator<<](#).

#### 12.375.4.6 GetVMType()

```
VMType gdcm::VM::GetVMType (
    const char * vm) [static]
```

#### 12.375.4.7 GetVMTypeFromLength()

```
VMType gdcm::VM::GetVMTypeFromLength (
    size_t length,
    unsigned int size) [static]
```

#### 12.375.4.8 IsValid()

```
bool gdcm::VM::IsValid (
    int vm1,
    VMType vm2) [static]
```

Check if vm1 is valid compare to vm2, i.e vm1 is element of vm2 vm1 is typically deduce from counting in a ValueField

#### 12.375.4.9 operator VMType()

```
gdcm::VM::operator VMType () const [inline]
```

## 12.375.5 Friends And Related Symbol Documentation

### 12.375.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & os,  
    const VM & vm) [friend]
```

References [VM\(\)](#), and [GetVMString\(\)](#).

Referenced by [GetLength\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmVM.h](#)

## 12.376 gdcm::VMToLength< T > Struct Template Reference

The documentation for this struct was generated from the following file:

- [gdcmVM.h](#)

## 12.377 gdcm::VR Class Reference

[VR](#) class.

```
#include <gdcmVR.h>
```

### Public Types

- enum [VRType](#) : long long {  
    [INVALID](#) = 0 ,  
    [AE](#) = 1 ,  
    [AS](#) = 2 ,  
    [AT](#) = 4 ,  
    [CS](#) = 8 ,  
    [DA](#) = 16 ,  
    [DS](#) = 32 ,  
    [DT](#) = 64 ,  
    [FD](#) = 128 ,  
    [FL](#) = 256 ,  
    [IS](#) = 512 ,  
    [LO](#) = 1024 ,  
    [LT](#) = 2048 ,  
    [OB](#) = 4096 ,  
    [OD](#) = 134217728 ,

```

OF = 8192 ,
OL = 268435456 ,
OV = 2147483648 ,
OW = 16384 ,
PN = 32768 ,
SH = 65536 ,
SL = 131072 ,
SQ = 262144 ,
SS = 524288 ,
ST = 1048576 ,
SV = 4294967296 ,
TM = 2097152 ,
UC = 536870912 ,
UI = 4194304 ,
UL = 8388608 ,
UN = 16777216 ,
UR = 1073741824 ,
US = 33554432 ,
UT = 67108864 ,
UV = 8589934592 ,
OB_OW = OB | OW ,
US_SS = US | SS ,
US_SS_OW = US | SS | OW ,
US_OW = US | OW ,
VL16 = AE | AS | AT | CS | DA | DS | DT | FD | FL | IS | LO | LT | PN | SH | SL | SS | ST | TM | UI | UL | US ,
VL32 = OB | OW | OD | OF | OL | OV | SQ | SV | UC | UN | UR | UT | UV ,
VRASCII = AE | AS | CS | DA | DS | DT | IS | LO | LT | PN | SH | ST | TM | UC | UI | UR | UT ,
VRBINARY = AT | FL | FD | OB | OD | OF | OL | OV | OW | SL | SQ | SS | SV | UL | UN | US | UV ,
VR_VM1 = AS | LT | ST | UT | SQ | OF | OL | OV | OD | OW | OB | UN ,
VRALL = VRASCII | VRBINARY ,
VR_END = UV+1 }

```

## Public Member Functions

- [VR](#) ([VRType](#) vr=[INVALID](#))
- bool [Compatible](#) ([VR](#) const &vr) const
- int [GetLength](#) () const
- unsigned int [GetSize](#) () const
- unsigned int [GetSizeof](#) () const
- bool [IsDual](#) () const
- bool [IsVRFile](#) () const
- operator [VRType](#) () const
- std::istream & [Read](#) (std::istream &is)
- const std::ostream & [Write](#) (std::ostream &os) const

## Static Public Member Functions

- static bool [CanDisplay](#) ([VRType](#) vr)
- static uint32\_t [GetLength](#) ([VRType](#) vr)
- static const char \* [GetVRString](#) ([VRType](#) vr)
- static const char \* [GetVRStringFromFile](#) ([VRType](#) vr)

- static [VRType](#) [GetVRType](#) (const char \*vr)
- static [VRType](#) [GetVRTypeFromFile](#) (const char \*vr)
- static bool [IsASCII](#) ([VRType](#) vr)
- static bool [IsASCII2](#) ([VRType](#) vr)
- static bool [IsBinary](#) ([VRType](#) vr)
- static bool [IsBinary2](#) ([VRType](#) vr)
- static bool [IsSwap](#) (const char \*vr)
- static bool [IsValid](#) (const char \*vr)
- static bool [IsValid](#) (const char \*vr1, [VRType](#) vr2)

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [VR](#) &vr)

## 12.377.1 Detailed Description

[VR](#) class.

This is adapted from DICOM standard The biggest difference is the INVALID [VR](#) and the composite one that differ from standard (more like an addition) This allow us to represent all the possible case express in the DICOMV3 dict

### Note

VALUE REPRESENTATION ([VR](#)) Specifies the data type and format of the Value(s) contained in the [Value](#) Field of a Data [Element](#). VALUE REPRESENTATION FIELD: The field where the [Value](#) Representation of a Data [Element](#) is stored in the encoding of a Data [Element](#) structure with explicit [VR](#).

### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), and [SimplePrint.cs](#).

## 12.377.2 Member Enumeration Documentation

### 12.377.2.1 VRType

```
enum gdcm::VR::VRType : long long
```

#### Enumerator

INVALID	
AE	
AS	
AT	

CS	
DA	
DS	
DT	
FD	
FL	
IS	
LO	
LT	
OB	
OD	
OF	
OL	
OV	
OW	
PN	
SH	
SL	
SQ	
SS	
ST	
SV	
TM	
UC	
UI	
UL	
UN	
UR	
US	
UT	
UV	
OB_OW	
US_SS	
US_SS_OW	
US_OW	
VL16	
VL32	
VRASCII	
VRBINARY	



VR_VM1	
VRALL	
VR_END	

#### Examples

[NewSequence.cs](#), and [SimplePrint.cs](#).

## 12.377.3 Constructor & Destructor Documentation

### 12.377.3.1 VR()

```
gdcmm::VR::VR (
    VRType vr = INVALID) [inline]
```

References [INVALID](#).

Referenced by [Compatible\(\)](#), and [operator<<](#).

## 12.377.4 Member Function Documentation

### 12.377.4.1 CanDisplay()

```
bool gdcmm::VR::CanDisplay (
    VRType vr) [static]
```

### 12.377.4.2 Compatible()

```
bool gdcmm::VR::Compatible (
    VR const & vr) const
```

#### Examples

[SimplePrint.cs](#).

References [VR\(\)](#).

### 12.377.4.3 GetLength() [1/2]

```
int gdcmm::VR::GetLength () const [inline]
```

References [GetLength\(\)](#).

Referenced by [GetLength\(\)](#).

#### 12.377.4.4 GetLength() [2/2]

```
uint32_t gdcm::VR::GetLength (
    VRType vr) [inline], [static]
```

References [VL32](#).

#### 12.377.4.5 GetSize()

```
unsigned int gdcm::VR::GetSize () const [inline]
```

References [AE](#), [AS](#), [AT](#), [CS](#), [DA](#), [DS](#), [DT](#), [FD](#), [FL](#), [INVALID](#), [IS](#), [LO](#), [LT](#), [OB](#), [OB\\_OW](#), [OD](#), [OF](#), [OL](#), [OV](#), [OW](#), [PN](#), [SH](#), [SL](#), [SQ](#), [SS](#), [ST](#), [SV](#), [TM](#), [UC](#), [UI](#), [UL](#), [UN](#), [UR](#), [US](#), [US\\_OW](#), [US\\_SS](#), [US\\_SS\\_OW](#), [UT](#), [UV](#), [VL16](#), [VL32](#), [VR\\_END](#), [VR\\_VM1](#), [VRALL](#), [VRASCII](#), [VRBINARY](#), and [VRTypeTemplateCase](#).

#### 12.377.4.6 GetSizeof()

```
unsigned int gdcm::VR::GetSizeof () const
```

#### 12.377.4.7 GetVRString()

```
const char * gdcm::VR::GetVRString (
    VRType vr) [static]
```

Referenced by [operator<<](#), and [Write\(\)](#).

#### 12.377.4.8 GetVRStringFromFile()

```
const char * gdcm::VR::GetVRStringFromFile (
    VRType vr) [static]
```

#### 12.377.4.9 GetVRType()

```
VRType gdcm::VR::GetVRType (
    const char * vr) [static]
```

#### 12.377.4.10 GetVRTypeFromFile()

```
VRType gdcm::VR::GetVRTypeFromFile (
    const char * vr) [static]
```

Referenced by [Read\(\)](#).

#### 12.377.4.11 IsASCII()

```
bool gdcm::VR::IsASCII (
    VRType vr) [static]
```

#### 12.377.4.12 IsASCII2()

```
bool gdcm::VR::IsASCII2 (
    VRType vr) [static]
```

#### 12.377.4.13 IsBinary()

```
bool gdcm::VR::IsBinary (
    VRType vr) [static]
```

#### 12.377.4.14 IsBinary2()

```
bool gdcm::VR::IsBinary2 (
    VRType vr) [static]
```

#### 12.377.4.15 IsDual()

```
bool gdcm::VR::IsDual () const
```

Referenced by [Write\(\)](#).

#### 12.377.4.16 IsSwap()

```
bool gdcm::VR::IsSwap (
    const char * vr) [static]
```

#### 12.377.4.17 IsValid() [1/2]

```
bool gdcm::VR::IsValid (
    const char * vr) [static]
```

#### 12.377.4.18 IsValid() [2/2]

```
bool gdcm::VR::IsValid (
    const char * vr1,
    VRType vr2) [static]
```

#### 12.377.4.19 IsVRFile()

```
bool gdcM::VR::IsVRFile () const
```

Referenced by [gdcM::DataElement::SetVR\(\)](#).

#### 12.377.4.20 operator VRType()

```
gdcM::VR::operator VRType () const [inline]
```

#### 12.377.4.21 Read()

```
std::istream & gdcM::VR::Read (  
    std::istream & is) [inline]
```

References [gdcMDebugMacro](#), [GetVRTypeFromFile\(\)](#), [INVALID](#), [VL32](#), and [VR\\_END](#).

#### 12.377.4.22 Write()

```
const std::ostream & gdcM::VR::Write (  
    std::ostream & os) const [inline]
```

References [gdcMAssertAlwaysMacro](#), [GetVRString\(\)](#), [INVALID](#), [IsDual\(\)](#), and [VL32](#).

### 12.377.5 Friends And Related Symbol Documentation

#### 12.377.5.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & os,  
    const VR & vr) [friend]
```

References [VR\(\)](#), and [GetVRString\(\)](#).

The documentation for this class was generated from the following file:

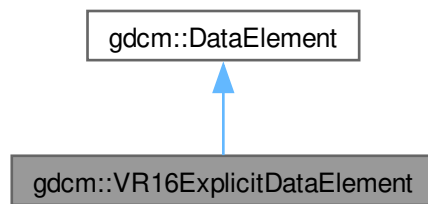
- [gdcMVR.h](#)

## 12.378 gdcm::VR16ExplicitDataElement Class Reference

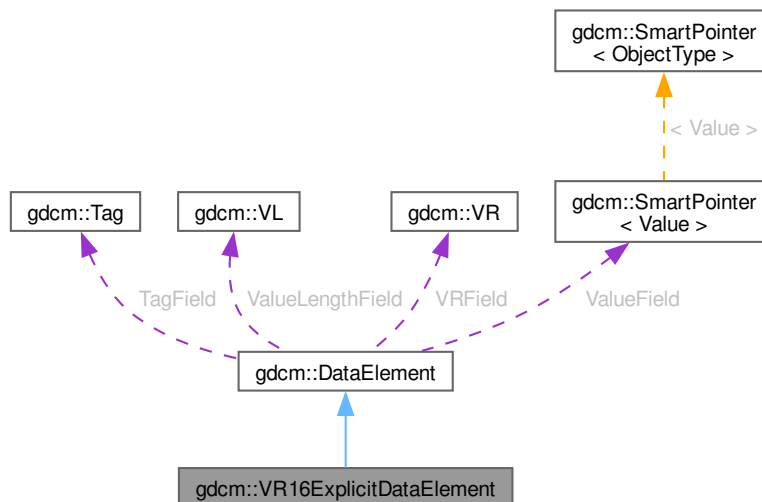
Class to read/write a [DataElement](#) as Explicit Data [Element](#).

```
#include <gdcmVR16ExplicitDataElement.h>
```

Inheritance diagram for gdcm::VR16ExplicitDataElement:



Collaboration diagram for gdcm::VR16ExplicitDataElement:



### Public Member Functions

- [VL GetLength](#) () const

- template<typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap>  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)

## Public Member Functions inherited from [gdcm::DataElement](#)

- [DataElement](#) (const DataElement &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()  
*Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#)).*
- void [Empty](#) ()  
*Make Data [Element](#) empty (no [Value](#)).*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE>  
[VL](#) [GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const
- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const  
*Get [Tag](#).*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const  
*Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const  
*Get [VL](#).*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const  
*Check if Data [Element](#) is empty.*
- bool [IsUndefinedLength](#) () const  
*return if [Value](#) Length if of undefined length*
- bool [operator<](#) (const [DataElement](#) &de) const
- [DataElement](#) & [operator=](#) (const [DataElement](#) &)=default
- bool [operator==](#) (const [DataElement](#) &de) const
- template<typename TDE, typename TSwap>  
std::istream & [Read](#) (std::istream &is)
- template<typename TDE, typename TSwap>  
std::istream & [ReadOrSkip](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadPreValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadValue](#) (std::istream &is, std::set< [Tag](#) > const &skiptags)

- template<typename TDE, typename TSwap>  
std::istream & [ReadValueWithLength](#) (std::istream &is, [VL](#) &length, std::set< [Tag](#) > const &skiptags)
- template<typename TDE, typename TSwap>  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)
- void [SetByteValue](#) (const char \*array, [VL](#) length)
- void [SetTag](#) (const [Tag](#) &t)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVL](#) (const [VL](#) &vl)
- void [SetVLToUndefined](#) ()
- void [SetVR](#) ([VR](#) const &vr)
- template<typename TDE, typename TSwap>  
const std::ostream & [Write](#) (std::ostream &os) const

### Additional Inherited Members

### Protected Types inherited from [gdcm::DataElement](#)

- typedef [SmartPointer](#)< [Value](#) > [ValuePtr](#)

### Protected Member Functions inherited from [gdcm::DataElement](#)

- void [SetValueFieldLength](#) ([VL](#) vl, bool readvalues)

### Protected Attributes inherited from [gdcm::DataElement](#)

- [Tag](#) TagField
- [ValuePtr](#) ValueField
- [VL](#) ValueLengthField
- [VR](#) VRField

## 12.378.1 Detailed Description

Class to read/write a [DataElement](#) as Explicit Data [Element](#).

#### Note

This class support 16 bits when finding an unknown [VR](#): For instance: Siemens\_CT\_Sensation64\_has\_VR\_RT.↔  
dcm

## 12.378.2 Member Function Documentation

### 12.378.2.1 GetLength()

[VL](#) [gdcm::VR16ExplicitDataElement::GetLength](#) () const

### 12.378.2.2 Read()

```
template<typename TSwap>
std::istream & gdc::VR16ExplicitDataElement::Read (
    std::istream & is)
```

### 12.378.2.3 ReadPreValue()

```
template<typename TSwap>
std::istream & gdc::VR16ExplicitDataElement::ReadPreValue (
    std::istream & is)
```

### 12.378.2.4 ReadValue()

```
template<typename TSwap>
std::istream & gdc::VR16ExplicitDataElement::ReadValue (
    std::istream & is,
    bool readvalues = true)
```

### 12.378.2.5 ReadWithLength()

```
template<typename TSwap>
std::istream & gdc::VR16ExplicitDataElement::ReadWithLength (
    std::istream & is,
    VL & length)
```

The documentation for this class was generated from the following file:

- [gdc::VR16ExplicitDataElement.h](#)

## 12.379 gdc::VRToEncoding< T > Struct Template Reference

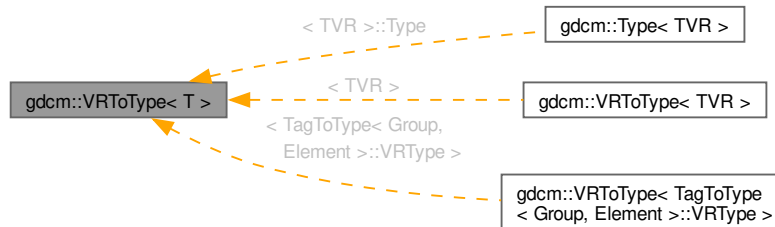
The documentation for this struct was generated from the following file:

- [gdc::VR.h](#)



## 12.380 gdcM::VRToType< T > Struct Template Reference

Inheritance diagram for gdcM::VRToType< T >:



### 12.380.1 Detailed Description

```
template<long long T>
struct gdcM::VRToType< T >
```

Examples

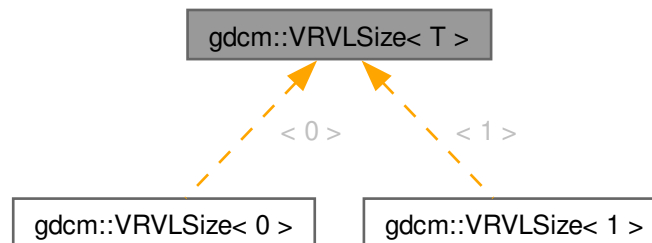
[DumpGEMSMovieGroup.cxx](#).

The documentation for this struct was generated from the following file:

- [gdcMVR.h](#)

## 12.381 gdcM::VRVLSIZE< T > Class Template Reference

Inheritance diagram for gdcM::VRVLSIZE< T >:



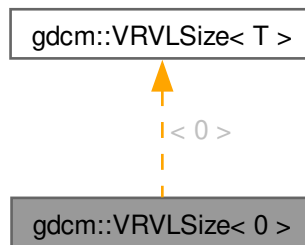
The documentation for this class was generated from the following file:

- [gdcMAttribute.h](#)

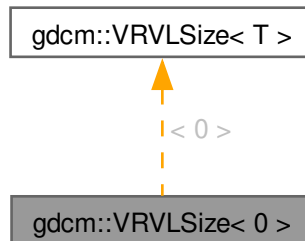
## 12.382 gdc::VRVLSIZE< 0 > Class Reference

```
#include <gdcAttribute.h>
```

Inheritance diagram for gdc::VRVLSIZE< 0 >:



Collaboration diagram for gdc::VRVLSIZE< 0 >:



### Static Public Member Functions

- static uint16\_t [Read](#) (std::istream &\_is)
- static void [Write](#) (std::ostream &os)

## 12.382.1 Member Function Documentation

### 12.382.1.1 Read()

```
uint16_t gdc::VRVLSIZE< 0 >::Read (
    std::istream &_is) [inline], [static]
```

### 12.382.1.2 Write()

```
void gdcmm::VRVLSIZE< 0 >::Write (
    std::ostream & os) [inline], [static]
```

The documentation for this class was generated from the following file:

- [gdcmmAttribute.h](#)

## 12.383 gdcmm::VRVLSIZE< 1 > Class Reference

```
#include <gdcmmAttribute.h>
```

Inheritance diagram for gdcmm::VRVLSIZE< 1 >:



Collaboration diagram for gdcmm::VRVLSIZE< 1 >:



### Static Public Member Functions

- static uint32\_t [Read](#) (std::istream &\_is)
- static void [Write](#) (std::ostream &os)

## 12.383.1 Member Function Documentation

### 12.383.1.1 Read()

```
uint32_t gdcM::VRVLSize< 1 >::Read (  
    std::istream & _is) [inline], [static]
```

### 12.383.1.2 Write()

```
void gdcM::VRVLSize< 1 >::Write (  
    std::ostream & os) [inline], [static]
```

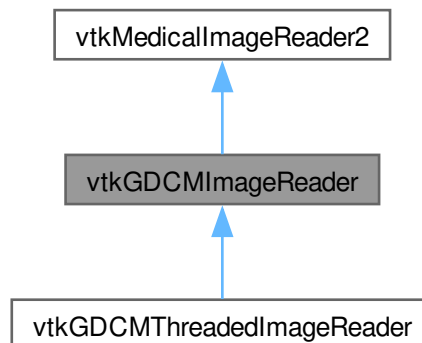
The documentation for this class was generated from the following file:

- [gdcMAttribute.h](#)

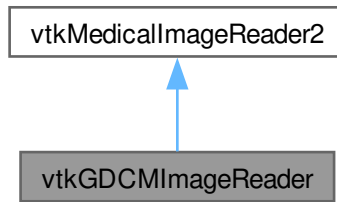
## 12.384 vtkGDCMImageReader Class Reference

```
#include <vtkGDCMImageReader.h>
```

Inheritance diagram for vtkGDCMImageReader:



Collaboration diagram for vtkGDCMImageReader:



### Public Member Functions

- virtual int [CanReadFile](#) (const char \*fname)
- virtual const char \* [GetDescriptiveName](#) ()
- virtual const char \* [GetFileExtensions](#) ()
- vtkImageData \* [GetIconImage](#) ()
- vtkImageData \* [GetOverlay](#) (int i)
- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetCurve](#) (vtkPolyData \*pd)
- virtual void [SetFileNames](#) (vtkStringArray \*)
- virtual void [SetMedicalImageProperties](#) (vtkMedicalImageProperties \*pd)
- [vtkBooleanMacro](#) ([ApplyLookupTable](#), int)
- int [vtkBooleanMacro](#) ([ApplyYBRToRGB](#), int)
- [vtkBooleanMacro](#) ([LoadIconImage](#), int)
- [vtkBooleanMacro](#) ([LoadOverlays](#), int)
- [vtkBooleanMacro](#) ([LossyFlag](#), int)
- [vtkGetMacro](#) ([ApplyLookupTable](#), int)
- [vtkGetMacro](#) ([ApplyYBRToRGB](#), int) [vtkSetMacro](#)([ApplyYBRToRGB](#)
- [vtkGetMacro](#) ([ImageFormat](#), int)
- [vtkGetMacro](#) ([LoadIconImage](#), int)
- [vtkGetMacro](#) ([LoadOverlays](#), int)
- [vtkGetMacro](#) ([LossyFlag](#), int)
- [vtkGetMacro](#) ([NumberOfIconImages](#), int)
- [vtkGetMacro](#) ([NumberOfOverlays](#), int)
- [vtkGetMacro](#) ([PlanarConfiguration](#), int)
- [vtkGetMacro](#) ([Scale](#), double)
- [vtkGetMacro](#) ([Shift](#), double)
- [vtkGetObjectMacro](#) ([Curve](#), vtkPolyData)
- [vtkGetObjectMacro](#) ([DirectionCosines](#), vtkMatrix4x4)
- [vtkGetObjectMacro](#) ([FileNames](#), vtkStringArray)
- [vtkGetObjectMacro](#) ([MedicalImageProperties](#), vtkMedicalImageProperties)
- [vtkGetVector3Macro](#) ([ImagePositionPatient](#), double)
- [vtkGetVector6Macro](#) ([ImageOrientationPatient](#), double)
- [vtkSetMacro](#) ([ApplyLookupTable](#), int)

- [vtkSetMacro](#) ([LoadIconImage](#), int)
- [vtkSetMacro](#) ([LoadOverlays](#), int)
- [vtkSetMacro](#) ([LossyFlag](#), int)
- [vtkTypeMacro](#) ([vtkGDCMImageReader](#), [vtkMedicalImageReader2](#))

### Static Public Member Functions

- static [vtkGDCMImageReader](#) \* [New](#) ()

### Protected Member Functions

- [vtkGDCMImageReader](#) ()
- [~vtkGDCMImageReader](#) ()
- void [ExecuteData](#) ([vtkDataObject](#) \*out)
- void [ExecuteInformation](#) ()
- void [FillMedicalImageInformation](#) (const [gdcm::ImageReader](#) &reader)
- int [LoadSingleFile](#) (const char \*filename, char \*pointer, unsigned long &outlen)
- int [RequestDataCompat](#) ()
- int [RequestInformationCompat](#) ()
- void [SetFilePattern](#) (const char \*)
- void [SetFilePrefix](#) (const char \*)
- [vtkGetStringMacro](#) (FilePattern)
- [vtkGetStringMacro](#) (FilePrefix)
- [vtkSetVector6Macro](#) ([ImageOrientationPatient](#), double)

### Protected Attributes

- int [ApplyInverseVideo](#)
- int [ApplyLookupTable](#)
- int [ApplyPlanarConfiguration](#)
- int [ApplyShiftScale](#)
- int [ApplyYBRTToRGB](#)
- [vtkPolyData](#) \* [Curve](#)
- [vtkMatrix4x4](#) \* [DirectionCosines](#)
- [vtkStringArray](#) \* [FileNames](#)
- int [ForceRescale](#)
- int [IconDataScalarType](#)
- int [IconImageDataExtent](#) [6]
- int [IconNumberOfScalarComponents](#)
- int [ImageFormat](#)
- double [ImageOrientationPatient](#) [6]
- double [ImagePositionPatient](#) [3]
- int [LoadIconImage](#)
- int [LoadOverlays](#)
- int [LossyFlag](#)
- [vtkMedicalImageProperties](#) \* [MedicalImageProperties](#)
- int [NumberOfIconImages](#)
- int [NumberOfOverlays](#)
- int [PlanarConfiguration](#)
- double [Scale](#)
- double [Shift](#)

## 12.384.1 Detailed Description

### Examples

[AWTMedical3.java](#), [Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [HelloActiviz.cs](#), [HelloActiviz2.cs](#), [HelloActiviz3.cs](#), [HelloActiviz4.cs](#), [HelloActiviz5.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld.java](#), [MIPViewer.java](#), [MPRViewer.java](#), [MPRViewer2.java](#), [MagnifyFile.cxx](#), [MetaImageMD5Activiz.cs](#), [ReadSeriesIntoVTK.java](#), [RefCounting.cs](#), [gdcmmorthoplanes.cxx](#), [gdcmmreslice.cxx](#), [gdcmmtexture.cxx](#), [gdcmmvolume.cxx](#), and [offscreenimage.cxx](#).

## 12.384.2 Constructor & Destructor Documentation

### 12.384.2.1 vtkGDCMImageReader()

```
vtkGDCMImageReader::vtkGDCMImageReader () [protected]
```

### Examples

[HelloActiviz2.cs](#).

References [vtkGDCMImageReader\(\)](#).

Referenced by [vtkGDCMImageReader\(\)](#), [~vtkGDCMImageReader\(\)](#), [New\(\)](#), [vtkGetStringMacro\(\)](#), [vtkTypeMacro\(\)](#), and [vtkGDCMThreadedImageReader::vtkTypeMacro\(\)](#).

### 12.384.2.2 ~vtkGDCMImageReader()

```
vtkGDCMImageReader::~~vtkGDCMImageReader () [protected]
```

References [vtkGDCMImageReader\(\)](#).

## 12.384.3 Member Function Documentation

### 12.384.3.1 CanReadFile()

```
virtual int vtkGDCMImageReader::CanReadFile (  
    const char * fname) [virtual]
```

### Examples

[AWTMedical3.java](#), and [MetaImageMD5Activiz.cs](#).

### 12.384.3.2 ExecuteData()

```
void vtkGDCMImageReader::ExecuteData (
    vtkDataObject * out) [protected]
```

### 12.384.3.3 ExecuteInformation()

```
void vtkGDCMImageReader::ExecuteInformation () [protected]
```

### 12.384.3.4 FillMedicalImageInformation()

```
void vtkGDCMImageReader::FillMedicalImageInformation (
    const gdcm::ImageReader & reader) [protected]
```

References [FillMedicalImageInformation\(\)](#).

Referenced by [FillMedicalImageInformation\(\)](#).

### 12.384.3.5 GetDescriptiveName()

```
virtual const char * vtkGDCMImageReader::GetDescriptiveName () [inline], [virtual]
```

### 12.384.3.6 GetFileExtensions()

```
virtual const char * vtkGDCMImageReader::GetFileExtensions () [inline], [virtual]
```

### 12.384.3.7 GetIconImage()

```
vtkImageData * vtkGDCMImageReader::GetIconImage ()
```

### 12.384.3.8 GetOverlay()

```
vtkImageData * vtkGDCMImageReader::GetOverlay (
    int i)
```

### 12.384.3.9 LoadSingleFile()

```
int vtkGDCMImageReader::LoadSingleFile (
    const char * filename,
    char * pointer,
    unsigned long & outlen) [protected]
```



### 12.384.3.10 New()

```
vtkGDCMImageReader * vtkGDCMImageReader::New () [static]
```

#### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [HelloActiviz.cs](#), [HelloActiviz3.cs](#), [HelloActiviz4.cs](#), [HelloActiviz5.cs](#), [HelloVTKWorld.cs](#), [MagnifyFile.cxx](#), [MetaImageMD5Activiz.cs](#), [RefCounting.cs](#), [gdcmmorthoplanes.cxx](#), [gdcmreslice.cxx](#), [gdcmttexture.cxx](#), [gdcmvolume.cxx](#), [offscreenimage.cxx](#), and [reslicesphere.cxx](#).

References [vtkGDCMImageReader\(\)](#).

### 12.384.3.11 PrintSelf()

```
virtual void vtkGDCMImageReader::PrintSelf (
    ostream & os,
    vtkIndent indent) [virtual]
```

Reimplemented in [vtkGDCMThreadedImageReader](#).

### 12.384.3.12 RequestDataCompat()

```
int vtkGDCMImageReader::RequestDataCompat () [protected]
```

References [RequestDataCompat\(\)](#).

Referenced by [RequestDataCompat\(\)](#).

### 12.384.3.13 RequestInformationCompat()

```
int vtkGDCMImageReader::RequestInformationCompat () [protected]
```

References [RequestInformationCompat\(\)](#).

Referenced by [RequestInformationCompat\(\)](#).

### 12.384.3.14 SetCurve()

```
virtual void vtkGDCMImageReader::SetCurve (
    vtkPolyData * pd) [virtual]
```

References [SetCurve\(\)](#).

Referenced by [SetCurve\(\)](#).

### 12.384.3.15 SetFileNames()

```
virtual void vtkGDCMImageReader::SetFileNames (
    vtkStringArray * ) [virtual]
```

#### Examples

[AWTMedical3.java](#), [HelloActiviz3.cs](#), [HelloActiviz4.cs](#), [HelloActiviz5.cs](#), [MIPViewer.java](#), [MPRViewer.java](#), [MPRViewer2.java](#), [ReadSeriesIntoVTK.java](#), and [gdcmmorthoplanes.cxx](#).

### 12.384.3.16 SetFilePattern()

```
void vtkGDCMImageReader::SetFilePattern (
    const char * ) [inline], [protected]
```

### 12.384.3.17 SetFilePrefix()

```
void vtkGDCMImageReader::SetFilePrefix (
    const char * ) [inline], [protected]
```

### 12.384.3.18 SetMedicalImageProperties()

```
virtual void vtkGDCMImageReader::SetMedicalImageProperties (
    vtkMedicalImageProperties * pd) [virtual]
```

### 12.384.3.19 vtkBooleanMacro() [1/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
    ApplyLookupTable ,
    int )
```

References [ApplyLookupTable](#).

### 12.384.3.20 vtkBooleanMacro() [2/5]

```
int vtkGDCMImageReader::vtkBooleanMacro (
    ApplyYBRToRGB ,
    int )
```

References [ApplyYBRToRGB](#), and [vtkBooleanMacro\(\)](#).

**12.384.3.21 vtkBooleanMacro()** [3/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
    LoadIconImage ,
    int )
```

References [LoadIconImage](#).

**12.384.3.22 vtkBooleanMacro()** [4/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
    LoadOverlays ,
    int )
```

References [LoadOverlays](#).

Referenced by [vtkBooleanMacro\(\)](#).

**12.384.3.23 vtkBooleanMacro()** [5/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
    LossyFlag ,
    int )
```

References [LossyFlag](#).

**12.384.3.24 vtkGetMacro()** [1/11]

```
vtkGDCMImageReader::vtkGetMacro (
    ApplyLookupTable ,
    int )
```

References [ApplyLookupTable](#).

**12.384.3.25 vtkGetMacro()** [2/11]

```
vtkGDCMImageReader::vtkGetMacro (
    ApplyYBRToRGB ,
    int )
```

References [ApplyYBRToRGB](#), and [vtkSetMacro\(\)](#).

**12.384.3.26 vtkGetMacro()** [3/11]

```
vtkGDCMImageReader::vtkGetMacro (
    ImageFormat ,
    int )
```

References [ImageFormat](#), and [vtkGetMacro\(\)](#).

**12.384.3.27 vtkGetMacro()** [4/11]

```
vtkGDCMImageReader::vtkGetMacro (
    LoadIconImage ,
    int )
```

References [LoadIconImage](#).

**12.384.3.28 vtkGetMacro()** [5/11]

```
vtkGDCMImageReader::vtkGetMacro (
    LoadOverlays ,
    int )
```

References [LoadOverlays](#).

Referenced by [vtkGetMacro\(\)](#), [vtkGetMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkGetMacro\(\)](#).

**12.384.3.29 vtkGetMacro()** [6/11]

```
vtkGDCMImageReader::vtkGetMacro (
    LossyFlag ,
    int )
```

References [LossyFlag](#).

**12.384.3.30 vtkGetMacro()** [7/11]

```
vtkGDCMImageReader::vtkGetMacro (
    NumberOfIconImages ,
    int )
```

References [NumberOfIconImages](#).

**12.384.3.31 vtkGetMacro()** [8/11]

```
vtkGDCMImageReader::vtkGetMacro (
    NumberOfOverlays ,
    int )
```

References [NumberOfOverlays](#).

**12.384.3.32 vtkGetMacro()** [9/11]

```
vtkGDCMImageReader::vtkGetMacro (
    PlanarConfiguration ,
    int )
```

References [PlanarConfiguration](#), and [vtkGetMacro\(\)](#).

**12.384.3.33 vtkGetMacro()** [10/11]

```
vtkGDCMImageReader::vtkGetMacro (
    Scale ,
    double )
```

References [Scale](#), and [vtkGetMacro\(\)](#).

**12.384.3.34 vtkGetMacro()** [11/11]

```
vtkGDCMImageReader::vtkGetMacro (
    Shift ,
    double )
```

References [Shift](#), and [vtkGetMacro\(\)](#).

**12.384.3.35 vtkGetObjectMacro()** [1/4]

```
vtkGDCMImageReader::vtkGetObjectMacro (
    Curve ,
    vtkPolyData )
```

References [Curve](#), and [vtkGetObjectMacro\(\)](#).

**12.384.3.36 vtkGetObjectMacro()** [2/4]

```
vtkGDCMImageReader::vtkGetObjectMacro (
    DirectionCosines ,
    vtkMatrix4x4 )
```

References [DirectionCosines](#).

Referenced by [vtkGetObjectMacro\(\)](#).

**12.384.3.37 vtkGetObjectMacro() [3/4]**

```
vtkGDCMImageReader::vtkGetObjectMacro (
    FileNames ,
    vtkStringArray )
```

References [FileNames](#).

**12.384.3.38 vtkGetObjectMacro() [4/4]**

```
vtkGDCMImageReader::vtkGetObjectMacro (
    MedicalImageProperties ,
    vtkMedicalImageProperties )
```

References [MedicalImageProperties](#).

**12.384.3.39 vtkGetStringMacro() [1/2]**

```
vtkGDCMImageReader::vtkGetStringMacro (
    FilePattern ) [protected]
```

References [vtkGDCMImageReader\(\)](#).

**12.384.3.40 vtkGetStringMacro() [2/2]**

```
vtkGDCMImageReader::vtkGetStringMacro (
    FilePrefix ) [protected]
```

**12.384.3.41 vtkGetVector3Macro()**

```
vtkGDCMImageReader::vtkGetVector3Macro (
    ImagePositionPatient ,
    double )
```

References [ImagePositionPatient](#), and [vtkGetVector3Macro\(\)](#).

Referenced by [vtkGetVector3Macro\(\)](#).

**12.384.3.42 vtkGetVector6Macro()**

```
vtkGDCMImageReader::vtkGetVector6Macro (
    ImageOrientationPatient ,
    double )
```

References [ImageOrientationPatient](#), and [vtkGetVector6Macro\(\)](#).

Referenced by [vtkGetVector6Macro\(\)](#).

**12.384.3.43 vtkSetMacro() [1/4]**

```
vtkGDCMImageReader::vtkSetMacro (
    ApplyLookupTable ,
    int )
```

References [ApplyLookupTable](#).

**12.384.3.44 vtkSetMacro() [2/4]**

```
vtkGDCMImageReader::vtkSetMacro (
    LoadIconImage ,
    int )
```

References [LoadIconImage](#).

**12.384.3.45 vtkSetMacro() [3/4]**

```
vtkGDCMImageReader::vtkSetMacro (
    LoadOverlays ,
    int )
```

References [LoadOverlays](#).

Referenced by [vtkGetMacro\(\)](#).

**12.384.3.46 vtkSetMacro() [4/4]**

```
vtkGDCMImageReader::vtkSetMacro (
    LossyFlag ,
    int )
```

References [LossyFlag](#).

**12.384.3.47 vtkSetVector6Macro()**

```
vtkGDCMImageReader::vtkSetVector6Macro (
    ImageOrientationPatient ,
    double ) [protected]
```

References [ImageOrientationPatient](#), and [vtkSetVector6Macro\(\)](#).

Referenced by [vtkSetVector6Macro\(\)](#).

#### 12.384.3.48 vtkTypeMacro()

```
vtkGDCMImageReader::vtkTypeMacro (
    vtkGDCMImageReader ,
    vtkMedicalImageReader2 )
```

References [vtkGDCMImageReader\(\)](#).

### 12.384.4 Member Data Documentation

#### 12.384.4.1 ApplyInverseVideo

```
int vtkGDCMImageReader::ApplyInverseVideo [protected]
```

#### 12.384.4.2 ApplyLookupTable

```
int vtkGDCMImageReader::ApplyLookupTable [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

#### 12.384.4.3 ApplyPlanarConfiguration

```
int vtkGDCMImageReader::ApplyPlanarConfiguration [protected]
```

#### 12.384.4.4 ApplyShiftScale

```
int vtkGDCMImageReader::ApplyShiftScale [protected]
```

#### 12.384.4.5 ApplyYBRToRGB

```
int vtkGDCMImageReader::ApplyYBRToRGB [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), and [vtkGetMacro\(\)](#).

#### 12.384.4.6 Curve

```
vtkPolyData* vtkGDCMImageReader::Curve [protected]
```

Referenced by [vtkGetObjectMacro\(\)](#).



#### 12.384.4.7 DirectionCosines

`vtkMatrix4x4* vtkGDCMImageReader::DirectionCosines [protected]`

Referenced by [vtkGetObjectMacro\(\)](#).

#### 12.384.4.8 FileNames

`vtkStringArray* vtkGDCMImageReader::FileNames [protected]`

Referenced by [vtkGetObjectMacro\(\)](#).

#### 12.384.4.9 ForceRescale

`int vtkGDCMImageReader::ForceRescale [protected]`

#### 12.384.4.10 IconDataScalarType

`int vtkGDCMImageReader::IconDataScalarType [protected]`

#### 12.384.4.11 IconImageDataExtent

`int vtkGDCMImageReader::IconImageDataExtent[6] [protected]`

#### 12.384.4.12 IconNumberOfScalarComponents

`int vtkGDCMImageReader::IconNumberOfScalarComponents [protected]`

#### 12.384.4.13 ImageFormat

`int vtkGDCMImageReader::ImageFormat [protected]`

Referenced by [vtkGetMacro\(\)](#).

#### 12.384.4.14 ImageOrientationPatient

`double vtkGDCMImageReader::ImageOrientationPatient[6] [protected]`

Referenced by [vtkGetVector6Macro\(\)](#), and [vtkSetVector6Macro\(\)](#).

**12.384.4.15 ImagePositionPatient**

```
double vtkGDCMImageReader::ImagePositionPatient[3] [protected]
```

Referenced by [vtkGetVector3Macro\(\)](#).

**12.384.4.16 LoadIconImage**

```
int vtkGDCMImageReader::LoadIconImage [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

**12.384.4.17 LoadOverlays**

```
int vtkGDCMImageReader::LoadOverlays [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

**12.384.4.18 LossyFlag**

```
int vtkGDCMImageReader::LossyFlag [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

**12.384.4.19 MedicalImageProperties**

```
vtkMedicalImageProperties* vtkGDCMImageReader::MedicalImageProperties [protected]
```

Referenced by [vtkGetObjectMacro\(\)](#).

**12.384.4.20 NumberOfIconImages**

```
int vtkGDCMImageReader::NumberOfIconImages [protected]
```

Referenced by [vtkGetMacro\(\)](#).

**12.384.4.21 NumberOfOverlays**

```
int vtkGDCMImageReader::NumberOfOverlays [protected]
```

Referenced by [vtkGetMacro\(\)](#).

#### 12.384.4.22 PlanarConfiguration

```
int vtkGDCMImageReader2::PlanarConfiguration [protected]
```

Referenced by [vtkGetMacro\(\)](#).

#### 12.384.4.23 Scale

```
double vtkGDCMImageReader2::Scale [protected]
```

Referenced by [vtkGetMacro\(\)](#), and [vtkGDCMThreadedImageReader2::vtkSetMacro\(\)](#).

#### 12.384.4.24 Shift

```
double vtkGDCMImageReader2::Shift [protected]
```

Referenced by [vtkGetMacro\(\)](#), and [vtkGDCMThreadedImageReader2::vtkSetMacro\(\)](#).

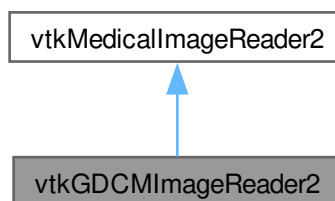
The documentation for this class was generated from the following file:

- [vtkGDCMImageReader.h](#)

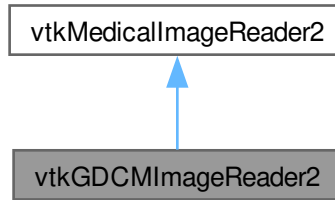
## 12.385 vtkGDCMImageReader2 Class Reference

```
#include <vtkGDCMImageReader2.h>
```

Inheritance diagram for vtkGDCMImageReader2:



Collaboration diagram for vtkGDCMImageReader2:



### Public Member Functions

- virtual int [CanReadFile](#) (const char \*fname)
- virtual const char \* [GetDescriptiveName](#) ()
- virtual const char \* [GetFileExtensions](#) ()
- vtkImageData \* [GetIconImage](#) ()
- vtkAlgorithmOutput \* [GetIconImagePort](#) ()
- vtkImageData \* [GetOverlay](#) (int i)
- vtkAlgorithmOutput \* [GetOverlayPort](#) (int index)
- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetCurve](#) (vtkPolyData \*pd)
- virtual void [SetMedicalImageProperties](#) (vtkMedicalImageProperties \*pd)
- [vtkBooleanMacro](#) ([ApplyLookupTable](#), int)
- int [vtkBooleanMacro](#) ([ApplyYBRToRGB](#), int)
- [vtkBooleanMacro](#) ([LoadIconImage](#), int)
- [vtkBooleanMacro](#) ([LoadOverlays](#), int)
- [vtkBooleanMacro](#) ([LossyFlag](#), int)
- [vtkGetMacro](#) ([ApplyLookupTable](#), int)
- [vtkGetMacro](#) ([ApplyYBRToRGB](#), int) [vtkSetMacro](#)([ApplyYBRToRGB](#)
- [vtkGetMacro](#) ([ImageFormat](#), int)
- [vtkGetMacro](#) ([LoadIconImage](#), int)
- [vtkGetMacro](#) ([LoadOverlays](#), int)
- [vtkGetMacro](#) ([LossyFlag](#), int)
- [vtkGetMacro](#) ([NumberOfIconImages](#), int)
- [vtkGetMacro](#) ([NumberOfOverlays](#), int)
- [vtkGetMacro](#) ([PlanarConfiguration](#), int)
- [vtkGetMacro](#) ([Scale](#), double)
- [vtkGetMacro](#) ([Shift](#), double)
- [vtkGetObjectMacro](#) ([Curve](#), vtkPolyData)
- [vtkGetObjectMacro](#) ([DirectionCosines](#), vtkMatrix4x4)
- [vtkGetVector3Macro](#) ([ImagePositionPatient](#), double)
- [vtkGetVector6Macro](#) ([ImageOrientationPatient](#), double)
- [vtkSetMacro](#) ([ApplyLookupTable](#), int)
- [vtkSetMacro](#) ([LoadIconImage](#), int)
- [vtkSetMacro](#) ([LoadOverlays](#), int)
- [vtkSetMacro](#) ([LossyFlag](#), int)
- [vtkTypeMacro](#) (vtkGDCMImageReader2, vtkMedicalImageReader2)

## Static Public Member Functions

- static [vtkGDCMImageReader2](#) \* [New](#) ()

## Protected Member Functions

- [vtkGDCMImageReader2](#) ()
- [~vtkGDCMImageReader2](#) ()
- void [FillMedicalImageInformation](#) (const [gdcml::ImageReader](#) &reader)
- int [LoadSingleFile](#) (const char \*filename, char \*pointer, unsigned long &outlen)
- int [ProcessRequest](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector)
- int [RequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector)
- int [RequestDataCompat](#) ()
- int [RequestInformation](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector)
- int [RequestInformationCompat](#) ()
- void [SetFilePattern](#) (const char \*)
- void [SetFilePrefix](#) (const char \*)
- [vtkGetStringMacro](#) (FilePattern)
- [vtkGetStringMacro](#) (FilePrefix)
- [vtkSetVector6Macro](#) (ImageOrientationPatient, double)

## Protected Attributes

- int [ApplyInverseVideo](#)
- int [ApplyLookupTable](#)
- int [ApplyPlanarConfiguration](#)
- int [ApplyShiftScale](#)
- int [ApplyYBRToRGB](#)
- vtkPolyData \* [Curve](#)
- vtkMatrix4x4 \* [DirectionCosines](#)
- int [ForceRescale](#)
- int [IconDataScalarType](#)
- int [IconImageDataExtent](#) [6]
- int [IconNumberOfScalarComponents](#)
- int [ImageFormat](#)
- double [ImageOrientationPatient](#) [6]
- double [ImagePositionPatient](#) [3]
- int [LoadIconImage](#)
- int [LoadOverlays](#)
- int [LossyFlag](#)
- int [NumberOfIconImages](#)
- int [NumberOfOverlays](#)
- int [PlanarConfiguration](#)
- double [Scale](#)
- double [Shift](#)

## 12.385.1 Detailed Description

### Examples

[Compute3DSpacing.cxx](#).

## 12.385.2 Constructor & Destructor Documentation

### 12.385.2.1 vtkGDCMImageReader2()

```
vtkGDCMImageReader2::vtkGDCMImageReader2 () [protected]
```

References [vtkGDCMImageReader2\(\)](#).

Referenced by [vtkGDCMImageReader2\(\)](#), [~vtkGDCMImageReader2\(\)](#), [New\(\)](#), [vtkGetStringMacro\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.385.2.2 ~vtkGDCMImageReader2()

```
vtkGDCMImageReader2::~~vtkGDCMImageReader2 () [protected]
```

References [vtkGDCMImageReader2\(\)](#).

## 12.385.3 Member Function Documentation

### 12.385.3.1 CanReadFile()

```
virtual int vtkGDCMImageReader2::CanReadFile (
    const char * fname) [virtual]
```

### 12.385.3.2 FillMedicalImageInformation()

```
void vtkGDCMImageReader2::FillMedicalImageInformation (
    const gdcm::ImageReader & reader) [protected]
```

References [FillMedicalImageInformation\(\)](#).

Referenced by [FillMedicalImageInformation\(\)](#).

### 12.385.3.3 GetDescriptiveName()

```
virtual const char * vtkGDCMImageReader2::GetDescriptiveName () [inline], [virtual]
```

#### 12.385.3.4 GetFileExtensions()

```
virtual const char * vtkGDCMImageReader2::GetFileExtensions () [inline], [virtual]
```

#### 12.385.3.5 GetIconImage()

```
vtkImageData * vtkGDCMImageReader2::GetIconImage ()
```

#### 12.385.3.6 GetIconImagePort()

```
vtkAlgorithmOutput * vtkGDCMImageReader2::GetIconImagePort ()
```

#### 12.385.3.7 GetOverlay()

```
vtkImageData * vtkGDCMImageReader2::GetOverlay (
    int i)
```

#### 12.385.3.8 GetOverlayPort()

```
vtkAlgorithmOutput * vtkGDCMImageReader2::GetOverlayPort (
    int index)
```

#### 12.385.3.9 LoadSingleFile()

```
int vtkGDCMImageReader2::LoadSingleFile (
    const char * filename,
    char * pointer,
    unsigned long & outlen) [protected]
```

References [LoadSingleFile\(\)](#).

Referenced by [LoadSingleFile\(\)](#).

#### 12.385.3.10 New()

```
vtkGDCMImageReader2 * vtkGDCMImageReader2::New () [static]
```

#### Examples

[Compute3DSpacing.cxx](#).

References [vtkGDCMImageReader2\(\)](#).

**12.385.3.11 PrintSelf()**

```
virtual void vtkGDCMImageReader2::PrintSelf (
    ostream & os,
    vtkIndent indent) [virtual]
```

**12.385.3.12 ProcessRequest()**

```
int vtkGDCMImageReader2::ProcessRequest (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector) [protected]
```

References [ProcessRequest\(\)](#).

Referenced by [ProcessRequest\(\)](#).

**12.385.3.13 RequestData()**

```
int vtkGDCMImageReader2::RequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector) [protected]
```

References [RequestData\(\)](#).

Referenced by [RequestData\(\)](#).

**12.385.3.14 RequestDataCompat()**

```
int vtkGDCMImageReader2::RequestDataCompat () [protected]
```

References [RequestDataCompat\(\)](#).

Referenced by [RequestDataCompat\(\)](#).

**12.385.3.15 RequestInformation()**

```
int vtkGDCMImageReader2::RequestInformation (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector) [protected]
```

References [RequestInformation\(\)](#).

Referenced by [RequestInformation\(\)](#).



### 12.385.3.16 RequestInformationCompat()

```
int vtkGDCMImageReader2::RequestInformationCompat () [protected]
```

References [RequestInformationCompat\(\)](#).

Referenced by [RequestInformationCompat\(\)](#).

### 12.385.3.17 SetCurve()

```
virtual void vtkGDCMImageReader2::SetCurve (
    vtkPolyData * pd) [virtual]
```

References [SetCurve\(\)](#).

Referenced by [SetCurve\(\)](#).

### 12.385.3.18 SetFilePattern()

```
void vtkGDCMImageReader2::SetFilePattern (
    const char * ) [inline], [protected]
```

### 12.385.3.19 SetFilePrefix()

```
void vtkGDCMImageReader2::SetFilePrefix (
    const char * ) [inline], [protected]
```

References [SetFilePrefix\(\)](#).

Referenced by [SetFilePrefix\(\)](#).

### 12.385.3.20 SetMedicalImageProperties()

```
virtual void vtkGDCMImageReader2::SetMedicalImageProperties (
    vtkMedicalImageProperties * pd) [virtual]
```

### 12.385.3.21 vtkBooleanMacro() [1/5]

```
vtkGDCMImageReader2::vtkBooleanMacro (
    ApplyLookupTable ,
    int )
```

References [ApplyLookupTable](#).

**12.385.3.22 vtkBooleanMacro()** [2/5]

```
int vtkGDCMImageReader2::vtkBooleanMacro (
    ApplyYBRToRGB ,
    int )
```

References [ApplyYBRToRGB](#), and [vtkBooleanMacro\(\)](#).

**12.385.3.23 vtkBooleanMacro()** [3/5]

```
vtkGDCMImageReader2::vtkBooleanMacro (
    LoadIconImage ,
    int )
```

References [LoadIconImage](#).

**12.385.3.24 vtkBooleanMacro()** [4/5]

```
vtkGDCMImageReader2::vtkBooleanMacro (
    LoadOverlays ,
    int )
```

References [LoadOverlays](#).

Referenced by [vtkBooleanMacro\(\)](#).

**12.385.3.25 vtkBooleanMacro()** [5/5]

```
vtkGDCMImageReader2::vtkBooleanMacro (
    LossyFlag ,
    int )
```

References [LossyFlag](#).

**12.385.3.26 vtkGetMacro()** [1/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    ApplyLookupTable ,
    int )
```

References [ApplyLookupTable](#).

**12.385.3.27 vtkGetMacro()** [2/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    ApplyYBRToRGB ,
    int )
```

References [ApplyYBRToRGB](#), and [vtkSetMacro\(\)](#).

**12.385.3.28 vtkGetMacro()** [3/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    ImageFormat ,
    int )
```

References [ImageFormat](#), and [vtkGetMacro\(\)](#).

**12.385.3.29 vtkGetMacro()** [4/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    LoadIconImage ,
    int )
```

References [LoadIconImage](#).

**12.385.3.30 vtkGetMacro()** [5/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    LoadOverlays ,
    int )
```

References [LoadOverlays](#).

Referenced by [vtkGetMacro\(\)](#), [vtkGetMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkGetMacro\(\)](#).

**12.385.3.31 vtkGetMacro()** [6/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    LossyFlag ,
    int )
```

References [LossyFlag](#).

**12.385.3.32 vtkGetMacro()** [7/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    NumberOfIconImages ,
    int )
```

References [NumberOfIconImages](#).

**12.385.3.33 vtkGetMacro()** [8/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    NumberOfOverlays ,
    int )
```

References [NumberOfOverlays](#).

**12.385.3.34 vtkGetMacro()** [9/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    PlanarConfiguration ,
    int )
```

References [PlanarConfiguration](#), and [vtkGetMacro\(\)](#).

**12.385.3.35 vtkGetMacro()** [10/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    Scale ,
    double )
```

References [Scale](#), and [vtkGetMacro\(\)](#).

**12.385.3.36 vtkGetMacro()** [11/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    Shift ,
    double )
```

References [Shift](#), and [vtkGetMacro\(\)](#).

**12.385.3.37 vtkGetObjectMacro()** [1/2]

```
vtkGDCMImageReader2::vtkGetObjectMacro (
    Curve ,
    vtkPolyData )
```

References [Curve](#), and [vtkGetObjectMacro\(\)](#).

**12.385.3.38 vtkGetObjectMacro() [2/2]**

```
vtkGDCMImageReader2::vtkGetObjectMacro (
    DirectionCosines ,
    vtkMatrix4x4 )
```

References [DirectionCosines](#).

Referenced by [vtkGetObjectMacro\(\)](#).

**12.385.3.39 vtkGetStringMacro() [1/2]**

```
vtkGDCMImageReader2::vtkGetStringMacro (
    FilePattern ) [protected]
```

References [vtkGDCMImageReader2\(\)](#).

**12.385.3.40 vtkGetStringMacro() [2/2]**

```
vtkGDCMImageReader2::vtkGetStringMacro (
    FilePrefix ) [protected]
```

**12.385.3.41 vtkGetVector3Macro()**

```
vtkGDCMImageReader2::vtkGetVector3Macro (
    ImagePositionPatient ,
    double )
```

References [ImagePositionPatient](#), and [vtkGetVector3Macro\(\)](#).

Referenced by [vtkGetVector3Macro\(\)](#).

**12.385.3.42 vtkGetVector6Macro()**

```
vtkGDCMImageReader2::vtkGetVector6Macro (
    ImageOrientationPatient ,
    double )
```

References [ImageOrientationPatient](#), and [vtkGetVector6Macro\(\)](#).

Referenced by [vtkGetVector6Macro\(\)](#).

**12.385.3.43 vtkSetMacro() [1/4]**

```
vtkGDCMImageReader2::vtkSetMacro (
    ApplyLookupTable ,
    int )
```

References [ApplyLookupTable](#).

**12.385.3.44 vtkSetMacro() [2/4]**

```
vtkGDCMImageReader2::vtkSetMacro (
    LoadIconImage ,
    int )
```

References [LoadIconImage](#).

**12.385.3.45 vtkSetMacro() [3/4]**

```
vtkGDCMImageReader2::vtkSetMacro (
    LoadOverlays ,
    int )
```

References [LoadOverlays](#).

Referenced by [vtkGetMacro\(\)](#).

**12.385.3.46 vtkSetMacro() [4/4]**

```
vtkGDCMImageReader2::vtkSetMacro (
    LossyFlag ,
    int )
```

References [LossyFlag](#).

**12.385.3.47 vtkSetVector6Macro()**

```
vtkGDCMImageReader2::vtkSetVector6Macro (
    ImageOrientationPatient ,
    double ) [protected]
```

References [ImageOrientationPatient](#), and [vtkSetVector6Macro\(\)](#).

Referenced by [vtkSetVector6Macro\(\)](#).

### 12.385.3.48 vtkTypeMacro()

```
vtkGDCMImageReader2::vtkTypeMacro (
    vtkGDCMImageReader2 ,
    vtkMedicalImageReader2 )
```

References [vtkGDCMImageReader2\(\)](#).

## 12.385.4 Member Data Documentation

### 12.385.4.1 ApplyInverseVideo

```
int vtkGDCMImageReader2::ApplyInverseVideo [protected]
```

### 12.385.4.2 ApplyLookupTable

```
int vtkGDCMImageReader2::ApplyLookupTable [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

### 12.385.4.3 ApplyPlanarConfiguration

```
int vtkGDCMImageReader2::ApplyPlanarConfiguration [protected]
```

### 12.385.4.4 ApplyShiftScale

```
int vtkGDCMImageReader2::ApplyShiftScale [protected]
```

### 12.385.4.5 ApplyYBRToRGB

```
int vtkGDCMImageReader2::ApplyYBRToRGB [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), and [vtkGetMacro\(\)](#).

### 12.385.4.6 Curve

```
vtkPolyData* vtkGDCMImageReader2::Curve [protected]
```

Referenced by [vtkGetObjectMacro\(\)](#).

#### 12.385.4.7 DirectionCosines

`vtkMatrix4x4* vtkGDCMImageReader2::DirectionCosines` [protected]

Referenced by [vtkGetObjectMacro\(\)](#).

#### 12.385.4.8 ForceRescale

`int vtkGDCMImageReader2::ForceRescale` [protected]

#### 12.385.4.9 IconDataScalarType

`int vtkGDCMImageReader2::IconDataScalarType` [protected]

#### 12.385.4.10 IconImageDataExtent

`int vtkGDCMImageReader2::IconImageDataExtent[6]` [protected]

#### 12.385.4.11 IconNumberOfScalarComponents

`int vtkGDCMImageReader2::IconNumberOfScalarComponents` [protected]

#### 12.385.4.12 ImageFormat

`int vtkGDCMImageReader2::ImageFormat` [protected]

Referenced by [vtkGetMacro\(\)](#).

#### 12.385.4.13 ImageOrientationPatient

`double vtkGDCMImageReader2::ImageOrientationPatient[6]` [protected]

Referenced by [vtkGetVector6Macro\(\)](#), and [vtkSetVector6Macro\(\)](#).

#### 12.385.4.14 ImagePositionPatient

`double vtkGDCMImageReader2::ImagePositionPatient[3]` [protected]

Referenced by [vtkGetVector3Macro\(\)](#).



#### 12.385.4.15 LoadIconImage

```
int vtkGDCMImageReader2::LoadIconImage [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

#### 12.385.4.16 LoadOverlays

```
int vtkGDCMImageReader2::LoadOverlays [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

#### 12.385.4.17 LossyFlag

```
int vtkGDCMImageReader2::LossyFlag [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

#### 12.385.4.18 NumberOfIconImages

```
int vtkGDCMImageReader2::NumberOfIconImages [protected]
```

Referenced by [vtkGetMacro\(\)](#).

#### 12.385.4.19 NumberOfOverlays

```
int vtkGDCMImageReader2::NumberOfOverlays [protected]
```

Referenced by [vtkGetMacro\(\)](#).

#### 12.385.4.20 PlanarConfiguration

```
int vtkGDCMImageReader2::PlanarConfiguration [protected]
```

Referenced by [vtkGetMacro\(\)](#).

#### 12.385.4.21 Scale

```
double vtkGDCMImageReader2::Scale [protected]
```

Referenced by [vtkGetMacro\(\)](#).

#### 12.385.4.22 Shift

```
double vtkGDCMImageReader2::Shift [protected]
```

Referenced by [vtkGetMacro\(\)](#).

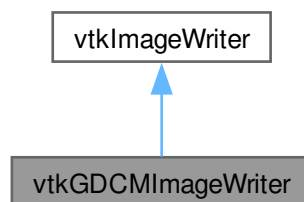
The documentation for this class was generated from the following file:

- [vtkGDCMImageReader2.h](#)

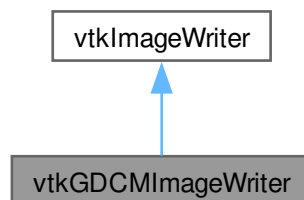
### 12.386 vtkGDCMImageWriter Class Reference

```
#include <vtkGDCMImageWriter.h>
```

Inheritance diagram for vtkGDCMImageWriter:



Collaboration diagram for vtkGDCMImageWriter:



## Public Types

- enum [CompressionTypes](#) {  
[NO\\_COMPRESSION](#) = 0 ,  
[JPEG\\_COMPRESSION](#) ,  
[JPEG2000\\_COMPRESSION](#) ,  
[JPEGLS\\_COMPRESSION](#) ,  
[RLE\\_COMPRESSION](#) }

## Public Member Functions

- virtual const char \* [GetDescriptiveName](#) ()
- virtual const char \* [GetFileExtensions](#) ()
- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetDirectionCosines](#) (vtkMatrix4x4 \*matrix)
- virtual void [SetDirectionCosinesFromImageOrientationPatient](#) (const double dircos[6])
- virtual void [SetFileNames](#) (vtkStringArray \*)
- virtual void [SetMedicalImageProperties](#) (vtkMedicalImageProperties \*)
- [vtkBooleanMacro](#) (FileLowerLeft, int)
- [vtkBooleanMacro](#) (LossyFlag, int)
- [vtkGetMacro](#) (CompressionType, int)
- [vtkGetMacro](#) (FileLowerLeft, int)
- [vtkGetMacro](#) (ImageFormat, int)
- [vtkGetMacro](#) (LossyFlag, int)
- [vtkGetMacro](#) (PlanarConfiguration, int)
- [vtkGetMacro](#) (Scale, double)
- [vtkGetMacro](#) (Shift, double)
- [vtkGetObjectMacro](#) (DirectionCosines, vtkMatrix4x4)
- [vtkGetObjectMacro](#) (FileNames, vtkStringArray)
- [vtkGetObjectMacro](#) (MedicalImageProperties, vtkMedicalImageProperties)
- [vtkGetStringMacro](#) (SeriesUID)
- [vtkGetStringMacro](#) (StudyUID)
- [vtkSetMacro](#) (CompressionType, int)
- [vtkSetMacro](#) (FileLowerLeft, int)
- [vtkSetMacro](#) (ImageFormat, int)
- [vtkSetMacro](#) (LossyFlag, int)
- [vtkSetMacro](#) (PlanarConfiguration, int)
- [vtkSetMacro](#) (Scale, double)
- [vtkSetMacro](#) (Shift, double)
- [vtkSetStringMacro](#) (SeriesUID)
- [vtkSetStringMacro](#) (StudyUID)
- [vtkTypeMacro](#) (vtkGDCMImageWriter, vtkImageWriter)
- virtual void [Write](#) ()

## Static Public Member Functions

- static [vtkGDCMImageWriter](#) \* [New](#) ()

## Protected Member Functions

- [vtkGDCMImageWriter](#) ()
- [~vtkGDCMImageWriter](#) ()
- virtual char \* [GetFileName](#) ()
- int [WriteGDCMData](#) (vtkImageData \*data, int timeStep)
- void [WriteSlice](#) (vtkImageData \*data)

## 12.386.1 Detailed Description

### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [CreateFakePET.cxx](#), [CreateFakeRTDOSE.cxx](#), [HelloActiviz.cs](#), [HelloActiviz2.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld.java](#), [HelloVTKWorld2.cs](#), [MagnifyFile.cxx](#), [RefCounting.cs](#), and [gdcmmorthoplanes.cxx](#).

## 12.386.2 Member Enumeration Documentation

### 12.386.2.1 CompressionTypes

```
enum vtkGDCMImageWriter::CompressionTypes
```

#### Enumerator

NO_COMPRESSION	
JPEG_COMPRESSION	
JPEG2000_COMPRESSION	
JPEGLS_COMPRESSION	
RLE_COMPRESSION	

## 12.386.3 Constructor & Destructor Documentation

### 12.386.3.1 vtkGDCMImageWriter()

```
vtkGDCMImageWriter::vtkGDCMImageWriter () [protected]
```

Referenced by [GetFileName\(\)](#), [New\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.386.3.2 ~vtkGDCMImageWriter()

```
vtkGDCMImageWriter::~~vtkGDCMImageWriter () [protected]
```

## 12.386.4 Member Function Documentation

### 12.386.4.1 GetDescriptiveName()

```
virtual const char * vtkGDCMImageWriter::GetDescriptiveName () [inline], [virtual]
```

### 12.386.4.2 GetFileExtensions()

```
virtual const char * vtkGDCMImageWriter::GetFileExtensions () [inline], [virtual]
```

### 12.386.4.3 GetFileName()

```
virtual char * vtkGDCMImageWriter::GetFileName () [protected], [virtual]
```

References [vtkGDCMImageWriter\(\)](#).

### 12.386.4.4 New()

```
vtkGDCMImageWriter * vtkGDCMImageWriter::New () [static]
```

#### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [CreateFakePET.cxx](#), [CreateFakeRTDOSE.cxx](#), [HelloActiviz.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld2.cs](#), [MagnifyFile.cxx](#), [RefCounting.cs](#), and [gdcmothoplanes.cxx](#).

References [vtkGDCMImageWriter\(\)](#).

### 12.386.4.5 PrintSelf()

```
virtual void vtkGDCMImageWriter::PrintSelf (
    ostream & os,
    vtkIndent indent) [virtual]
```

### 12.386.4.6 SetDirectionCosines()

```
virtual void vtkGDCMImageWriter::SetDirectionCosines (
    vtkMatrix4x4 * matrix) [virtual]
```

#### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [HelloActiviz2.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld.java](#), [MagnifyFile.cxx](#), and [gdcmothoplanes.cxx](#).

#### 12.386.4.7 SetDirectionCosinesFromImageOrientationPatient()

```
virtual void vtkGDCMImageWriter::SetDirectionCosinesFromImageOrientationPatient (
    const double dircos[6]) [virtual]
```

#### 12.386.4.8 SetFileNames()

```
virtual void vtkGDCMImageWriter::SetFileNames (
    vtkStringArray * ) [virtual]
```

##### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

#### 12.386.4.9 SetMedicalImageProperties()

```
virtual void vtkGDCMImageWriter::SetMedicalImageProperties (
    vtkMedicalImageProperties * ) [virtual]
```

##### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [HelloActiviz.cs](#), [HelloActiviz2.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld.java](#), [MagnifyFile.cxx](#), and [gdcmmorthoplanes.cxx](#).

#### 12.386.4.10 vtkBooleanMacro() [1/2]

```
vtkGDCMImageWriter::vtkBooleanMacro (
    FileLowerLeft ,
    int )
```

#### 12.386.4.11 vtkBooleanMacro() [2/2]

```
vtkGDCMImageWriter::vtkBooleanMacro (
    LossyFlag ,
    int )
```

#### 12.386.4.12 vtkGetMacro() [1/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    CompressionType ,
    int )
```

**12.386.4.13 vtkGetMacro()** [2/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    FileLowerLeft ,
    int )
```

**12.386.4.14 vtkGetMacro()** [3/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    ImageFormat ,
    int )
```

**12.386.4.15 vtkGetMacro()** [4/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    LossyFlag ,
    int )
```

**12.386.4.16 vtkGetMacro()** [5/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    PlanarConfiguration ,
    int )
```

**12.386.4.17 vtkGetMacro()** [6/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    Scale ,
    double )
```

**12.386.4.18 vtkGetMacro()** [7/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    Shift ,
    double )
```

**12.386.4.19 vtkGetObjectMacro()** [1/3]

```
vtkGDCMImageWriter::vtkGetObjectMacro (
    DirectionCosines ,
    vtkMatrix4x4 )
```

**12.386.4.20 vtkGetObjectMacro() [2/3]**

```
vtkGDCMImageWriter::vtkGetObjectMacro (
    FileNames ,
    vtkStringArray )
```

**12.386.4.21 vtkGetObjectMacro() [3/3]**

```
vtkGDCMImageWriter::vtkGetObjectMacro (
    MedicalImageProperties ,
    vtkMedicalImageProperties )
```

**12.386.4.22 vtkGetStringMacro() [1/2]**

```
vtkGDCMImageWriter::vtkGetStringMacro (
    SeriesUID )
```

**12.386.4.23 vtkGetStringMacro() [2/2]**

```
vtkGDCMImageWriter::vtkGetStringMacro (
    StudyUID )
```

**12.386.4.24 vtkSetMacro() [1/7]**

```
vtkGDCMImageWriter::vtkSetMacro (
    CompressionType ,
    int )
```

**12.386.4.25 vtkSetMacro() [2/7]**

```
vtkGDCMImageWriter::vtkSetMacro (
    FileLowerLeft ,
    int )
```

**12.386.4.26 vtkSetMacro() [3/7]**

```
vtkGDCMImageWriter::vtkSetMacro (
    ImageFormat ,
    int )
```



**12.386.4.27 vtkSetMacro()** [4/7]

```
vtkGDCMImageWriter::vtkSetMacro (
    LossyFlag ,
    int )
```

**12.386.4.28 vtkSetMacro()** [5/7]

```
vtkGDCMImageWriter::vtkSetMacro (
    PlanarConfiguration ,
    int )
```

**12.386.4.29 vtkSetMacro()** [6/7]

```
vtkGDCMImageWriter::vtkSetMacro (
    Scale ,
    double )
```

**12.386.4.30 vtkSetMacro()** [7/7]

```
vtkGDCMImageWriter::vtkSetMacro (
    Shift ,
    double )
```

**12.386.4.31 vtkSetStringMacro()** [1/2]

```
vtkGDCMImageWriter::vtkSetStringMacro (
    SeriesUID )
```

**12.386.4.32 vtkSetStringMacro()** [2/2]

```
vtkGDCMImageWriter::vtkSetStringMacro (
    StudyUID )
```

**12.386.4.33 vtkTypeMacro()**

```
vtkGDCMImageWriter::vtkTypeMacro (
    vtkGDCMImageWriter ,
    vtkImageWriter )
```

References [vtkGDCMImageWriter\(\)](#).

#### 12.386.4.34 Write()

```
virtual void vtkGDCMImageWriter::Write () [virtual]
```

##### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [CreateFakePET.cxx](#), [CreateFakeRTDOSE.cxx](#), [HelloActiviz.cs](#), [HelloActiviz2.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld.java](#), [HelloVTKWorld2.cs](#), [MagnifyFile.cxx](#), and [gdcmmorthoplanes.cxx](#).

#### 12.386.4.35 WriteGDCMData()

```
int vtkGDCMImageWriter::WriteGDCMData (  
    vtkImageData * data,  
    int timeStep) [protected]
```

#### 12.386.4.36 WriteSlice()

```
void vtkGDCMImageWriter::WriteSlice (  
    vtkImageData * data) [protected]
```

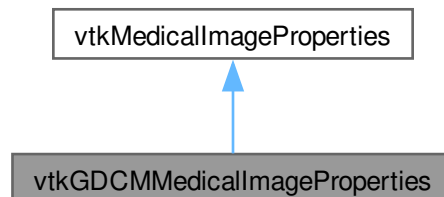
The documentation for this class was generated from the following file:

- [vtkGDCMImageWriter.h](#)

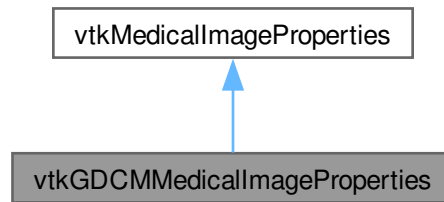
## 12.387 vtkGDCMMedicalImageProperties Class Reference

```
#include <vtkGDCMMedicalImageProperties.h>
```

Inheritance diagram for vtkGDCMMedicalImageProperties:



Collaboration diagram for vtkGDCMMedicalImageProperties:



### Public Member Functions

- virtual void [Clear](#) ()
- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkTypeMacro](#) ([vtkGDCMMedicalImageProperties](#), vtkMedicalImageProperties)

### Static Public Member Functions

- static [vtkGDCMMedicalImageProperties](#) \* [New](#) ()

### Protected Member Functions

- [vtkGDCMMedicalImageProperties](#) ()
- [~vtkGDCMMedicalImageProperties](#) ()
- [gdcmm::File](#) const & [GetFile](#) (unsigned int t)
- void [PushBackFile](#) ([gdcmm::File](#) const &f)

### Friends

- class [vtkGDCMImageReader](#)
- class [vtkGDCMImageReader2](#)
- class [vtkGDCMImageWriter](#)

## 12.387.1 Constructor & Destructor Documentation

### 12.387.1.1 vtkGDCMMedicalImageProperties()

```
vtkGDCMMedicalImageProperties::vtkGDCMMedicalImageProperties () [protected]
```

Referenced by [GetFile\(\)](#), [New\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.387.1.2 ~vtkGDCMMedicalImageProperties()

```
vtkGDCMMedicalImageProperties::~~vtkGDCMMedicalImageProperties () [protected]
```

## 12.387.2 Member Function Documentation

### 12.387.2.1 Clear()

```
virtual void vtkGDCMMedicalImageProperties::Clear () [virtual]
```

### 12.387.2.2 GetFile()

```
gdcmm::File const & vtkGDCMMedicalImageProperties::GetFile (
    unsigned int t) [protected]
```

References [vtkGDCMMedicalImageProperties\(\)](#).

### 12.387.2.3 New()

```
vtkGDCMMedicalImageProperties * vtkGDCMMedicalImageProperties::New () [static]
```

References [vtkGDCMMedicalImageProperties\(\)](#).

### 12.387.2.4 PrintSelf()

```
void vtkGDCMMedicalImageProperties::PrintSelf (
    ostream & os,
    vtkIndent indent)
```

### 12.387.2.5 PushBackFile()

```
void vtkGDCMMedicalImageProperties::PushBackFile (
    gdcmm::File const & f) [protected]
```

### 12.387.2.6 vtkTypeMacro()

```
vtkGDCMMedicalImageProperties::vtkTypeMacro (
    vtkGDCMMedicalImageProperties ,
    vtkMedicalImageProperties )
```

References [vtkGDCMMedicalImageProperties\(\)](#).

## 12.387.3 Friends And Related Symbol Documentation

### 12.387.3.1 vtkGDCMImageReader

friend class [vtkGDCMImageReader](#) [friend]

References [vtkGDCMImageReader](#).

Referenced by [vtkGDCMImageReader](#).

### 12.387.3.2 vtkGDCMImageReader2

friend class [vtkGDCMImageReader2](#) [friend]

References [vtkGDCMImageReader2](#).

Referenced by [vtkGDCMImageReader2](#).

### 12.387.3.3 vtkGDCMImageWriter

friend class [vtkGDCMImageWriter](#) [friend]

References [vtkGDCMImageWriter](#).

Referenced by [vtkGDCMImageWriter](#).

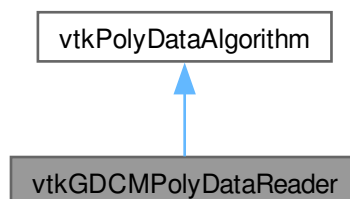
The documentation for this class was generated from the following file:

- [vtkGDCMMedicalImageProperties.h](#)

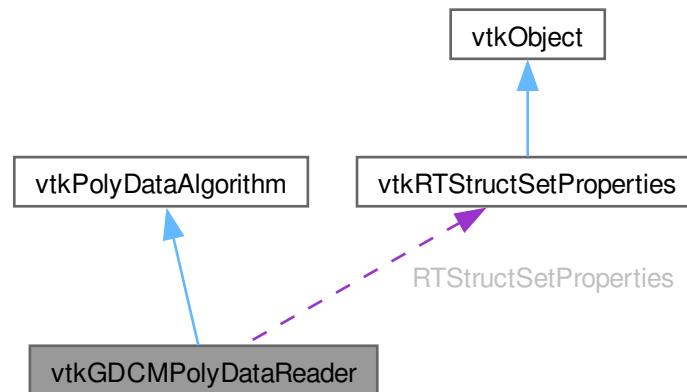
## 12.388 vtkGDCMPolyDataReader Class Reference

```
#include <vtkGDCMPolyDataReader.h>
```

Inheritance diagram for vtkGDCMPolyDataReader:



Collaboration diagram for vtkGDCMPolyDataReader:



### Public Member Functions

- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkGetObjectMacro](#) (MedicalImageProperties, vtkMedicalImageProperties)
- [vtkGetObjectMacro](#) (RTStructSetProperties, vtkRTStructSetProperties)
- [vtkGetStringMacro](#) (FileName)
- [vtkSetStringMacro](#) (FileName)
- [vtkTypeMacro](#) (vtkGDCMPolyDataReader, vtkPolyDataAlgorithm)

### Static Public Member Functions

- static [vtkGDCMPolyDataReader](#) \* [New](#) ()

### Protected Member Functions

- [vtkGDCMPolyDataReader](#) ()
- [~vtkGDCMPolyDataReader](#) ()
- void [FillMedicalImageInformation](#) (const [gdcmm::Reader](#) &reader)
- int [RequestData](#) (vtkInformation \*, vtkInformationVector \*\*, vtkInformationVector \*)
- int [RequestData\\_HemodynamicWaveformStorage](#) ([gdcmm::Reader](#) const &reader, vtkInformationVector \*outputVector)
- int [RequestData\\_RTStructureSetStorage](#) ([gdcmm::Reader](#) const &reader, vtkInformationVector \*outputVector)
- int [RequestInformation](#) (vtkInformation \*vtkNotUsed(request), vtkInformationVector \*\*vtkNotUsed(inputVector), vtkInformationVector \*outputVector)
- int [RequestInformation\\_HemodynamicWaveformStorage](#) ([gdcmm::Reader](#) const &reader)
- int [RequestInformation\\_RTStructureSetStorage](#) ([gdcmm::Reader](#) const &reader)

**Protected Attributes**

- char \* [FileName](#)
- vtkMedicalImageProperties \* [MedicalImageProperties](#)
- [vtkRTStructSetProperties](#) \* [RTStructSetProperties](#)

**12.388.1 Detailed Description****Examples**

[GenerateRTSTRUCT.cxx](#), [gdcmscene.cxx](#), and [rtstructapp.cxx](#).

**12.388.2 Constructor & Destructor Documentation****12.388.2.1 vtkGDCMPolyDataReader()**

```
vtkGDCMPolyDataReader::vtkGDCMPolyDataReader () [protected]
```

Referenced by [New\(\)](#), [RequestData\\_HemodynamicWaveformStorage\(\)](#), and [vtkTypeMacro\(\)](#).

**12.388.2.2 ~vtkGDCMPolyDataReader()**

```
vtkGDCMPolyDataReader::~~vtkGDCMPolyDataReader () [protected]
```

**12.388.3 Member Function Documentation****12.388.3.1 FillMedicalImageInformation()**

```
void vtkGDCMPolyDataReader::FillMedicalImageInformation (
    const gdcm::Reader & reader) [protected]
```

**12.388.3.2 New()**

```
vtkGDCMPolyDataReader * vtkGDCMPolyDataReader::New () [static]
```

**Examples**

[GenerateRTSTRUCT.cxx](#), [gdcmscene.cxx](#), and [rtstructapp.cxx](#).

References [vtkGDCMPolyDataReader\(\)](#).

### 12.388.3.3 PrintSelf()

```
virtual void vtkGDCMPolyDataReader::PrintSelf (
    ostream & os,
    vtkIndent indent) [virtual]
```

### 12.388.3.4 RequestData()

```
int vtkGDCMPolyDataReader::RequestData (
    vtkInformation * ,
    vtkInformationVector ** ,
    vtkInformationVector * ) [protected]
```

### 12.388.3.5 RequestData\_HemodynamicWaveformStorage()

```
int vtkGDCMPolyDataReader::RequestData_HemodynamicWaveformStorage (
    gdcM::Reader const & reader,
    vtkInformationVector * outputVector) [protected]
```

References [vtkGDCMPolyDataReader\(\)](#).

### 12.388.3.6 RequestData\_RTStructureSetStorage()

```
int vtkGDCMPolyDataReader::RequestData_RTStructureSetStorage (
    gdcM::Reader const & reader,
    vtkInformationVector * outputVector) [protected]
```

### 12.388.3.7 RequestInformation()

```
int vtkGDCMPolyDataReader::RequestInformation (
    vtkInformation * vtkNotUsedrequest,
    vtkInformationVector ** vtkNotUsedinputVector,
    vtkInformationVector * outputVector) [protected]
```

### 12.388.3.8 RequestInformation\_HemodynamicWaveformStorage()

```
int vtkGDCMPolyDataReader::RequestInformation_HemodynamicWaveformStorage (
    gdcM::Reader const & reader) [protected]
```

### 12.388.3.9 RequestInformation\_RTStructureSetStorage()

```
int vtkGDCMPolyDataReader::RequestInformation_RTStructureSetStorage (
    gdcM::Reader const & reader) [protected]
```



**12.388.3.10 vtkGetObjectMacro() [1/2]**

```
vtkGDCMPolyDataReader::vtkGetObjectMacro (
    MedicalImageProperties ,
    vtkMedicalImageProperties )
```

References [MedicalImageProperties](#).

**12.388.3.11 vtkGetObjectMacro() [2/2]**

```
vtkGDCMPolyDataReader::vtkGetObjectMacro (
    RTStructSetProperties ,
    vtkRTStructSetProperties )
```

References [RTStructSetProperties](#).

**12.388.3.12 vtkGetStringMacro()**

```
vtkGDCMPolyDataReader::vtkGetStringMacro (
    FileName )
```

References [FileName](#).

**12.388.3.13 vtkSetStringMacro()**

```
vtkGDCMPolyDataReader::vtkSetStringMacro (
    FileName )
```

References [FileName](#).

**12.388.3.14 vtkTypeMacro()**

```
vtkGDCMPolyDataReader::vtkTypeMacro (
    vtkGDCMPolyDataReader ,
    vtkPolyDataAlgorithm )
```

References [vtkGDCMPolyDataReader\(\)](#).

**12.388.4 Member Data Documentation****12.388.4.1 FileName**

```
char* vtkGDCMPolyDataReader::FileName [protected]
```

Referenced by [vtkGetStringMacro\(\)](#), and [vtkSetStringMacro\(\)](#).

### 12.388.4.2 MedicalImageProperties

```
vtkMedicalImageProperties* vtkGDCMPolyDataReader::MedicalImageProperties [protected]
```

Referenced by [vtkGetObjectMacro\(\)](#).

### 12.388.4.3 RTStructSetProperties

```
vtkRTStructSetProperties* vtkGDCMPolyDataReader::RTStructSetProperties [protected]
```

Referenced by [vtkGetObjectMacro\(\)](#).

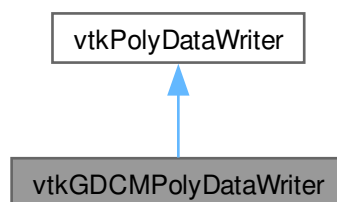
The documentation for this class was generated from the following file:

- [vtkGDCMPolyDataReader.h](#)

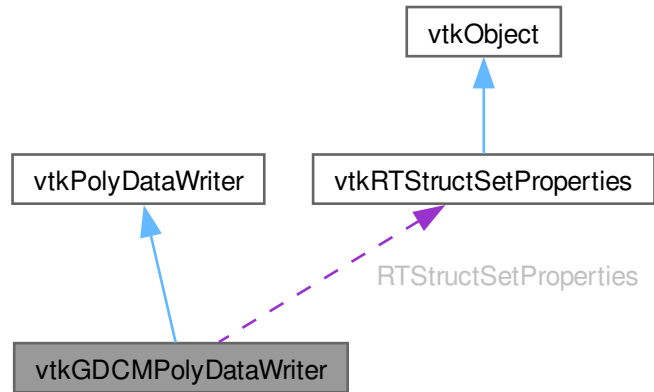
## 12.389 vtkGDCMPolyDataWriter Class Reference

```
#include <vtkGDCMPolyDataWriter.h>
```

Inheritance diagram for vtkGDCMPolyDataWriter:



Collaboration diagram for vtkGDCMPolyDataWriter:



### Public Member Functions

- void [InitializeRTStructSet](#) (vtkStdString inDirectory, vtkStdString inStructLabel, vtkStdString inStructName, vtkStringArray \*inROINames, vtkStringArray \*inROIAlgorithmName, vtkStringArray \*inROIType)
- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetMedicalImageProperties](#) (vtkMedicalImageProperties \*pd)
- void [SetNumberOfInputPorts](#) (int n)
- virtual void [SetRTStructSetProperties](#) (vtkRTStructSetProperties \*pd)
- [vtkTypeMacro](#) (vtkGDCMPolyDataWriter, vtkPolyDataWriter)

### Static Public Member Functions

- static [vtkGDCMPolyDataWriter \\* New](#) ()

### Protected Member Functions

- [vtkGDCMPolyDataWriter](#) ()
- [~vtkGDCMPolyDataWriter](#) ()
- void [WriteData](#) ()
- void [WriteRTSTRUCTData](#) (gdcmm::File &file, int num)
- void [WriteRTSTRUCTInfo](#) (gdcmm::File &file)

### Protected Attributes

- vtkMedicalImageProperties \* [MedicalImageProperties](#)
- [vtkRTStructSetProperties](#) \* [RTStructSetProperties](#)

## 12.389.1 Detailed Description

### Examples

[GenerateRTSTRUCT.cxx](#), and [rtstructapp.cxx](#).

## 12.389.2 Constructor & Destructor Documentation

### 12.389.2.1 vtkGDCMPolyDataWriter()

```
vtkGDCMPolyDataWriter::vtkGDCMPolyDataWriter () [protected]
```

Referenced by [New\(\)](#), [vtkTypeMacro\(\)](#), and [WriteRTSTRUCTData\(\)](#).

### 12.389.2.2 ~vtkGDCMPolyDataWriter()

```
vtkGDCMPolyDataWriter::~~vtkGDCMPolyDataWriter () [protected]
```

## 12.389.3 Member Function Documentation

### 12.389.3.1 InitializeRTStructSet()

```
void vtkGDCMPolyDataWriter::InitializeRTStructSet (
    vtkStdString inDirectory,
    vtkStdString inStructLabel,
    vtkStdString inStructName,
    vtkStringArray * inROINames,
    vtkStringArray * inROIAlgorithmName,
    vtkStringArray * inROIType)
```

### Examples

[GenerateRTSTRUCT.cxx](#).

### 12.389.3.2 New()

```
vtkGDCMPolyDataWriter * vtkGDCMPolyDataWriter::New () [static]
```

### Examples

[GenerateRTSTRUCT.cxx](#), and [rtstructapp.cxx](#).

References [vtkGDCMPolyDataWriter\(\)](#).

### 12.389.3.3 PrintSelf()

```
virtual void vtkGDCMPolyDataWriter::PrintSelf (
    ostream & os,
    vtkIndent indent) [virtual]
```

### 12.389.3.4 SetMedicalImageProperties()

```
virtual void vtkGDCMPolyDataWriter::SetMedicalImageProperties (
    vtkMedicalImageProperties * pd) [virtual]
```

#### Examples

[GenerateRTSTRUCT.cxx](#), and [rtstructapp.cxx](#).

### 12.389.3.5 SetNumberOfInputPorts()

```
void vtkGDCMPolyDataWriter::SetNumberOfInputPorts (
    int n)
```

#### Examples

[GenerateRTSTRUCT.cxx](#), and [rtstructapp.cxx](#).

### 12.389.3.6 SetRTStructSetProperties()

```
virtual void vtkGDCMPolyDataWriter::SetRTStructSetProperties (
    vtkRTStructSetProperties * pd) [virtual]
```

#### Examples

[GenerateRTSTRUCT.cxx](#), and [rtstructapp.cxx](#).

### 12.389.3.7 vtkTypeMacro()

```
vtkGDCMPolyDataWriter::vtkTypeMacro (
    vtkGDCMPolyDataWriter ,
    vtkPolyDataWriter )
```

References [vtkGDCMPolyDataWriter\(\)](#).

### 12.389.3.8 WriteData()

```
void vtkGDCMPolyDataWriter::WriteData () [protected]
```

### 12.389.3.9 WriteRTSTRUCTData()

```
void vtkGDCMPolyDataWriter::WriteRTSTRUCTData (  
    gdcM::File & file,  
    int num) [protected]
```

References [vtkGDCMPolyDataWriter\(\)](#).

### 12.389.3.10 WriteRTSTRUCTInfo()

```
void vtkGDCMPolyDataWriter::WriteRTSTRUCTInfo (  
    gdcM::File & file) [protected]
```

## 12.389.4 Member Data Documentation

### 12.389.4.1 MedicalImageProperties

```
vtkMedicalImageProperties* vtkGDCMPolyDataWriter::MedicalImageProperties [protected]
```

### 12.389.4.2 RTStructSetProperties

```
vtkRTStructSetProperties* vtkGDCMPolyDataWriter::RTStructSetProperties [protected]
```

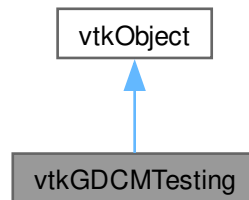
The documentation for this class was generated from the following file:

- [vtkGDCMPolyDataWriter.h](#)

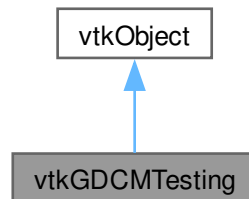
## 12.390 vtkGDCMTesting Class Reference

```
#include <vtkGDCMTesting.h>
```

Inheritance diagram for vtkGDCMTesting:



Collaboration diagram for vtkGDCMTesting:



### Public Types

- typedef const char \*const (\* [MD5MetalImagesType](#))[3]

### Public Member Functions

- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkTypeMacro](#) ([vtkGDCMTesting](#), vtkObject)

## Static Public Member Functions

- static const char \* [GetGDCMDataRoot](#) ()
- static const char \*const \* [GetMD5MetaImage](#) (unsigned int file)
- static const char \* [GetMHDMD5FromFile](#) (const char \*filepath)
- static unsigned int [GetNumberOfMD5MetaImages](#) ()
- static const char \* [GetRAWMD5FromFile](#) (const char \*filepath)
- static const char \* [GetVTKDataRoot](#) ()
- static [vtkGDCMTesting](#) \* [New](#) ()

## Protected Member Functions

- [vtkGDCMTesting](#) ()
- [~vtkGDCMTesting](#) ()

## 12.390.1 Detailed Description

### Examples

[HelloActiviz5.cs](#), [HelloVTKWorld2.cs](#), [MetaImageMD5Activiz.cs](#), [ReadSeriesIntoVTK.java](#), and [RefCounting.cs](#).

## 12.390.2 Member Typedef Documentation

### 12.390.2.1 MD5MetaImagesType

```
typedef const char* const(* vtkGDCMTesting::MD5MetaImagesType) [3]
```

## 12.390.3 Constructor & Destructor Documentation

### 12.390.3.1 vtkGDCMTesting()

```
vtkGDCMTesting::vtkGDCMTesting () [protected]
```

Referenced by [~vtkGDCMTesting\(\)](#), [New\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.390.3.2 ~vtkGDCMTesting()

```
vtkGDCMTesting::~~vtkGDCMTesting () [protected]
```

References [vtkGDCMTesting\(\)](#).



## 12.390.4 Member Function Documentation

### 12.390.4.1 GetGDCMDataRoot()

```
const char * vtkGDCMTesting::GetGDCMDataRoot () [static]
```

#### Examples

[HelloActiviz5.cs](#), and [ReadSeriesIntoVTK.java](#).

### 12.390.4.2 GetMD5MetaImage()

```
const char *const * vtkGDCMTesting::GetMD5MetaImage (
    unsigned int file) [static]
```

### 12.390.4.3 GetMHDMD5FromFile()

```
const char * vtkGDCMTesting::GetMHDMD5FromFile (
    const char * filepath) [static]
```

#### Examples

[MetaImageMD5Activiz.cs](#).

### 12.390.4.4 GetNumberOfMD5MetaImages()

```
unsigned int vtkGDCMTesting::GetNumberOfMD5MetaImages () [static]
```

### 12.390.4.5 GetRAWMD5FromFile()

```
const char * vtkGDCMTesting::GetRAWMD5FromFile (
    const char * filepath) [static]
```

#### Examples

[MetaImageMD5Activiz.cs](#).

### 12.390.4.6 GetVTKDataRoot()

```
const char * vtkGDCMTesting::GetVTKDataRoot () [static]
```

#### Examples

[HelloActiviz5.cs](#), and [HelloVTKWorld2.cs](#).

#### 12.390.4.7 New()

```
vtkGDCMTesting * vtkGDCMTesting::New () [static]
```

##### Examples

[RefCounting.cs](#).

References [vtkGDCMTesting\(\)](#).

#### 12.390.4.8 PrintSelf()

```
void vtkGDCMTesting::PrintSelf (
    ostream & os,
    vtkIndent indent)
```

#### 12.390.4.9 vtkTypeMacro()

```
vtkGDCMTesting::vtkTypeMacro (
    vtkGDCMTesting ,
    vtkObject )
```

References [vtkGDCMTesting\(\)](#).

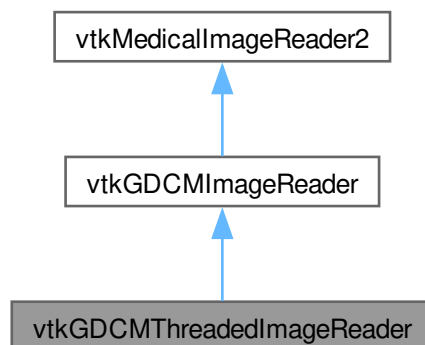
The documentation for this class was generated from the following file:

- [vtkGDCMTesting.h](#)

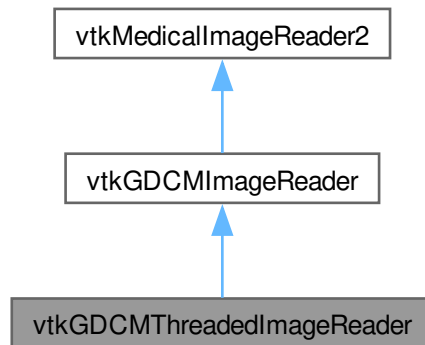
## 12.391 vtkGDCMThreadedImageReader Class Reference

```
#include <vtkGDCMThreadedImageReader.h>
```

Inheritance diagram for vtkGDCMThreadedImageReader:



Collaboration diagram for vtkGDCMThreadedImageReader:



### Public Member Functions

- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkBooleanMacro](#) (UseShiftScale, int)
- [vtkGetMacro](#) (UseShiftScale, int)
- [vtkSetMacro](#) (Scale, double)
- [vtkSetMacro](#) (Shift, double)
- [vtkSetMacro](#) (UseShiftScale, int)
- [vtkTypeMacro](#) (vtkGDCMThreadedImageReader, vtkGDCMImageReader)

### Public Member Functions inherited from [vtkGDCMImageReader](#)

- virtual int [CanReadFile](#) (const char \*fname)
- virtual const char \* [GetDescriptiveName](#) ()
- virtual const char \* [GetFileExtensions](#) ()
- vtkImageData \* [GetIconImage](#) ()
- vtkImageData \* [GetOverlay](#) (int i)
- virtual void [SetCurve](#) (vtkPolyData \*pd)
- virtual void [SetFileNames](#) (vtkStringArray \*)
- virtual void [SetMedicalImageProperties](#) (vtkMedicalImageProperties \*pd)
- [vtkBooleanMacro](#) (ApplyLookupTable, int)
- int [vtkBooleanMacro](#) (ApplyYBRToRGB, int)
- [vtkBooleanMacro](#) (LoadIconImage, int)
- [vtkBooleanMacro](#) (LoadOverlays, int)
- [vtkBooleanMacro](#) (LossyFlag, int)
- [vtkGetMacro](#) (ApplyLookupTable, int)
- [vtkGetMacro](#) (ApplyYBRToRGB, int) [vtkSetMacro](#) (ApplyYBRToRGB, int)
- [vtkGetMacro](#) (ImageFormat, int)
- [vtkGetMacro](#) (LoadIconImage, int)

- [vtkGetMacro](#) ([LoadOverlays](#), int)
- [vtkGetMacro](#) ([LossyFlag](#), int)
- [vtkGetMacro](#) ([NumberOfIconImages](#), int)
- [vtkGetMacro](#) ([NumberOfOverlays](#), int)
- [vtkGetMacro](#) ([PlanarConfiguration](#), int)
- [vtkGetMacro](#) ([Scale](#), double)
- [vtkGetMacro](#) ([Shift](#), double)
- [vtkGetObjectMacro](#) ([Curve](#), [vtkPolyData](#))
- [vtkGetObjectMacro](#) ([DirectionCosines](#), [vtkMatrix4x4](#))
- [vtkGetObjectMacro](#) ([FileNames](#), [vtkStringArray](#))
- [vtkGetObjectMacro](#) ([MedicalImageProperties](#), [vtkMedicalImageProperties](#))
- [vtkGetVector3Macro](#) ([ImagePositionPatient](#), double)
- [vtkGetVector6Macro](#) ([ImageOrientationPatient](#), double)
- [vtkSetMacro](#) ([ApplyLookupTable](#), int)
- [vtkSetMacro](#) ([LoadIconImage](#), int)
- [vtkSetMacro](#) ([LoadOverlays](#), int)
- [vtkSetMacro](#) ([LossyFlag](#), int)
- [vtkTypeMacro](#) ([vtkGDCMImageReader](#), [vtkMedicalImageReader2](#))

### Static Public Member Functions

- static [vtkGDCMThreadedImageReader](#) \* [New](#) ()

### Static Public Member Functions inherited from [vtkGDCMImageReader](#)

- static [vtkGDCMImageReader](#) \* [New](#) ()

### Protected Member Functions

- [vtkGDCMThreadedImageReader](#) ()
- [~vtkGDCMThreadedImageReader](#) ()
- void [ExecuteData](#) ([vtkDataObject](#) \*out)
- void [ExecuteInformation](#) ()
- void [ReadFiles](#) (unsigned int nfiles, const char \*filenames[])
- void [RequestDataCompat](#) ()

### Protected Member Functions inherited from [vtkGDCMImageReader](#)

- [vtkGDCMImageReader](#) ()
- [~vtkGDCMImageReader](#) ()
- void [ExecuteData](#) ([vtkDataObject](#) \*out)
- void [ExecuteInformation](#) ()
- void [FillMedicalImageInformation](#) (const [gdcm::ImageReader](#) &reader)
- int [LoadSingleFile](#) (const char \*filename, char \*pointer, unsigned long &outlen)
- int [RequestDataCompat](#) ()
- int [RequestInformationCompat](#) ()
- void [SetFilePattern](#) (const char \*)
- void [SetFilePrefix](#) (const char \*)
- [vtkGetStringMacro](#) ([FilePattern](#))
- [vtkGetStringMacro](#) ([FilePrefix](#))
- [vtkSetVector6Macro](#) ([ImageOrientationPatient](#), double)

**Additional Inherited Members****Protected Attributes inherited from [vtkGDCMImageReader](#)**

- int [ApplyInverseVideo](#)
- int [ApplyLookupTable](#)
- int [ApplyPlanarConfiguration](#)
- int [ApplyShiftScale](#)
- int [ApplyYBRTToRGB](#)
- vtkPolyData \* [Curve](#)
- vtkMatrix4x4 \* [DirectionCosines](#)
- vtkStringArray \* [FileNames](#)
- int [ForceRescale](#)
- int [IconDataScalarType](#)
- int [IconImageDataExtent](#) [6]
- int [IconNumberOfScalarComponents](#)
- int [ImageFormat](#)
- double [ImageOrientationPatient](#) [6]
- double [ImagePositionPatient](#) [3]
- int [LoadIconImage](#)
- int [LoadOverlays](#)
- int [LossyFlag](#)
- vtkMedicalImageProperties \* [MedicalImageProperties](#)
- int [NumberOfIconImages](#)
- int [NumberOfOverlays](#)
- int [PlanarConfiguration](#)
- double [Scale](#)
- double [Shift](#)

**12.391.1 Constructor & Destructor Documentation****12.391.1.1 [vtkGDCMThreadedImageReader\(\)](#)**

`vtkGDCMThreadedImageReader::vtkGDCMThreadedImageReader ()` [protected]

Referenced by [New\(\)](#), [RequestDataCompat\(\)](#), and [vtkTypeMacro\(\)](#).

**12.391.1.2 [~vtkGDCMThreadedImageReader\(\)](#)**

`vtkGDCMThreadedImageReader::~~vtkGDCMThreadedImageReader ()` [protected]

**12.391.2 Member Function Documentation****12.391.2.1 [ExecuteData\(\)](#)**

`void vtkGDCMThreadedImageReader::ExecuteData (`  
`vtkDataObject * out) [protected]`

### 12.391.2.2 ExecuteInformation()

```
void vtkGDCMThreadedImageReader::ExecuteInformation () [protected]
```

### 12.391.2.3 New()

```
vtkGDCMThreadedImageReader * vtkGDCMThreadedImageReader::New () [static]
```

References [vtkGDCMThreadedImageReader\(\)](#).

### 12.391.2.4 PrintSelf()

```
virtual void vtkGDCMThreadedImageReader::PrintSelf (
    ostream & os,
    vtkIndent indent) [virtual]
```

Reimplemented from [vtkGDCMImageReader](#).

### 12.391.2.5 ReadFiles()

```
void vtkGDCMThreadedImageReader::ReadFiles (
    unsigned int nfiles,
    const char * filenames[]) [protected]
```

### 12.391.2.6 RequestDataCompat()

```
void vtkGDCMThreadedImageReader::RequestDataCompat () [protected]
```

References [vtkGDCMThreadedImageReader\(\)](#).

### 12.391.2.7 vtkBooleanMacro()

```
vtkGDCMThreadedImageReader::vtkBooleanMacro (
    UseShiftScale ,
    int )
```

### 12.391.2.8 vtkGetMacro()

```
vtkGDCMThreadedImageReader::vtkGetMacro (
    UseShiftScale ,
    int )
```

**12.391.2.9 vtkSetMacro()** [1/3]

```
vtkGDCMThreadedImageReader::vtkSetMacro (
    Scale ,
    double )
```

References [vtkGDCMImageReader::Scale](#).

**12.391.2.10 vtkSetMacro()** [2/3]

```
vtkGDCMThreadedImageReader::vtkSetMacro (
    Shift ,
    double )
```

References [vtkGDCMImageReader::Shift](#).

**12.391.2.11 vtkSetMacro()** [3/3]

```
vtkGDCMThreadedImageReader::vtkSetMacro (
    UseShiftScale ,
    int )
```

**12.391.2.12 vtkTypeMacro()**

```
vtkGDCMThreadedImageReader::vtkTypeMacro (
    vtkGDCMThreadedImageReader ,
    vtkGDCMImageReader )
```

References [vtkGDCMImageReader::vtkGDCMImageReader\(\)](#), and [vtkGDCMThreadedImageReader\(\)](#).

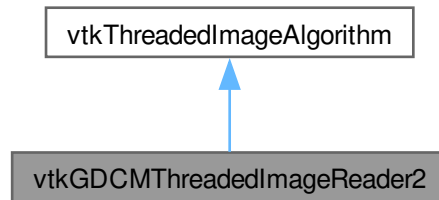
The documentation for this class was generated from the following file:

- [vtkGDCMThreadedImageReader.h](#)

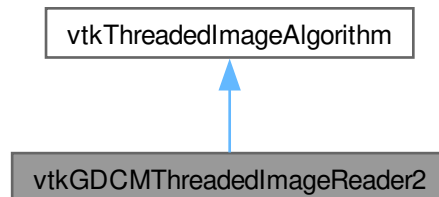
## 12.392 vtkGDCMThreadedImageReader2 Class Reference

```
#include <vtkGDCMThreadedImageReader2.h>
```

Inheritance diagram for vtkGDCMThreadedImageReader2:



Collaboration diagram for vtkGDCMThreadedImageReader2:



### Public Member Functions

- virtual const char \* [GetFileName](#) (int i=0)
- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetFileName](#) (const char \*filename)
- virtual void [SetFileNames](#) (vtkStringArray \*)
- int [SplitExtent](#) (int splitExt[6], int startExt[6], int num, int total)
- [vtkBooleanMacro](#) (FileLowerLeft, int)
- [vtkBooleanMacro](#) (LoadOverlays, int)
- [vtkBooleanMacro](#) (UseShiftScale, int)
- [vtkGetMacro](#) (DataScalarType, int)
- [vtkGetMacro](#) (FileLowerLeft, int)
- [vtkGetMacro](#) (LoadOverlays, int)



- [vtkGetMacro](#) (NumberOfOverlays, int)
- [vtkGetMacro](#) (NumberOfScalarComponents, int)
- [vtkGetMacro](#) (Scale, double)
- [vtkGetMacro](#) (Shift, double)
- [vtkGetMacro](#) (UseShiftScale, int)
- [vtkGetObjectMacro](#) (FileNames, vtkStringArray)
- [vtkGetVector3Macro](#) (DataOrigin, double)
- [vtkGetVector3Macro](#) (DataSpacing, double)
- [vtkGetVector6Macro](#) (DataExtent, int)
- [vtkSetMacro](#) (DataScalarType, int)
- [vtkSetMacro](#) (FileLowerLeft, int)
- [vtkSetMacro](#) (LoadOverlays, int)
- [vtkSetMacro](#) (NumberOfScalarComponents, int)
- [vtkSetMacro](#) (Scale, double)
- [vtkSetMacro](#) (Shift, double)
- [vtkSetMacro](#) (UseShiftScale, int)
- [vtkSetVector3Macro](#) (DataOrigin, double)
- [vtkSetVector3Macro](#) (DataSpacing, double)
- [vtkSetVector6Macro](#) (DataExtent, int)
- [vtkTypeMacro](#) ([vtkGDCMThreadedImageReader2](#), [vtkThreadedImageAlgorithm](#))

### Static Public Member Functions

- static [vtkGDCMThreadedImageReader2](#) \* [New](#) ()

### Protected Member Functions

- [vtkGDCMThreadedImageReader2](#) ()
- [~vtkGDCMThreadedImageReader2](#) ()
- int [RequestInformation](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector)
- void [ThreadedRequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector, vtkImageData \*\*\*inData, vtkImageData \*\*outData, int outExt[6], int id)

## 12.392.1 Constructor & Destructor Documentation

### 12.392.1.1 vtkGDCMThreadedImageReader2()

`vtkGDCMThreadedImageReader2::vtkGDCMThreadedImageReader2 ()` [protected]

Referenced by [New\(\)](#), [ThreadedRequestData\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.392.1.2 ~vtkGDCMThreadedImageReader2()

`vtkGDCMThreadedImageReader2::~~vtkGDCMThreadedImageReader2 ()` [protected]

## 12.392.2 Member Function Documentation

### 12.392.2.1 GetFileName()

```
virtual const char * vtkGDCMThreadedImageReader2::GetFileName (
    int i = 0) [virtual]
```

### 12.392.2.2 New()

```
vtkGDCMThreadedImageReader2 * vtkGDCMThreadedImageReader2::New () [static]
```

References [vtkGDCMThreadedImageReader2\(\)](#).

### 12.392.2.3 PrintSelf()

```
virtual void vtkGDCMThreadedImageReader2::PrintSelf (
    ostream & os,
    vtkIndent indent) [virtual]
```

### 12.392.2.4 RequestInformation()

```
int vtkGDCMThreadedImageReader2::RequestInformation (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector) [protected]
```

### 12.392.2.5 SetFileName()

```
virtual void vtkGDCMThreadedImageReader2::SetFileName (
    const char * filename) [virtual]
```

### 12.392.2.6 SetFileNames()

```
virtual void vtkGDCMThreadedImageReader2::SetFileNames (
    vtkStringArray * ) [virtual]
```

### 12.392.2.7 SplitExtent()

```
int vtkGDCMThreadedImageReader2::SplitExtent (
    int splitExt[6],
    int startExt[6],
    int num,
    int total)
```

### 12.392.2.8 ThreadedRequestData()

```
void vtkGDCMThreadedImageReader2::ThreadedRequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector,
    vtkImageData *** inData,
    vtkImageData ** outData,
    int outExt[6],
    int id) [protected]
```

References [vtkGDCMThreadedImageReader2\(\)](#).

### 12.392.2.9 vtkBooleanMacro() [1/3]

```
vtkGDCMThreadedImageReader2::vtkBooleanMacro (
    FileLowerLeft ,
    int )
```

### 12.392.2.10 vtkBooleanMacro() [2/3]

```
vtkGDCMThreadedImageReader2::vtkBooleanMacro (
    LoadOverlays ,
    int )
```

### 12.392.2.11 vtkBooleanMacro() [3/3]

```
vtkGDCMThreadedImageReader2::vtkBooleanMacro (
    UseShiftScale ,
    int )
```

### 12.392.2.12 vtkGetMacro() [1/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    DataScalarType ,
    int )
```

### 12.392.2.13 vtkGetMacro() [2/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    FileLowerLeft ,
    int )
```

**12.392.2.14 vtkGetMacro() [3/8]**

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    LoadOverlays ,
    int )
```

**12.392.2.15 vtkGetMacro() [4/8]**

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    NumberOfOverlays ,
    int )
```

**12.392.2.16 vtkGetMacro() [5/8]**

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    NumberOfScalarComponents ,
    int )
```

**12.392.2.17 vtkGetMacro() [6/8]**

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    Scale ,
    double )
```

**12.392.2.18 vtkGetMacro() [7/8]**

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    Shift ,
    double )
```

**12.392.2.19 vtkGetMacro() [8/8]**

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    UseShiftScale ,
    int )
```

**12.392.2.20 vtkGetObjectMacro()**

```
vtkGDCMThreadedImageReader2::vtkGetObjectMacro (
    FileNames ,
    vtkStringArray )
```

**12.392.2.21 vtkGetVector3Macro()** [1/2]

```
vtkGDCMThreadedImageReader2::vtkGetVector3Macro (
    DataOrigin ,
    double )
```

**12.392.2.22 vtkGetVector3Macro()** [2/2]

```
vtkGDCMThreadedImageReader2::vtkGetVector3Macro (
    DataSpacing ,
    double )
```

**12.392.2.23 vtkGetVector6Macro()**

```
vtkGDCMThreadedImageReader2::vtkGetVector6Macro (
    DataExtent ,
    int )
```

**12.392.2.24 vtkSetMacro()** [1/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    DataScalarType ,
    int )
```

**12.392.2.25 vtkSetMacro()** [2/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    FileLowerLeft ,
    int )
```

**12.392.2.26 vtkSetMacro()** [3/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    LoadOverlays ,
    int )
```

**12.392.2.27 vtkSetMacro()** [4/7]

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    NumberOfScalarComponents ,
    int )
```

**12.392.2.28 vtkSetMacro() [5/7]**

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    Scale ,
    double )
```

**12.392.2.29 vtkSetMacro() [6/7]**

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    Shift ,
    double )
```

**12.392.2.30 vtkSetMacro() [7/7]**

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    UseShiftScale ,
    int )
```

**12.392.2.31 vtkSetVector3Macro() [1/2]**

```
vtkGDCMThreadedImageReader2::vtkSetVector3Macro (
    DataOrigin ,
    double )
```

**12.392.2.32 vtkSetVector3Macro() [2/2]**

```
vtkGDCMThreadedImageReader2::vtkSetVector3Macro (
    DataSpacing ,
    double )
```

**12.392.2.33 vtkSetVector6Macro()**

```
vtkGDCMThreadedImageReader2::vtkSetVector6Macro (
    DataExtent ,
    int )
```

**12.392.2.34 vtkTypeMacro()**

```
vtkGDCMThreadedImageReader2::vtkTypeMacro (
    vtkGDCMThreadedImageReader2 ,
    vtkThreadedImageAlgorithm )
```

References [vtkGDCMThreadedImageReader2\(\)](#).

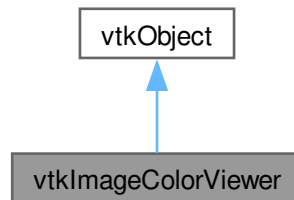
The documentation for this class was generated from the following file:

- [vtkGDCMThreadedImageReader2.h](#)

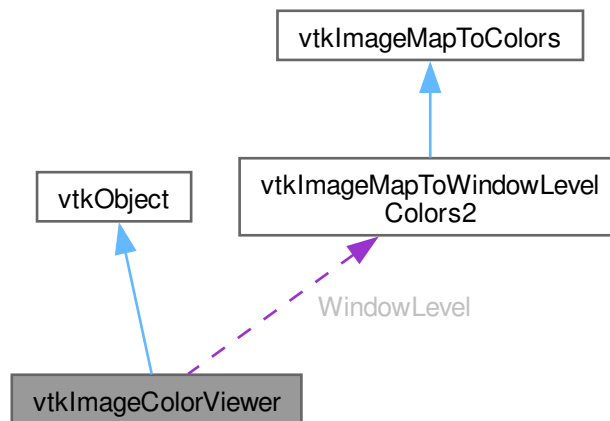
## 12.393 vtkImageColorViewer Class Reference

```
#include <vtkImageColorViewer.h>
```

Inheritance diagram for vtkImageColorViewer:



Collaboration diagram for vtkImageColorViewer:



### Public Types

- enum {  
    SLICE\_ORIENTATION\_YZ = 0 ,  
    SLICE\_ORIENTATION\_XZ = 1 ,  
    SLICE\_ORIENTATION\_XY = 2 }

## Public Member Functions

- virtual void [AddInput](#) (vtkImageData \*input)
- virtual void [AddInputConnection](#) (vtkAlgorithmOutput \*input)
- virtual double [GetColorLevel](#) ()
- virtual double [GetColorWindow](#) ()
- virtual vtkImageData \* [GetInput](#) ()
- virtual int [GetOffScreenRendering](#) ()
- double [GetOverlayVisibility](#) ()
- virtual int \* [GetPosition](#) ()
- virtual int \* [GetSize](#) ()
- virtual int [GetSliceMax](#) ()
- virtual int [GetSliceMin](#) ()
- virtual int \* [GetSliceRange](#) ()
- virtual void [GetSliceRange](#) (int &min, int &max)
- virtual void [GetSliceRange](#) (int range[2])
- virtual const char \* [GetWindowName](#) ()
- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [Render](#) (void)
- virtual void [SetColorLevel](#) (double s)
- virtual void [SetColorWindow](#) (double s)
- virtual void [SetDisplayId](#) (void \*a)
- virtual void [SetInput](#) (vtkImageData \*in)
- virtual void [SetInputConnection](#) (vtkAlgorithmOutput \*input)
- virtual void [SetOffScreenRendering](#) (int)
- void [SetOverlayVisibility](#) (double vis)
- virtual void [SetParentId](#) (void \*a)
- virtual void [SetPosition](#) (int a, int b)
- virtual void [SetPosition](#) (int a[2])
- virtual void [SetRenderer](#) (vtkRenderer \*arg)
- virtual void [SetRenderWindow](#) (vtkRenderWindow \*arg)
- virtual void [SetSize](#) (int a, int b)
- virtual void [SetSize](#) (int a[2])
- virtual void [SetSlice](#) (int s)
- virtual void [SetSliceOrientation](#) (int orientation)
- virtual void [SetSliceOrientationToXY](#) ()
- virtual void [SetSliceOrientationToXZ](#) ()
- virtual void [SetSliceOrientationToYZ](#) ()
- virtual void [SetupInteractor](#) (vtkRenderWindowInteractor \*)
- virtual void [SetWindowId](#) (void \*a)
- virtual void [UpdateDisplayExtent](#) ()
- [vtkBooleanMacro](#) (OffScreenRendering, int)
- [vtkGetMacro](#) (Slice, int)
- [vtkGetMacro](#) (SliceOrientation, int)
- [vtkGetObjectMacro](#) (ImageActor, vtkImageActor)
- [vtkGetObjectMacro](#) (InteractorStyle, vtkInteractorStyleImage)
- [vtkGetObjectMacro](#) (Renderer, vtkRenderer)
- [vtkGetObjectMacro](#) (RenderWindow, vtkRenderWindow)
- [vtkGetObjectMacro](#) (WindowLevel, vtkImageMapToWindowLevelColors2)
- [vtkTypeMacro](#) (vtkImageColorViewer, vtkObject)



### Static Public Member Functions

- static [vtkImageColorViewer](#) \* [New](#) ()

### Protected Member Functions

- [vtkImageColorViewer](#) ()
- [~vtkImageColorViewer](#) ()
- virtual void [InstallPipeline](#) ()
- virtual void [UnInstallPipeline](#) ()
- virtual void [UpdateOrientation](#) ()

### Protected Attributes

- int [FirstRender](#)
- vtkImageActor \* [ImageActor](#)
- vtkRenderWindowInteractor \* [Interactor](#)
- vtkInteractorStyleImage \* [InteractorStyle](#)
- vtkImageActor \* [OverlayImageActor](#)
- vtkRenderer \* [Renderer](#)
- vtkRenderWindow \* [RenderWindow](#)
- int [Slice](#)
- int [SliceOrientation](#)
- [vtkImageMapToWindowLevelColors2](#) \* [WindowLevel](#)

### Friends

- class [vtkImageColorViewerCallback](#)

## 12.393.1 Detailed Description

### Examples

[gdcmrtonplan.cxx](#), and [gdcmrtpplan.cxx](#).

## 12.393.2 Member Enumeration Documentation

### 12.393.2.1 anonymous enum

anonymous enum

### Enumerator

---

SLICE_ORIENTATION_YZ	
SLICE_ORIENTATION_XZ	
SLICE_ORIENTATION_XY	

### 12.393.3 Constructor & Destructor Documentation

#### 12.393.3.1 vtkImageColorViewer()

`vtkImageColorViewer::vtkImageColorViewer () [protected]`

Referenced by [New\(\)](#), [vtkImageColorViewerCallback](#), and [vtkTypeMacro\(\)](#).

#### 12.393.3.2 ~vtkImageColorViewer()

`vtkImageColorViewer::~~vtkImageColorViewer () [protected]`

### 12.393.4 Member Function Documentation

#### 12.393.4.1 AddInput()

`virtual void vtkImageColorViewer::AddInput (`  
`vtkImageData * input) [virtual]`

#### 12.393.4.2 AddInputConnection()

`virtual void vtkImageColorViewer::AddInputConnection (`  
`vtkAlgorithmOutput * input) [virtual]`

#### 12.393.4.3 GetColorLevel()

`virtual double vtkImageColorViewer::GetColorLevel () [virtual]`

#### 12.393.4.4 GetColorWindow()

`virtual double vtkImageColorViewer::GetColorWindow () [virtual]`

#### 12.393.4.5 GetInput()

`virtual vtkImageData * vtkImageColorViewer::GetInput () [virtual]`

#### 12.393.4.6 GetOffScreenRendering()

```
virtual int vtkImageColorViewer::GetOffScreenRendering () [virtual]
```

#### 12.393.4.7 GetOverlayVisibility()

```
double vtkImageColorViewer::GetOverlayVisibility ()
```

#### 12.393.4.8 GetPosition()

```
virtual int * vtkImageColorViewer::GetPosition () [virtual]
```

#### 12.393.4.9 GetSize()

```
virtual int * vtkImageColorViewer::GetSize () [virtual]
```

#### 12.393.4.10 GetSliceMax()

```
virtual int vtkImageColorViewer::GetSliceMax () [virtual]
```

#### 12.393.4.11 GetSliceMin()

```
virtual int vtkImageColorViewer::GetSliceMin () [virtual]
```

#### 12.393.4.12 GetSliceRange() [1/3]

```
virtual int * vtkImageColorViewer::GetSliceRange () [virtual]
```

#### 12.393.4.13 GetSliceRange() [2/3]

```
virtual void vtkImageColorViewer::GetSliceRange (
    int & min,
    int & max) [virtual]
```

#### 12.393.4.14 GetSliceRange() [3/3]

```
virtual void vtkImageColorViewer::GetSliceRange (
    int range[2]) [inline], [virtual]
```

References [GetSliceRange\(\)](#).

Referenced by [GetSliceRange\(\)](#).

**12.393.4.15 GetWindowName()**

```
virtual const char * vtkImageColorViewer::GetWindowName () [virtual]
```

**12.393.4.16 InstallPipeline()**

```
virtual void vtkImageColorViewer::InstallPipeline () [protected], [virtual]
```

**12.393.4.17 New()**

```
vtkImageColorViewer * vtkImageColorViewer::New () [static]
```

**Examples**

[gdcmrptionplan.cxx](#), and [gdcmrtpplan.cxx](#).

References [vtkImageColorViewer\(\)](#).

**12.393.4.18 PrintSelf()**

```
void vtkImageColorViewer::PrintSelf (
    ostream & os,
    vtkIndent indent)
```

**12.393.4.19 Render()**

```
virtual void vtkImageColorViewer::Render (
    void ) [virtual]
```

**Examples**

[gdcmrptionplan.cxx](#), and [gdcmrtpplan.cxx](#).

**12.393.4.20 SetColorLevel()**

```
virtual void vtkImageColorViewer::SetColorLevel (
    double s) [virtual]
```

**12.393.4.21 SetColorWindow()**

```
virtual void vtkImageColorViewer::SetColorWindow (
    double s) [virtual]
```

**12.393.4.22 SetDisplayId()**

```
virtual void vtkImageColorViewer::SetDisplayId (  
    void * a) [virtual]
```

**12.393.4.23 SetInput()**

```
virtual void vtkImageColorViewer::SetInput (  
    vtkImageData * in) [virtual]
```

**Examples**

[gdcmrtonplan.cxx](#), and [gdcmrtpplan.cxx](#).

**12.393.4.24 SetInputConnection()**

```
virtual void vtkImageColorViewer::SetInputConnection (  
    vtkAlgorithmOutput * input) [virtual]
```

**12.393.4.25 SetOffScreenRendering()**

```
virtual void vtkImageColorViewer::SetOffScreenRendering (  
    int ) [virtual]
```

**12.393.4.26 SetOverlayVisibility()**

```
void vtkImageColorViewer::SetOverlayVisibility (  
    double vis)
```

**12.393.4.27 SetParentId()**

```
virtual void vtkImageColorViewer::SetParentId (  
    void * a) [virtual]
```

**12.393.4.28 SetPosition() [1/2]**

```
virtual void vtkImageColorViewer::SetPosition (  
    int a,  
    int b) [virtual]
```

**12.393.4.29 SetPosition() [2/2]**

```
virtual void vtkImageColorViewer::SetPosition (  
    int a[2]) [inline], [virtual]
```

References [SetPosition\(\)](#).

Referenced by [SetPosition\(\)](#).

**12.393.4.30 SetRenderer()**

```
virtual void vtkImageColorViewer::SetRenderer (  
    vtkRenderer * arg) [virtual]
```

**12.393.4.31 SetRenderWindow()**

```
virtual void vtkImageColorViewer::SetRenderWindow (  
    vtkRenderWindow * arg) [virtual]
```

**12.393.4.32 SetSize() [1/2]**

```
virtual void vtkImageColorViewer::SetSize (  
    int a,  
    int b) [virtual]
```

**Examples**

[gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

**12.393.4.33 SetSize() [2/2]**

```
virtual void vtkImageColorViewer::SetSize (  
    int a[2]) [inline], [virtual]
```

References [SetSize\(\)](#).

Referenced by [SetSize\(\)](#).

**12.393.4.34 SetSlice()**

```
virtual void vtkImageColorViewer::SetSlice (  
    int s) [virtual]
```

#### 12.393.4.35 SetSliceOrientation()

```
virtual void vtkImageColorViewer::SetSliceOrientation (
    int orientation) [virtual]
```

Referenced by [SetSliceOrientationToXY\(\)](#), [SetSliceOrientationToXZ\(\)](#), and [SetSliceOrientationToYZ\(\)](#).

#### 12.393.4.36 SetSliceOrientationToXY()

```
virtual void vtkImageColorViewer::SetSliceOrientationToXY () [inline], [virtual]
```

References [SetSliceOrientation\(\)](#), and [SLICE\\_ORIENTATION\\_XY](#).

#### 12.393.4.37 SetSliceOrientationToXZ()

```
virtual void vtkImageColorViewer::SetSliceOrientationToXZ () [inline], [virtual]
```

References [SetSliceOrientation\(\)](#), and [SLICE\\_ORIENTATION\\_XZ](#).

#### 12.393.4.38 SetSliceOrientationToYZ()

```
virtual void vtkImageColorViewer::SetSliceOrientationToYZ () [inline], [virtual]
```

References [SetSliceOrientation\(\)](#), and [SLICE\\_ORIENTATION\\_YZ](#).

#### 12.393.4.39 SetupInteractor()

```
virtual void vtkImageColorViewer::SetupInteractor (
    vtkRenderWindowInteractor * ) [virtual]
```

##### Examples

[gdcmrtonplan.cxx](#), and [gdcmrtpplan.cxx](#).

#### 12.393.4.40 SetWindowId()

```
virtual void vtkImageColorViewer::SetWindowId (
    void * a) [virtual]
```

#### 12.393.4.41 UnInstallPipeline()

```
virtual void vtkImageColorViewer::UnInstallPipeline () [protected], [virtual]
```

**12.393.4.42 UpdateDisplayExtent()**

```
virtual void vtkImageColorViewer::UpdateDisplayExtent () [virtual]
```

**12.393.4.43 UpdateOrientation()**

```
virtual void vtkImageColorViewer::UpdateOrientation () [protected], [virtual]
```

**12.393.4.44 vtkBooleanMacro()**

```
vtkImageColorViewer::vtkBooleanMacro (
    OffScreenRendering ,
    int )
```

**12.393.4.45 vtkGetMacro() [1/2]**

```
vtkImageColorViewer::vtkGetMacro (
    Slice ,
    int )
```

References [Slice](#).

**12.393.4.46 vtkGetMacro() [2/2]**

```
vtkImageColorViewer::vtkGetMacro (
    SliceOrientation ,
    int )
```

References [SliceOrientation](#).

**12.393.4.47 vtkGetObjectMacro() [1/5]**

```
vtkImageColorViewer::vtkGetObjectMacro (
    ImageActor ,
    vtkImageActor )
```

References [ImageActor](#).

**12.393.4.48 vtkGetObjectMacro() [2/5]**

```
vtkImageColorViewer::vtkGetObjectMacro (
    InteractorStyle ,
    vtkInteractorStyleImage )
```

References [InteractorStyle](#).



**12.393.4.49 vtkGetObjectMacro() [3/5]**

```
vtkImageColorViewer::vtkGetObjectMacro (
    Renderer ,
    vtkRenderer )
```

References [Renderer](#).

**12.393.4.50 vtkGetObjectMacro() [4/5]**

```
vtkImageColorViewer::vtkGetObjectMacro (
    RenderWindow ,
    vtkRenderWindow )
```

References [RenderWindow](#).

**12.393.4.51 vtkGetObjectMacro() [5/5]**

```
vtkImageColorViewer::vtkGetObjectMacro (
    WindowLevel ,
    vtkImageMapToWindowLevelColors2 )
```

References [WindowLevel](#).

**12.393.4.52 vtkTypeMacro()**

```
vtkImageColorViewer::vtkTypeMacro (
    vtkImageColorViewer ,
    vtkObject )
```

References [vtkImageColorViewer\(\)](#).

**12.393.5 Friends And Related Symbol Documentation****12.393.5.1 vtkImageColorViewerCallback**

```
friend class vtkImageColorViewerCallback [friend]
```

References [vtkImageColorViewer\(\)](#), and [vtkImageColorViewerCallback](#).

Referenced by [vtkImageColorViewerCallback](#).

## 12.393.6 Member Data Documentation

### 12.393.6.1 FirstRender

`int vtkImageColorViewer::FirstRender` [protected]

### 12.393.6.2 ImageActor

`vtkImageActor* vtkImageColorViewer::ImageActor` [protected]

Referenced by [vtkGetObjectMacro\(\)](#).

### 12.393.6.3 Interactor

`vtkRenderWindowInteractor* vtkImageColorViewer::Interactor` [protected]

### 12.393.6.4 InteractorStyle

`vtkInteractorStyleImage* vtkImageColorViewer::InteractorStyle` [protected]

Referenced by [vtkGetObjectMacro\(\)](#).

### 12.393.6.5 OverlayImageActor

`vtkImageActor* vtkImageColorViewer::OverlayImageActor` [protected]

### 12.393.6.6 Renderer

`vtkRenderer* vtkImageColorViewer::Renderer` [protected]

Referenced by [vtkGetObjectMacro\(\)](#).

### 12.393.6.7 RenderWindow

`vtkRenderWindow* vtkImageColorViewer::RenderWindow` [protected]

Referenced by [vtkGetObjectMacro\(\)](#).

### 12.393.6.8 Slice

```
int vtkImageColorViewer::Slice [protected]
```

Referenced by [vtkGetMacro\(\)](#).

### 12.393.6.9 SliceOrientation

```
int vtkImageColorViewer::SliceOrientation [protected]
```

Referenced by [vtkGetMacro\(\)](#).

### 12.393.6.10 WindowLevel

```
vtkImageMapToWindowLevelColors2* vtkImageColorViewer::WindowLevel [protected]
```

Referenced by [vtkGetObjectMacro\(\)](#).

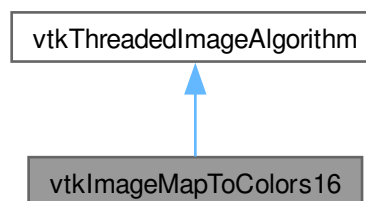
The documentation for this class was generated from the following file:

- [vtkImageColorViewer.h](#)

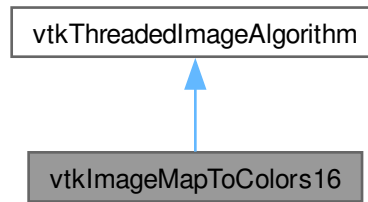
## 12.394 vtkImageMapToColors16 Class Reference

```
#include <vtkImageMapToColors16.h>
```

Inheritance diagram for vtkImageMapToColors16:



Collaboration diagram for vtkImageMapToColors16:



### Public Member Functions

- virtual unsigned long [GetMTime](#) ()
- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetLookupTable](#) (vtkScalarsToColors \*)
- void [SetOutputFormatToLuminance](#) ()
- void [SetOutputFormatToLuminanceAlpha](#) ()
- void [SetOutputFormatToRGB](#) ()
- void [SetOutputFormatToRGBA](#) ()
- [vtkBooleanMacro](#) ([PassAlphaToOutput](#), int)
- [vtkGetMacro](#) ([ActiveComponent](#), int)
- [vtkGetMacro](#) ([OutputFormat](#), int)
- [vtkGetMacro](#) ([PassAlphaToOutput](#), int)
- [vtkGetObjectMacro](#) ([LookupTable](#), vtkScalarsToColors)
- [vtkSetMacro](#) ([ActiveComponent](#), int)
- [vtkSetMacro](#) ([OutputFormat](#), int)
- [vtkSetMacro](#) ([PassAlphaToOutput](#), int)
- [vtkTypeMacro](#) (vtkImageMapToColors16, vtkThreadedImageAlgorithm)

### Static Public Member Functions

- static [vtkImageMapToColors16 \\* New](#) ()

### Protected Member Functions

- [vtkImageMapToColors16](#) ()
- [~vtkImageMapToColors16](#) ()
- virtual int [RequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector)
- virtual int [RequestInformation](#) (vtkInformation \*, vtkInformationVector \*\*, vtkInformationVector \*)
- void [ThreadedRequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector, vtkImageData \*\*\*inData, vtkImageData \*\*outData, int extent[6], int id)

## Protected Attributes

- int [ActiveComponent](#)
- int [DataWasPassed](#)
- vtkScalarsToColors \* [LookupTable](#)
- int [OutputFormat](#)
- int [PassAlphaToOutput](#)

## 12.394.1 Constructor & Destructor Documentation

### 12.394.1.1 vtkImageMapToColors16()

```
vtkImageMapToColors16::vtkImageMapToColors16 () [protected]
```

Referenced by [New\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.394.1.2 ~vtkImageMapToColors16()

```
vtkImageMapToColors16::~~vtkImageMapToColors16 () [protected]
```

## 12.394.2 Member Function Documentation

### 12.394.2.1 GetMTime()

```
virtual unsigned long vtkImageMapToColors16::GetMTime () [virtual]
```

Referenced by [vtkGetMacro\(\)](#).

### 12.394.2.2 New()

```
vtkImageMapToColors16 * vtkImageMapToColors16::New () [static]
```

References [vtkImageMapToColors16\(\)](#).

### 12.394.2.3 PrintSelf()

```
void vtkImageMapToColors16::PrintSelf (  
    ostream & os,  
    vtkIndent indent)
```

**12.394.2.4 RequestData()**

```
virtual int vtkImageMapToColors16::RequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector) [protected], [virtual]
```

**12.394.2.5 RequestInformation()**

```
virtual int vtkImageMapToColors16::RequestInformation (
    vtkInformation * ,
    vtkInformationVector ** ,
    vtkInformationVector * ) [protected], [virtual]
```

**12.394.2.6 SetLookupTable()**

```
virtual void vtkImageMapToColors16::SetLookupTable (
    vtkScalarsToColors * ) [virtual]
```

**12.394.2.7 SetOutputFormatToLuminance()**

```
void vtkImageMapToColors16::SetOutputFormatToLuminance () [inline]
```

References [OutputFormat](#).

**12.394.2.8 SetOutputFormatToLuminanceAlpha()**

```
void vtkImageMapToColors16::SetOutputFormatToLuminanceAlpha () [inline]
```

References [OutputFormat](#).

**12.394.2.9 SetOutputFormatToRGB()**

```
void vtkImageMapToColors16::SetOutputFormatToRGB () [inline]
```

References [OutputFormat](#).

**12.394.2.10 SetOutputFormatToRGBA()**

```
void vtkImageMapToColors16::SetOutputFormatToRGBA () [inline]
```

References [OutputFormat](#).

### 12.394.2.11 ThreadedRequestData()

```
void vtkImageMapToColors16::ThreadedRequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector,
    vtkImageData *** inData,
    vtkImageData ** outData,
    int extent[6],
    int id) [protected]
```

### 12.394.2.12 vtkBooleanMacro()

```
vtkImageMapToColors16::vtkBooleanMacro (
    PassAlphaToOutput ,
    int )
```

References [PassAlphaToOutput](#).

### 12.394.2.13 vtkGetMacro() [1/3]

```
vtkImageMapToColors16::vtkGetMacro (
    ActiveComponent ,
    int )
```

References [ActiveComponent](#).

### 12.394.2.14 vtkGetMacro() [2/3]

```
vtkImageMapToColors16::vtkGetMacro (
    OutputFormat ,
    int )
```

References [OutputFormat](#).

### 12.394.2.15 vtkGetMacro() [3/3]

```
vtkImageMapToColors16::vtkGetMacro (
    PassAlphaToOutput ,
    int )
```

References [GetMTime\(\)](#), and [PassAlphaToOutput](#).

### 12.394.2.16 vtkGetObjectMacro()

```
vtkImageMapToColors16::vtkGetObjectMacro (
    LookupTable ,
    vtkScalarsToColors )
```

References [LookupTable](#).

### 12.394.2.17 vtkSetMacro() [1/3]

```
vtkImageMapToColors16::vtkSetMacro (
    ActiveComponent ,
    int )
```

References [ActiveComponent](#).

### 12.394.2.18 vtkSetMacro() [2/3]

```
vtkImageMapToColors16::vtkSetMacro (
    OutputFormat ,
    int )
```

References [OutputFormat](#).

### 12.394.2.19 vtkSetMacro() [3/3]

```
vtkImageMapToColors16::vtkSetMacro (
    PassAlphaToOutput ,
    int )
```

References [PassAlphaToOutput](#).

### 12.394.2.20 vtkTypeMacro()

```
vtkImageMapToColors16::vtkTypeMacro (
    vtkImageMapToColors16 ,
    vtkThreadedImageAlgorithm )
```

References [vtkImageMapToColors16\(\)](#).

## 12.394.3 Member Data Documentation

### 12.394.3.1 ActiveComponent

```
int vtkImageMapToColors16::ActiveComponent [protected]
```

Referenced by [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).



### 12.394.3.2 DataWasPassed

```
int vtkImageMapToColors16::DataWasPassed [protected]
```

### 12.394.3.3 LookupTable

```
vtkScalarsToColors* vtkImageMapToColors16::LookupTable [protected]
```

Referenced by [vtkGetObjectMacro\(\)](#).

### 12.394.3.4 OutputFormat

```
int vtkImageMapToColors16::OutputFormat [protected]
```

Referenced by [SetOutputFormatToLuminance\(\)](#), [SetOutputFormatToLuminanceAlpha\(\)](#), [SetOutputFormatToRGB\(\)](#), [SetOutputFormatToRGBA\(\)](#), [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

### 12.394.3.5 PassAlphaToOutput

```
int vtkImageMapToColors16::PassAlphaToOutput [protected]
```

Referenced by [vtkBooleanMacro\(\)](#), [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

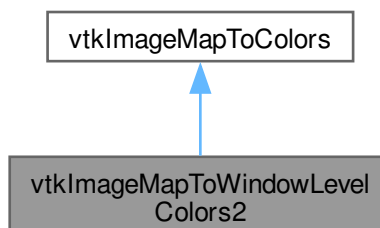
The documentation for this class was generated from the following file:

- [vtkImageMapToColors16.h](#)

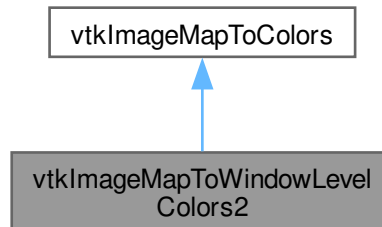
## 12.395 vtkImageMapToWindowLevelColors2 Class Reference

```
#include <vtkImageMapToWindowLevelColors2.h>
```

Inheritance diagram for vtkImageMapToWindowLevelColors2:



Collaboration diagram for vtkImageMapToWindowLevelColors2:



### Public Member Functions

- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkGetMacro](#) (Level, double)
- [vtkGetMacro](#) (Window, double)
- [vtkSetMacro](#) (Level, double)
- [vtkSetMacro](#) (Window, double)
- [vtkTypeMacro](#) (vtkImageMapToWindowLevelColors2, vtkImageMapToColors)

### Static Public Member Functions

- static [vtkImageMapToWindowLevelColors2 \\* New](#) ()

### Protected Member Functions

- [vtkImageMapToWindowLevelColors2](#) ()
- [~vtkImageMapToWindowLevelColors2](#) ()
- virtual int [RequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector)
- virtual int [RequestInformation](#) (vtkInformation \*, vtkInformationVector \*\*, vtkInformationVector \*)
- void [ThreadedRequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector, vtkImageData \*\*\*inData, vtkImageData \*\*outData, int extent[6], int id)

### Protected Attributes

- double [Level](#)
- double [Window](#)

## 12.395.1 Constructor & Destructor Documentation

### 12.395.1.1 vtkImageMapToWindowLevelColors2()

```
vtkImageMapToWindowLevelColors2::vtkImageMapToWindowLevelColors2 () [protected]
```

Referenced by [New\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.395.1.2 ~vtkImageMapToWindowLevelColors2()

```
vtkImageMapToWindowLevelColors2::~~vtkImageMapToWindowLevelColors2 () [protected]
```

## 12.395.2 Member Function Documentation

### 12.395.2.1 New()

```
vtkImageMapToWindowLevelColors2 * vtkImageMapToWindowLevelColors2::New () [static]
```

References [vtkImageMapToWindowLevelColors2\(\)](#).

### 12.395.2.2 PrintSelf()

```
void vtkImageMapToWindowLevelColors2::PrintSelf (
    ostream & os,
    vtkIndent indent)
```

### 12.395.2.3 RequestData()

```
virtual int vtkImageMapToWindowLevelColors2::RequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector) [protected], [virtual]
```

### 12.395.2.4 RequestInformation()

```
virtual int vtkImageMapToWindowLevelColors2::RequestInformation (
    vtkInformation * ,
    vtkInformationVector ** ,
    vtkInformationVector * ) [protected], [virtual]
```

### 12.395.2.5 ThreadedRequestData()

```
void vtkImageMapToWindowLevelColors2::ThreadedRequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector,
    vtkImageData *** inData,
    vtkImageData ** outData,
    int extent[6],
    int id) [protected]
```

### 12.395.2.6 vtkGetMacro() [1/2]

```
vtkImageMapToWindowLevelColors2::vtkGetMacro (
    Level ,
    double )
```

References [Level](#).

### 12.395.2.7 vtkGetMacro() [2/2]

```
vtkImageMapToWindowLevelColors2::vtkGetMacro (
    Window ,
    double )
```

References [Window](#).

### 12.395.2.8 vtkSetMacro() [1/2]

```
vtkImageMapToWindowLevelColors2::vtkSetMacro (
    Level ,
    double )
```

References [Level](#).

### 12.395.2.9 vtkSetMacro() [2/2]

```
vtkImageMapToWindowLevelColors2::vtkSetMacro (
    Window ,
    double )
```

References [Window](#).

### 12.395.2.10 vtkTypeMacro()

```
vtkImageMapToWindowLevelColors2::vtkTypeMacro (
    vtkImageMapToWindowLevelColors2 ,
    vtkImageMapToColors )
```

References [vtkImageMapToWindowLevelColors2\(\)](#).

## 12.395.3 Member Data Documentation

### 12.395.3.1 Level

```
double vtkImageMapToWindowLevelColors2::Level [protected]
```

Referenced by [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

### 12.395.3.2 Window

```
double vtkImageMapToWindowLevelColors2::Window [protected]
```

Referenced by [vtkGetMacro\(\)](#), and [vtkSetMacro\(\)](#).

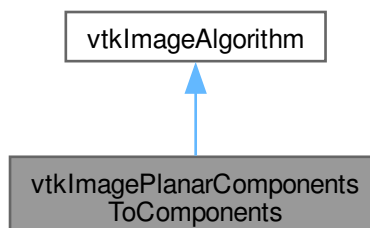
The documentation for this class was generated from the following file:

- [vtkImageMapToWindowLevelColors2.h](#)

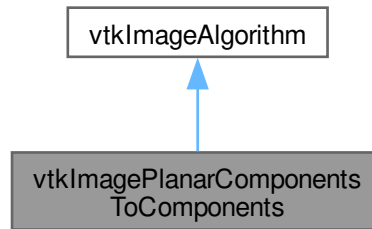
## 12.396 vtkImagePlanarComponentsToComponents Class Reference

```
#include <vtkImagePlanarComponentsToComponents.h>
```

Inheritance diagram for vtkImagePlanarComponentsToComponents:



Collaboration diagram for `vtkImagePlanarComponentsToComponents`:



### Public Member Functions

- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkTypeMacro](#) ([vtkImagePlanarComponentsToComponents](#), [vtkImageAlgorithm](#))

### Static Public Member Functions

- static [vtkImagePlanarComponentsToComponents](#) \* [New](#) ()

### Protected Member Functions

- [vtkImagePlanarComponentsToComponents](#) ()
- [~vtkImagePlanarComponentsToComponents](#) ()
- virtual int [RequestData](#) (vtkInformation \*, vtkInformationVector \*\*, vtkInformationVector \*)

## 12.396.1 Constructor & Destructor Documentation

### 12.396.1.1 `vtkImagePlanarComponentsToComponents()`

```
vtkImagePlanarComponentsToComponents::vtkImagePlanarComponentsToComponents () [protected]
```

Referenced by [New\(\)](#), [RequestData\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.396.1.2 `~vtkImagePlanarComponentsToComponents()`

```
vtkImagePlanarComponentsToComponents::~~vtkImagePlanarComponentsToComponents () [inline], [protected]
```

## 12.396.2 Member Function Documentation

### 12.396.2.1 New()

[vtkImagePlanarComponentsToComponents](#) \* [vtkImagePlanarComponentsToComponents::New](#) () [static]

References [vtkImagePlanarComponentsToComponents\(\)](#).

### 12.396.2.2 PrintSelf()

```
void vtkImagePlanarComponentsToComponents::PrintSelf (
    ostream & os,
    vtkIndent indent)
```

### 12.396.2.3 RequestData()

```
virtual int vtkImagePlanarComponentsToComponents::RequestData (
    vtkInformation * ,
    vtkInformationVector ** ,
    vtkInformationVector * ) [protected], [virtual]
```

References [vtkImagePlanarComponentsToComponents\(\)](#).

### 12.396.2.4 vtkTypeMacro()

```
vtkImagePlanarComponentsToComponents::vtkTypeMacro (
    vtkImagePlanarComponentsToComponents ,
    vtkImageAlgorithm )
```

References [vtkImagePlanarComponentsToComponents\(\)](#).

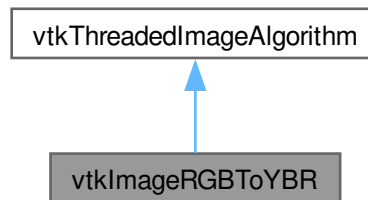
The documentation for this class was generated from the following file:

- [vtkImagePlanarComponentsToComponents.h](#)

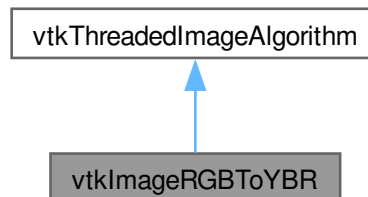
## 12.397 vtkImageRGBToYBR Class Reference

```
#include <vtkImageRGBToYBR.h>
```

Inheritance diagram for vtkImageRGBToYBR:



Collaboration diagram for vtkImageRGBToYBR:



### Public Member Functions

- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkTypeMacro](#) ([vtkImageRGBToYBR](#), [vtkThreadedImageAlgorithm](#))

### Static Public Member Functions

- static [vtkImageRGBToYBR](#) \* [New](#) ()



## Protected Member Functions

- [vtkImageRGBToYBR \(\)](#)
- [~vtkImageRGBToYBR \(\)](#)
- void [ThreadedExecute](#) (vtkImageData \*inData, vtkImageData \*outData, int ext[6], int id)

## 12.397.1 Constructor & Destructor Documentation

### 12.397.1.1 vtkImageRGBToYBR()

```
vtkImageRGBToYBR::vtkImageRGBToYBR () [protected]
```

Referenced by [New\(\)](#), [ThreadedExecute\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.397.1.2 ~vtkImageRGBToYBR()

```
vtkImageRGBToYBR::~~vtkImageRGBToYBR () [inline], [protected]
```

## 12.397.2 Member Function Documentation

### 12.397.2.1 New()

```
vtkImageRGBToYBR * vtkImageRGBToYBR::New () [static]
```

References [vtkImageRGBToYBR\(\)](#).

### 12.397.2.2 PrintSelf()

```
void vtkImageRGBToYBR::PrintSelf (  
    ostream & os,  
    vtkIndent indent)
```

### 12.397.2.3 ThreadedExecute()

```
void vtkImageRGBToYBR::ThreadedExecute (  
    vtkImageData * inData,  
    vtkImageData * outData,  
    int ext[6],  
    int id) [protected]
```

References [vtkImageRGBToYBR\(\)](#).

### 12.397.2.4 vtkTypeMacro()

```
vtkImageRGBToYBR::vtkTypeMacro (
    vtkImageRGBToYBR ,
    vtkThreadedImageAlgorithm )
```

References [vtkImageRGBToYBR\(\)](#).

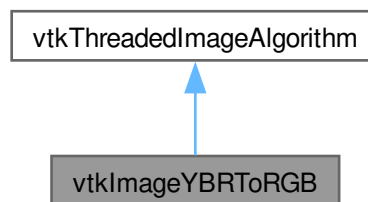
The documentation for this class was generated from the following file:

- [vtkImageRGBToYBR.h](#)

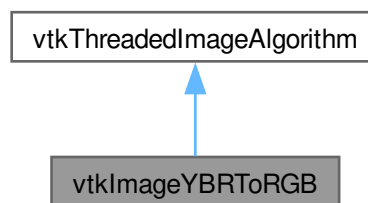
## 12.398 vtkImageYBRToRGB Class Reference

```
#include <vtkImageYBRToRGB.h>
```

Inheritance diagram for vtkImageYBRToRGB:



Collaboration diagram for vtkImageYBRToRGB:



**Public Member Functions**

- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkTypeMacro](#) (vtkImageYBRToRGB, vtkThreadedImageAlgorithm)

**Static Public Member Functions**

- static [vtkImageYBRToRGB](#) \* [New](#) ()

**Protected Member Functions**

- [vtkImageYBRToRGB](#) ()
- [~vtkImageYBRToRGB](#) ()
- void [ThreadedExecute](#) (vtkImageData \*inData, vtkImageData \*outData, int ext[6], int id)

**12.398.1 Constructor & Destructor Documentation****12.398.1.1 vtkImageYBRToRGB()**

```
vtkImageYBRToRGB::vtkImageYBRToRGB () [protected]
```

Referenced by [New\(\)](#), [ThreadedExecute\(\)](#), and [vtkTypeMacro\(\)](#).

**12.398.1.2 ~vtkImageYBRToRGB()**

```
vtkImageYBRToRGB::~~vtkImageYBRToRGB () [inline], [protected]
```

**12.398.2 Member Function Documentation****12.398.2.1 New()**

```
vtkImageYBRToRGB * vtkImageYBRToRGB::New () [static]
```

References [vtkImageYBRToRGB\(\)](#).

**12.398.2.2 PrintSelf()**

```
void vtkImageYBRToRGB::PrintSelf (
    ostream & os,
    vtkIndent indent)
```

### 12.398.2.3 ThreadedExecute()

```
void vtkImageYBRToRGB::ThreadedExecute (
    vtkImageData * inData,
    vtkImageData * outData,
    int ext[6],
    int id) [protected]
```

References [vtkImageYBRToRGB\(\)](#).

### 12.398.2.4 vtkTypeMacro()

```
vtkImageYBRToRGB::vtkTypeMacro (
    vtkImageYBRToRGB ,
    vtkThreadedImageAlgorithm )
```

References [vtkImageYBRToRGB\(\)](#).

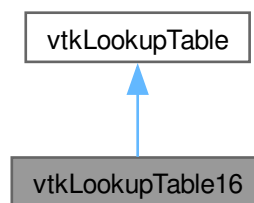
The documentation for this class was generated from the following file:

- [vtkImageYBRToRGB.h](#)

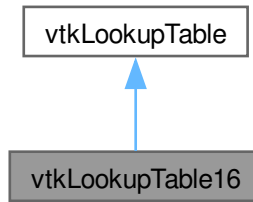
## 12.399 vtkLookupTable16 Class Reference

```
#include <vtkLookupTable16.h>
```

Inheritance diagram for vtkLookupTable16:



Collaboration diagram for vtkLookupTable16:



### Public Member Functions

- void [Build](#) ()
- unsigned short \* [GetPointer](#) (const vtkIdType id)
- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- void [SetNumberOfTableValues](#) (vtkIdType number)
- [vtkTypeMacro](#) ([vtkLookupTable16](#), vtkLookupTable)
- unsigned char \* [WritePointer](#) (const vtkIdType id, const int number)

### Static Public Member Functions

- static [vtkLookupTable16](#) \* [New](#) ()

### Protected Member Functions

- [vtkLookupTable16](#) (int size=256, int ext=256)
- [~vtkLookupTable16](#) ()
- void [MapScalarsThroughTable2](#) (void \*input, unsigned char \*output, int inputDataType, int numberOfValues, int inputIncrement, int outputFormat)

### Protected Attributes

- vtkUnsignedShortArray \* [Table16](#)

## 12.399.1 Constructor & Destructor Documentation

### 12.399.1.1 vtkLookupTable16()

```

vtkLookupTable16::vtkLookupTable16 (
    int size = 256,
    int ext = 256) [protected]
  
```

Referenced by [MapScalarsThroughTable2\(\)](#), [New\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.399.1.2 ~vtkLookupTable16()

```
vtkLookupTable16::~vtkLookupTable16 () [protected]
```

## 12.399.2 Member Function Documentation

### 12.399.2.1 Build()

```
void vtkLookupTable16::Build ()
```

### 12.399.2.2 GetPointer()

```
unsigned short * vtkLookupTable16::GetPointer (
    const vtkIdType id) [inline]
```

References [Table16](#).

### 12.399.2.3 MapScalarsThroughTable2()

```
void vtkLookupTable16::MapScalarsThroughTable2 (
    void * input,
    unsigned char * output,
    int inputDataType,
    int numberOfValues,
    int inputIncrement,
    int outputFormat) [protected]
```

References [vtkLookupTable16\(\)](#).

### 12.399.2.4 New()

```
vtkLookupTable16 * vtkLookupTable16::New () [static]
```

References [vtkLookupTable16\(\)](#).

### 12.399.2.5 PrintSelf()

```
void vtkLookupTable16::PrintSelf (
    ostream & os,
    vtkIndent indent)
```

### 12.399.2.6 SetNumberOfTableValues()

```
void vtkLookupTable16::SetNumberOfTableValues (
    vtkIdType number)
```

References [WritePointer\(\)](#).

### 12.399.2.7 vtkTypeMacro()

```
vtkLookupTable16::vtkTypeMacro (
    vtkLookupTable16 ,
    vtkLookupTable )
```

References [vtkLookupTable16\(\)](#).

### 12.399.2.8 WritePointer()

```
unsigned char * vtkLookupTable16::WritePointer (
    const vtkIdType id,
    const int number) [inline]
```

References [Table16](#).

Referenced by [SetNumberOfTableValues\(\)](#).

## 12.399.3 Member Data Documentation

### 12.399.3.1 Table16

```
vtkUnsignedShortArray* vtkLookupTable16::Table16 [protected]
```

Referenced by [GetPointer\(\)](#), and [WritePointer\(\)](#).

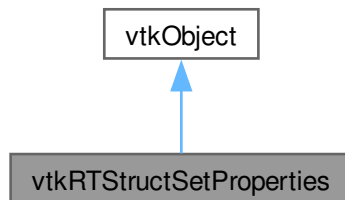
The documentation for this class was generated from the following file:

- [vtkLookupTable16.h](#)

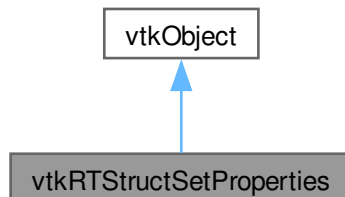
## 12.400 vtkRTStructSetProperties Class Reference

```
#include <vtkRTStructSetProperties.h>
```

Inheritance diagram for vtkRTStructSetProperties:



Collaboration diagram for vtkRTStructSetProperties:



### Public Member Functions

- void [AddContourReferencedFrameOfReference](#) (vtkIdType pdnum, const char \*classuid, const char \*instanceuid)
- void [AddReferencedFrameOfReference](#) (const char \*classuid, const char \*instanceuid)
- void [AddStructureSetROI](#) (int roinumber, const char \*reframerefuid, const char \*roiname, const char \*ROIGenerationAlgorithm, const char \*ROIDescription=0)
- void [AddStructureSetROIObservation](#) (int refnumber, int observationnumber, const char \*rtroiinterpretedtype, const char \*roiinterpreter, const char \*roiobservationlabel=0)
- virtual void [Clear](#) ()
- virtual void [DeepCopy](#) (vtkRTStructSetProperties \*p)
- const char \* [GetContourReferencedFrameOfReferenceClassUID](#) (vtkIdType pdnum, vtkIdType id)
- const char \* [GetContourReferencedFrameOfReferenceInstanceUID](#) (vtkIdType pdnum, vtkIdType id)
- vtkIdType [GetNumberOfContourReferencedFrameOfReferences](#) ()



- vtkIdType [GetNumberOfContourReferencedFrameOfReferences](#) (vtkIdType pdnum)
- vtkIdType [GetNumberOfReferencedFrameOfReferences](#) ()
- vtkIdType [GetNumberOfStructureSetROIs](#) ()
- const char \* [GetReferencedFrameOfReferenceClassUID](#) (vtkIdType id)
- const char \* [GetReferencedFrameOfReferenceInstanceUID](#) (vtkIdType id)
- int [GetStructureSetObservationNumber](#) (vtkIdType id)
- const char \* [GetStructureSetROIDescription](#) (vtkIdType id)
- const char \* [GetStructureSetROIGenerationAlgorithm](#) (vtkIdType)
- const char \* [GetStructureSetROIName](#) (vtkIdType)
- int [GetStructureSetROINumber](#) (vtkIdType id)
- const char \* [GetStructureSetROIObservationLabel](#) (vtkIdType id)
- const char \* [GetStructureSetROIRefFrameRefUID](#) (vtkIdType)
- const char \* [GetStructureSetRTROIInterpretedType](#) (vtkIdType id)
- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkGetStringMacro](#) (ReferenceFrameOfReferenceUID)
- [vtkGetStringMacro](#) (ReferenceSeriesInstanceUID)
- [vtkGetStringMacro](#) (SeriesInstanceUID)
- [vtkGetStringMacro](#) (SOPInstanceUID)
- [vtkGetStringMacro](#) (StructureSetDate)
- [vtkGetStringMacro](#) (StructureSetLabel)
- [vtkGetStringMacro](#) (StructureSetName)
- [vtkGetStringMacro](#) (StructureSetTime)
- [vtkGetStringMacro](#) (StudyInstanceUID)
- [vtkSetStringMacro](#) (ReferenceFrameOfReferenceUID)
- [vtkSetStringMacro](#) (ReferenceSeriesInstanceUID)
- [vtkSetStringMacro](#) (SeriesInstanceUID)
- [vtkSetStringMacro](#) (SOPInstanceUID)
- [vtkSetStringMacro](#) (StructureSetDate)
- [vtkSetStringMacro](#) (StructureSetLabel)
- [vtkSetStringMacro](#) (StructureSetName)
- [vtkSetStringMacro](#) (StructureSetTime)
- [vtkSetStringMacro](#) (StudyInstanceUID)
- [vtkTypeMacro](#) (vtkRTStructSetProperties, vtkObject)

### Static Public Member Functions

- static [vtkRTStructSetProperties](#) \* [New](#) ()

### Protected Member Functions

- [vtkRTStructSetProperties](#) ()
- [~vtkRTStructSetProperties](#) ()

## Protected Attributes

- vtkRTStructSetPropertiesInternals \* [Internals](#)
- char \* [ReferenceFrameOfReferenceUID](#)
- char \* [ReferenceSeriesInstanceUID](#)
- char \* [SeriesInstanceUID](#)
- char \* [SOPInstanceUID](#)
- char \* [StructureSetDate](#)
- char \* [StructureSetLabel](#)
- char \* [StructureSetName](#)
- char \* [StructureSetTime](#)
- char \* [StudyInstanceUID](#)

## 12.400.1 Detailed Description

### Examples

[GenerateRTSTRUCT.cxx](#).

## 12.400.2 Constructor & Destructor Documentation

### 12.400.2.1 vtkRTStructSetProperties()

```
vtkRTStructSetProperties::vtkRTStructSetProperties () [protected]
```

Referenced by [DeepCopy\(\)](#), [New\(\)](#), and [vtkTypeMacro\(\)](#).

### 12.400.2.2 ~vtkRTStructSetProperties()

```
vtkRTStructSetProperties::~~vtkRTStructSetProperties () [protected]
```

## 12.400.3 Member Function Documentation

### 12.400.3.1 AddContourReferencedFrameOfReference()

```
void vtkRTStructSetProperties::AddContourReferencedFrameOfReference (
    vtkIdType pdnum,
    const char * classuid,
    const char * instanceuid)
```

### 12.400.3.2 AddReferencedFrameOfReference()

```
void vtkRTStructSetProperties::AddReferencedFrameOfReference (
    const char * classuid,
    const char * instanceuid)
```

### 12.400.3.3 AddStructureSetROI()

```
void vtkRTStructSetProperties::AddStructureSetROI (
    int roinumber,
    const char * refframerefuid,
    const char * roiname,
    const char * ROIGenerationAlgorithm,
    const char * ROIDescription = 0)
```

### 12.400.3.4 AddStructureSetROIObservation()

```
void vtkRTStructSetProperties::AddStructureSetROIObservation (
    int refnumber,
    int observationnumber,
    const char * rtroiinterpretedtype,
    const char * roiinterpreter,
    const char * roiobservationlabel = 0)
```

### 12.400.3.5 Clear()

```
virtual void vtkRTStructSetProperties::Clear () [virtual]
```

### 12.400.3.6 DeepCopy()

```
virtual void vtkRTStructSetProperties::DeepCopy (
    vtkRTStructSetProperties * p) [virtual]
```

References [vtkRTStructSetProperties\(\)](#).

### 12.400.3.7 GetContourReferencedFrameOfReferenceClassUID()

```
const char * vtkRTStructSetProperties::GetContourReferencedFrameOfReferenceClassUID (
    vtkIdType pdnum,
    vtkIdType id)
```

### 12.400.3.8 GetContourReferencedFrameOfReferenceInstanceUID()

```
const char * vtkRTStructSetProperties::GetContourReferencedFrameOfReferenceInstanceUID (
    vtkIdType pdnum,
    vtkIdType id)
```

### 12.400.3.9 GetNumberOfContourReferencedFrameOfReferences() [1/2]

```
vtkIdType vtkRTStructSetProperties::GetNumberOfContourReferencedFrameOfReferences ()
```

**12.400.3.10 GetNumberOfContourReferencedFrameOfReferences() [2/2]**

```
vtkIdType vtkRTStructSetProperties::GetNumberOfContourReferencedFrameOfReferences (
    vtkIdType pdnum)
```

**12.400.3.11 GetNumberOfReferencedFrameOfReferences()**

```
vtkIdType vtkRTStructSetProperties::GetNumberOfReferencedFrameOfReferences ()
```

**12.400.3.12 GetNumberOfStructureSetROIs()**

```
vtkIdType vtkRTStructSetProperties::GetNumberOfStructureSetROIs ()
```

**12.400.3.13 GetReferencedFrameOfReferenceClassUID()**

```
const char * vtkRTStructSetProperties::GetReferencedFrameOfReferenceClassUID (
    vtkIdType id)
```

**12.400.3.14 GetReferencedFrameOfReferenceInstanceUID()**

```
const char * vtkRTStructSetProperties::GetReferencedFrameOfReferenceInstanceUID (
    vtkIdType id)
```

**12.400.3.15 GetStructureSetObservationNumber()**

```
int vtkRTStructSetProperties::GetStructureSetObservationNumber (
    vtkIdType id)
```

**12.400.3.16 GetStructureSetROIDescription()**

```
const char * vtkRTStructSetProperties::GetStructureSetROIDescription (
    vtkIdType id)
```

**12.400.3.17 GetStructureSetROIGenerationAlgorithm()**

```
const char * vtkRTStructSetProperties::GetStructureSetROIGenerationAlgorithm (
    vtkIdType )
```

**12.400.3.18 GetStructureSetROIName()**

```
const char * vtkRTStructSetProperties::GetStructureSetROIName (
    vtkIdType )
```

**12.400.3.19 GetStructureSetROINumber()**

```
int vtkRTStructSetProperties::GetStructureSetROINumber (
    vtkIdType id)
```

**12.400.3.20 GetStructureSetROIObservationLabel()**

```
const char * vtkRTStructSetProperties::GetStructureSetROIObservationLabel (
    vtkIdType id)
```

**12.400.3.21 GetStructureSetROIRefFrameRefUID()**

```
const char * vtkRTStructSetProperties::GetStructureSetROIRefFrameRefUID (
    vtkIdType )
```

**12.400.3.22 GetStructureSetRTROIInterpretedType()**

```
const char * vtkRTStructSetProperties::GetStructureSetRTROIInterpretedType (
    vtkIdType id)
```

**12.400.3.23 New()**

```
vtkRTStructSetProperties * vtkRTStructSetProperties::New () [static]
```

**Examples**

[GenerateRTSTRUCT.cxx](#).

References [vtkRTStructSetProperties\(\)](#).

**12.400.3.24 PrintSelf()**

```
void vtkRTStructSetProperties::PrintSelf (
    ostream & os,
    vtkIndent indent)
```

**12.400.3.25 vtkGetStringMacro()** [1/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    ReferenceFrameOfReferenceUID )
```

References [ReferenceFrameOfReferenceUID](#).

**12.400.3.26 vtkGetStringMacro()** [2/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    ReferenceSeriesInstanceUID )
```

References [ReferenceSeriesInstanceUID](#).

**12.400.3.27 vtkGetStringMacro()** [3/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    SeriesInstanceUID )
```

References [SeriesInstanceUID](#).

**12.400.3.28 vtkGetStringMacro()** [4/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    SOPInstanceUID )
```

References [SOPInstanceUID](#).

**12.400.3.29 vtkGetStringMacro()** [5/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    StructureSetDate )
```

References [StructureSetDate](#).

**12.400.3.30 vtkGetStringMacro()** [6/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    StructureSetLabel )
```

References [StructureSetLabel](#).

**12.400.3.31 vtkGetStringMacro()** [7/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    StructureSetName )
```

References [StructureSetName](#).

**12.400.3.32 vtkGetStringMacro()** [8/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    StructureSetTime )
```

References [StructureSetTime](#).

**12.400.3.33 vtkGetStringMacro()** [9/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    StudyInstanceUID )
```

References [StudyInstanceUID](#).

**12.400.3.34 vtkSetStringMacro()** [1/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    ReferenceFrameOfReferenceUID )
```

References [ReferenceFrameOfReferenceUID](#).

**12.400.3.35 vtkSetStringMacro()** [2/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    ReferenceSeriesInstanceUID )
```

References [ReferenceSeriesInstanceUID](#).

**12.400.3.36 vtkSetStringMacro()** [3/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    SeriesInstanceUID )
```

References [SeriesInstanceUID](#).

**12.400.3.37 vtkSetStringMacro()** [4/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    SOPInstanceUID )
```

References [SOPInstanceUID](#).

**12.400.3.38 vtkSetStringMacro()** [5/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    StructureSetDate )
```

References [StructureSetDate](#).

**12.400.3.39 vtkSetStringMacro()** [6/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    StructureSetLabel )
```

References [StructureSetLabel](#).

**12.400.3.40 vtkSetStringMacro()** [7/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    StructureSetName )
```

References [StructureSetName](#).

**12.400.3.41 vtkSetStringMacro()** [8/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    StructureSetTime )
```

References [StructureSetTime](#).

**12.400.3.42 vtkSetStringMacro()** [9/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    StudyInstanceUID )
```

References [StudyInstanceUID](#).



### 12.400.3.43 vtkTypeMacro()

```
vtkRTStructSetProperties::vtkTypeMacro (
    vtkRTStructSetProperties ,
    vtkObject )
```

References [vtkRTStructSetProperties\(\)](#).

## 12.400.4 Member Data Documentation

### 12.400.4.1 Internals

```
vtkRTStructSetPropertiesInternals* vtkRTStructSetProperties::Internals [protected]
```

### 12.400.4.2 ReferenceFrameOfReferenceUID

```
char* vtkRTStructSetProperties::ReferenceFrameOfReferenceUID [protected]
```

Referenced by [vtkGetStringMacro\(\)](#), and [vtkSetStringMacro\(\)](#).

### 12.400.4.3 ReferenceSeriesInstanceUID

```
char* vtkRTStructSetProperties::ReferenceSeriesInstanceUID [protected]
```

Referenced by [vtkGetStringMacro\(\)](#), and [vtkSetStringMacro\(\)](#).

### 12.400.4.4 SeriesInstanceUID

```
char* vtkRTStructSetProperties::SeriesInstanceUID [protected]
```

Referenced by [vtkGetStringMacro\(\)](#), and [vtkSetStringMacro\(\)](#).

### 12.400.4.5 SOPInstanceUID

```
char* vtkRTStructSetProperties::SOPInstanceUID [protected]
```

Referenced by [vtkGetStringMacro\(\)](#), and [vtkSetStringMacro\(\)](#).

### 12.400.4.6 StructureSetDate

```
char* vtkRTStructSetProperties::StructureSetDate [protected]
```

Referenced by [vtkGetStringMacro\(\)](#), and [vtkSetStringMacro\(\)](#).

#### 12.400.4.7 StructureSetLabel

```
char* vtkRTStructSetProperties::StructureSetLabel [protected]
```

Referenced by [vtkGetStringMacro\(\)](#), and [vtkSetStringMacro\(\)](#).

#### 12.400.4.8 StructureSetName

```
char* vtkRTStructSetProperties::StructureSetName [protected]
```

Referenced by [vtkGetStringMacro\(\)](#), and [vtkSetStringMacro\(\)](#).

#### 12.400.4.9 StructureSetTime

```
char* vtkRTStructSetProperties::StructureSetTime [protected]
```

Referenced by [vtkGetStringMacro\(\)](#), and [vtkSetStringMacro\(\)](#).

#### 12.400.4.10 StudyInstanceUID

```
char* vtkRTStructSetProperties::StudyInstanceUID [protected]
```

Referenced by [vtkGetStringMacro\(\)](#), and [vtkSetStringMacro\(\)](#).

The documentation for this class was generated from the following file:

- [vtkRTStructSetProperties.h](#)

## 12.401 gdcm::Waveform Class Reference

[Waveform](#) class.

```
#include <gdcmWaveform.h>
```

### Public Member Functions

- [Waveform](#) ()=default

#### 12.401.1 Detailed Description

[Waveform](#) class.

## 12.401.2 Constructor & Destructor Documentation

### 12.401.2.1 Waveform()

```
gdcm::Waveform::Waveform () [default]
```

The documentation for this class was generated from the following file:

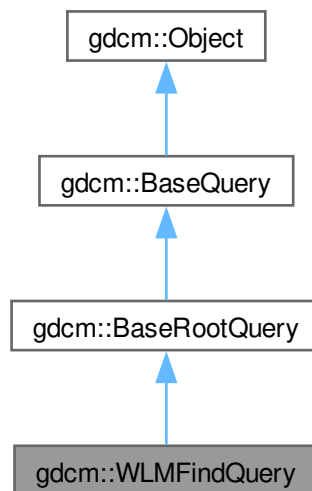
- [gdcmWaveform.h](#)

## 12.402 gdcm::WLMFindQuery Class Reference

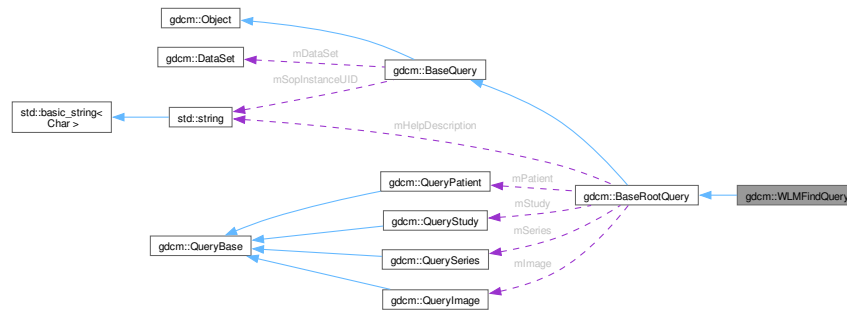
PatientRootQuery.

```
#include <gdcmWLMFindQuery.h>
```

Inheritance diagram for gdcm::WLMFindQuery:



Collaboration diagram for `gdcm::WLMFindQuery`:



### Public Member Functions

- [WLMFindQuery](#) ()
- [UIDs::TSName GetAbstractSyntaxUID](#) () const override
- `std::vector< Tag >` [GetTagListByLevel](#) (const [EQueryLevel](#) &inQueryLevel) override
- void [InitializeDataSet](#) (const [EQueryLevel](#) &inQueryLevel) override
- bool [ValidateQuery](#) (bool inStrict=true) const override

### Public Member Functions inherited from [gdcm::BaseRootQuery](#)

- [~BaseRootQuery](#) () override=default
- [EQueryLevel GetQueryLevelFromQueryRoot](#) ([ERootType](#) roottype)

### Public Member Functions inherited from [gdcm::BaseQuery](#)

- [~BaseQuery](#) () override
- void [AddQueryDataSet](#) (const [DataSet](#) &ds)
- [DataSet &](#) [GetQueryDataSet](#) ()
- [DataSet](#) const & [GetQueryDataSet](#) () const
- *Set/Get the internal representation of the query as a [DataSet](#).*
- `std::string` [GetSOPInstanceUID](#) () const
- void [Print](#) (std::ostream &os) const override
- void [SetSearchParameter](#) (const std::string &inKeyword, const std::string &inValue)
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const std::string &inValue)
- void [SetSOPInstanceUID](#) (const std::string &iSopInstanceUID)
- const std::ostream & [WriteHelpFile](#) (std::ostream &os)
- bool [WriteQuery](#) (const std::string &inFileName)

### Public Member Functions inherited from [gdcm::Object](#)

- [Object](#) ()
- [Object](#) (const [Object](#) &)
- *Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)

### Protected Member Functions

- [DataSet GetValidDataSet](#) () const

### Protected Member Functions inherited from [gdcm::BaseRootQuery](#)

- [BaseRootQuery](#) ()

### Protected Member Functions inherited from [gdcm::BaseQuery](#)

- [BaseQuery](#) ()
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [DictEntry](#) &inDictEntry, const std::string &inValue)
- bool [ValidDataSet](#) (const [DataSet](#) &dataSetToValid, const [DataSet](#) &dataSetReference) const

### Protected Member Functions inherited from [gdcm::Object](#)

- void [Register](#) ()
- void [UnRegister](#) ()

### Friends

- class [QueryFactory](#)

### Additional Inherited Members

### Static Public Member Functions inherited from [gdcm::BaseRootQuery](#)

- static [QueryBase](#) \* [Construct](#) ([ERootType](#) inRootType, [EQueryLevel](#) qllevel)
- static int [GetQueryLevelFromString](#) (const char \*str)
- static const char \* [GetQueryLevelString](#) ([EQueryLevel](#) ql)

### Protected Attributes inherited from [gdcm::BaseRootQuery](#)

- std::string [mHelpDescription](#)
- [QueryImage](#) [mImage](#)
- [QueryPatient](#) [mPatient](#)
- [ERootType](#) [mRootType](#)
- [QuerySeries](#) [mSeries](#)
- [QueryStudy](#) [mStudy](#)

### Protected Attributes inherited from [gdcm::BaseQuery](#)

- [DataSet](#) [mDataSet](#)
- std::string [mSopInstanceUID](#)

### 12.402.1 Detailed Description

PatientRootQuery.

contains: the class which will produce a dataset for c-find with patient root

### 12.402.2 Constructor & Destructor Documentation

#### 12.402.2.1 WLMFindQuery()

```
gdcm::WLMFindQuery::WLMFindQuery ()
```

### 12.402.3 Member Function Documentation

#### 12.402.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::WLMFindQuery::GetAbstractSyntaxUID () const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

#### 12.402.3.2 GetTagListByLevel()

```
std::vector< Tag > gdcm::WLMFindQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel) [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements [gdcm::BaseRootQuery](#).

#### 12.402.3.3 GetValidDataSet()

```
DataSet gdcm::WLMFindQuery::GetValidDataSet () const [protected]
```

#### 12.402.3.4 InitializeDataSet()

```
void gdcm::WLMFindQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel) [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmTk

Implements [gdcm::BaseRootQuery](#).

### 12.402.3.5 ValidateQuery()

```
bool gdcm::WLMFindQuery::ValidateQuery (
    bool inStrict = true) const [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements [gdcm::BaseRootQuery](#).

## 12.402.4 Friends And Related Symbol Documentation

### 12.402.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

References [QueryFactory](#).

Referenced by [QueryFactory](#).

The documentation for this class was generated from the following file:

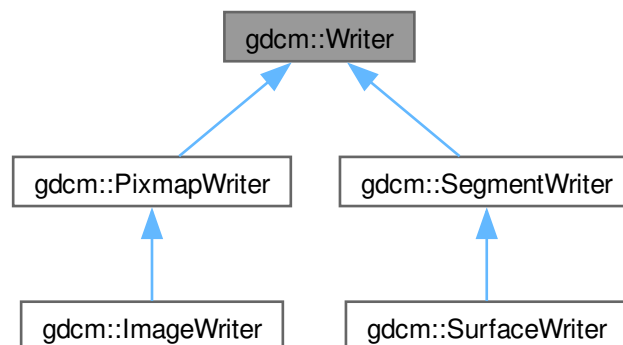
- [gdcmWLMFindQuery.h](#)

## 12.403 gdcm::Writer Class Reference

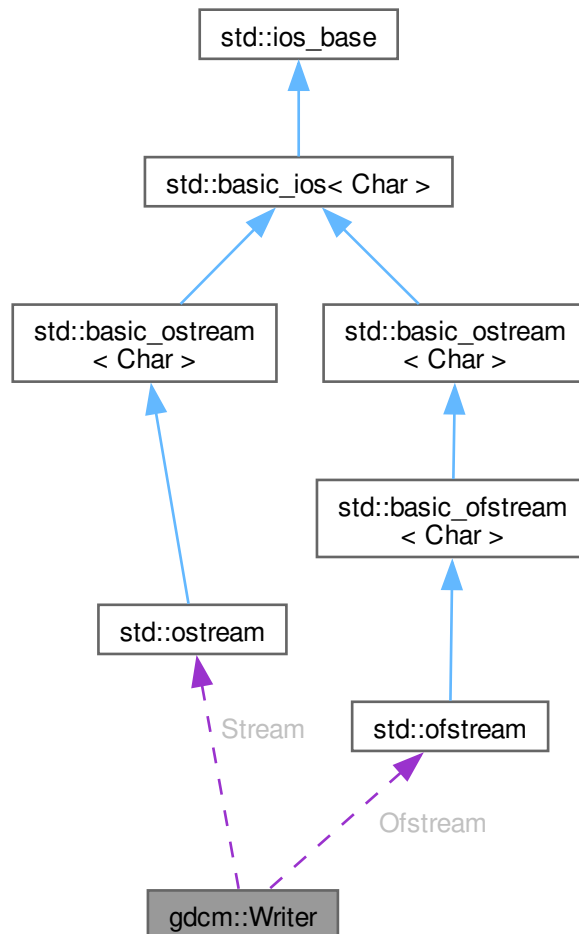
[Writer](#) ala DOM (Document [Object](#) Model).

```
#include <gdcmWriter.h>
```

Inheritance diagram for gdcm::Writer:



Collaboration diagram for `gdcm::Writer`:



## Public Member Functions

- [Writer](#) ()
- virtual [~Writer](#) ()
- void [CheckFileMetaInformationOff](#) ()
- void [CheckFileMetaInformationOn](#) ()
- [File](#) & [GetFile](#) ()
- void [SetCheckFileMetaInformation](#) (bool b)  
*Undocumented function, do not use (= leave default).*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get the DICOM file ([DataSet](#) + Header).*
- void [SetFileName](#) (const char \*filename\_native)



*Set the filename of DICOM file to write:*

- void [SetStream](#) (std::ostream &output\_stream)

*Set user ostream buffer.*

- virtual bool [Write](#) ()

*Main function to tell the writer to write.*

### Protected Member Functions

- bool [GetCheckFileMetaInformation](#) () const
- std::ostream \* [GetStreamPtr](#) () const
- void [SetWriteDataSetOnly](#) (bool b)

### Protected Attributes

- std::ofstream \* [Ofstream](#)
- std::ostream \* [Stream](#)

### Friends

- class [StreamImageWriter](#)

## 12.403.1 Detailed Description

[Writer](#) ala DOM (Document [Object](#) Model).

This class is a non-validating writer, it will only performs well- formedness check only.

Detailed description here To avoid GDCM being yet another broken DICOM lib we try to be user level and avoid writing illegal stuff (odd length, non-zero value for [Item](#) start/end length ...) Therefore you cannot (well unless you are really smart) write DICOM with even length tag. All the checks are consider basics:

- Correct Meta Information Header (see [gdcm::FileMetaInformation](#))
- Zero value for [Item](#) Length (0xfffe, 0xe00d/0xe0dd)
- Even length for any elements
- Alphabetical order for elements (guaranteed by design of internals)
- 32bits [VR](#) will be rewritten with 00

### Warning

[gdcm::Writer](#) cannot write a [DataSet](#) if no SOP Instance UID (0008,0018) is found, unless a [DICOMDIR](#) is being written out

### See also

[Reader DataSet File](#)

### Examples

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [ClinicalTrialAnnotate.cxx](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DeriveSeries.cxx](#), [DuplicatePCDE.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GenerateDICOMDIR.cs](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReformatFile.cs](#), [StreamImageReaderTest.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

## 12.403.2 Constructor & Destructor Documentation

### 12.403.2.1 Writer()

```
gdcM::Writer::Writer ()
```

### 12.403.2.2 ~Writer()

```
virtual gdcM::Writer::~Writer () [virtual]
```

## 12.403.3 Member Function Documentation

### 12.403.3.1 CheckFileMetaInformationOff()

```
void gdcM::Writer::CheckFileMetaInformationOff () [inline]
```

#### Examples

[CreateFakeRTDOSE.cxx](#), [FixBrokenJ2K.cxx](#), and [HelloWorld.cxx](#).

### 12.403.3.2 CheckFileMetaInformationOn()

```
void gdcM::Writer::CheckFileMetaInformationOn () [inline]
```

### 12.403.3.3 GetCheckFileMetaInformation()

```
bool gdcM::Writer::GetCheckFileMetaInformation () const [inline], [protected]
```

### 12.403.3.4 GetFile()

```
File & gdcM::Writer::GetFile () [inline]
```

#### Examples

[CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [QIDO-RS.cxx](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 12.403.3.5 GetStreamPtr()

```
std::ostream * gdcm::Writer::GetStreamPtr () const [inline], [protected]
```

References [Stream](#).

### 12.403.3.6 SetCheckFileMetaInformation()

```
void gdcm::Writer::SetCheckFileMetaInformation (
    bool b) [inline]
```

Undocumented function, do not use (= leave default).

#### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), and [PatchFile.cxx](#).

### 12.403.3.7 SetFile()

```
void gdcm::Writer::SetFile (
    const File & f) [inline]
```

Set/Get the DICOM file ([DataSet](#) + Header).

#### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [CreateFakeRTDOSE.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DuplicatePCDE.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GenerateDICOMDIR.cs](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [MergeTwoFiles.cxx](#), [NewSequence.cs](#), [PatchFile.cxx](#), [ReformatFile.cs](#), [StandardizeFiles.cs](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 12.403.3.8 SetFileName()

```
void gdcm::Writer::SetFileName (
    const char * filename_native)
```

Set the filename of DICOM file to write:

#### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [CreateFakeRTDOSE.cxx](#), [CreateJIPDataSet.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DuplicatePCDE.cxx](#), [EncapsulateFileInRawData.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GenerateDICOMDIR.cs](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReformatFile.cs](#), [StandardizeFiles.cs](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

#### 12.403.3.9 SetStream()

```
void gdcm::Writer::SetStream (
    std::ostream & output_stream) [inline]
```

Set user ostream buffer.

References [Stream](#).

#### 12.403.3.10 SetWriteDataSetOnly()

```
void gdcm::Writer::SetWriteDataSetOnly (
    bool b) [inline], [protected]
```

#### 12.403.3.11 Write()

```
virtual bool gdcm::Writer::Write () [virtual]
```

Main function to tell the writer to write.

Reimplemented in [gdcm::ImageWriter](#), [gdcm::PixmapWriter](#), [gdcm::SegmentWriter](#), and [gdcm::SurfaceWriter](#).

#### Examples

[BasicAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DeriveSeries.cxx](#), [DuplicatePCDE.cxx](#), [EncapsulateFileInRawData.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GenerateDICOMDIR.cs](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReformatFile.cs](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 12.403.4 Friends And Related Symbol Documentation

#### 12.403.4.1 StreamImageWriter

```
friend class StreamImageWriter [friend]
```

References [StreamImageWriter](#).

Referenced by [StreamImageWriter](#).

### 12.403.5 Member Data Documentation

#### 12.403.5.1 Ofstream

```
std::ofstream* gdcm::Writer::Ofstream [protected]
```

### 12.403.5.2 Stream

```
std::ostream* gdcm::Writer::Stream [protected]
```

Referenced by [GetStreamPtr\(\)](#), and [SetStream\(\)](#).

The documentation for this class was generated from the following file:

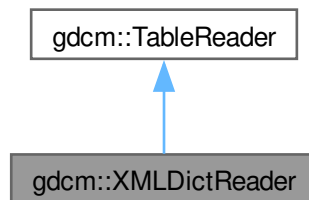
- [gdcmWriter.h](#)

## 12.404 gdcm::XMLDictReader Class Reference

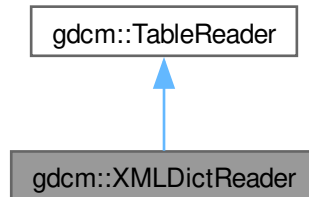
Class for representing a [XMLDictReader](#).

```
#include <gdcmXMLDictReader.h>
```

Inheritance diagram for gdcm::XMLDictReader:



Collaboration diagram for gdcm::XMLDictReader:



**Public Member Functions**

- [XMLDictReader](#) ()
- [~XMLDictReader](#) ()
- void [CharacterDataHandler](#) (const char \*data, int length)
- void [EndElement](#) (const char \*name)
- const [Dict](#) & [GetDict](#) ()
- void [StartElement](#) (const char \*name, const char \*\*atts)

**Public Member Functions inherited from [gdcm::TableReader](#)**

- [TableReader](#) (Defs &defs)
- virtual [~TableReader](#) ()=default
- const [Defs](#) & [GetDefs](#) () const
- const char \* [GetFilename](#) ()
- void [HandleIOD](#) (const char \*\*atts)
- void [HandleIODEntry](#) (const char \*\*atts)
- void [HandleMacro](#) (const char \*\*atts)
- void [HandleMacroEntry](#) (const char \*\*atts)
- void [HandleMacroEntryDescription](#) (const char \*\*atts)
- void [HandleModule](#) (const char \*\*atts)
- void [HandleModuleEntry](#) (const char \*\*atts)
- void [HandleModuleEntryDescription](#) (const char \*\*atts)
- void [HandleModuleInclude](#) (const char \*\*atts)
- int [Read](#) ()
- void [SetFilename](#) (const char \*filename)

**Protected Member Functions**

- void [HandleDescription](#) (const char \*\*atts)
- void [HandleEntry](#) (const char \*\*atts)

**12.404.1 Detailed Description**

Class for representing a [XMLDictReader](#).

**Note**

bla Will read the DICOMV3.xml file

**12.404.2 Constructor & Destructor Documentation****12.404.2.1 XMLDictReader()**

```
gdcm::XMLDictReader::XMLDictReader ()
```

### 12.404.2.2 ~XMLDictReader()

```
gdcm::XMLDictReader::~XMLDictReader () [inline]
```

## 12.404.3 Member Function Documentation

### 12.404.3.1 CharacterDataHandler()

```
void gdcm::XMLDictReader::CharacterDataHandler (
    const char * data,
    int length) [virtual]
```

Reimplemented from [gdcm::TableReader](#).

### 12.404.3.2 EndElement()

```
void gdcm::XMLDictReader::EndElement (
    const char * name) [virtual]
```

Reimplemented from [gdcm::TableReader](#).

### 12.404.3.3 GetDict()

```
const Dict & gdcm::XMLDictReader::GetDict () [inline]
```

### 12.404.3.4 HandleDescription()

```
void gdcm::XMLDictReader::HandleDescription (
    const char ** atts) [protected]
```

### 12.404.3.5 HandleEntry()

```
void gdcm::XMLDictReader::HandleEntry (
    const char ** atts) [protected]
```

### 12.404.3.6 StartElement()

```
void gdcm::XMLDictReader::StartElement (
    const char * name,
    const char ** atts) [virtual]
```

Reimplemented from [gdcm::TableReader](#).

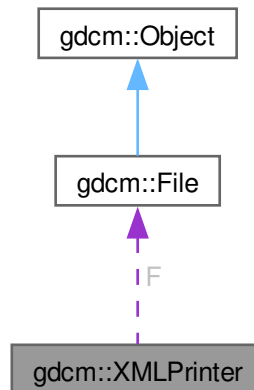
The documentation for this class was generated from the following file:

- [gdcmXMLDictReader.h](#)

## 12.405 gdcm::XMLPrinter Class Reference

```
#include <gdcmXMLPrinter.h>
```

Collaboration diagram for gdcm::XMLPrinter:



### Public Types

- enum [PrintStyles](#) {  
[OnlyUUID](#) = 0 ,  
[LOADBULKDATA](#) = 1 }

### Public Member Functions

- [XMLPrinter](#) ()
- virtual [~XMLPrinter](#) ()
- [PrintStyles](#) [GetPrintStyle](#) () const
- virtual void [HandleBulkData](#) (const char \*uuid, const [TransferSyntax](#) &ts, const char \*bulkdata, size\_t bulklen)
- void [Print](#) (std::ostream &os)
- void [PrintDataSet](#) (const [DataSet](#) &ds, const [TransferSyntax](#) &ts, std::ostream &os)
- void [SetFile](#) ([File](#) const &f)
- void [SetStyle](#) ([PrintStyles](#) ps)

### Protected Member Functions

- [VR PrintDataElement](#) (std::ostream &os, const [Dicts](#) &dicts, const [DataSet](#) &ds, const [DataElement](#) &de, const [TransferSyntax](#) &ts)
- void [PrintSQ](#) (const [SequenceOfItems](#) \*sqi, const [TransferSyntax](#) &ts, std::ostream &os)



## Protected Attributes

- const [File](#) \* [F](#)
- [PrintStyles](#) [PrintStyle](#)

## 12.405.1 Member Enumeration Documentation

### 12.405.1.1 PrintStyles

```
enum gdcm::XMLPrinter::PrintStyles
```

#### Enumerator

OnlyUUID	
LOADBULKDATA	

## 12.405.2 Constructor & Destructor Documentation

### 12.405.2.1 XMLPrinter()

```
gdcm::XMLPrinter::XMLPrinter ()
```

### 12.405.2.2 ~XMLPrinter()

```
virtual gdcm::XMLPrinter::~~XMLPrinter () [virtual]
```

## 12.405.3 Member Function Documentation

### 12.405.3.1 GetPrintStyle()

```
PrintStyles gdcm::XMLPrinter::GetPrintStyle () const [inline]
```

References [PrintStyle](#).

### 12.405.3.2 HandleBulkData()

```
virtual void gdcm::XMLPrinter::HandleBulkData (  
    const char * uuid,  
    const TransferSyntax & ts,  
    const char * bulkdata,  
    size_t bulklen) [virtual]
```

Virtual function mechanism to allow application programmer to override the default mechanism for BulkData handling. By default GDCM will simply discard the BulkData and only write the UUID

### 12.405.3.3 Print()

```
void gdcm::XMLPrinter::Print (
    std::ostream & os)
```

### 12.405.3.4 PrintDataElement()

```
VR gdcm::XMLPrinter::PrintDataElement (
    std::ostream & os,
    const Dicts & dicts,
    const DataSet & ds,
    const DataElement & de,
    const TransferSyntax & ts) [protected]
```

### 12.405.3.5 PrintDataSet()

```
void gdcm::XMLPrinter::PrintDataSet (
    const DataSet & ds,
    const TransferSyntax & ts,
    std::ostream & os)
```

### 12.405.3.6 PrintSQ()

```
void gdcm::XMLPrinter::PrintSQ (
    const SequenceOfItems * sqi,
    const TransferSyntax & ts,
    std::ostream & os) [protected]
```

### 12.405.3.7 SetFile()

```
void gdcm::XMLPrinter::SetFile (
    File const & f) [inline]
```

References [F](#).

### 12.405.3.8 SetStyle()

```
void gdcm::XMLPrinter::SetStyle (
    PrintStyles ps) [inline]
```

References [PrintStyle](#).

## 12.405.4 Member Data Documentation

### 12.405.4.1 F

const [File\\*](#) gdcm::XMLPrinter::F [protected]

Referenced by [SetFile\(\)](#).

### 12.405.4.2 PrintStyle

[PrintStyles](#) gdcm::XMLPrinter::PrintStyle [protected]

Referenced by [GetPrintStyle\(\)](#), and [SetStyle\(\)](#).

The documentation for this class was generated from the following file:

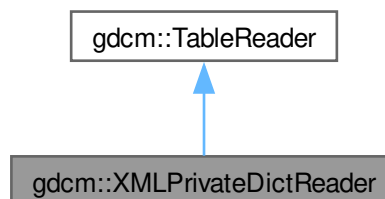
- [gdcmXMLPrinter.h](#)

## 12.406 gdcm::XMLPrivateDictReader Class Reference

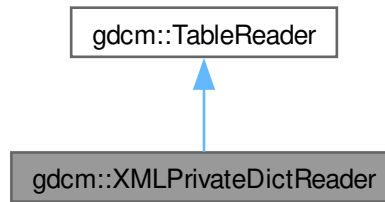
Class for representing a [XMLPrivateDictReader](#).

```
#include <gdcmXMLPrivateDictReader.h>
```

Inheritance diagram for gdcm::XMLPrivateDictReader:



Collaboration diagram for `gdcm::XMLPrivateDictReader`:



### Public Member Functions

- [XMLPrivateDictReader](#) ()
- [~XMLPrivateDictReader](#) ()
- void [CharacterDataHandler](#) (const char \*data, int length)
- void [EndElement](#) (const char \*name)
- const [PrivateDict](#) & [GetPrivateDict](#) ()
- void [StartElement](#) (const char \*name, const char \*\*atts)

### Public Member Functions inherited from [gdcm::TableReader](#)

- [TableReader](#) (Defs &defs)
- virtual [~TableReader](#) ()=default
- const [Defs](#) & [GetDefs](#) () const
- const char \* [GetFilename](#) ()
- void [HandleIOD](#) (const char \*\*atts)
- void [HandleIODEntry](#) (const char \*\*atts)
- void [HandleMacro](#) (const char \*\*atts)
- void [HandleMacroEntry](#) (const char \*\*atts)
- void [HandleMacroEntryDescription](#) (const char \*\*atts)
- void [HandleModule](#) (const char \*\*atts)
- void [HandleModuleEntry](#) (const char \*\*atts)
- void [HandleModuleEntryDescription](#) (const char \*\*atts)
- void [HandleModuleInclude](#) (const char \*\*atts)
- int [Read](#) ()
- void [SetFilename](#) (const char \*filename)

### Protected Member Functions

- void [HandleDescription](#) (const char \*\*atts)
- void [HandleEntry](#) (const char \*\*atts)

## 12.406.1 Detailed Description

Class for representing a [XMLPrivateDictReader](#).

### Note

bla Will read the Private.xml file

## 12.406.2 Constructor & Destructor Documentation

### 12.406.2.1 XMLPrivateDictReader()

```
gdcm::XMLPrivateDictReader::XMLPrivateDictReader ()
```

### 12.406.2.2 ~XMLPrivateDictReader()

```
gdcm::XMLPrivateDictReader::~~XMLPrivateDictReader () [inline]
```

## 12.406.3 Member Function Documentation

### 12.406.3.1 CharacterDataHandler()

```
void gdcm::XMLPrivateDictReader::CharacterDataHandler (
    const char * data,
    int length) [virtual]
```

Reimplemented from [gdcm::TableReader](#).

### 12.406.3.2 EndElement()

```
void gdcm::XMLPrivateDictReader::EndElement (
    const char * name) [virtual]
```

Reimplemented from [gdcm::TableReader](#).

### 12.406.3.3 GetPrivateDict()

```
const PrivateDict & gdcm::XMLPrivateDictReader::GetPrivateDict () [inline]
```

#### 12.406.3.4 HandleDescription()

```
void gdcm::XMLPrivateDictReader::HandleDescription (  
    const char ** atts) [protected]
```

#### 12.406.3.5 HandleEntry()

```
void gdcm::XMLPrivateDictReader::HandleEntry (  
    const char ** atts) [protected]
```

#### 12.406.3.6 StartElement()

```
void gdcm::XMLPrivateDictReader::StartElement (  
    const char * name,  
    const char ** atts) [virtual]
```

Reimplemented from [gdcm::TableReader](#).

The documentation for this class was generated from the following file:

- [gdcmXMLPrivateDictReader.h](#)

# Chapter 13

## File Documentation

### 13.1 README.txt File Reference

### 13.2 TestsList.txt File Reference

### 13.3 gdc ASN1.h File Reference

```
#include "gdcTypes.h"
Include dependency graph for gdc ASN1.h:
```



#### Classes

- class `gdc::ASN1`  
Class for `ASN1`.

## Namespaces

- namespace [gdcm](#)

## 13.4 gdcmASN1.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMASN1_H
00015 #define GDCMASN1_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021 {
00022 //-----
00023 class ASN1Internals;
00024 class GDCM_EXPORT ASN1
00025 {
00026 public :
00027   ASN1();
00028   ~ASN1();
00029
00030   static bool ParseDumpFile(const char *filename);
00031
00032   static bool ParseDump(const char *array, size_t length);
00033
00034   ASN1(const ASN1&) = delete;
00035   void operator=(const ASN1&) = delete;
00036 protected:
00037   int TestPBKDF2();
00038 private:
00039   ASN1Internals *Internals;
00040 };
00041 } // end namespace gdcm
00042 //-----
00043 #endif //GDCMASN1_H
```



## 13.5 gdcmBase64.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmBase64.h:



### Classes

- class [gdcm::Base64](#)  
Class for [Base64](#).

### Namespaces

- namespace [gdcm](#)

## 13.6 gdcmBase64.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMBASE64_H
00015  #define GDCMBASE64_H
00016
00017  #include "gdcmTypes.h"
00018
00019  namespace gdcm
00020  {
00025  class GDCM_EXPORT Base64

```

```

00026 {
00027 public:
00028
00032 static size_t GetEncodeLength(const char *src, size_t srclen );
00033
00045 static size_t Encode( char *dst, size_t dlen, const char *src, size_t slen );
00046
00050 static size_t GetDecodeLength( const char *src, size_t len );
00051
00062 static size_t Decode( char *dst, size_t dlen, const char *src, size_t slen );
00063
00064 Base64(const Base64&) = delete;
00065 void operator=(const Base64&) = delete;
00066 };
00067
00068 } // end namespace gdcM
00069
00070 #endif // GDCMBASE64_H

```

## 13.7 gdcMBoxRegion.h File Reference

```
#include "gdcMRegion.h"
```

Include dependency graph for gdcMBoxRegion.h:



### Classes

- class `gdcM::BoxRegion`  
Class for manipulation box region.

### Namespaces

- namespace `gdcM`

## 13.8 gdcmBoxRegion.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMBOXREGION_H
00015 #define GDCMBOXREGION_H
00016
00017 #include "gdcmRegion.h"
00018
00019 namespace gdcm
00020 {
00021   class BoxRegionInternals;
00022
00023   //-----
00024   class GDCM_EXPORT BoxRegion : public Region
00025   {
00026   public :
00027     BoxRegion();
00028     ~BoxRegion() override;
00029
00030     void SetDomain(unsigned int xmin, unsigned int xmax,
00031                   unsigned int ymin, unsigned int ymax,
00032                   unsigned int zmin, unsigned int zmax);
00033
00034     unsigned int GetXMin() const;
00035     unsigned int GetXMax() const;
00036     unsigned int GetYMin() const;
00037     unsigned int GetYMax() const;
00038     unsigned int GetZMin() const;
00039     unsigned int GetZMax() const;
00040
00041     // Satisfy pure virtual parent class
00042     Region *Clone() const override;
00043     bool Empty() const override;
00044     bool IsValid() const override;
00045     size_t Area() const override;
00046     BoxRegion ComputeBoundingBox() override;
00047
00048     void Print(std::ostream &os = std::cout) const override;
00049
00050     static BoxRegion BoundingBox(BoxRegion const & b1, BoxRegion const & b2 );
00051
00052     BoxRegion(const BoxRegion&);
00053     void operator=(const BoxRegion&);
00054 private:
00055     BoxRegionInternals *Internals;
00056   };
00057
00058 } // end namespace gdcm
00059 //-----
00060 #endif //GDCMREGION_H

```

## 13.9 gdcmByteSwap.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmSwapCode.h"

```

```
#include "gdcmByteSwap.txx"
```

Include dependency graph for gdcmByteSwap.h:



## Classes

- class [gdcm::ByteSwap< T >](#)  
*ByteSwap.*

## Namespaces

- namespace [gdcm](#)

## 13.10 gdcmByteSwap.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMBYTESWAP_H
00015 #define GDCMBYTESWAP_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmSwapCode.h"
00019
00020 namespace gdcm
00021 {
00022
00029   template<class T>

```

```

00030 class ByteSwap
00031 {
00032 public:
00034     static bool SystemIsBigEndian ();
00035     static bool SystemIsLittleEndian ();
00036
00037     static void Swap(T &p);
00038     static void SwapFromSwapCodeIntoSystem(T &p, SwapCode const &sc);
00039     static void SwapRange(T *p, unsigned int num);
00040     static void SwapRangeFromSwapCodeIntoSystem(T *p, SwapCode const &sc,
00041         std::streamoff num);
00042
00043 protected:
00044 // ByteSwap() {}
00045 // ~ByteSwap() {}
00046
00047 private:
00048
00049 };
00050
00055
00056 } // end namespace gdcm
00057
00058 #include "gdcmByteSwap.txx"
00059
00060 #endif //GDCMBYTESWAP_H

```

## 13.11 gdcmCAPICryptoFactory.h File Reference

```
#include "gdcmCryptoFactory.h"
```

Include dependency graph for gdcmCAPICryptoFactory.h:



### Classes

- class `gdcm::CAPICryptoFactory`

## Namespaces

- namespace [gdcm](#)

## 13.12 gdcmCAPICryptoFactory.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCAPICRYPTOFACTORY_H
00015 #define GDCMCAPICRYPTOFACTORY_H
00016
00017 #include "gdcmCryptoFactory.h"
00018
00019 namespace gdcm
00020 {
00021
00022 class GDCM_EXPORT CAPICryptoFactory : public CryptoFactory
00023 {
00024 public:
00025     CAPICryptoFactory(CryptoLib id);
00026     CryptographicMessageSyntax* CreateCMSProvider();
00027
00028 private:
00029     CAPICryptoFactory() {}
00030 };
00031
00032 } // end namespace gdcm
00033
00034 #endif //GDCMCAPICRYPTOFACTORY_H

```

## 13.13 gdcmCAPICryptographicMessageSyntax.h File Reference

```

#include "gdcmCryptographicMessageSyntax.h"
#include <windows.h>
#include <wincrypt.h>
#include <vector>

```

Include dependency graph for gdcmCAPICryptographicMessageSyntax.h:



## Classes

- class [gdcm::CAPICryptographicMessageSyntax](#)

## Namespaces

- namespace [gdcm](#)

## 13.14 gdcmCAPICryptographicMessageSyntax.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCAPICRYPTOGRAPHICMESSAGESYNTAX_H
00015 #define GDCMCAPICRYPTOGRAPHICMESSAGESYNTAX_H
00016
00017 #include "gdcmCryptographicMessageSyntax.h"
00018 #include <windows.h>
00019 #include <wincrypt.h>
00020 #include <vector>
00021
00022 namespace gdcm
00023 {
00024
00025   class GDCM_EXPORT CAPICryptographicMessageSyntax : public CryptographicMessageSyntax
00026   {
00027   public:

```

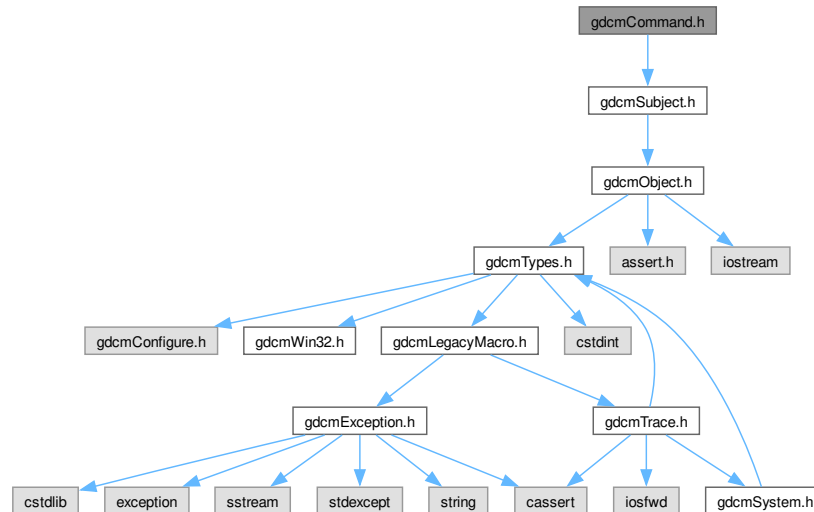
```
00028     CAPICryptographicMessageSyntax();
00029     ~CAPICryptographicMessageSyntax();
00030
00031     // X.509
00032     bool ParseCertificateFile( const char *filename );
00033     bool ParseKeyFile( const char *filename );
00034
00035     // PBE
00036     bool SetPassword(const char * pass, size_t passLen);
00037
00038     void SetCipherType(CipherTypes type);
00039
00040     CipherTypes GetCipherType() const;
00041
00042     bool Encrypt(char *output, size_t &outlen, const char *array, size_t len) const;
00043     bool Decrypt(char *output, size_t &outlen, const char *array, size_t len) const;
00044
00045     bool GetInitialized() const
00046     {
00047         return initialized;
00048     }
00049
00050 private:
00051     bool Initialize();
00052     static ALG_ID GetAlgIdByObjId(const char * pszObjId);
00053     const char *GetCipherObjId() const;
00054     static void ReverseBytes(unsigned char* data, DWORD len);
00055     static bool LoadFile(const char * filename, unsigned char* & buffer, DWORD & bufLen);
00056
00057 private:
00058     bool initialized;
00059     HCRYPTPROV hProv;
00060     std::vector<PCCERT_CONTEXT> certifList;
00061     HCRYPTKEY hRsaPrivK;
00062     CipherTypes cipherType;
00063 };
00064
00065 } // end namespace gdcms
00066
00067 #endif // GDCMCAPICRYPTOGRAPHICMESSAGESYNTAX_H
```



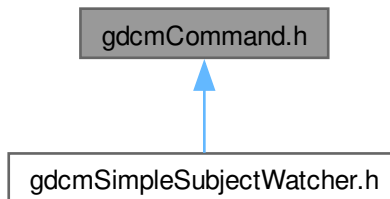
## 13.15 gdcmCommand.h File Reference

```
#include "gdcmSubject.h"
```

Include dependency graph for gdcmCommand.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::Command](#)  
*Command superclass for callback/observer methods.*
- class [gdcm::MemberCommand< T >](#)  
*Command subclass that calls a pointer to a member function.*
- class [gdcm::SimpleMemberCommand< T >](#)  
*Command subclass that calls a pointer to a member function.*

## Namespaces

- namespace `gdcm`

## 13.16 gdcmCommand.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCOMMAND_H
00015 #define GDCMCOMMAND_H
00016
00017 #include "gdcmSubject.h"
00018
00019 namespace gdcm
00020 {
00021   class Event;
00022
00023   class GDCM_EXPORT Command : public Subject
00024   {
00025   public :
00026     Command(const Command&) = delete;
00027     void operator=(const Command&) = delete;
00028
00029     virtual void Execute(Subject *caller, const Event & event ) = 0;
00030     virtual void Execute(const Subject *caller, const Event & event ) = 0;
00031
00032   protected:
00033     Command();
00034     ~Command() override;
00035   };
00036
00037   template <class T>
00038   class MemberCommand : public Command
00039   {
00040   public:
00041     typedef void (T::*TMemberFunctionPointer)(Subject*, const Event &);
00042     typedef void (T::*TConstMemberFunctionPointer)(const Subject*,
00043                                                     const Event &);
00043
00044     typedef MemberCommand      Self;
00045     //typedef SmartPointer<Self> Pointer;
00046
00047     MemberCommand(const Self&) = delete;
00048     void operator=(const Self&) = delete;
00049
00050     static SmartPointer<MemberCommand> New()
00051     {
00052       return new MemberCommand;
00053     }
00054
00055     //gdcmTypeMacro(MemberCommand,Command);
00056
00057     void SetCallbackFunction(T* object,
00058                             TMemberFunctionPointer memberFunction)
00059     {
00060       m_This = object;
00061       m_MemberFunction = memberFunction;
00062     }
00063     void SetCallbackFunction(T* object,

```

```

00089         TConstMemberFunctionPointer memberFunction)
00090     {
00091         m_This = object;
00092         m_ConstMemberFunction = memberFunction;
00093     }
00094
00096 void Execute(Subject *caller, const Event & event ) override
00097 {
00098     if( m_MemberFunction )
00099     {
00100         ((*m_This).*(m_MemberFunction))(caller, event);
00101     }
00102 }
00103
00105 void Execute( const Subject *caller, const Event & event ) override
00106 {
00107     if( m_ConstMemberFunction )
00108     {
00109         ((*m_This).*(m_ConstMemberFunction))(caller, event);
00110     }
00111 }
00112 protected:
00113
00114
00115 T* m_This;
00116 TMemberFunctionPointer m_MemberFunction;
00117 TConstMemberFunctionPointer m_ConstMemberFunction;
00118 MemberCommand():m_MemberFunction(nullptr),m_ConstMemberFunction(nullptr) {}
00119 ~MemberCommand() override= default;
00120
00121 };
00122
00129 template <typename T>
00130 class SimpleMemberCommand : public Command
00131 {
00132 public:
00133
00135     typedef void (T::*TMemberFunctionPointer) ();
00136
00138     typedef SimpleMemberCommand Self;
00139     //typedef SmartPointer<Self> Pointer;
00140
00141     SimpleMemberCommand(const Self&) = delete;
00142     void operator=(const Self&) = delete;
00143
00145     //gdcmTypeMacro(SimpleMemberCommand,Command);
00146
00148     static SmartPointer<SimpleMemberCommand> New()
00149     {
00150         return new SimpleMemberCommand;
00151     }
00152
00154     void SetCallbackFunction(T* object,
00155                             TMemberFunctionPointer memberFunction)
00156     {
00157         m_This = object;
00158         m_MemberFunction = memberFunction;
00159     }
00160
00162 void Execute(Subject *,const Event & ) override
00163 {
00164     if( m_MemberFunction )
00165     {
00166         ((*m_This).*(m_MemberFunction)) ();
00167     }
00168 }
00169 void Execute(const Subject *,const Event & ) override
00170 {
00171     if( m_MemberFunction )
00172     {
00173         ((*m_This).*(m_MemberFunction)) ();
00174     }
00175 }
00176
00177 protected:
00178 T* m_This;
00179 TMemberFunctionPointer m_MemberFunction;
00180 SimpleMemberCommand():m_This(nullptr),m_MemberFunction(nullptr) {}
00181 ~SimpleMemberCommand() override = default;
00182 };
00183

```

```

00184 } // end namespace gdcm
00185 //-----
00186 #endif //GDCMCOMMAND_H

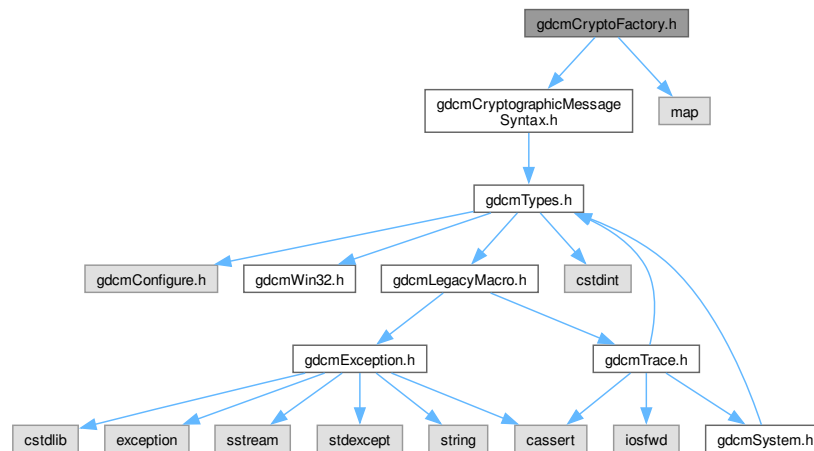
```

## 13.17 gdcmCryptoFactory.h File Reference

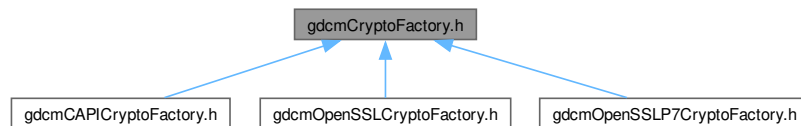
```
#include "gdcmCryptographicMessageSyntax.h"
```

```
#include <map>
```

Include dependency graph for gdcmCryptoFactory.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::CryptoFactory](#)  
*Class to do handle the crypto factory.*

### Namespaces

- namespace [gdcm](#)

## 13.18 gdcmCryptoFactory.h

[Go to the documentation of this file.](#)

```

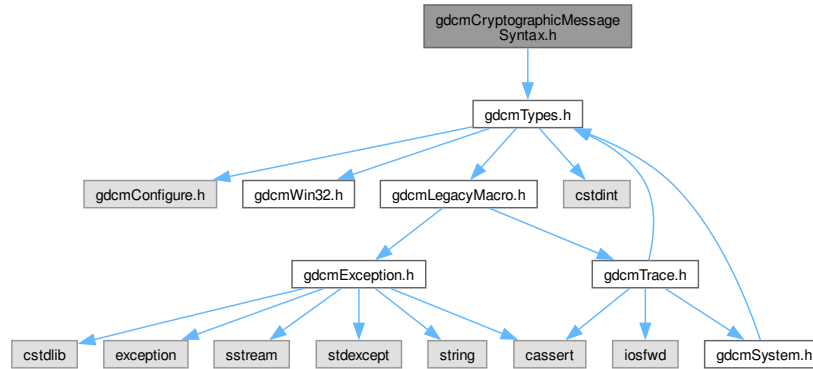
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
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00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCRYPTOFACTORY_H
00015 #define GDCMCRYPTOFACTORY_H
00016
00017 #include "gdcmCryptographicMessageSyntax.h"
00018 #include <map>
00019
00020 namespace gdcm
00021 {
00022
00023     class GDCM_EXPORT CryptoFactory
00024     {
00025     public:
00026         enum CryptoLib {DEFAULT = 0, OPENSSSL = 1, CAPI = 2, OPENSSELP7 = 3};
00027
00028         virtual CryptographicMessageSyntax* CreateCMSProvider() = 0;
00029         static CryptoFactory* GetFactoryInstance(CryptoLib id = DEFAULT);
00030
00031     protected:
00032         CryptoFactory(CryptoLib id)
00033         {
00034             AddLib(id, this);
00035         }
00036
00037     private:
00038         static std::map<CryptoLib, CryptoFactory*> getInstanceMap()
00039         {
00040             static std::map<CryptoLib, CryptoFactory*> libs;
00041             return libs;
00042         }
00043
00044         static void AddLib(CryptoLib id, CryptoFactory* f)
00045         {
00046             if (getInstanceMap().insert(std::pair<CryptoLib, CryptoFactory*>(id, f)).second == false)
00047             {
00048                 gdcmErrorMacro( "Library already registered under id " « (int)id );
00049             }
00050         }
00051
00052     protected:
00053         CryptoFactory()= default;
00054         ~CryptoFactory()= default;
00055     };
00056
00057 } // end namespace gdcm
00058
00059 #endif // GDCMCRYPTOFACTORY_H

```

## 13.19 gdcmCryptographicMessageSyntax.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmCryptographicMessageSyntax.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::CryptographicMessageSyntax](#)

### Namespaces

- namespace [gdcm](#)

## 13.20 gdcmCryptographicMessageSyntax.h

[Go to the documentation of this file.](#)

```

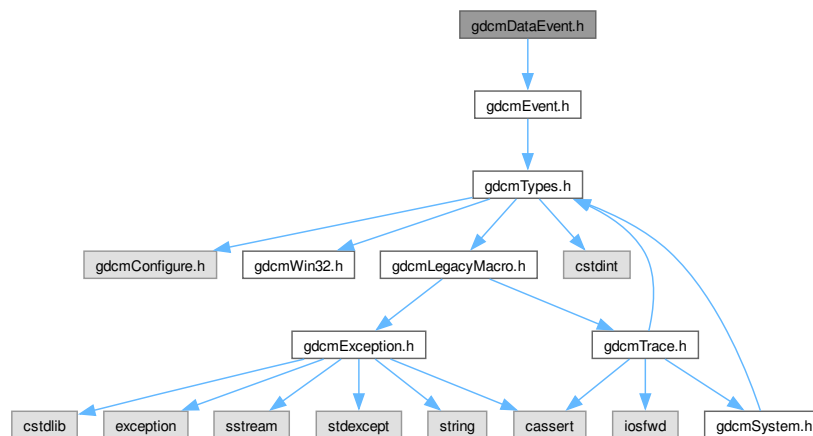
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCRYPTOGRAPHICMESSAGESYNTAX_H
00015 #define GDCMCRYPTOGRAPHICMESSAGESYNTAX_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021
00022 class GDCM_EXPORT CryptographicMessageSyntax
00023 {
00024 public:
00025     CryptographicMessageSyntax() = default;
00026
00027     virtual ~CryptographicMessageSyntax() = default;
00028     CryptographicMessageSyntax(const CryptographicMessageSyntax&) = delete;
00029     void operator=(const CryptographicMessageSyntax&) = delete;
00030
00031     typedef enum {
00032         DES3_CIPHER, // Triple DES
00033         AES128_CIPHER, // CBC AES
00034         AES192_CIPHER, // ' '
00035         AES256_CIPHER // ' '
00036     } CipherTypes;
00037
00038     // X.509
00039     virtual bool ParseCertificateFile( const char *filename ) = 0;
00040     virtual bool ParseKeyFile( const char *filename ) = 0;
00041
00042     // PBE
00043     virtual bool SetPassword(const char * pass, size_t passLen) = 0;
00044
00046     virtual bool Encrypt(char *output, size_t &outlen, const char *array, size_t len) const = 0;
00048     virtual bool Decrypt(char *output, size_t &outlen, const char *array, size_t len) const = 0;
00049
00050     virtual void SetCipherType(CipherTypes type) = 0;
00051
00052     virtual CipherTypes GetCipherType() const = 0;
00053 };
00054
00055 } // end namespace gdcm
00056
00057 #endif //GDCMCRYPTOGRAPHICMESSAGESYNTAX_H

```

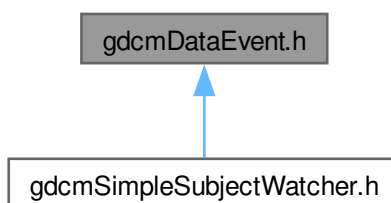
## 13.21 gdcmDataEvent.h File Reference

```
#include "gdcmEvent.h"
```

Include dependency graph for gdcmDataEvent.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class `gdcm::DataEvent`  
*DataEvent.*

### Namespaces

- namespace `gdcm`



## 13.22 gdcmDataEvent.h

[Go to the documentation of this file.](#)

```

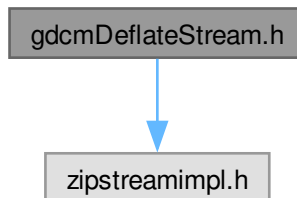
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00012
00013 =====*/
00014 #ifndef GDCMDATAEVENT_H
00015 #define GDCMDATAEVENT_H
00016
00017 #include "gdcmEvent.h"
00018
00019 namespace gdcm
00020 {
00021
00025 class DataEvent : public AnyEvent
00026 {
00027 public:
00028     typedef DataEvent Self;
00029     typedef AnyEvent Superclass;
00030     DataEvent(const char *bytes = nullptr, size_t len = 0):Bytes(bytes),Length(len) {}
00031     ~DataEvent() override = default;
00032     DataEvent(const Self&s) : AnyEvent(s){};
00033     void operator=(const Self&) = delete;
00034
00035     const char * GetEventName() const override { return "DataEvent"; }
00036     bool CheckEvent(const ::gdcm::Event* e) const override
00037     { return (dynamic_cast<const Self*>(e) == nullptr ? false : true) ; }
00038     ::gdcm::Event* MakeObject() const override
00039     { return new Self; }
00040
00041     void SetData(const char *bytes, size_t len) {
00042         Bytes = bytes;
00043         Length = len;
00044     }
00045     size_t GetDataLength() const { return Length; }
00046     const char *GetData() const { return Bytes; }
00047
00048     //std::string GetValueAsString() const { return; }
00049
00050 private:
00051     const char *Bytes;
00052     size_t Length;
00053 };
00054
00055
00056 } // end namespace gdcm
00057
00058 #endif //GDCMDATAEVENT_H

```

## 13.23 gdcmDeflateStream.h File Reference

```
#include "zipstreamimpl.h"
```

Include dependency graph for gdcmDeflateStream.h:



## 13.24 gdcmDeflateStream.h

[Go to the documentation of this file.](#)

```

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00012
00013   =====*/
00014 #ifndef GDCMDEFLATESTREAM_H
00015 #define GDCMDEFLATESTREAM_H
00016
00017 #include "zipstreamimpl.h"
00018
00019 #endif //GDCMDEFLATESTREAM_H
  
```

## 13.25 gdcmDirectory.h File Reference

```

#include "gdcmTypes.h"
#include <string>
#include <vector>
#include <iostream>
  
```

```
#include <assert.h>
```

Include dependency graph for gdcmDirectory.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::Directory](#)  
*Class for manipulation directories.*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Directory &d)`

## 13.26 gdcmDirectory.h

[Go to the documentation of this file.](#)

```

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```

```

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00012
00013 =====*/
00014 #ifndef GDCMDIRECTORY_H
00015 #define GDCMDIRECTORY_H
00016
00017 #include "gdcmTypes.h"
00018
00019 #include <string>
00020 #include <vector>
00021 #include <iostream>
00022 #include <assert.h>
00023
00024 namespace gdcm
00025 {
00041 //-----
00042 class GDCM_EXPORT Directory
00043 {
00044     friend std::ostream& operator<(std::ostream &_os, const Directory &d);
00045 public :
00046     Directory() = default;
00047     ~Directory() = default;
00048     typedef std::string FilenameType;
00049     typedef std::vector<FilenameType> FilenamesType;
00050
00052     void Print(std::ostream &os = std::cout) const;
00053
00055     FilenameType const &GetToplevel() const { return Toplevel; }
00056
00058     FilenamesType const &GetFilenames() const {
00059         assert( !(Toplevel.empty()) && "Need to call Explore first" );
00060         return Filenames; }
00061
00063     FilenamesType const &GetDirectories() const { return Directories; }
00064
00067     unsigned int Load(FilenameType const &name, bool recursive = false);
00068
00069     // \todo later: GLOB
00070     // The glob() function searches for all the pathnames matching pattern according to
00071     // the rules used by the shell (see glob(7)). No tilde expansion or parameter
00072     // substitution is done; if you want these, use wordexp(3).
00073     // int Glob(...);
00074
00075 protected:
00077     unsigned int Explore(FilenameType const &name, bool recursive);
00078
00079 private :
00081     FilenamesType Filenames;
00082     FilenamesType Directories;
00083
00085     FilenameType Toplevel;
00086 };
00087 //-----
00088 inline std::ostream& operator<(std::ostream &os, const Directory &d)
00089 {
00090     d.Print( os );
00091     return os;
00092 }
00093
00094 } // end namespace gdcm
00095 //-----
00096 #endif //GDCMDIRECTORY_H

```

## 13.27 gdcmDummyValueGenerator.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmDummyValueGenerator.h:



### Classes

- class `gdcm::DummyValueGenerator`  
Class for generating dummy value.

### Namespaces

- namespace `gdcm`

## 13.28 gdcmDummyValueGenerator.h

[Go to the documentation of this file.](#)

```

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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012  =====*/
00013  #ifndef GDCMDUMMYVALUEGENERATOR_H
00014  #define GDCMDUMMYVALUEGENERATOR_H
00015
00016  #include "gdcmTypes.h"
00017
00018  namespace gdcm
00019  {
00020
00021

```

```

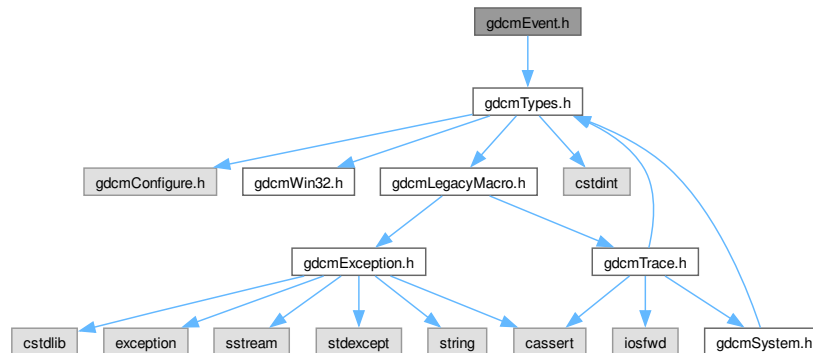
00026 class GDCM_EXPORT DummyValueGenerator
00027 {
00028 public:
00029
00035     static const char* Generate(const char *input);
00036
00037 private:
00038 };
00039
00040
00041 } // end namespace gdcM
00042
00043 #endif //GDCMDUMMYVALUEGENERATOR_H

```

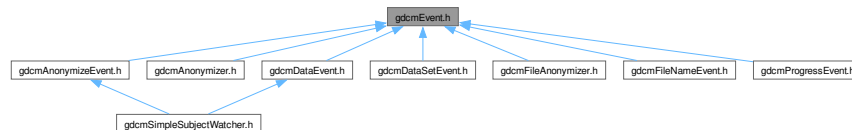
## 13.29 gdcMEvent.h File Reference

```
#include "gdcMTypes.h"
```

Include dependency graph for gdcMEvent.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcM::AbortEvent](#)
- class [gdcM::AnyEvent](#)
- class [gdcM::EndEvent](#)
- class [gdcM::Event](#)

*superclass for callback/observer methods*

- class [gdcm::ExitEvent](#)
- class [gdcm::InitializeEvent](#)
- class [gdcm::IterationEvent](#)
- class [gdcm::ModifiedEvent](#)
- class [gdcm::NoEvent](#)
- class [gdcm::StartEvent](#)
- class [gdcm::UserEvent](#)

## Namespaces

- namespace [gdcm](#)

## Macros

- `#define gdcmEventMacro(classname, super)`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Event &e)`  
*Generic inserter operator for [Event](#) and its subclasses.*

## 13.29.1 Macro Definition Documentation

### 13.29.1.1 gdcmEventMacro

```
#define gdcmEventMacro(  
    classname,  
    super)
```

#### Value:

```
\  
class classname : public super { \  
public: \  
    typedef classname Self; \  
    typedef super Superclass; \  
    classname() {} \  
    virtual ~classname() override = default; \  
    virtual const char * GetEventName() const override { return #classname; } \  
    virtual bool CheckEvent(const ::gdcm::Event* e) const override \  
    { return dynamic_cast<const Self*>(e) ? true : false; } \  
    virtual ::gdcm::Event* MakeObject() const override \  
    { return new Self; } \  
    classname(const Self&s) : super(s){} \  
private: \  
    void operator=(const Self&); \  
}
```

## 13.30 gdcmEvent.h

[Go to the documentation of this file.](#)

```

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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMEVENT_H
00015 #define GDCMEVENT_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021 //-----
00022 class GDCM_EXPORT Event
00023 {
00024 public :
00025     Event();
00026     virtual ~Event();
00027     Event(const Event&);
00028     void operator=(const Event&) = delete;
00029
00030     virtual Event* MakeObject() const = 0;
00031
00032     virtual void Print(std::ostream& os) const;
00033
00034     virtual const char * GetEventName() const = 0;
00035
00036     virtual bool CheckEvent(const Event*) const = 0;
00037 };
00038
00039 inline std::ostream& operator<<(std::ostream& os, const Event &e)
00040 {
00041     e.Print(os);
00042     return os;
00043 }
00044
00045 /*
00046  * Macro for creating new Events
00047  */
00048 #define gdcmEventMacro( classname , super ) \
00049 \
00050 class classname : public super { \
00051 public: \
00052     typedef classname Self; \
00053     typedef super Superclass; \
00054     classname() {} \
00055     virtual ~classname() override = default; \
00056     virtual const char * GetEventName() const override { return #classname; } \
00057     virtual bool CheckEvent(const ::gdcm::Event* e) const override \
00058     { return dynamic_cast<const Self*>(e) ? true : false; } \
00059     virtual ::gdcm::Event* MakeObject() const override \
00060     { return new Self; } \
00061     classname(const Self&s) : super(s){} \
00062 private: \
00063     void operator=(const Self&); \
00064 }
00065
00066 gdcmEventMacro( NoEvent , Event );
00067 gdcmEventMacro( AnyEvent , Event );
00068 gdcmEventMacro( StartEvent , AnyEvent );
00069 gdcmEventMacro( EndEvent , AnyEvent );
00070 //gdcmEventMacro( ProgressEvent , AnyEvent );
00071 gdcmEventMacro( ExitEvent , AnyEvent );
00072 gdcmEventMacro( AbortEvent , AnyEvent );
00073 gdcmEventMacro( ModifiedEvent , AnyEvent );
00074 gdcmEventMacro( InitializeEvent , AnyEvent );

```



```

00091 gdcmEventMacro( IterationEvent      , AnyEvent );
00092 //gdcmEventMacro( AnonymizeEvent    , AnyEvent );
00093 gdcmEventMacro( UserEvent           , AnyEvent );
00094
00095
00096 } // end namespace gdcm
00097 //-----
00098 #endif //GDCMEVENT_H

```

## 13.31 gdcmException.h File Reference

```

#include <cassert>
#include <cstdlib>
#include <exception>
#include <sstream>
#include <stdexcept>
#include <string>

```

Include dependency graph for gdcmException.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::Exception](#)  
*Exception.*

### Namespaces

- namespace [gdcm](#)

## 13.32 gdcmException.h

[Go to the documentation of this file.](#)

```

00001 /*=====
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMEXCEPTION_H
00015 #define GDCMEXCEPTION_H
00016
00017 #include <cassert>
00018 #include <cstdlib> // NULL
00019 #include <exception>
00020 #include <sstream> // ostringstream
00021 #include <stdexcept> // logic_error
00022 #include <string>
00023
00024 // Disable clang warning "dynamic exception specifications are deprecated".
00025 // We need to be C++03 and C++11 compatible, and if we remove the 'throw()'
00026 // specifier we'll get an error in C++03 by not matching the superclass.
00027 #if defined(__clang__) && defined(__has_warning)
00028 # if __has_warning("-Wdeprecated")
00029 #   pragma clang diagnostic push
00030 #   pragma clang diagnostic ignored "-Wdeprecated"
00031 # endif
00032 #endif
00033
00034 namespace gdcm
00035 {
00036
00037   class Exception : public std::exception
00038   {
00039   public:
00040     typedef std::logic_error StringHolder;
00041
00042     static StringHolder CreateWhat(const char* const desc,
00043                                   const char* const file,
00044                                   const unsigned int lineNumber,
00045                                   const char* const func)
00046     {
00047       assert(desc != nullptr);
00048       assert(file != nullptr);
00049       assert(func != nullptr);
00050       std::ostringstream oswhat;
00051       oswhat << file << ":" << lineNumber << " (" << func << "):\n";
00052       oswhat << desc;
00053       return StringHolder( oswhat.str() );
00054     }
00055
00056   public:
00057     explicit Exception(const char *desc = "None",
00058                       const char *file = __FILE__,
00059                       unsigned int lineNumber = __LINE__,
00060                       // FIXME: __PRETTY_FUNCTION__ is the non-mangled version for __GNUC__ compiler
00061                       const char *func = "" /*__FUNCTION__*/)
00062       :
00063       What( CreateWhat(desc, file, lineNumber, func) ),
00064       Description(desc)
00065     {
00066     }
00067
00068     ~Exception() throw() override {}
00069
00070     const char* what() const throw() override
00071     {
00072       return What.what();
00073     }
00074
00075     const char * GetDescription() const { return Description.what(); }
00076
00077   };
00078
00079   }
00080
00081
00082
00083
00084
00085
00086
00087
00088
00089
00090
00091
00092
00093

```

```

00094 private:
00095     StringHolder What;
00096     StringHolder Description;
00097 };
00098
00099 } // end namespace gdcm
00100
00101 // Undo warning suppression.
00102 #if defined(__clang__) && defined(__has_warning)
00103 # if __has_warning("-Wdeprecated")
00104 #   pragma clang diagnostic pop
00105 # endif
00106 #endif
00107
00108 #endif

```

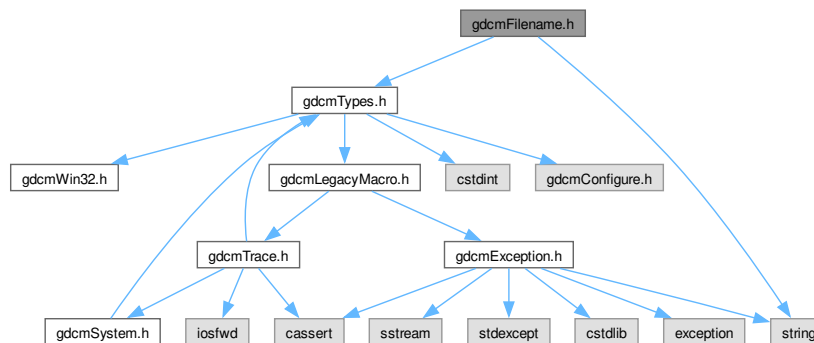
## 13.33 gdcmFilename.h File Reference

```

#include "gdcmTypes.h"
#include <string>

```

Include dependency graph for gdcmFilename.h:



### Classes

- class `gdcm::Filename`  
Class to manipulate file name's.

### Namespaces

- namespace `gdcm`

## 13.34 gdcmFilename.h

[Go to the documentation of this file.](#)

```

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00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMFILENAME_H
00015 #define GDCMFILENAME_H
00016
00017 #include "gdcmTypes.h"
00018
00019 #include <string>
00020
00021 namespace gdcm
00022 {
00023   class GDCM_EXPORT Filename
00024   {
00025   public:
00026     Filename(const char* filename = ""):FileName(filename ? filename : ""),Path(),Conversion() {}
00027
00028     const char *GetFileName() const { return FileName.c_str(); }
00029     const char *GetPath();
00030     const char *GetName();
00031     const char *GetExtension();
00032     const char *ToUnixSlashes();
00033     const char *ToWindowsSlashes();
00034
00035     static const char *Join(const char *path, const char *filename);
00036
00037     bool IsEmpty() const { return FileName.empty(); }
00038
00039     operator const char * () const { return GetFileName(); }
00040
00041     // FIXME: I don't like this function
00042     // It hides the realpath call (maybe useful)
00043     // and it forces file to exist on the disk whereas FileName
00044     // should be independent from file existence.
00045     bool IsIdentical(Filename const &fn) const;
00046
00047     bool EndWith(const char ending[]) const;
00048
00049   private:
00050     std::string FileName;
00051     std::string Path;
00052     std::string Conversion;
00053   };
00054 } // end namespace gdcm
00055 #endif //GDCMFILENAME_H

```

## 13.35 gdcmFileNameEvent.h File Reference

```

#include "gdcmEvent.h"
#include "gdcmTag.h"

```

Include dependency graph for gdcmFileNameEvent.h:



## Classes

- class [gdcm::FileNameEvent](#)  
*FileNameEvent.*

## Namespaces

- namespace [gdcm](#)

## 13.36 gdcmFileNameEvent.h

[Go to the documentation of this file.](#)

```

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00012
00013   =====*/
00014 #ifndef GDCMFILENAMEEVENT_H
00015 #define GDCMFILENAMEEVENT_H
00016
00017 #include "gdcmEvent.h"
00018 #include "gdcmTag.h"
00019
00020 namespace gdcm
00021 {
00022
00023   class FileNameEvent : public AnyEvent

```

```

00030 {
00031 public:
00032     typedef FileNameEvent Self;
00033     typedef AnyEvent Superclass;
00034     FileNameEvent(const char *s = "") : m_FileName(s) {}
00035     ~FileNameEvent() override = default;
00036
00037     FileNameEvent(const Self&s) : AnyEvent(s){}
00038     void operator=(const Self&) = delete;
00039
00040
00041     const char * GetEventName() const override { return "FileNameEvent"; }
00042     bool CheckEvent(const ::gdcM::Event* e) const override
00043     { return dynamic_cast<const Self*>(e) ? true : false; }
00044     ::gdcM::Event* MakeObject() const override
00045     { return new Self; }
00046
00047     void SetFileName(const char *f) { m_FileName = f; }
00048     const char *GetFileName() const { return m_FileName.c_str(); }
00049 private:
00050     std::string m_FileName;
00051 };
00052
00053
00054 } // end namespace gdcM
00055
00056 #endif //GDCMFILENAMEEVENT_H

```

## 13.37 gdcMFilenameGenerator.h File Reference

```
#include "gdcMTypes.h"
```

```
#include <string>
```

```
#include <vector>
```

Include dependency graph for gdcMFilenameGenerator.h:



### Classes

- class `gdcM::FilenameGenerator`  
*FilenameGenerator.*

### Namespaces

- namespace `gdcM`

## 13.38 gdcmFilenameGenerator.h

[Go to the documentation of this file.](#)

```

00001 /*=====
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00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMFILENAMEGENERATOR_H
00015 #define GDCMFILENAMEGENERATOR_H
00016
00017 #include "gdcmTypes.h"
00018 #include <string>
00019 #include <vector>
00020
00021
00022 namespace gdcm
00023 {
00024
00025
00026 class GDCM_EXPORT FilenameGenerator
00027 {
00028 public:
00029   FilenameGenerator():Pattern(),Prefix(),FileNames() {}
00030   ~FilenameGenerator() = default;
00031   // FIXME: already defines in gdcm::Directory
00032   typedef std::string FilenameType;
00033   typedef std::vector<FilenameType> FileNamesType;
00034   typedef FileNamesType::size_type SizeType;
00035
00036   void SetPattern(const char *pattern) { Pattern = pattern; }
00037   const char *GetPattern() const { return Pattern.c_str(); }
00038
00039   void SetPrefix(const char *prefix) { Prefix = prefix; }
00040   const char *GetPrefix() const { return Prefix.c_str(); }
00041
00042   bool Generate();
00043
00044   void SetNumberOfFileNames(SizeType nfiles);
00045   SizeType GetNumberOfFileNames() const;
00046
00047   const char * GetFilename(SizeType n) const;
00048   FileNamesType const & GetFileNames() const { assert( !Pattern.empty() ); return FileNames; }
00049
00050 private:
00051   FilenameType Pattern;
00052   FilenameType Prefix;
00053   FileNamesType FileNames;
00054 };
00055
00056 } // end namespace gdcm
00057
00058 #endif //GDCMFILENAMEGENERATOR_H

```

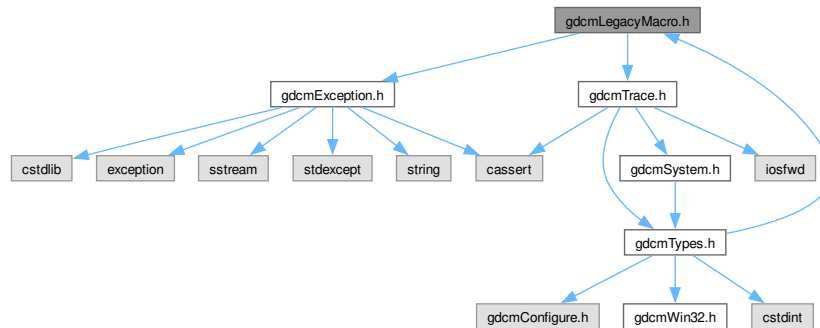
## 13.39 gdcmLegacyMacro.h File Reference

```

#include "gdcmException.h"
#include "gdcmTrace.h"

```

Include dependency graph for `gdcmlLegacyMacro.h`:



This graph shows which files directly or indirectly include this file:



## Macros

- `#define GDCM_LEGACY(method)`
- `#define GDCM_LEGACY_BODY(method, version)`
- `#define GDCM_LEGACY_REPLACED_BODY(method, version, replace)`
- `#define GDCM_NOOP_STATEMENT static_assert(true, "")`

## 13.39.1 Macro Definition Documentation

### 13.39.1.1 GDCM\_LEGACY

```
#define GDCM_LEGACY(  
    method)
```

#### Value:

```
method;
```

### 13.39.1.2 GDCM\_LEGACY\_BODY

```
#define GDCM_LEGACY_BODY(  
    method,  
    version)
```

#### Value:

```
gdcmlWarningMacro(#method " was deprecated for " version " and will be removed in a future version.")
```



### 13.39.1.3 GDCM\_LEGACY\_REPLACED\_BODY

```
#define GDCM_LEGACY_REPLACED_BODY(
    method,
    version,
    replace)
```

#### Value:

```
gdcmWarningMacro(#method " was deprecated for " version " and will be removed in a future version. Use "
    #replace " instead.")
```

### 13.39.1.4 GDCM\_NOOP\_STATEMENT

```
#define GDCM_NOOP_STATEMENT static_assert(true, "")
```

The `static_assert(true, "")` idiom is commonly employed for C++11 or greater to ensure that it is compile-time only check that can not be part of the binary file. This allows a macro to be used anywhere that a statement is expected, and to enforce consistent use of `;` after a macro. The `static_assert` is a `constexpr` that can be used in places where raw statements (i.e. `'do{} while(0)'`) are not allowed (i.e. after class member function definitions).

## 13.40 gdcmLegacyMacro.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMLEGACYMACRO_H
00015 #define GDCMLEGACYMACRO_H
00016
00017 #if !defined(GDCMTYPES_H) && !defined(SWIG)
00018 #error you need to include gdcmTypes.h instead
00019 #endif
00020
00021 #include "gdcmException.h"
00022
00023 //-----
00024 // Setup legacy code policy.
00025
00026 // Define GDCM_LEGACY macro to mark legacy methods where they are
00027 // declared in their class. Example usage:
00028 //
00029 //   @deprecated Replaced by MyOtherMethod() as of GDCM 2.0.
00030 //   GDCM_LEGACY(void MyMethod());
00031 #if defined(GDCM_LEGACY_REMOVE)
00032 # define GDCM_LEGACY(method)
00033 #elif defined(GDCM_LEGACY_SILENT) || defined(SWIG)
00034 // Provide legacy methods with no warnings.
00035 # define GDCM_LEGACY(method) method;
00036 #else
00037 // Setup compile-time warnings for uses of deprecated methods if
00038 // possible on this compiler.
00039 # if defined(__GNUC__) && !defined(__INTEL_COMPILER) && (__GNUC__ > 3 || (__GNUC__ == 3 && __GNUC_MINOR__
    >= 1))
```

```

00040 # define GDCM_LEGACY(method) method __attribute__((deprecated));
00041 # elif defined(_MSC_VER) && _MSC_VER >= 1300
00042 # define GDCM_LEGACY(method) __declspec(deprecated) method;
00043 # else
00044 # define GDCM_LEGACY(method) method;
00045 # endif
00046 #endif
00047
00057 # define GDCM_NOOP_STATEMENT static_assert(true, "")
00058
00059 // Macros to create runtime deprecation warning messages in function
00060 // bodies. Example usage:
00061 //
00062 // #if !defined(GDCM_LEGACY_REMOVE)
00063 // void gdcM::MyClass::MyOldMethod()
00064 // {
00065 //     GDCM_LEGACY_BODY(gdcM::MyClass::MyOldMethod, "GDCM 2.0");
00066 // }
00067 // #endif
00068 //
00069 // #if !defined(GDCM_LEGACY_REMOVE)
00070 // void gdcM::MyClass::MyMethod()
00071 // {
00072 //     GDCM_LEGACY_REPLACED_BODY(gdcM::MyClass::MyMethod, "GDCM 2.0",
00073 //                               gdcM::MyClass::MyOtherMethod);
00074 // }
00075 // #endif
00076 #if defined(GDCM_LEGACY_REMOVE) || defined(GDCM_LEGACY_SILENT)
00077 # define GDCM_LEGACY_BODY(method, version)
00078 # define GDCM_LEGACY_REPLACED_BODY(method, version, replace)
00079 #else
00080 # define GDCM_LEGACY_BODY(method, version) \
00081     gdcMWarningMacro("#method " was deprecated for " version " and will be removed in a future version.")
00082 # define GDCM_LEGACY_REPLACED_BODY(method, version, replace) \
00083     gdcMWarningMacro("#method " was deprecated for " version " and will be removed in a future version. Use "
00084                       "#replace " instead.")
00085 #endif
00086 #include "gdcMTrace.h"
00087
00088 #endif // GDCMLEGACYMACRO_H

```

## 13.41 gdcMMD5.h File Reference

```
#include "gdcMTypes.h"
```

Include dependency graph for gdcMMD5.h:



**Classes**

- class [gdcm::MD5](#)  
Class for [MD5](#).

**Namespaces**

- namespace [gdcm](#)

**13.42 gdcmMD5.h**

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMMD5_H
00015 #define GDCMMD5_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021 //-----
00022 class GDCM_EXPORT MD5
00023 {
00024 public :
00025     // Compute md5 from memory pointed by `pointer` of size `buf_len`
00026     static bool Compute(const char *buffer, size_t buf_len, char digest_str[33]);
00027
00028     static bool ComputeFile(const char *filename, char digest_str[33]);
00029 };
00030
00031 } // end namespace gdcm
00032 //-----
00033 #endif //GDCMMD5_H

```

**13.43 gdcmObject.h File Reference**

```

#include "gdcmTypes.h"
#include <assert.h>

```

```
#include <iostream>
```

Include dependency graph for `gdcmObject.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Object`  
*Object.*

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Object &obj)`

## 13.44 gdcmObject.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
  
```

```

00007 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMOBJECT_H
00015 #define GDCMOBJECT_H
00016
00017 #include "gdcmTypes.h"
00018
00019 #include <assert.h>
00020 #include <iostream> // grrrr
00021
00022 //namespace std { class ostream; }
00023 namespace gdcm
00024 {
00025
00026 template<class ObjectType> class SmartPointer;
00027
00028 class GDCM_EXPORT Object
00029 {
00030     template <class ObjectType> friend class SmartPointer;
00031     friend std::ostream& operator<(std::ostream &os, const Object &obj);
00032
00033 public:
00034     Object():ReferenceCount(0) {}
00035
00036     // Implementation note:
00037     // If I move ~Object in the protected section I can prevent people
00038     // from writing:
00039     // SmartPointer<Object> p = new Object;
00040     // delete p; // due to SmartPointer::operator ObjectType * () const
00041     // but on the other hand one could not define an Object on the stack
00042     // Object obj;
00043     // Furthermore it would not prevent anyone from doing:
00044     // class MyObject : public Object {};
00045     // SmartPointer<MyObject> o = new MyObject;
00046     // delete o; // grrrrrr
00047     virtual ~Object() {
00048         // If your debugger reach here it means you are doing something silly
00049         // like using SmartPointer on object allocated on the stack (vs heap)
00050         assert(ReferenceCount == 0);
00051     }
00052
00053     // http://www.parashift.com/c++-faq-lite/freestore-mgmt.html#faq-16.24
00054     // Set the ref count to 0
00055     // Do NOT copy the reference count !
00056     Object(const Object&):ReferenceCount(0) {}
00057     void operator=(const Object&){}
00058
00059     //static Object* New() { return new Object; }
00060
00061 protected:
00062     // For the purpose of the invasive SmartPointer implementation
00063     void Register() {
00064         ReferenceCount++;
00065         assert( ReferenceCount > 0 );
00066     }
00067     void UnRegister() {
00068         assert( ReferenceCount > 0 );
00069         ReferenceCount--;
00070         if(!ReferenceCount)
00071         {
00072             delete this;
00073         }
00074     }
00075
00076 public:
00077     // For dealing with printing of object and polymorphism
00078     virtual void Print(std::ostream &) const {}
00079
00080 private:
00081     long ReferenceCount;
00082 };
00083
00084 //-----
00085 // function do not carry vtable. Thus define in the base class the operator
00086 // and use the member function ->Print() to call the appropriate function
00087 // NOTE: All subclass of Object needs to implement the Print function

```

```

00097 inline std::ostream& operator<<(std::ostream &os, const Object &obj)
00098 {
00099     obj.Print(os);
00100     return os;
00101 }
00102
00103 } // end namespace gdcm
00104
00105 #endif //GDCMOBJECT_H

```

## 13.45 gdcmOpenSSLCryptoFactory.h File Reference

```

#include "gdcmCryptoFactory.h"
#include "gdcmOpenSSLCryptographicMessageSyntax.h"

```

Include dependency graph for gdcmOpenSSLCryptoFactory.h:



### Classes

- class `gdcm::OpenSSLCryptoFactory`

### Namespaces

- namespace `gdcm`

## 13.46 gdcmOpenSSLCryptoFactory.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMOPENSSLCRYPTOFACTORY_H
00015 #define GDCMOPENSSLCRYPTOFACTORY_H
00016
00017 #include "gdcmCryptoFactory.h"
00018 #include "gdcmOpenSSLCryptographicMessageSyntax.h"
00019
00020 namespace gdcm
00021 {
00022
00023   class GDCM_EXPORT OpenSSLCryptoFactory : public CryptoFactory
00024   {
00025   public:
00026     OpenSSLCryptoFactory(CryptoLib id) : CryptoFactory(id)
00027     {
00028       gdcmDebugMacro( "OpenSSL Factory registered." );
00029     }
00030
00031   public:
00032     CryptographicMessageSyntax* CreateCMSProvider()
00033     {
00034       InitOpenSSL();
00035       return new OpenSSLCryptographicMessageSyntax();
00036     }
00037
00038   protected:
00039     void InitOpenSSL();
00040
00041   private:
00042     OpenSSLCryptoFactory() {}
00043   };
00044
00045 } // end namespace gdcm
00046
00047 #endif //GDCMOPENSSLCRYPTOFACTORY_H

```

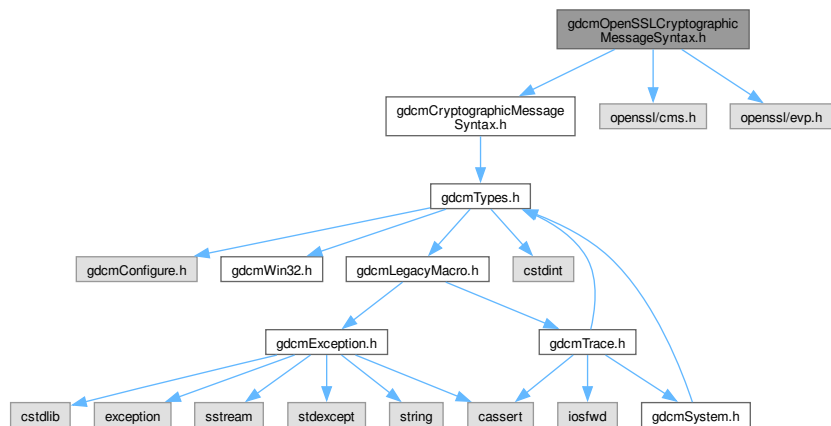
## 13.47 gdcmOpenSSLCryptographicMessageSyntax.h File Reference

```

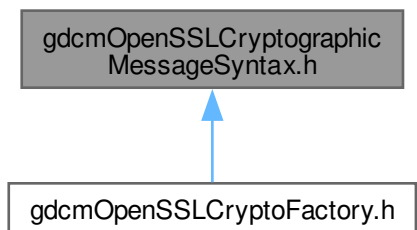
#include "gdcmCryptographicMessageSyntax.h"
#include <openssl/cms.h>
#include <openssl/evp.h>

```

Include dependency graph for `gdcmOpenSSLCryptographicMessageSyntax.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::OpenSSLCryptographicMessageSyntax](#)

## Namespaces

- namespace [gdcm](#)



## 13.48 gdcmOpenSSLCryptographicMessageSyntax.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMOPENSSLCRYPTOGRAPHICMESSAGESYNTAX_H
00015 #define GDCMOPENSSLCRYPTOGRAPHICMESSAGESYNTAX_H
00016
00017 #include "gdcmCryptographicMessageSyntax.h"
00018 #include <openssl/cms.h>
00019 #include <openssl/evp.h>
00020
00021 namespace gdcm
00022 {
00023
00024   class GDCM_EXPORT OpenSSLCryptographicMessageSyntax : public CryptographicMessageSyntax
00025   {
00026   public:
00027     OpenSSLCryptographicMessageSyntax();
00028     ~OpenSSLCryptographicMessageSyntax();
00029
00030     // X.509
00031     bool ParseCertificateFile( const char *filename );
00032     bool ParseKeyFile( const char *filename );
00033
00034     // PBE
00035     bool SetPassword(const char * pass, size_t passLen);
00036
00037     void SetCipherType(CipherTypes type);
00038     CipherTypes GetCipherType() const;
00039     bool Encrypt(char *output, size_t &outlen, const char *array, size_t len) const;
00040     bool Decrypt(char *output, size_t &outlen, const char *array, size_t len) const;
00041
00042   private:
00043     // #ifdef GDCM_HAVE_CMS_RECIPIENT_PASSWORD
00044     //   ::stack_st_X509 *recips;
00045     // #else
00046     STACK_OF(X509) *recips;
00047     // #endif
00048     ::EVP_PKEY *pkey;
00049     const EVP_CIPHER *internalCipherType;
00050     char * password;
00051     size_t passwordLength;
00052     CipherTypes cipherType;
00053
00054   private:
00055     OpenSSLCryptographicMessageSyntax(const OpenSSLCryptographicMessageSyntax&); // Not implemented.
00056     void operator=(const OpenSSLCryptographicMessageSyntax&); // Not implemented.
00057     const EVP_CIPHER *CreateCipher( CryptographicMessageSyntax::CipherTypes ciphertype);
00058
00059   };
00060
00061 } // end namespace gdcm
00062
00063 #endif //GDCMOPENSSLCRYPTOGRAPHICMESSAGESYNTAX_H

```

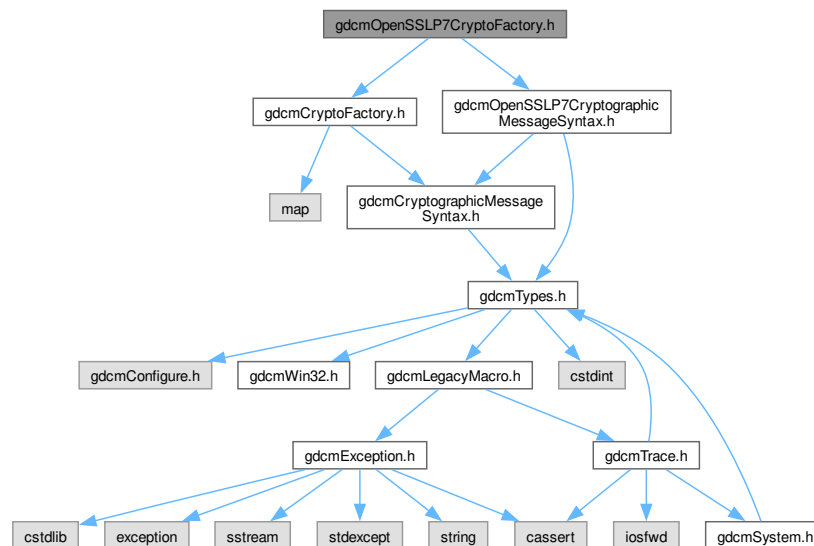
## 13.49 gdcmOpenSSLP7CryptoFactory.h File Reference

```

#include "gdcmCryptoFactory.h"
#include "gdcmOpenSSLP7CryptographicMessageSyntax.h"

```

Include dependency graph for `gdcOpenSSL7CryptoFactory.h`:



## Classes

- class `gdc::OpenSSL7CryptoFactory`

## Namespaces

- namespace `gdc`

## 13.50 `gdcOpenSSL7CryptoFactory.h`

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdc.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMOPENSSL7CRYPTOFACTORY_H
00015 #define GDCMOPENSSL7CRYPTOFACTORY_H
00016
00017 #include "gdcCryptoFactory.h"
00018 #include "gdcOpenSSL7CryptographicMessageSyntax.h"
00019
00020 namespace gdc

```

```

00021 {
00022 class GDCM_EXPORT OpenSSL7CryptoFactory : public CryptoFactory
00023 {
00024 public:
00025     OpenSSL7CryptoFactory(CryptoLib id) : CryptoFactory(id)
00026     {
00027         gdcmDebugMacro( "OpenSSL (PKCS7) Factory registered." );
00028     }
00029
00030 public:
00031     CryptographicMessageSyntax* CreateCMSProvider()
00032     {
00033         return new OpenSSL7CryptographicMessageSyntax();
00034     }
00035
00036 private:
00037     OpenSSL7CryptoFactory() {}
00038 };
00039 }
00040
00041 #endif //GDCMOPENSSL7CRYPTOFACTORY_H

```

## 13.51 gdcOpenSSL7CryptographicMessageSyntax.h File Reference

```
#include "gdcmCryptographicMessageSyntax.h"
```

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcOpenSSL7CryptographicMessageSyntax.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdc::OpenSSL7CryptographicMessageSyntax](#)

## Namespaces

- namespace [gdc](#)

## 13.52 gdcOpenSSL7CryptographicMessageSyntax.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMOPENSSL7CRYPTOGRAPHICMESSAGESYNTAX_H
00015 #define GDCMOPENSSL7CRYPTOGRAPHICMESSAGESYNTAX_H
00016
00017 #include "gdcCryptographicMessageSyntax.h"
00018 #include "gdcTypes.h"
00019
00020 namespace gdc
00021 {
00022   class CryptographicMessageSyntaxInternals;
00023   //-----
00024
00034   class GDCM_EXPORT OpenSSL7CryptographicMessageSyntax : public CryptographicMessageSyntax
00035   {
00036   public:
00037     OpenSSL7CryptographicMessageSyntax();
00038     ~OpenSSL7CryptographicMessageSyntax();
00039

```

```

00040     // X.509
00041     bool ParseCertificateFile( const char *filename );
00042     bool ParseKeyFile( const char *filename );
00043
00044     // PBE
00045     bool SetPassword(const char * /*pass*/, size_t /*passLen*/)
00046     {
00047         gdcmWarningMacro( "Openssl using PKCS7 does not support Password Based Encryption." );
00048         return false;
00049     }
00050
00053     void SetCipherType(CipherTypes type);
00054     CipherTypes GetCipherType() const;
00055
00057     bool Encrypt(char *output, size_t &outlen, const char *array, size_t len) const;
00058
00060     bool Decrypt(char *output, size_t &outlen, const char *array, size_t len) const;
00061
00062 private:
00063     CryptographicMessageSyntaxInternals *Internals;
00064 private:
00065     OpenSSL7CryptographicMessageSyntax(const OpenSSL7CryptographicMessageSyntax&); // Not implemented.
00066     void operator=(const OpenSSL7CryptographicMessageSyntax&); // Not implemented.
00067 };
00068 } // end namespace gdcm
00069 //-----
00070 #endif //GDCMOPENSSL7CRYPTOGRAPHICMESSAGESYNTAX_H

```

## 13.53 gdcmProgressEvent.h File Reference

```
#include "gdcmEvent.h"
```

```
#include "gdcmTag.h"
```

Include dependency graph for gdcmProgressEvent.h:



### Classes

- class `gdcm::ProgressEvent`  
*ProgressEvent.*

## Namespaces

- namespace [gdcm](#)

## 13.54 gdcmProgressEvent.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPROGRESSEVENT_H
00015 #define GDCMPROGRESSEVENT_H
00016
00017 #include "gdcmEvent.h"
00018 #include "gdcmTag.h"
00019
00020 namespace gdcm
00021 {
00022
00023   class ProgressEvent : public AnyEvent
00024   {
00025   public:
00026     typedef ProgressEvent Self;
00027     typedef AnyEvent Superclass;
00028     ProgressEvent(double p = 0):m_Progress(p) {}
00029     ~ProgressEvent() override = default;
00030
00031     ProgressEvent(const Self&s) : AnyEvent(s){};
00032     void operator=(const Self&) = delete;
00033
00034     const char * GetEventName() const override { return "ProgressEvent"; }
00035     bool CheckEvent(const ::gdcm::Event* e) const override
00036     { return dynamic_cast<const Self*>(e) ? true : false; }
00037     ::gdcm::Event* MakeObject() const override
00038     { return new Self; }
00039
00040     void SetProgress(double p) { m_Progress = p; }
00041     double GetProgress() const { return m_Progress; }
00042   private:
00043     double m_Progress;
00044   };
00045
00046 } // end namespace gdcm
00047
00048 #endif //GDCMPROGRESSEVENT_H

```

## 13.55 gdcmRegion.h File Reference

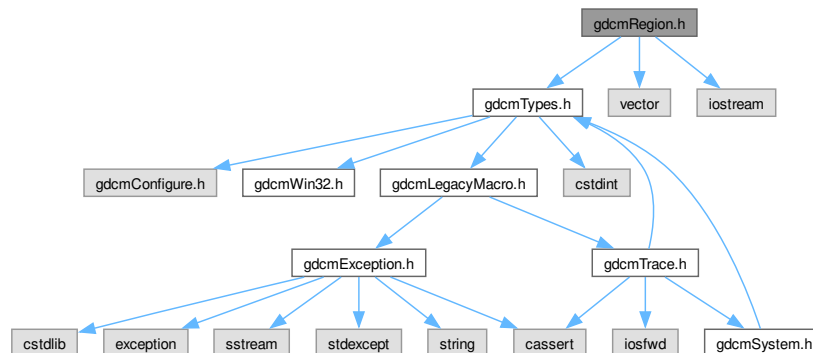
```

#include "gdcmTypes.h"
#include <vector>

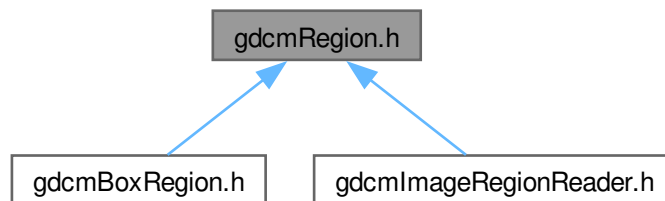
```

```
#include <iostream>
```

Include dependency graph for gdcmRegion.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::Region](#)  
*Class for manipulation region.*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Region &r)`

## 13.56 gdcmRegion.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00008
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00012
00013 =====*/
00014 #ifndef GDCMREGION_H
00015 #define GDCMREGION_H
00016
00017 #include "gdcmTypes.h"
00018 #include <vector>
00019 #include <iostream>
00020
00021 namespace gdcm
00022 {
00023   class BoxRegion;
00024   //-----
00025   class GDCM_EXPORT Region
00026   {
00027   public :
00028     Region();
00029     virtual ~Region();
00030
00031     virtual void Print(std::ostream &os = std::cout) const;
00032
00033     virtual bool Empty() const = 0;
00034
00035     virtual bool IsValid() const = 0;
00036
00037     virtual size_t Area() const = 0;
00038
00039     // implementation detail of heterogeneous container in C++
00040     virtual Region *Clone() const = 0;
00041
00042     virtual BoxRegion ComputeBoundingBox() = 0;
00043 private:
00044 };
00045 //-----
00046 inline std::ostream& operator<<(std::ostream &os, const Region&r)
00047 {
00048   r.Print( os );
00049   return os;
00050 }
00051
00052 } // end namespace gdcm
00053 //-----
00054 #endif //GDCMREGION_H

```



## 13.57 gdcmSHA1.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmSHA1.h:



### Classes

- class [gdcm::SHA1](#)  
Class for [SHA1](#).

### Namespaces

- namespace [gdcm](#)

## 13.58 gdcmSHA1.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMSHA1_H
00015  #define GDCMSHA1_H
00016
00017  #include "gdcmTypes.h"
00018
00019  namespace gdcm
00020  {
00021  //-----

```

```

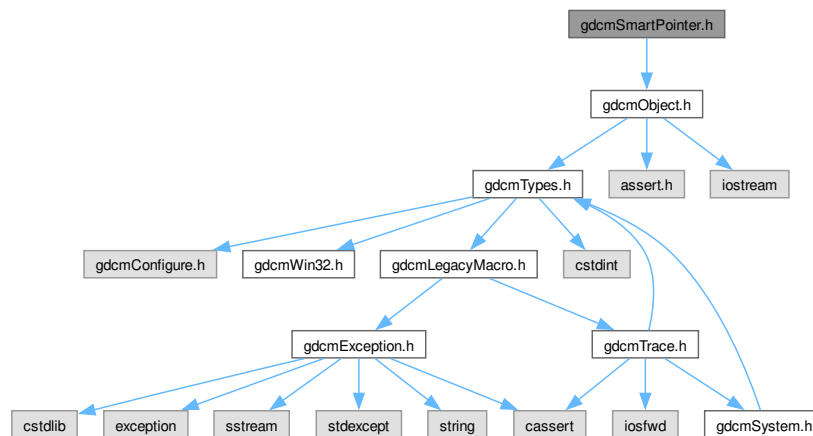
00022 class SHA1Internals;
00032 class GDCM_EXPORT SHA1
00033 {
00034 public :
00035     SHA1();
00036     ~SHA1();
00037     SHA1(const SHA1&) = delete;
00038     void operator=(const SHA1&) = delete;
00039
00040     static bool Compute(const char *buffer, unsigned long buf_len, char digest_str[20*2+1]);
00041
00042     static bool ComputeFile(const char *filename, char digest_str[20*2+1]);
00043 private:
00044     SHA1Internals *Internals;
00045 };
00046 } // end namespace gdc
00047 } // end namespace gdc
00048 //-----
00049 #endif //GDCMSHA1_H

```

## 13.59 gdcSmartPointer.h File Reference

```
#include "gdcObject.h"
```

Include dependency graph for gdcSmartPointer.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdc::SmartPointer< ObjectType >](#)  
*Class for Smart Pointer.*

## Namespaces

- namespace `gdcm`

## 13.60 gdcmSmartPointer.h

[Go to the documentation of this file.](#)

```

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00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00012
00013 =====*/
00014 #ifndef GDCMSMARTPOINTER_H
00015 #define GDCMSMARTPOINTER_H
00016
00017 #include "gdcmObject.h"
00018
00019 namespace gdcm
00020 {
00021     template<class ObjectType>
00022     class SmartPointer
00023     {
00024     public:
00025         SmartPointer():Pointer(nullptr) {}
00026         SmartPointer(const SmartPointer<ObjectType>& p):Pointer(p.Pointer)
00027         { Register(); }
00028         SmartPointer(ObjectType* p):Pointer(p)
00029         { Register(); }
00030         SmartPointer(ObjectType const & p)
00031         {
00032             Pointer = const_cast<ObjectType*>(&p);
00033             Register();
00034         }
00035         ~SmartPointer() {
00036             UnRegister();
00037             Pointer = nullptr;
00038         }
00039
00040         ObjectType *operator -> () const
00041         { return Pointer; }
00042
00043         ObjectType& operator * () const
00044         {
00045             assert( Pointer );
00046             return *Pointer;
00047         }
00048
00049         operator ObjectType * () const
00050         { return Pointer; }
00051
00052         SmartPointer &operator = (SmartPointer const &r)
00053         { return operator = (r.Pointer); }
00054
00055         SmartPointer &operator = (ObjectType *r)
00056         {
00057             // http://www.parashift.com/c++-faq-lite/freestore-mgmt.html#faq-16.22
00058             // DO NOT CHANGE THE ORDER OF THESE STATEMENTS!
00059             // (This order properly handles self-assignment)
00060             // (This order also properly handles recursion, e.g., if a ObjectType contains
00061             SmartPointer<ObjectType>s)
00062             if( Pointer != r )
00063             {
00064                 ObjectType* old = Pointer;
00065                 Pointer = r;
00066                 Register();
00067             }
00068         }
00069     };

```

```

00087         if ( old ) { old->UnRegister(); }
00088     }
00089     return *this;
00090 }
00091
00092 SmartPointer &operator = (ObjectType const &r)
00093 {
00094     ObjectType* tmp = const_cast<ObjectType*>(&r);
00095     return operator = (tmp);
00096 }
00097
00099 ObjectType *GetPointer() const
00100 { return Pointer; }
00101
00102 private:
00103 void Register()
00104 {
00105     if(Pointer) Pointer->Register();
00106 }
00107
00108 void UnRegister()
00109 {
00110     if(Pointer) Pointer->UnRegister();
00111 }
00112
00113 ObjectType* Pointer;
00114 };
00115
00116 } // end namespace gdcm
00117
00118 #endif //GDCMSMARTPOINTER_H

```

## 13.61 gdcmStaticAssert.h File Reference

This graph shows which files directly or indirectly include this file:



### Classes

- struct [gdcm::static\\_assert\\_test< x >](#)
- struct [gdcm::STATIC\\_ASSERTION\\_FAILURE< true >](#)

### Namespaces

- namespace [gdcm](#)

### Macros

- #define [GDCM\\_DO\\_JOIN\(X, Y\)](#)
  - #define [GDCM\\_DO\\_JOIN2\(X, Y\)](#)
  - #define [GDCM\\_JOIN\(X, Y\)](#)
  - #define [GDCM\\_STATIC\\_ASSERT\(B\)](#)
- The GDCM\_JOIN + **LINE** is needed to create a uniq identifier.*

## 13.61.1 Macro Definition Documentation

### 13.61.1.1 GDCM\_DO\_JOIN

```
#define GDCM_DO_JOIN(  
    X,  
    Y)
```

**Value:**

`GDCM_DO_JOIN2 (X, Y)`

### 13.61.1.2 GDCM\_DO\_JOIN2

```
#define GDCM_DO_JOIN2(  
    X,  
    Y)
```

**Value:**

`X##Y`

### 13.61.1.3 GDCM\_JOIN

```
#define GDCM_JOIN(  
    X,  
    Y)
```

**Value:**

`GDCM_DO_JOIN ( X, Y )`

### 13.61.1.4 GDCM\_STATIC\_ASSERT

```
#define GDCM_STATIC_ASSERT(  
    B)
```

**Value:**

```
typedef ::gdcm::static_assert_test<\n    sizeof(::gdcm::STATIC_ASSERTION_FAILURE< (bool) ( B ) >)>\n    GDCM_JOIN(gdcm_static_assert_typedef_, __LINE__)
```

The `GDCM_JOIN + LINE` is needed to create a uniq identifier.

## 13.62 gdcmStaticAssert.h

[Go to the documentation of this file.](#)

```

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00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSTATICASSERT_H
00015 #define GDCMSTATICASSERT_H
00016
00017
00018 // the following was shamelessly borrowed from BOOST static assert:
00019 namespace gdcm
00020 {
00021     template <bool x>
00022     struct STATIC_ASSERTION_FAILURE;
00023
00024     template <>
00025     struct STATIC_ASSERTION_FAILURE<true> { enum { value = 1 }; };
00026
00027     template <int x>
00028     struct static_assert_test {};
00029 }
00030
00031 #define GDCM_JOIN( X, Y ) GDCM_DO_JOIN( X, Y )
00032 #define GDCM_DO_JOIN( X, Y ) GDCM_DO_JOIN2(X,Y)
00033 #define GDCM_DO_JOIN2( X, Y ) X##Y
00034
00035 #define GDCM_STATIC_ASSERT( B ) \
00036     typedef ::gdcm::static_assert_test<\
00037         sizeof(::gdcm::STATIC_ASSERTION_FAILURE< (bool) ( B ) >)>\
00038         GDCM_JOIN(gdcm_static_assert_typedef_, __LINE__)
00039
00040
00041
00042 /* Example of use:
00043 *
00044 * template <class T>
00045 * struct must_not_be_instantiated
00046 * {
00047 * // this will be triggered if this type is instantiated
00048 * GDCM_STATIC_ASSERT(sizeof(T) == 0);
00049 * };
00050 *
00051 */
00052 #endif // GDCMSTATICASSERT_H

```

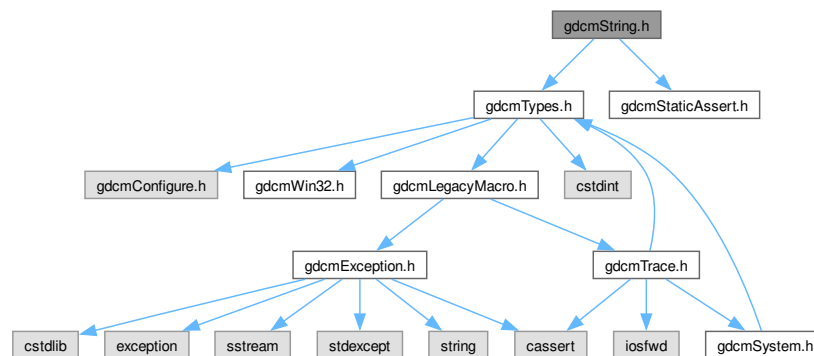
## 13.63 gdcmString.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmStaticAssert.h"

```

Include dependency graph for gdcmString.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::String< TDelimiter, TMaxLength, TPadChar >`  
*String*.

## Namespaces

- namespace `gdcm`

## Functions

- template<char TDelimiter, unsigned int TMaxLength, char TPadChar>  
`std::istream & gdcm::operator>> (std::istream &is, String< TDelimiter, TMaxLength, TPadChar > &ms)`

## 13.64 gdcmString.h

[Go to the documentation of this file.](#)

```

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00012
00013 =====*/
00014 #ifndef GDCMSTRING_H
00015 #define GDCMSTRING_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmStaticAssert.h"
00019
00020 namespace gdcm
00021 {
00022
00023   template <char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
00031   class /*GDCM_EXPORT*/ String : public std::string /* PLEASE do not export me */
00032   {
00033   // UI wants \0 for pad character, while ASCII ones wants space char... do not allow anything else
00034   GDCM_STATIC_ASSERT( TPadChar == ' ' || TPadChar == 0 );
00035
00036   public:
00037   // typedef are not inherited:
00038   typedef std::string::value_type      value_type;
00039   typedef std::string::pointer         pointer;
00040   typedef std::string::reference       reference;
00041   typedef std::string::const_reference const_reference;
00042   typedef std::string::size_type       size_type;
00043   typedef std::string::difference_type difference_type;
00044   typedef std::string::iterator        iterator;
00045   typedef std::string::const_iterator  const_iterator;
00046   typedef std::string::reverse_iterator reverse_iterator;
00047   typedef std::string::const_reverse_iterator const_reverse_iterator;
00048
00050   String(): std::string() {}
00051   String(const value_type* s): std::string(s)
00052   {
00053   if( size() % 2 )
00054   {
00055     push_back( TPadChar );
00056   }
00057   }
00058   String(const value_type* s, size_type n): std::string(s, n)
00059   {
00060   // We are being passed a const char* pointer, so s[n] == 0 (guaranteed!)
00061   if( n % 2 )
00062   {
00063     push_back( TPadChar );
00064   }
00065   }
00066   String(const std::string& s, size_type pos=0, size_type n=npos):
00067   std::string(s, pos, n)
00068   {
00069   // FIXME: some users might already have padded the string 's' with a trailing \0...
00070   if( size() % 2 )
00071   {
00072     push_back( TPadChar );
00073   }
00074   }
00075
00077   operator const char *() const { return this->c_str(); }
00078
00080   bool IsValid() const {
00081   // Check Length:
00082   size_type l = size();
00083   if( l > TMaxLength ) return false;
00084   return true;
00085   }

```



```

00086
00087 gdcm::String<TDelimiter, TMaxLength, TPadChar> Truncate() const {
00088     if( !IsValid() ) return *this;
00089     std::string str = *this; // copy
00090     str.resize( TMaxLength );
00091     return str;
00092 }
00093
00096 std::string Trim() const {
00097     std::string str = *this; // copy
00098     std::string::size_type pos1 = str.find_first_not_of(' ');
00099     std::string::size_type pos2 = str.find_last_not_of(' ');
00100     str = str.substr( (pos1 == std::string::npos) ? 0 : pos1,
00101                     (pos2 == std::string::npos) ? (str.size() - 1) : (pos2 - pos1 + 1));
00102     return str;
00103 }
00104
00105 static std::string Trim(const char *input) {
00106     if( !input ) return "";
00107     std::string str = input;
00108     std::string::size_type pos1 = str.find_first_not_of(' ');
00109     std::string::size_type pos2 = str.find_last_not_of(' ');
00110     str = str.substr( (pos1 == std::string::npos) ? 0 : pos1,
00111                     (pos2 == std::string::npos) ? (str.size() - 1) : (pos2 - pos1 + 1));
00112     return str;
00113 }
00114 };
00115 template <char TDelimiter, unsigned int TMaxLength, char TPadChar>
00116 inline std::istream& operator>>(std::istream &is, String<TDelimiter,TMaxLength,TPadChar> &ms)
00117 {
00118     if(is)
00119     {
00120         std::getline(is, ms, TDelimiter);
00121         // no such thing as std::get where the delim char would be left, so I need to manually add it back...
00122         // hopefully this is the right thing to do (no overhead)
00123         if( !is.eof() ) is.putback( TDelimiter );
00124     }
00125     return is;
00126 }
00127 //template <char TDelimiter = EOF, unsigned int TMaxLength = 64, char TPadChar = ' '>
00128 //String String::Trim() const
00129 //{
00130 //    String s;
00131 //    return s;
00132 //}
00133
00134 } // end namespace gdcm
00135
00136 #endif //GDCMSTRING_H

```



```
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00012
00013 =====*/
00014 #ifndef GDCMSUBJECT_H
00015 #define GDCMSUBJECT_H
00016
00017 #include "gdcmObject.h"
00018
00019 namespace gdcm
00020 {
00021 class Event;
00022 class Command;
00023 class SubjectInternals;
00028 class GDCM_EXPORT Subject : public Object
00029 {
00030 public:
00031 Subject();
00032 ~Subject() override;
00033
00042 unsigned long AddObserver(const Event & event, Command *);
00043 unsigned long AddObserver(const Event & event, Command *) const;
00044
00050 Command* GetCommand(unsigned long tag);
00051
00053 void InvokeEvent( const Event & );
00054
00057 void InvokeEvent( const Event & ) const;
00058
00060 void RemoveObserver(unsigned long tag);
00061
00063 void RemoveAllObservers();
00064
00066 bool HasObserver( const Event & event ) const;
00067
00068 protected:
00069
00070 private:
00071 SubjectInternals *Internals;
00072 private:
00073 };
00074
00075 } // end namespace gdcm
00076
00077 #endif //GDCMSUBJECT_H
```

## 13.67 gdcmSwapCode.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
```

Include dependency graph for `gdcmSwapCode.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::SwapCode`  
*SwapCode* representation.

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const SwapCode &sc)`

## 13.68 gdcmSwapCode.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
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```

```

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00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMSWAPCODE_H
00015 #define GDCMSWAPCODE_H
00016
00017 #include "gdcmTypes.h"
00018 #include <iostream>
00019
00020 namespace gdcm
00021 {
00022
00026 class GDCM_EXPORT SwapCode
00027 {
00028 public:
00029     typedef enum {
00030         Unknown          = 0,
00031         LittleEndian     = 1234,
00032         BigEndian        = 4321,
00033         BadLittleEndian  = 3412,
00034         BadBigEndian     = 2143
00035     } SwapCodeType;
00036
00037     operator SwapCodeType() const { return SwapCodeValue; }
00038     SwapCode(SwapCodeType sc = Unknown):SwapCodeValue(sc) { }
00039     static const char* GetSwapCodeString(SwapCode const & sc);
00040
00041     friend std::ostream& operator<<(std::ostream& os, const SwapCode& sc);
00042 protected:
00043     static int GetIndex(SwapCode const & sc);
00044
00045 private:
00046     SwapCodeType SwapCodeValue;
00047 };
00048 //-----
00049 inline std::ostream& operator<<(std::ostream& os, const SwapCode& sc)
00050 {
00051     os << SwapCode::GetSwapCodeString(sc);
00052     return os;
00053 }
00054
00055 } // end namespace gdcm
00056
00057 #endif //GDCMSWAPCODE_H

```

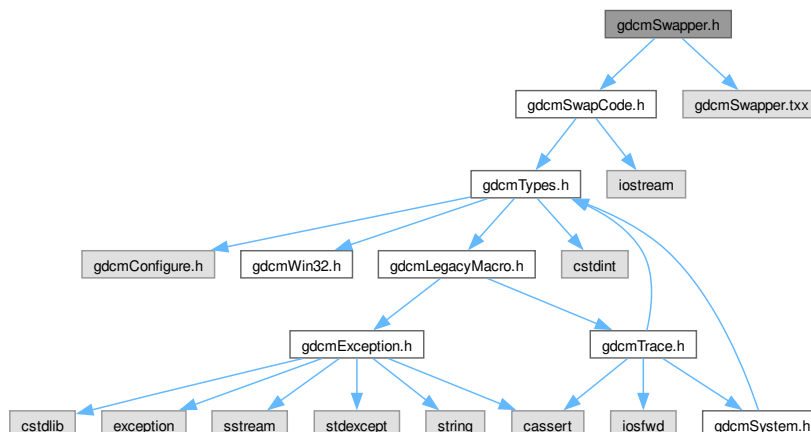
## 13.69 gdcmSwapper.h File Reference

```

#include "gdcmSwapCode.h"
#include "gdcmSwapper.txx"

```

Include dependency graph for `gdcmswapper.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcmswapper::SwapperDoOp`
- class `gdcmswapper::SwapperNoOp`

## Namespaces

- namespace `gdcmswapper`

## 13.70 gdcmswapper.h

[Go to the documentation of this file.](#)

```

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00003 Program: GDCM (Grassroots DICOM). A DICOM library
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00012

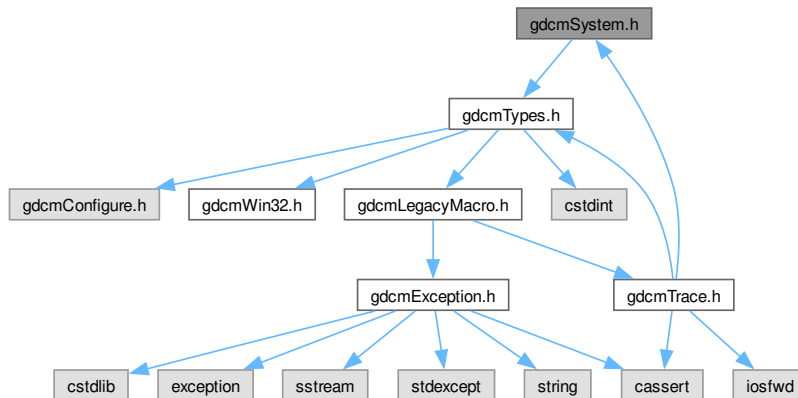
```

```
00013 =====*/
00014 #ifndef GDCMSWAPPER_H
00015 #define GDCMSWAPPER_H
00016
00017 #include "gdcmSwapCode.h"
00018
00019 namespace gdcm
00020 {
00021
00022
00023 #ifdef GDCM_WORDS_BIGENDIAN
00024 class SwapperDoOp
00025 {
00026 public:
00027     template <typename T> static T Swap(T val) {return val;}
00028     template <typename T> static void SwapArray(T *, size_t ) {}
00029 };
00030
00031 class SwapperNoOp
00032 {
00033 public:
00034     template <typename T> static T Swap(T val);
00035     template <typename T>
00036     static void SwapArray(T *array, size_t n)
00037     {
00038         // TODO: need to unroll loop:
00039         for(size_t i = 0; i < n; ++i)
00040         {
00041             array[i] = Swap<T>(array[i]);
00042         }
00043     }
00044 };
00045 #else
00046 class SwapperNoOp
00047 {
00048 public:
00049     template <typename T> static T Swap(T val) {return val;}
00050     template <typename T> static void SwapArray(T *, size_t ) {}
00051 };
00052
00053 class SwapperDoOp
00054 {
00055 public:
00056     template <typename T> static T Swap(T val);
00057     template <typename T>
00058     static void SwapArray(T *array, size_t n)
00059     {
00060         // TODO: need to unroll loop:
00061         for(size_t i = 0; i < n; ++i)
00062         {
00063             array[i] = Swap<T>(array[i]);
00064         }
00065     }
00066 };
00067 #endif
00068
00069
00070 } // end namespace gdcm
00071
00072 #include "gdcmSwapper.txx"
00073
00074 #endif //GDCMSWAPPER_H
```

## 13.71 gdcmSystem.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmSystem.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::System](#)  
*Class to do system operation.*

### Namespaces

- namespace [gdcm](#)

## 13.72 gdcmSystem.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003 Program: GDCM (Grassroots DICOM). A DICOM library
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00008

```



```

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00012
00013      =====*/
00014      #ifndef GDCMSYSTEM_H
00015      #define GDCMSYSTEM_H
00016
00017      #include "gdcmTypes.h"
00018
00019      namespace gdcm
00020      {
00021
00022      class GDCM_EXPORT System
00023      {
00024      public:
00025          static bool MakeDirectory(const char *path);
00026          static bool FileExists(const char* filename);
00027          static bool FileIsDirectory(const char* name);
00028          static bool FileIsSymlink(const char* name);
00029          static bool RemoveFile(const char* source);
00030          static bool DeleteDirectory(const char *source);
00031
00032          static std::wstring ConvertToUNC(const char *utf8path);
00033
00034          static const char *GetLastSystemError();
00035
00036          static size_t FileSize(const char* filename);
00037
00038          static time_t FileTime(const char* filename);
00039
00040          static const char *GetCurrentProcessFileName();
00041
00042          static const char *GetCurrentModuleFileName();
00043
00044          static const char *GetCurrentResourcesDirectory();
00045
00046          // TODO some system calls
00047          // Chdir
00048          // copy a file
00049
00050          static bool GetHostName(char hostname[255]);
00051
00052          // In the following the size '22' is explicitly listed. You need to pass in
00053          // at least 22bytes of array. If the string is an output it will be
00054          // automatically padded ( array[21] == 0 ) for you.
00055          // Those functions: GetCurrentDateTime / FormatDateTime / ParseDateTime do
00056          // not return the &YYZZ part of the DT structure as defined in DICOM PS 3.5 -
00057          // 2008 In this case it is simple to split the date[22] into a DA and TM
00058          // structure
00059
00060          static bool GetCurrentDateTime(char date[22]);
00061
00062          static bool FormatDateTime(char date[22], time_t t, long milliseconds = 0);
00063
00064          static bool ParseDateTime(time_t &timep, const char date[22]);
00065
00066          static bool ParseDateTime(time_t &timep, long &milliseconds, const char date[22]);
00067
00068          static const char *GetTimezoneOffsetFromUTC();
00069
00070          static size_t EncodeBytes(char *out, const unsigned char *data, int size);
00071
00072          static int StrCaseCmp(const char *s1, const char *s2);
00073          static int StrNCaseCmp(const char *s1, const char *s2, size_t n);
00074
00075          static const char * GetCWD();
00076
00077          static char *StrTokR(char *ptr, const char *sep, char **end);
00078
00079          static char *StrSep(char **stringp, const char *delim);
00080
00081          static const char *GetLocaleCharset();
00082
00083          /*
00084          static void SetArgv0(const char *);
00085          static const char* GetArgv0();
00086          */
00087
00088      protected:
00089          static bool GetPermissions(const char* file, unsigned short& mode);

```

```

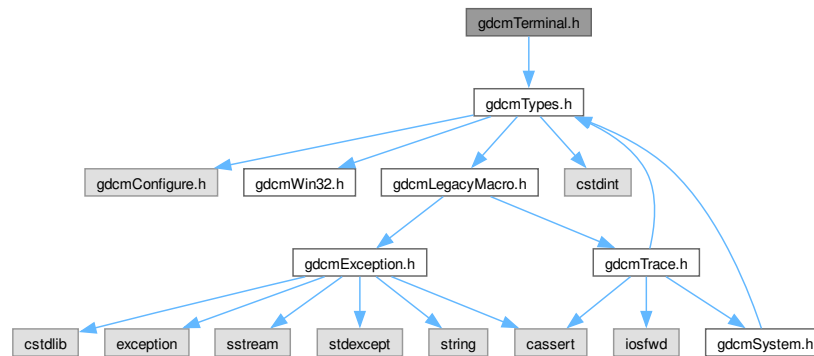
00144     static bool SetPermissions(const char* file, unsigned short mode);
00145
00146 private:
00147 };
00148
00149 } // end namespace gdcm
00150
00151 #endif //GDCMSYSTEM_H

```

## 13.73 gdcmTerminal.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmTerminal.h:



### Namespaces

- namespace `gdcm`
- namespace `gdcm::terminal`

*Class for Terminal.*

### Enumerations

- enum `gdcm::terminal::Attribute` {  
`gdcm::terminal::reset` = 0 ,  
`gdcm::terminal::bright` = 1 ,  
`gdcm::terminal::dim` = 2 ,  
`gdcm::terminal::underline` = 3 ,  
`gdcm::terminal::blink` = 5 ,  
`gdcm::terminal::reverse` = 7 ,  
`gdcm::terminal::hidden` = 8 }

- enum `gdcm::terminal::Color` {  
`gdcm::terminal::black` = 0 ,  
`gdcm::terminal::red` ,  
`gdcm::terminal::green` ,  
`gdcm::terminal::yellow` ,  
`gdcm::terminal::blue` ,  
`gdcm::terminal::magenta` ,  
`gdcm::terminal::cyan` ,  
`gdcm::terminal::white` }
- enum `gdcm::terminal::Mode` {  
`gdcm::terminal::CONSOLE` = 0 ,  
`gdcm::terminal::VT100` }

## Functions

- `GDCM_EXPORT std::string gdcm::terminal::setAttribute (Attribute att)`
- `GDCM_EXPORT std::string gdcm::terminal::setbgcolor (Color c)`
- `GDCM_EXPORT std::string gdcm::terminal::setfgcolor (Color c)`
- `GDCM_EXPORT void gdcm::terminal::setmode (Mode m)`

## 13.74 gdcmTerminal.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMTERMINAL_H
00015  #define GDCMTERMINAL_H
00016
00017  #include "gdcmTypes.h"
00018
00019
00020  namespace gdcm
00021  {
00022  //-----
00023
00024  namespace terminal
00025  {
00026
00027      typedef enum
00028      {
00029          CONSOLE = 0,
00030          VT100
00031      } Mode;
00032
00033      typedef enum
00034      {
00035          black = 0,
00036          red,
00037          green,
00038          yellow, // brown ??
00039          blue,
00040          magenta,
00041          cyan,
00042          white
00043      } Color;
00044  }
00045  }

```

```

00047     } Color;
00048     typedef enum
00049     {
00050         reset      = 0,
00051         bright     = 1, // bold
00052         dim        = 2,
00053         underline  = 3,
00054         blink      = 5,
00055         reverse    = 7,
00056         hidden     = 8
00057     } Attribute;
00058     GDCM_EXPORT std::string setattribute( Attribute att );
00059     GDCM_EXPORT std::string setfgcolor( Color c );
00060     GDCM_EXPORT std::string setbgcolor( Color c );
00061     GDCM_EXPORT void setmode( Mode m);
00062 }
00063
00064 } // end namespace gdc
00065 //-----
00066 #endif //GDCMTERMINAL_H

```

## 13.75 gdcTestDriver.h File Reference

```

#include <locale>
#include <locale>

```

Include dependency graph for gdcTestDriver.h:



## 13.76 gdcTestDriver.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdc.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 // This header is included by all the C++ test drivers in GDCM.
00015 #ifndef GDCMTESTDRIVER_H

```

```

00016 #define GDCMTESTDRIVER_H
00017
00018 // CREATE_TEST_SOURCELIST supports the flag EXTRA_INCLUDE but only one per call.
00019 // So there is no way to specify we want to include two files... instead
00020 // gather the #include in a single file and include that one...
00021 #include <clocale> // C setlocale()
00022 #include <locale> // C++ locale
00023
00024 #endif // GDCMTESTDRIVER_H

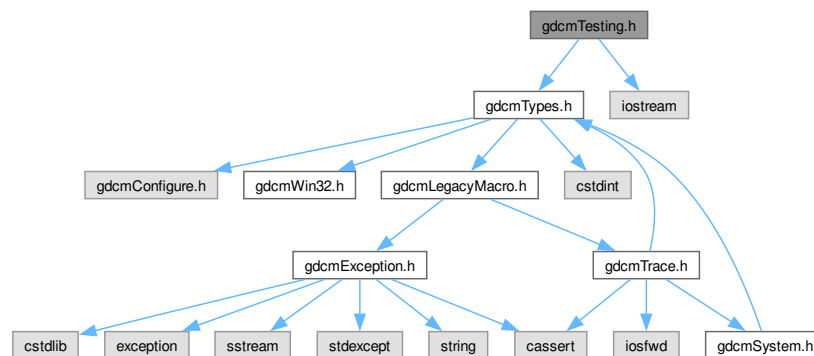
```

## 13.77 gdcmTesting.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <iostream>
```

Include dependency graph for gdcmTesting.h:



### Classes

- class [gdcm::Testing](#)  
*class for testing*

### Namespaces

- namespace [gdcm](#)

## 13.78 gdcmTesting.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003 Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005 Copyright (c) 2006-2011 Mathieu Malaterre
00006 All rights reserved.

```

```

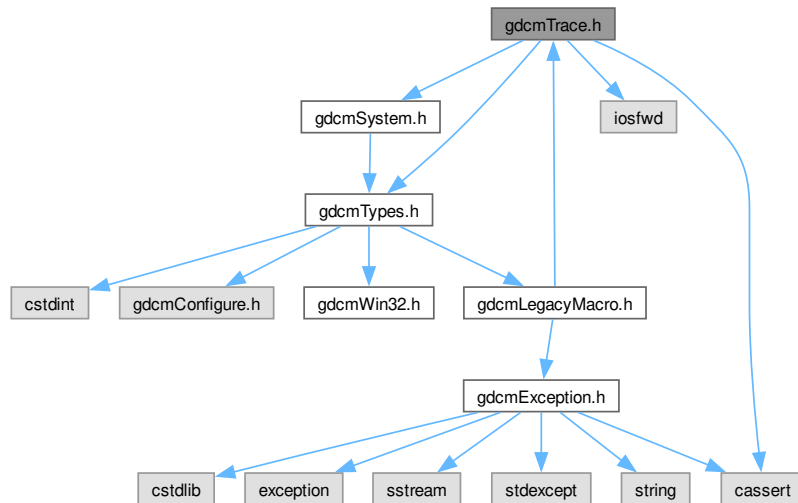
00007 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMTESTING_H
00015 #define GDCMTESTING_H
00016
00017 #include "gdcmTypes.h"
00018
00019 #include <iostream>
00020
00021 namespace gdcm
00022 {
00023 //-----
00024 class GDCM_EXPORT Testing
00025 {
00026 public :
00027     Testing() = default;
00028     ~Testing() = default;
00029
00030     static bool ComputeMD5(const char *buffer, size_t buf_len,
00031         char digest_str[33]);
00032     static bool ComputeFileMD5(const char *filename, char digest_str[33]);
00033
00034     void Print(std::ostream &os = std::cout);
00035
00036     static const char * const * GetFileNames();
00037     static unsigned int GetNumberOfFileNames();
00038     static const char * GetFileName(unsigned int file);
00039
00040     typedef const char* const (*MediaStorageDataFilesType) [2];
00041     static MediaStorageDataFilesType GetMediaStorageDataFiles();
00042     static unsigned int GetNumberOfMediaStorageDataFiles();
00043     static const char * const * GetMediaStorageDataFile(unsigned int file);
00044     static const char * GetMediaStorageFromFile(const char *filepath);
00045
00046     typedef const char* const (*MD5DataImagesType) [2];
00047     static MD5DataImagesType GetMD5DataImages();
00048     static unsigned int GetNumberOfMD5DataImages();
00049     static const char * const * GetMD5DataImage(unsigned int file);
00050     static const char * GetMD5FromFile(const char *filepath);
00051
00052     static const char * GetMD5FromBrokenFile(const char *filepath);
00053
00054     static std::streamoff GetStreamOffsetFromFile(const char *filepath);
00055
00056     static std::streamoff GetSelectedTagsOffsetFromFile(const char *filepath);
00057
00058     static std::streamoff GetSelectedPrivateGroupOffsetFromFile(const char *filepath);
00059
00060     static int GetLossyFlagFromFile(const char *filepath);
00061
00062     static const char * GetDataRoot();
00063
00064     static const char * GetDataExtraRoot();
00065
00066     static const char * GetPixelSpacingDataRoot();
00067
00068     static const char * GetTempDirectory(const char * subdir = nullptr);
00069
00070     static const wchar_t * GetTempDirectoryW(const wchar_t * subdir = nullptr);
00071
00072     static const char * GetTempFilename(const char *filename, const char * subdir = nullptr);
00073
00074     static const wchar_t * GetTempFilenameW(const wchar_t *filename, const wchar_t * subdir = nullptr);
00075
00076     static const char * GetSourceDirectory();
00077 };
00078 } // end namespace gdcm
00079 //-----
00080 #endif //GDCMTESTING_H

```

## 13.79 gdcmTrace.h File Reference

```
#include "gdcmTypes.h"  
#include "gdcmSystem.h"  
#include <iosfwd>  
#include <cassert>
```

Include dependency graph for gdcmTrace.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class `gdcm::Trace`  
*Trace.*

### Namespaces

- namespace `gdcm`

## Macros

- `#define GDCM_FUNCTION "<unknown>"`
- `#define gdcmAssertAlwaysMacro(arg)`  
*AssertAlways.*
- `#define gdcmAssertMacro(arg)`  
*Assert.*
- `#define gdcmDebugMacro(msg)`  
*Debug.*
- `#define gdcmErrorMacro(msg)`  
*Error this is pretty bad, more than just warning It could mean lost of data, something not handle...*
- `#define gdcmWarningMacro(msg)`  
*Warning.*

## 13.79.1 Macro Definition Documentation

### 13.79.1.1 GDCM\_FUNCTION

```
#define GDCM_FUNCTION "<unknown>"
```

### 13.79.1.2 gdcmAssertAlwaysMacro

```
#define gdcmAssertAlwaysMacro(  
    arg)
```

#### Value:

`gdcmAssertMacro(arg)`

*AssertAlways.*

#### Parameters

<i>arg</i>	argument to test An easy solution to pass also a message is to do: <code>gdcmAssertMacro( "my message" &amp;&amp; 2 &lt; 3 )</code>
------------	---

Referenced by `gdcm::DataElement::GetValue()`, `gdcm::DataElement::GetValue()`, `gdcm::BasicOffsetTable::Read()`, `gdcm::SequenceOfFragments::ReadValue()`, `gdcm::DataSet::Replace()`, `gdcm::DataSet::ReplaceEmpty()`, and `gdcm::VR::Write()`.



### 13.79.1.3 gdcmAssertMacro

```
#define gdcmAssertMacro(  
    arg)
```

#### Value:

```
{  
    if( !(arg) )  
    {  
        std::ostringstream osmacro;  
        osmacro << "Assert: In " __FILE__ ", line " << __LINE__  
            << ", function " << GDCM_FUNCTION  
            << "\n\n";  
        std::ostream &_os = gdcm::Trace::GetErrorStream();  
        _os << osmacro.str() << std::endl;  
        assert ( arg );  
    }  
}  
GDCM_NOOP_STATEMENT
```

Assert.

#### Parameters

<i>arg</i>	argument to test An easy solution to pass also a message is to do: <code>gdcmAssertMacro( "my message" &amp;&amp; 2 &lt; 3 )</code>
------------	---

Referenced by [gdcm::PixelFormat::SetSamplesPerPixel\(\)](#).

### 13.79.1.4 gdcmDebugMacro

```
#define gdcmDebugMacro(  
    msg)
```

#### Value:

```
{  
    if( gdcm::Trace::GetDebugFlag() )  
    {  
        std::ostringstream osmacro;  
        osmacro << "Debug: In " __FILE__ ", line " << __LINE__  
            << ", function " << GDCM_FUNCTION << '\n'  
            << "Last system error was: "  
            << gdcm::System::GetLastSystemError() << '\n' << msg;  
        std::ostream &_os = gdcm::Trace::GetDebugStream();  
        _os << osmacro.str() << "\n\n" << std::endl;  
    }  
}  
GDCM_NOOP_STATEMENT
```

Debug.

#### Parameters

<i>msg</i>	message part
------------	--------------

Referenced by [gdcm::OpenSSLCryptoFactory::OpenSSLCryptoFactory\(\)](#), [gdcm::OpenSSLP7CryptoFactory::OpenSSLP7CryptoFactory\(\)](#), [gdcm::Item::Read\(\)](#), [gdcm::SequenceOfItems::Read\(\)](#), [gdcm::VR::Read\(\)](#), [gdcm::SequenceOfFragments::ReadPreValue\(\)](#), and [gdcm::SequenceOfFragments::ReadValue\(\)](#).

### 13.79.1.5 gdcmErrorMacro

```
#define gdcmErrorMacro(  
    msg)
```

#### Value:

```
{  
    if( gdcm::Trace::GetErrorFlag() )  
    {  
        std::ostringstream osmacro;  
        osmacro << "Error: In " << __FILE__ ", line " << __LINE__  
            << ", function " << GDCM_FUNCTION << '\n'  
            << msg << "\n\n";  
        std::ostream &_os = gdcm::Trace::GetErrorStream();  
        _os << osmacro.str() << std::endl;  
    }  
}  
GDCM_NOOP_STATEMENT
```

Error this is pretty bad, more than just warning It could mean lost of data, something not handle...

#### Parameters

<i>msg</i>	second message part
------------	---------------------

Referenced by [gdcm::CommandDataSet::Insert\(\)](#), [gdcm::DataSet::Insert\(\)](#), [gdcm::FileMetaInformation::Insert\(\)](#), [gdcm::Item::Read\(\)](#), and [gdcm::Fragment::ReadBacktrack\(\)](#).

### 13.79.1.6 gdcmWarningMacro

```
#define gdcmWarningMacro(  
    msg)
```

#### Value:

```
{  
    if( gdcm::Trace::GetWarningFlag() )  
    {  
        std::ostringstream osmacro;  
        osmacro << "Warning: In " << __FILE__ ", line " << __LINE__  
            << ", function " << GDCM_FUNCTION << "\n"  
            << msg << "\n\n";  
        std::ostream &_os = gdcm::Trace::GetWarningStream();  
        _os << osmacro.str() << std::endl;  
    }  
}  
GDCM_NOOP_STATEMENT
```

Warning.

#### Parameters

<i>msg</i>	message part
------------	--------------

Referenced by [gdcm::DataSet::InsertDataElement\(\)](#), [gdcm::Item::Read\(\)](#), [gdcm::SequenceOfItems::Read\(\)](#), [gdcm::Fragment::ReadBacktrack\(\)](#), [gdcm::Fragment::ReadValue\(\)](#), [gdcm::SequenceOfFragments::ReadValue\(\)](#), [gdcm::OpenSSLP7CryptographicMessageSyntax::SetPassword\(\)](#) and [gdcm::Item::Write\(\)](#).

## 13.80 gdcmTrace.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMTRACE_H
00015 #define GDCMTRACE_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmSystem.h"
00019
00020 #include <iosfwd>
00021 #include <cassert>
00022
00023 namespace gdcm
00024 {
00025
00041 class GDCM_EXPORT Trace
00042 {
00043 public :
00044   Trace();
00045   ~Trace();
00046
00049   static void SetStream(std::ostream &os);
00050   static std::ostream &GetStream();
00051
00053   static void SetDebugStream(std::ostream &os);
00054   static std::ostream &GetDebugStream();
00055
00057   static void SetWarningStream(std::ostream &os);
00058   static std::ostream &GetWarningStream();
00059
00061   static void SetErrorStream(std::ostream &os);
00062   static std::ostream &GetErrorStream();
00063
00066   static void SetStreamToFile( const char *filename );
00067
00069   static void SetDebug(bool debug);
00070   static void DebugOn();
00071   static void DebugOff();
00072   static bool GetDebugFlag();
00073
00075   static void SetWarning(bool debug);
00076   static void WarningOn();
00077   static void WarningOff();
00078   static bool GetWarningFlag();
00079
00081   static void SetError(bool debug);
00082   static void ErrorOn();
00083   static void ErrorOff();
00084   static bool GetErrorFlag();
00085
00086 protected:
00087 private:
00088 };
00089
00090 // Here we define function this is the only way to be able to pass
00091 // stuff with indirection like:
00092 // gdcmDebug( "my message:" « i « '\t' );
00093 // You cannot use function unless you use vnsprintf ...
00094
00095 // __FUNCTION__ is not always defined by preprocessor
00096 // In c++ we should use __PRETTY_FUNCTION__ instead...
00097 #ifdef GDCM_CXX_HAS_FUNCTION
00098 // Handle particular case for GNU C++ which also defines __PRETTY_FUNCTION__
00099 // which is a lot nice in C++
00100 #ifdef __BORLANDC__

```

```

00101 # define __FUNCTION__ __FUNC__
00102 #endif
00103 #ifdef __GNUC__
00104 # define GDCM_FUNCTION __PRETTY_FUNCTION__
00105 #else
00106 # define GDCM_FUNCTION __FUNCTION__
00107 #endif //__GNUC__
00108 #else
00109 # define GDCM_FUNCTION "<unknown>"
00110 #endif //GDCM_CXX_HAS_FUNCTION
00111
00116 #if defined(NDEBUG) && !defined(GDCM_ALWAYS_TRACE_MACRO)
00117 #define gdcmDebugMacro(msg) GDCM_NOOP_STATEMENT
00118 #else
00119 #define gdcmDebugMacro(msg)
00120 {
00121     if( gdcm::Trace::GetDebugFlag() )
00122     {
00123         std::ostringstream osmacro;
00124         osmacro < "Debug: In " __FILE__ ", line " < __LINE__
00125             < ", function " < GDCM_FUNCTION < '\n'
00126             < "Last system error was: "
00127             < gdcm::System::GetLastSystemError() < '\n' < msg;
00128         std::ostream &_os = gdcm::Trace::GetDebugStream();
00129         _os < osmacro.str() < "\n\n" < std::endl;
00130     }
00131 }
00132 GDCM_NOOP_STATEMENT
00133 #endif //NDEBUG
00134
00139 #if defined(NDEBUG) && !defined(GDCM_ALWAYS_TRACE_MACRO)
00140 #define gdcmWarningMacro(msg) GDCM_NOOP_STATEMENT
00141 #else
00142 #define gdcmWarningMacro(msg)
00143 {
00144     if( gdcm::Trace::GetWarningFlag() )
00145     {
00146         std::ostringstream osmacro;
00147         osmacro < "Warning: In " __FILE__ ", line " < __LINE__
00148             < ", function " < GDCM_FUNCTION < "\n"
00149             < msg < "\n\n";
00150         std::ostream &_os = gdcm::Trace::GetWarningStream();
00151         _os < osmacro.str() < std::endl;
00152     }
00153 }
00154 GDCM_NOOP_STATEMENT
00155 #endif //NDEBUG
00156
00162 #if defined(NDEBUG) && !defined(GDCM_ALWAYS_TRACE_MACRO)
00163 #define gdcmErrorMacro(msg) GDCM_NOOP_STATEMENT
00164 #else
00165 #define gdcmErrorMacro(msg)
00166 {
00167     if( gdcm::Trace::GetErrorFlag() )
00168     {
00169         std::ostringstream osmacro;
00170         osmacro < "Error: In " __FILE__ ", line " < __LINE__
00171             < ", function " < GDCM_FUNCTION < '\n'
00172             < msg < "\n\n";
00173         std::ostream &_os = gdcm::Trace::GetErrorStream();
00174         _os < osmacro.str() < std::endl;
00175     }
00176 }
00177 GDCM_NOOP_STATEMENT
00178 #endif //NDEBUG
00179
00186 #if defined(NDEBUG) && !defined(GDCM_ALWAYS_TRACE_MACRO)
00187 #define gdcmAssertMacro(arg) GDCM_NOOP_STATEMENT
00188 #else
00189 #define gdcmAssertMacro(arg)
00190 {
00191     if( !(arg) )
00192     {
00193         std::ostringstream osmacro;
00194         osmacro < "Assert: In " __FILE__ ", line " < __LINE__
00195             < ", function " < GDCM_FUNCTION
00196             < "\n\n";
00197         std::ostream &_os = gdcm::Trace::GetErrorStream();
00198         _os < osmacro.str() < std::endl;
00199         assert ( arg );
00200     }

```

```

00201 }
00202 GDCM_NOOP_STATEMENT
00203 #endif //NDEBUG
00204
00211 #if defined(NDEBUG)
00212 // User asked for release compilation, but still need to report
00213 // if grave issue.
00214 #define gdcmAssertAlwaysMacro(arg) \
00215 {
00216     if( !(arg) )
00217     {
00218         std::ostringstream osmacro;
00219         osmacro << "Assert: In " __FILE__ ", line " << __LINE__
00220             << ", function " << GDCM_FUNCTION
00221             << "\n\n";
00222         throw osmacro.str();
00223     }
00224 }
00225 GDCM_NOOP_STATEMENT
00226 #else
00227 // Simply reproduce gdcmAssertMacro behavior:
00228 #define gdcmAssertAlwaysMacro(arg) gdcmAssertMacro(arg)
00229 #endif //NDEBUG
00230
00231 } // end namespace gdcm
00232 //-----
00233 #endif //GDCMTRACE_H

```

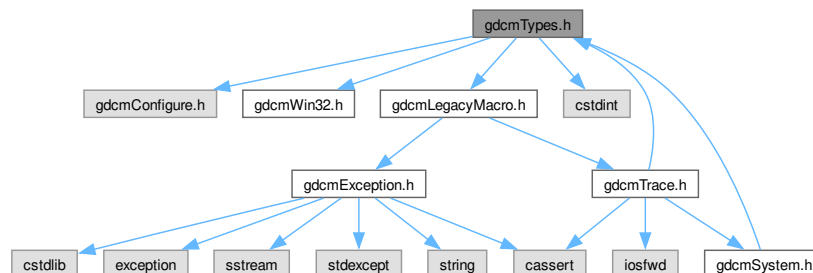
## 13.81 gdcmTypes.h File Reference

```

#include "gdcmConfigure.h"
#include "gdcmWin32.h"
#include "gdcmLegacyMacro.h"
#include <stdint>

```

Include dependency graph for gdcmTypes.h:



## 13.82 gdcmTypes.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.

```

```

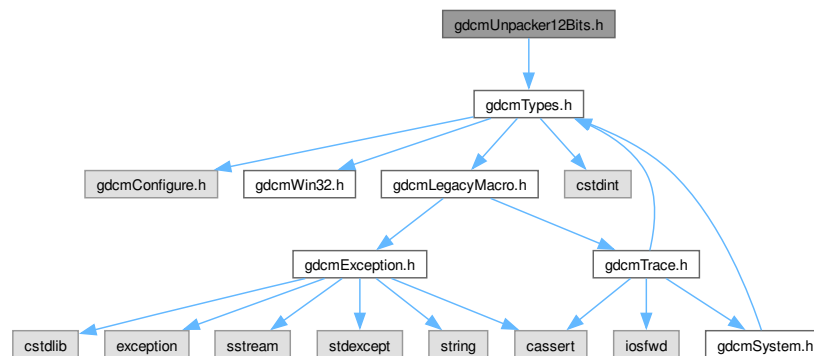
00007  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009      This software is distributed WITHOUT ANY WARRANTY; without even
00010      the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011      PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMTYPES_H
00015 #define GDCMTYPES_H
00016
00017 #include "gdcmConfigure.h"
00018 #include "gdcmWin32.h"
00019 #include "gdcmLegacyMacro.h"
00020
00021 //-----
00022 #include <stdint>
00023
00024 //-----
00025 #endif //GDCMTYPES_H

```

### 13.83 gdcmUnpacker12Bits.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmUnpacker12Bits.h:



#### Classes

- class `gdcm::Unpacker12Bits`  
*Pack/Unpack 12 bits pixel into 16bits.*

#### Namespaces

- namespace `gdcm`

## 13.84 gdcmUnpacker12Bits.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMUNPACKER12BITS_H
00015 #define GDCMUNPACKER12BITS_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00034   class GDCM_EXPORT Unpacker12Bits
00035   {
00036   public:
00040     static bool Pack(char *out, const char *in, size_t n);
00041
00045     static bool Unpack(char *out, const char *in, size_t n);
00046   };
00047
00048 } // end namespace gdcm
00049
00050 #endif //GDCMUNPACKER12BITS_H

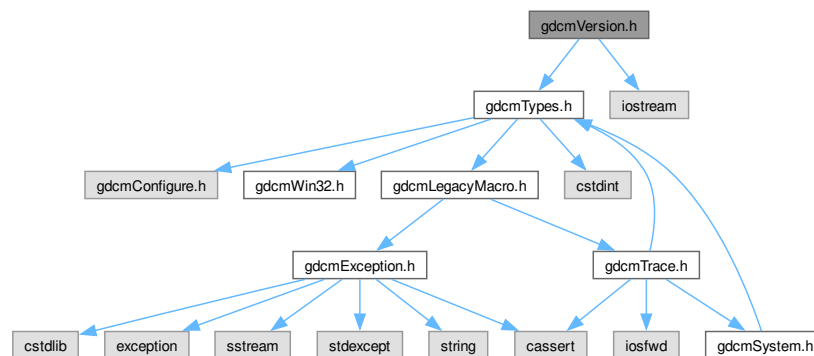
```

## 13.85 gdcmVersion.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <iostream>
```

Include dependency graph for gdcmVersion.h:



### Classes

- class `gdcm::Version`  
major/minor and build version

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Version &v)`

## 13.86 gdcmVersion.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMVERSION_H
00015 #define GDCMVERSION_H
00016
00017 #include "gdcmTypes.h"
00018 #include <iostream>
00019
00020 namespace gdcm
00021 {
00022 //-----
00023 class GDCM_EXPORT Version
00024 {
00025     friend std::ostream& operator<<(std::ostream &_os, const Version &v);
00026 public:
00027     static const char *GetVersion();
00028     static int GetMajorVersion();
00029     static int GetMinorVersion();
00030     static int GetBuildVersion();
00031
00032     void Print(std::ostream &os = std::cout) const;
00033
00034 //protected:
00035     Version() = default;
00036     ~Version() = default;
00037 };
00038 //-----
00039 inline std::ostream& operator<<(std::ostream &os, const Version &v)
00040 {
00041     v.Print( os );
00042     return os;
00043 }
00044
00045 } // end namespace gdcm
00046 //-----
00047 #endif //GDCMVERSION_H

```

## 13.87 gdcmWin32.h File Reference

This graph shows which files directly or indirectly include this file:





**Macros**

- `#define GDCM_EXPORT`

**13.87.1 Macro Definition Documentation****13.87.1.1 GDCM\_EXPORT**

```
#define GDCM_EXPORT
```

Referenced by `gdcm::terminal::setAttribute()`, `gdcm::terminal::setbgcolor()`, `gdcm::terminal::setfgcolor()`, and `gdcm::terminal::setmode()`.

**13.88 gdcmWin32.h**

[Go to the documentation of this file.](#)

```
00001 /*=====
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00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014
00015 #ifndef GDCMWIN32_H
00016 #define GDCMWIN32_H
00017
00018 #if !defined(GDCMTYPES_H)
00019 #error you need to include gdcmTypes.h instead
00020 #endif
00021 //-----
00022 // http://gcc.gnu.org/wiki/Visibility
00023 #if defined(_WIN32) && defined(GDCM_BUILD_SHARED_LIBS)
00024   #if (defined(gdcmCommon_EXPORTS) || defined(gdcmDICT_EXPORTS) || defined(gdcmDSED_EXPORTS) ||
00025         defined(gdcmIOD_EXPORTS) || defined(gdcmMSFF_EXPORTS) || defined(gdcmMEXD_EXPORTS) ||
00026         defined(_gdcmswig_EXPORTS)) || defined(vtkgdcm_EXPORTS)
00027     #define GDCM_EXPORT __declspec( dllexport )
00028   #else
00029     #define GDCM_EXPORT __declspec( dllimport )
00030   #endif
00031 #else
00032   #if __GNUC__ >= 4 && defined(GDCM_BUILD_SHARED_LIBS)
00033     #define GDCM_EXPORT __attribute__ ((visibility ("default")))
00034     #define GDCM_LOCAL __attribute__ ((visibility ("hidden")))
00035   #else
00036     #define GDCM_EXPORT
00037   #endif
00038 #endif
00039 #undef GDCM_EXPORT
00040 #define GDCM_EXPORT
00041 #endif
00042
00043 // In VTK 4.2 vtkWrapPython does not like anything other than VTK_*EXPORT
00044 // [ 86%] Generating vtkGDCMImageReaderPython.cxx
00045 // syntax error
```

```

00046 // *** SYNTAX ERROR found in parsing the header file
00047 //usr/local/src/gdcm2/tags/gdcm-2-0-11/Utilities/VTK/vtkGDCMImageReader.h before line 128***
00047 // make[2]: *** [Utilities/VTK/vtkGDCMImageReaderPython.cxx] Error 1
00048 // make[1]: *** [Utilities/VTK/CMakeFiles/vtkgdcmPythonD.dir/all] Error 2
00049 // make: *** [all] Error 2
00050
00051 #if defined(VTK_MAJOR_VERSION) && ( VTK_MAJOR_VERSION == 4 )
00052 #undef VTK_EXPORT
00053 #define VTK_EXPORT GDCM_EXPORT
00054 #endif
00055
00056 //-----
00057 //This is needed when compiling in debug mode
00058 #ifdef _MSC_VER
00059 // to allow construct such as: std::numeric_limits<int>::max() we need the following:
00060 // warning C4003: not enough actual parameters for macro 'max'
00061 #ifndef NOMINMAX
00062 #define NOMINMAX
00063 #endif
00064 #pragma warning ( default : 4263 ) /* no override, call convention differs */
00065 // 'identifier' : class 'type' needs to have dll-interface to be used by
00066 // clients of class 'type2'
00067 #pragma warning ( disable : 4251 )
00068 // non dll-interface class 'type' used as base for dll-interface class 'type2'
00069 #pragma warning ( disable : 4275 )
00070 // 'identifier' : identifier was truncated to 'number' characters in the
00071 // debug information
00072 #pragma warning ( disable : 4786 )
00073 // 'identifier' : decorated name length exceeded, name was truncated
00074 #pragma warning ( disable : 4503 )
00075 #endif // _MSC_VER
00076
00077 //-----
00078 #endif //GDCMWIN32_H

```

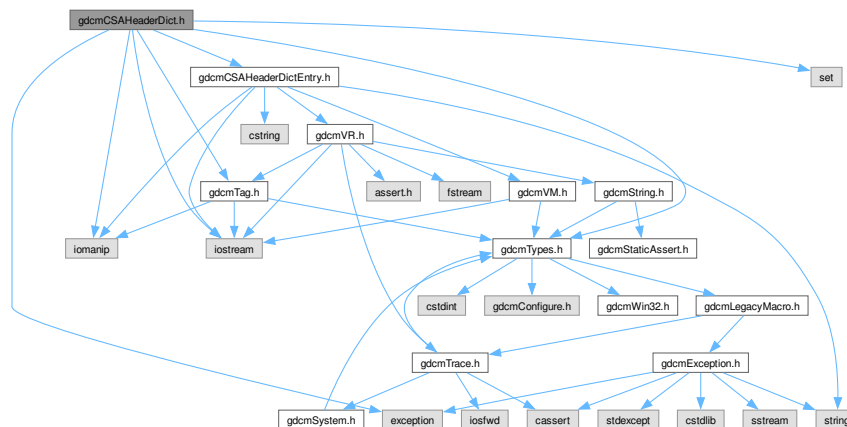
## 13.89 gdcmCSAHeaderDict.h File Reference

```

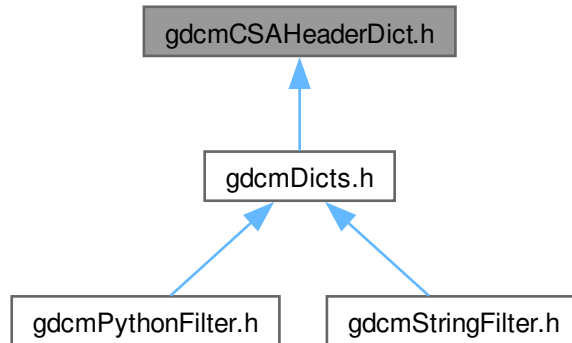
#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmCSAHeaderDictEntry.h"
#include <iostream>
#include <iomanip>
#include <set>
#include <exception>

```

Include dependency graph for gdcmCSAHeaderDict.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::CSAHeaderDict](#)  
*Class to represent a map of [CSAHeaderDictEntry](#).*
- class [gdcm::CSAHeaderDictException](#)

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const CSAHeaderDict &val)`

## 13.90 gdcmCSAHeaderDict.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMCSAHEADERDICT_H

```

```

00015 #define GDCMCSAHEADERDICT_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmTag.h"
00019 #include "gdcmCSAHeaderDictEntry.h"
00020
00021 #include <iostream>
00022 #include <iomanip>
00023 #include <set>
00024 #include <exception>
00025
00026 namespace gdcm
00027 {
00028
00029 class GDCM_EXPORT CSAHeaderDictException : public std::exception {};
00030
00031 class GDCM_EXPORT CSAHeaderDict
00032 {
00033 public:
00034     typedef std::set<CSAHeaderDictEntry> MapCSAHeaderDictEntry;
00035     typedef MapCSAHeaderDictEntry::iterator Iterator;
00036     typedef MapCSAHeaderDictEntry::const_iterator ConstIterator;
00037     //static CSAHeaderDictEntry GroupLengthCSAHeaderDictEntry; // = CSAHeaderDictEntry("Group
00038     Length",VR::UL,VM::VMI);
00039
00040     CSAHeaderDict():CSAHeaderDictInternal() {
00041         assert( CSAHeaderDictInternal.empty() );
00042     }
00043     CSAHeaderDict &operator=(const CSAHeaderDict &_val) = delete;
00044     CSAHeaderDict(const CSAHeaderDict &_val) = delete;
00045
00046     friend std::ostream& operator<<(std::ostream& _os, const CSAHeaderDict &_val);
00047
00048     ConstIterator Begin() const { return CSAHeaderDictInternal.begin(); }
00049     ConstIterator End() const { return CSAHeaderDictInternal.end(); }
00050
00051     bool IsEmpty() const { return CSAHeaderDictInternal.empty(); }
00052     void AddCSAHeaderDictEntry(const CSAHeaderDictEntry &de)
00053     {
00054         #ifndef NDEBUB
00055             MapCSAHeaderDictEntry::size_type s = CSAHeaderDictInternal.size();
00056             #endif
00057             CSAHeaderDictInternal.insert( de );
00058             assert( s < CSAHeaderDictInternal.size() );
00059         }
00060
00061     const CSAHeaderDictEntry &GetCSAHeaderDictEntry(const char *name) const
00062     {
00063         MapCSAHeaderDictEntry::const_iterator it = CSAHeaderDictInternal.find( name );
00064         if( it != CSAHeaderDictInternal.end() )
00065         {
00066             return *it;
00067         }
00068         throw CSAHeaderDictException();
00069     }
00070
00071 protected:
00072     friend class Dicts;
00073     void LoadDefault();
00074
00075 private:
00076     MapCSAHeaderDictEntry CSAHeaderDictInternal;
00077 };
00078
00079 //-----
00080 inline std::ostream& operator<<(std::ostream& os, const CSAHeaderDict &val)
00081 {
00082     CSAHeaderDict::MapCSAHeaderDictEntry::const_iterator it = val.CSAHeaderDictInternal.begin();
00083     for(; it != val.CSAHeaderDictInternal.end(); ++it)
00084     {
00085         const CSAHeaderDictEntry &de = *it;
00086         os << de << '\n';
00087     }
00088
00089     return os;
00090 }
00091
00092 // end namespace gdcm
00093
00094
00095
00096
00097

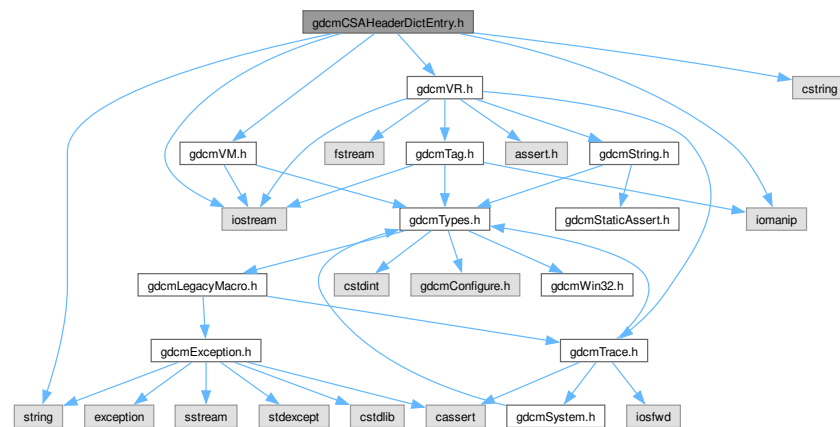
```

```
00098 #endif //GDCMCSAHEADERDICT_H
```

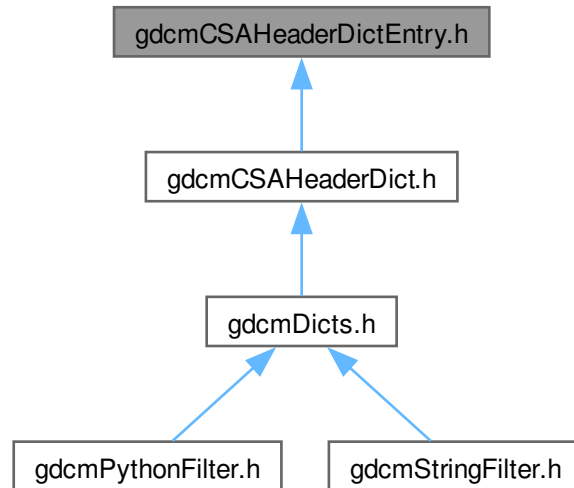
## 13.91 gdcmCSAHeaderDictEntry.h File Reference

```
#include "gdcmVR.h"
#include "gdcmVM.h"
#include <string>
#include <iostream>
#include <iomanip>
#include <cstring>
```

Include dependency graph for gdcmCSAHeaderDictEntry.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcmsaheaderdictentry](#)  
*Class to represent an Entry in the [Dict](#).*

## Namespaces

- namespace [gdcmsaheaderdictentry](#)

## Functions

- `std::ostream & gdcmsaheaderdictentry::operator<< (std::ostream &os, const CSAHeaderDictEntry &val)`

## 13.92 gdcmsaheaderdictentry.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcmsaheaderdictentry.sourceforge.net/Copyright.html for details.
00008

```

```

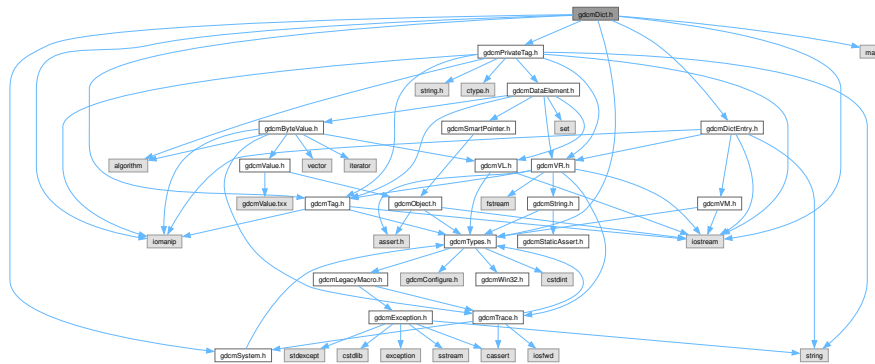
00009      This software is distributed WITHOUT ANY WARRANTY; without even
00010      the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011      PURPOSE. See the above copyright notice for more information.
00012
00013      =====*/
00014 #ifndef GDCMCSAHEADERDICTENTRY_H
00015 #define GDCMCSAHEADERDICTENTRY_H
00016
00017 #include "gdcmVR.h"
00018 #include "gdcmVM.h"
00019
00020 #include <string>
00021 #include <iostream>
00022 #include <iomanip>
00023
00024 #include <cstring>
00025
00026 namespace gdcm
00027 {
00028     class GDCM_EXPORT CSAHeaderDictEntry
00029     {
00030     public:
00031         CSAHeaderDictEntry(const char *name = "", VR const &vr = VR::INVALID, VM const &vm = VM::VM0, const char
00032         *desc = ""):Name(name),ValueRepresentation(vr),ValueMultiplicity(vm),Description(desc) {
00033         }
00034
00035         friend std::ostream& operator<<(std::ostream& _os, const CSAHeaderDictEntry &_val);
00036
00037         const VR &GetVR() const { return ValueRepresentation; }
00038         void SetVR(const VR &vr) { ValueRepresentation = vr; }
00039
00040         const VM &GetVM() const { return ValueMultiplicity; }
00041         void SetVM(VM const &vm) { ValueMultiplicity = vm; }
00042
00043         const char *GetName() const { return Name.c_str(); }
00044         void SetName(const char* name) { Name = name; }
00045
00046         const char *GetDescription() const { return Description.c_str(); }
00047         void SetDescription(const char* desc) { Description = desc; }
00048
00049         bool operator<(const CSAHeaderDictEntry &entry) const
00050         {
00051             return strcmp(GetName(),entry.GetName()) < 0;
00052         }
00053
00054     private:
00055         std::string Name;
00056         VR ValueRepresentation;
00057         VM ValueMultiplicity;
00058         std::string Description;
00059         std::string Type; // TODO
00060     };
00061
00062 //-----
00063 inline std::ostream& operator<<(std::ostream& os, const CSAHeaderDictEntry &val)
00064 {
00065     if( val.Name.empty() )
00066     {
00067         os << "[No name]";
00068     }
00069     else
00070     {
00071         os << val.Name;
00072     }
00073     os << "\t" << val.ValueRepresentation << "\t" << val.ValueMultiplicity;
00074     if( !val.Description.empty() )
00075     {
00076         os << "\t" << val.Description;
00077     }
00078     return os;
00079 }
00080
00081 // end namespace gdcm
00082 #endif //GDCMCSAHEADERDICTENTRY_H

```

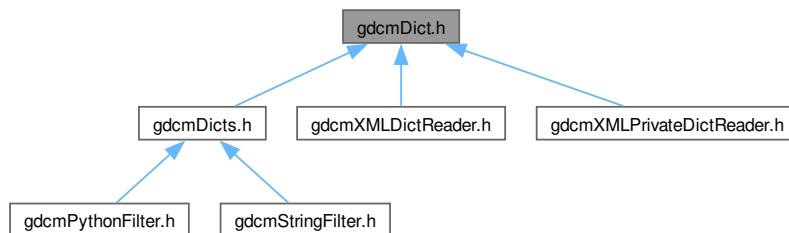
### 13.93 gdcmDict.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmDictEntry.h"
#include "gdcmSystem.h"
#include <iostream>
#include <iomanip>
#include <map>
```

Include dependency graph for gdcmDict.h:



This graph shows which files directly or indirectly include this file:



#### Classes

- class [gdcm::Dict](#)  
Class to represent a map of [DictEntry](#).
- class [gdcm::PrivateDict](#)  
Private [Dict](#).



## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Dict &val)`
- `std::ostream & gdcm::operator<< (std::ostream &os, const PrivateDict &val)`

# 13.94 gdcmDict.h

[Go to the documentation of this file.](#)

```

00001 /*=====
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMDICT_H
00015 #define GDCMDICT_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmTag.h"
00019 #include "gdcmPrivateTag.h"
00020 #include "gdcmDictEntry.h"
00021 #include "gdcmSystem.h"
00022
00023 #include <iostream>
00024 #include <iomanip>
00025 #include <map>
00026
00027 /*
00028  * FIXME / TODO
00029  * I need to seriously rewrite this mess. a class template should work for both a public
00030  * and a private dict
00031  */
00032
00033 namespace gdcm
00034 {
00035   // Data Element Tag
00044   class GDCM_EXPORT Dict
00045   {
00046   public:
00047     typedef std::map<Tag, DictEntry> MapDictEntry;
00048     typedef MapDictEntry::iterator Iterator;
00049     typedef MapDictEntry::const_iterator ConstIterator;
00050     //static DictEntry GroupLengthDictEntry; // = DictEntry("Group Length",VR::UL,VM::VM1);
00051
00052     Dict():DictInternal() {
00053       assert( DictInternal.empty() );
00054     }
00055     Dict &operator=(const Dict &_val) = delete;
00056     Dict(const Dict &_val) = delete;
00057
00058
00059     friend std::ostream& operator<<(std::ostream& _os, const Dict &_val);
00060
00061     ConstIterator Begin() const { return DictInternal.begin(); }
00062     ConstIterator End() const { return DictInternal.end(); }
00063
00064     bool IsEmpty() const { return DictInternal.empty(); }
00065     void AddDictEntry(const Tag &tag, const DictEntry &de)

```

```

00066     {
00067 #ifndef NDEBUG
00068     MapDictEntry::size_type s = DictInternal.size();
00069 #endif
00070     DictInternal.insert(
00071         MapDictEntry::value_type(tag, de));
00072     assert( s < DictInternal.size() );
00073     }
00074
00075     const DictEntry &GetDictEntry(const Tag &tag) const
00076     {
00077         MapDictEntry::const_iterator it =
00078             DictInternal.find(tag);
00079         if (it == DictInternal.end())
00080         {
00081 #ifdef UNKNOWNPUBLICTAG
00082             // test.acr
00083             if( tag != Tag(0x28,0x15)
00084                 && tag != Tag(0x28,0x16)
00085                 && tag != Tag(0x28,0x199)
00086                 // gdcmData/TherapysGDCM1.dcm
00087                 && tag != Tag(0x20,0x1)
00088                 // gdcmData/0019004_Baseline_IMG1.dcm
00089                 && tag != Tag(0x8348,0x339)
00090                 && tag != Tag(0xb5e8,0x338)
00091                 // gdcmData/dicomdir_Acusson_WithPrivate_WithSR
00092                 && tag != Tag(0x40,0xa125)
00093             )
00094             {
00095                 assert( 0 && "Impossible" );
00096             }
00097 #endif
00098             it = DictInternal.find( Tag(0xffff,0xffff) );
00099             return it->second;
00100         }
00101         assert( DictInternal.count(tag) == 1 );
00102         return it->second;
00103     }
00104
00106     const char *GetKeywordFromTag(Tag const & tag) const
00107     {
00108         MapDictEntry::const_iterator it =
00109             DictInternal.find(tag);
00110         if (it == DictInternal.end())
00111         {
00112             return nullptr;
00113         }
00114         assert( DictInternal.count(tag) == 1 );
00115         return it->second.GetKeyword();
00116     }
00117
00122     const DictEntry &GetDictEntryByKeyword(const char *keyword, Tag & tag) const
00123     {
00124         MapDictEntry::const_iterator it =
00125             DictInternal.begin();
00126         if( keyword )
00127         {
00128             for(; it != DictInternal.end(); ++it)
00129             {
00130                 if( strcmp( keyword, it->second.GetKeyword() ) == 0 )
00131                 {
00132                     // Found a match !
00133                     tag = it->first;
00134                     break;
00135                 }
00136             }
00137         }
00138         else
00139         {
00140             it = DictInternal.end();
00141         }
00142         if (it == DictInternal.end())
00143         {
00144             tag = Tag(0xffff,0xffff);
00145             it = DictInternal.find( tag );
00146             return it->second;
00147         }
00148         assert( DictInternal.count(tag) == 1 );
00149         return it->second;
00150     }
00151

```

```

00155     const DictEntry &GetDictEntryByName(const char *name, Tag & tag) const
00156     {
00157         MapDictEntry::const_iterator it =
00158             DictInternal.begin();
00159         if ( name )
00160         {
00161             for(; it != DictInternal.end(); ++it)
00162             {
00163                 if( strcmp( name, it->second.GetName() ) == 0 )
00164                 {
00165                     // Found a match !
00166                     tag = it->first;
00167                     break;
00168                 }
00169             }
00170         }
00171         else
00172         {
00173             it = DictInternal.end();
00174         }
00175         if (it == DictInternal.end())
00176         {
00177             tag = Tag(0xffff,0xffff);
00178             it = DictInternal.find( tag );
00179             return it->second;
00180         }
00181         assert( DictInternal.count(tag) == 1 );
00182         return it->second;
00183     }
00184
00185 protected:
00186     friend class Dicts;
00187     void LoadDefault();
00188
00189 private:
00190     MapDictEntry DictInternal;
00191 };
00192 //-----
00193 inline std::ostream& operator<<(std::ostream& os, const Dict &val)
00194 {
00195     Dict::MapDictEntry::const_iterator it = val.DictInternal.begin();
00196     for(; it != val.DictInternal.end(); ++it)
00197     {
00198         const Tag &t = it->first;
00199         const DictEntry &de = it->second;
00200         os << t << " " << de << '\n';
00201     }
00202
00203     return os;
00204 }
00205
00206 // TODO
00207 // For private dict, element < 0x10 should automatically defined:
00208 // Name = "Private Creator"
00209 // ValueRepresentation = LO
00210 // ValueMultiplicity = 1
00211 // Owner = ""
00212
00216 class GDCM_EXPORT PrivateDict
00217 {
00218     typedef std::map<PrivateTag, DictEntry> MapDictEntry;
00219     friend std::ostream& operator<<(std::ostream& os, const PrivateDict &val);
00220 public:
00221     PrivateDict() = default;
00222     ~PrivateDict() = default;
00223     void AddDictEntry(const PrivateTag &tag, const DictEntry &de)
00224     {
00225         #ifndef NDEBUG
00226             MapDictEntry::size_type s = DictInternal.size();
00227         #endif
00228         DictInternal.insert(
00229             MapDictEntry::value_type(tag, de));
00230         // The following code should only be used when manually constructing a Private.xml file by hand
00231         // it will get rid of VR::UN duplicate (ie. if a VR != VR::Un can be found)
00232         #if defined(NDEBUG) && 0
00233             if ( s == DictInternal.size() )
00234             {
00235                 MapDictEntry::iterator it =
00236                     DictInternal.find(tag);
00237                 assert( it != DictInternal.end() );
00238                 DictEntry &duplicate = it->second;

```

```

00239     assert( de.GetVR() == VR::UN || duplicate.GetVR() == VR::UN );
00240     assert( de.GetVR() != duplicate.GetVR() );
00241     if( duplicate.GetVR() == VR::UN )
00242     {
00243         assert( de.GetVR() != VR::UN );
00244         duplicate.SetVR( de.GetVR() );
00245         duplicate.SetVM( de.GetVM() );
00246         assert( GetDictEntry( tag ).GetVR() != VR::UN );
00247         assert( GetDictEntry( tag ).GetVR() == de.GetVR() );
00248         assert( GetDictEntry( tag ).GetVM() == de.GetVM() );
00249     }
00250     return;
00251 }
00252 #endif
00253     assert( s < DictInternal.size() /*&& std::cout << tag << ", " << de << std::endl*/ );
00254 }
00255 bool RemoveDictEntry(const PrivateTag &tag)
00256 {
00257     MapDictEntry::size_type s =
00258         DictInternal.erase(tag);
00259     assert( s == 1 || s == 0 );
00260     return s == 1;
00261 }
00262 bool FindDictEntry(const PrivateTag &tag) const
00263 {
00264     MapDictEntry::const_iterator it =
00265         DictInternal.find(tag);
00266     if (it == DictInternal.end())
00267     {
00268         return false;
00269     }
00270     return true;
00271 }
00272 const DictEntry &GetDictEntry(const PrivateTag &tag) const
00273 {
00274     // if 0x10 -> return Private Creator
00275     MapDictEntry::const_iterator it =
00276         DictInternal.find(tag);
00277     if (it == DictInternal.end())
00278     {
00279         //assert( 0 && "Impossible" );
00280         it = DictInternal.find( PrivateTag(0xffff,0xffff,"GDCM Private Sentinel" ) );
00281         assert (it != DictInternal.end());
00282         return it->second;
00283     }
00284     assert( DictInternal.count(tag) == 1 );
00285     return it->second;
00286 }
00287 void PrintXML() const
00288 {
00289     MapDictEntry::const_iterator it = DictInternal.begin();
00290     std::cout << "<dict edition=\"2008\">\n";
00291     for(;it != DictInternal.end(); ++it)
00292     {
00293         const PrivateTag &t = it->first;
00294         const DictEntry &de = it->second;
00295         std::cout << "  <entry group=\"" << std::hex << std::setw(4)
00296             << std::setfill('0') << t.GetGroup() << "\" " <<
00297             " element=\"" << std::setw(2) << std::setfill('0') << t.GetElement() << "\" " << " vr=\""
00298             << de.GetVR() << "\" vm=\"" << de.GetVM() << "\" owner=\""
00299             << t.GetOwner();
00300         const char *name = de.GetName();
00301         if( *name == 0 )
00302         {
00303             std::cout << "\"/>\n";
00304         }
00305         else
00306         {
00307             std::cout << "\" name=\"" << de.GetName() << "\"/>\n";
00308         }
00309     }
00310     std::cout << "</dict>\n";
00311 }
00312 bool IsEmpty() const { return DictInternal.empty(); }
00313 protected:
00314 friend class Dicts;
00315 void LoadDefault();
00316

```

```

00322 private:
00323     PrivateDict &operator=(const PrivateDict &_val) = delete;
00324     PrivateDict(const PrivateDict &_val) = delete;
00325
00326     MapDictEntry DictInternal;
00327 };
00328 //-----
00329 inline std::ostream& operator<<(std::ostream& os, const PrivateDict &val)
00330 {
00331     PrivateDict::MapDictEntry::const_iterator it = val.DictInternal.begin();
00332     for(; it != val.DictInternal.end(); ++it)
00333     {
00334         const PrivateTag &t = it->first;
00335         const DictEntry &de = it->second;
00336         os << t << " " << de << '\n';
00337     }
00338
00339     return os;
00340 }
00341
00342 } // end namespace gdc
00343
00344 #endif //GDCMDICT_H

```

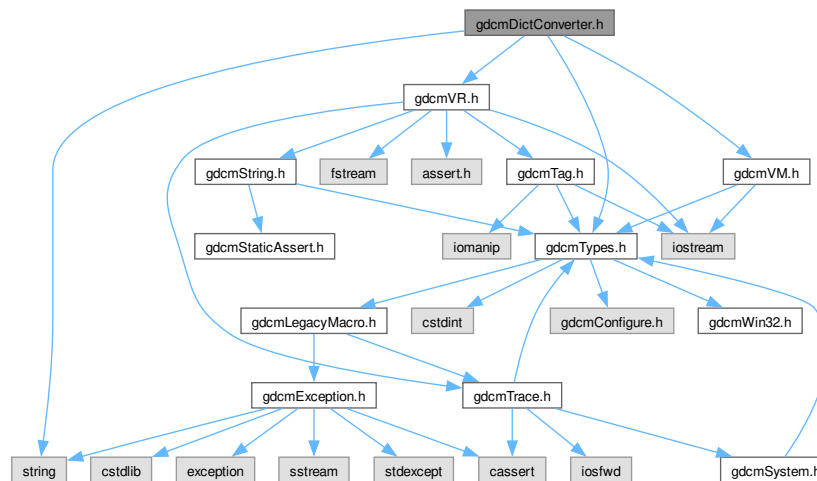
## 13.95 gdcDictConverter.h File Reference

```

#include "gdcTypes.h"
#include "gdcVR.h"
#include "gdcVM.h"
#include <string>

```

Include dependency graph for gdcDictConverter.h:



## Classes

- class [gdc::DictConverter](#)

*Class to convert a .dic file into something else:*

## Namespaces

- namespace `gdcm`

## 13.96 gdcmDictConverter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014
00015 #ifndef GDCMDICTCONVERTER_H
00016 #define GDCMDICTCONVERTER_H
00017
00018 #include "gdcmTypes.h"
00019 #include "gdcmVR.h"
00020 #include "gdcmVM.h"
00021
00022 #include <string>
00023
00024 namespace gdcm
00025 {
00026
00027   class DictConverterInternal;
00036   class GDCM_EXPORT DictConverter
00037   {
00038   public:
00039     DictConverter();
00040     ~DictConverter();
00041     void SetInputFileName(const char* filename);
00042     const std::string &GetInputFilename() const;
00043     void SetOutputFileName(const char* filename);
00044     const std::string &GetOutputFilename() const;
00045
00046     int GetOutputType() const {
00047         return OutputType;
00048     }
00049     void SetOutputType(int type) {
00050         OutputType = type;
00051     }
00052     const std::string &GetDictName() const;
00053     void SetDictName(const char *name);
00054
00055     void Convert();
00056
00057     // Leaving them public for now. Not really user oriented but may be
00058     // useful
00059     static bool ReadVR(const char *raw, VR::VRType &type);
00060     static bool ReadVM(const char *raw, VM::VMType &type);
00061     static bool Readuint16(const char *raw, uint16_t &ov);
00062
00063     enum OutputTypes {
00064         DICT_DEFAULT = 0,
00065         DICT_DEBUG,
00066         DICT_XML
00067     };
00068
00069   protected:
00070     void WriteHeader();
00071     void WriteFooter();
00072     bool ConvertToXML(const char *raw, std::string &cxx);
00073     bool ConvertToCXX(const char *raw, std::string &cxx);
00074     void AddGroupLength();

```

```

00075
00076 private:
00077     DictConverterInternal *Internal;
00078
00079     int OutputType;
00080 };
00081
00082 } // end namespace gdc
00083
00084 #endif //GDCMDICTCONVERTER_H

```

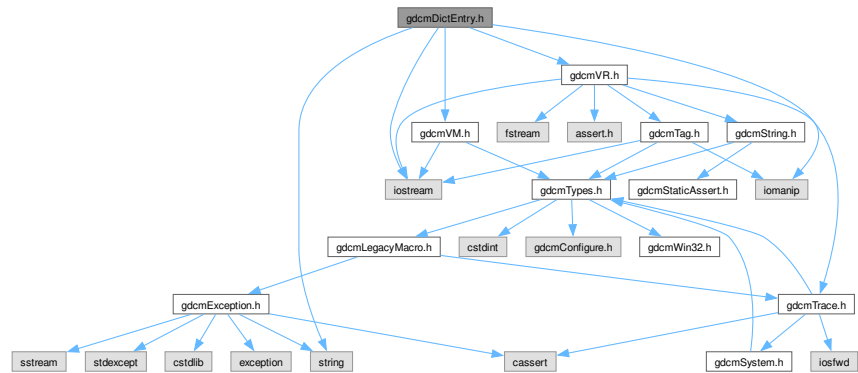
## 13.97 gdcDictEntry.h File Reference

```

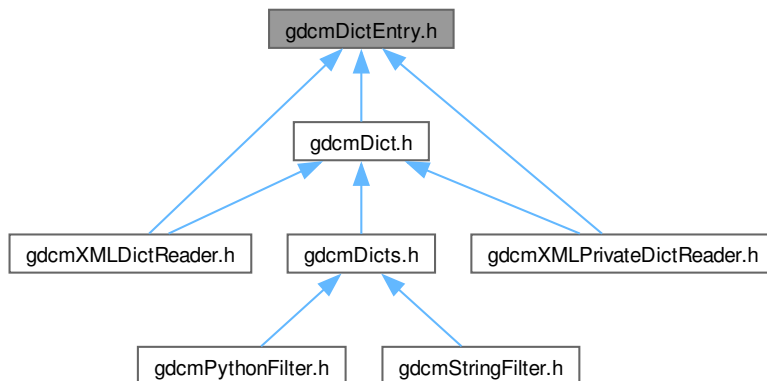
#include "gdcVR.h"
#include "gdcVM.h"
#include <string>
#include <iostream>
#include <iomanip>

```

Include dependency graph for gdcDictEntry.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::DictEntry](#)  
Class to represent an Entry in the *Dict*.

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const DictEntry &val)`

## 13.98 gdcmDictEntry.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMDICTENTRY_H
00015  #define GDCMDICTENTRY_H
00016
00017  #include "gdcmVR.h"
00018  #include "gdcmVM.h"
00019
00020  #include <string>
00021  #include <iostream>
00022  #include <iomanip>
00023
00024  namespace gdcm
00025  {
00026  class GDCM_EXPORT DictEntry
00027  {
00028  public:
00029      DictEntry(const char *name = "", const char *keyword = "", VR const &vr = VR::INVALID, VM const &vm =
00030      VM::VM0, bool ret = false):
00031          Name(name),
00032          Keyword(keyword),
00033          ValueRepresentation(vr),
00034          ValueMultiplicity(vm),
00035          Retired(ret),
00036          GroupXX(false),
00037          ElementXX(false)
00038      {
00039      }
00040
00041      friend std::ostream& operator<<(std::ostream& _os, const DictEntry &_val);
00042
00043      const VR &GetVR() const { return ValueRepresentation; }
00044      void SetVR(const VR &vr) { ValueRepresentation = vr; }
00045      // bool IsValid() const { return ValueRepresentation != VR::VR_END; }
00046      // !Name.empty() /*&& ValueRepresentation && ValueMultiplicity*/; }
00047
00048      const VM &GetVM() const { return ValueMultiplicity; }
00049      void SetVM(VM const &vm) { ValueMultiplicity = vm; }

```



```

00061
00063     const char *GetName() const { return Name.c_str(); }
00064     void SetName(const char* name) { Name = name; }
00065
00067     const char *GetKeyword() const { return Keyword.c_str(); }
00068     void SetKeyword(const char* keyword) { Keyword = keyword; }
00069
00071     bool GetRetired() const { return Retired; }
00072     void SetRetired(bool retired) { Retired = retired; }
00073
00074     // <entry group="50xx" element="0005" vr="US" vm="1" retired="true" version="3">
00076     void SetGroupXX(bool v) { GroupXX = v; }
00077
00078     // <entry group="0020" element="31xx" vr="CS" vm="1-n" retired="true" version="2">
00080     void SetElementXX(bool v) { ElementXX = v; }
00081
00084     bool IsUnique() const { return ElementXX == false && GroupXX == false; }
00085
00086 private:
00087     //
00088     friend class Dict;
00089     static bool CheckKeywordAgainstName(const char *name, const char *keyword);
00090
00091 private:
00092     std::string Name;
00093     std::string Keyword;
00094     VR ValueRepresentation;
00095     VM ValueMultiplicity;
00096     bool Retired : 1;
00097     bool GroupXX : 1;
00098     bool ElementXX : 1;
00099 };
00100
00101 #if 0
00102 class GDCM_EXPORT PrivateDictEntry : public DictEntry
00103 {
00104 public:
00105     PrivateDictEntry(const char *name = "", VR::VRType const &vr = VR::INVALID, VM::VMType const &vm =
VM::VM0, bool ret = false, const char *owner = ""):DictEntry(name,vr,vm,ret),Owner(owner) {}
00106     PrivateDictEntry(const char *name, const char *vr, const char *vm):DictEntry(name,vr,vm) {}
00107
00108     const char *GetOwner() const { return Owner.c_str(); }
00109     void SetOwner(const char *owner) { Owner = owner; }
00110
00111 private:
00112     // SIEMENS MED, GEMS_PETD_01 ...
00113     std::string Owner;
00114 };
00115 #endif
00116
00117 //-----
00118 inline std::ostream& operator<<(std::ostream& os, const DictEntry &val)
00119 {
00120     if( val.Name.empty() )
00121     {
00122         os << "[No name]";
00123     }
00124     else
00125     {
00126         os << val.Name;
00127     }
00128     if( val.Keyword.empty() )
00129     {
00130         os << "[No keyword]";
00131     }
00132     else
00133     {
00134         os << val.Keyword;
00135     }
00136     os << "\t" << val.ValueRepresentation << "\t" << val.ValueMultiplicity;
00137     if( val.Retired )
00138     {
00139         os << "\t(RET)";
00140     }
00141     return os;
00142 }
00143
00144 } // end namespace gdcm
00145
00146 #endif //GDCMDICTENTRY_H

```



## 13.100 gdcmDicts.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMDICTS_H
00015 #define GDCMDICTS_H
00016
00017 #include "gdcmDict.h"
00018 #include "gdcmCSAHeaderDict.h"
00019
00020 #include <string>
00021
00022 namespace gdcm
00023 {
00024     class GDCM_EXPORT Dicts
00025     {
00026     public:
00027         Dicts();
00028         ~Dicts();
00029         Dicts &operator=(const Dicts &_val) = delete;
00030         Dicts(const Dicts &_val) = delete;
00031
00032         // DataSet::GetPrivateCreator
00033         const DictEntry &GetDictEntry(const Tag& tag, const char *owner = nullptr) const;
00034
00035         const DictEntry &GetDictEntry(const PrivateTag& tag) const;
00036
00037         //enum PublicTypes {
00038         //    DICOMV3_DICT,
00039         //    ACRNEMA_DICT,
00040         //    NIH_DICT
00041         //};
00042         const Dict &GetPublicDict() const;
00043
00044         const PrivateDict &GetPrivateDict() const;
00045         PrivateDict &GetPrivateDict();
00046
00047         const CSAHeaderDict &GetCSAHeaderDict() const;
00048
00049         bool IsEmpty() const { return GetPublicDict().IsEmpty(); }
00050
00051 protected:
00052         typedef enum {
00053             PHILIPS,
00054             GEMS,
00055             SIEMENS
00056         } ConstructorType;
00057         static const char *GetConstructorString(ConstructorType type);
00058
00059         friend class Global;
00060         void LoadDefaults();
00061
00062 private:
00063         // Public dict:
00064         Dict PublicDict;
00065
00066         // Private Dicts:
00067         PrivateDict ShadowDict;
00068
00069         CSAHeaderDict CSADict;
00070     };
00071
00072 //-----
00073 inline std::ostream& operator<<(std::ostream &os, const Dicts &d)
00074 {

```

```

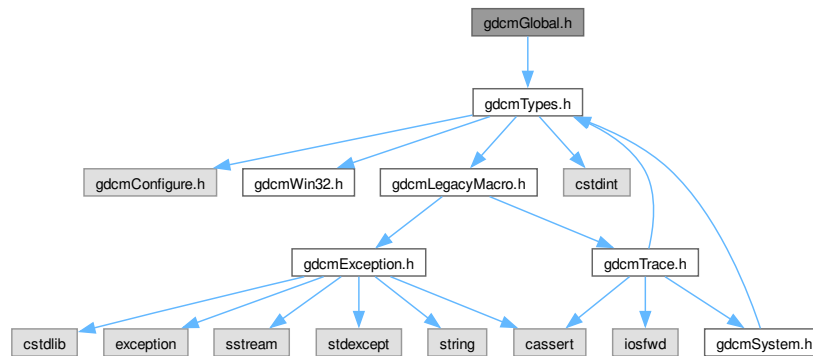
00084     (void)d;
00085     return os;
00086 }
00087
00088
00089 } // end namespace gdcM
00090
00091 #endif //GDCMDICTS_H

```

## 13.101 gdcMGlobal.h File Reference

```
#include "gdcMTypes.h"
```

Include dependency graph for gdcMGlobal.h:



### Classes

- class [gdcM::Global](#)  
*Global.*

### Namespaces

- namespace [gdcM](#)

### Functions

- `std::ostream & gdcM::operator<< (std::ostream &os, const Global &g)`

### Variables

- static [Global](#) [gdcM::GlobalInstance](#)

## 13.102 gdcmGlobal.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 // Implementation detail was shamelessly borrowed from the VTK excellent
00015 // implementation of debug leak manager singleton:
00016 /*=====
00017
00018   Program:   Visualization Toolkit
00019   Module:    $RCSfile: vtkDebugLeaks.cxx,v $
00020
00021   Copyright (c) Ken Martin, Will Schroeder, Bill Lorensen
00022   All rights reserved.
00023   See Copyright.txt or http://www.kitware.com/Copyright.htm for details.
00024
00025   This software is distributed WITHOUT ANY WARRANTY; without even
00026   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00027   PURPOSE. See the above copyright notice for more information.
00028
00029   =====*/
00030 #ifndef GDCMGLOBAL_H
00031 #define GDCMGLOBAL_H
00032
00033 #include "gdcmTypes.h"
00034
00035 namespace gdcm
00036 {
00037   class GlobalInternal;
00038   class Dicts;
00039   class Defs;
00040   class GDCM_EXPORT Global // why expose the symbol I think I only need to expose the instance...
00041   {
00042   friend std::ostream& operator<<(std::ostream &os, const Global &g);
00043   public:
00044     Global();
00045     ~Global();
00046     Global &operator=(const Global &val) = delete;
00047     Global(const Global &val) = delete;
00048
00049     Dicts const &GetDicts() const;
00050     Dicts &GetDicts();
00051
00052     Defs const &GetDefs() const;
00053
00054     static Global& GetInstance();
00055
00056     bool LoadResourcesFiles();
00057
00058     bool Append(const char *path);
00059
00060     bool Prepend(const char *path);
00061
00062   protected:
00063     const char *Locate(const char *resfile) const;
00064
00065   private:
00066     // PIMPL:
00067     // but we could have also directly exposed a Dicts *Internals;
00068     static GlobalInternal *Internals;
00069   };
00070 //-----
00071 inline std::ostream& operator<<(std::ostream &os, const Global &g)
00072 {
00073   (void)g;
00074   return os;
00075 }

```

```

00098
00099 // This instance will show up in any translation unit that uses
00100 // Global or that has a singleton. It will make sure
00101 // Global is initialized before it is used and is the last
00102 // static object destroyed.
00103 static Global GlobalInstance;
00104
00105 } // end namespace gdcm
00106
00107 #endif //GDCMGLOBAL_H

```

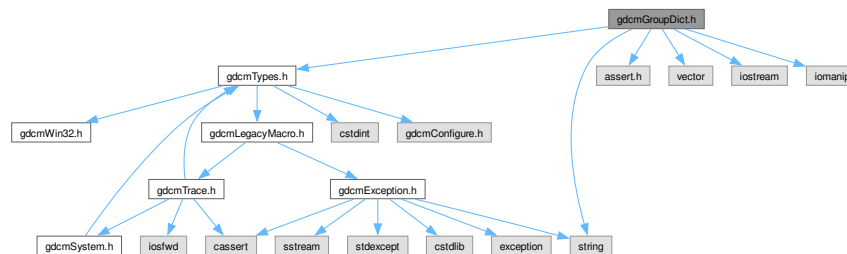
### 13.103 gdcmGroupDict.h File Reference

```

#include "gdcmTypes.h"
#include <assert.h>
#include <vector>
#include <string>
#include <iostream>
#include <iomanip>

```

Include dependency graph for gdcmGroupDict.h:



#### Classes

- class [gdcm::GroupDict](#)  
Class to represent the mapping from group number to its abbreviation and name.

#### Namespaces

- namespace [gdcm](#)

#### Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &\_os, const [GroupDict](#) &\_val)

## 13.104 gdcmGroupDict.h

[Go to the documentation of this file.](#)

```

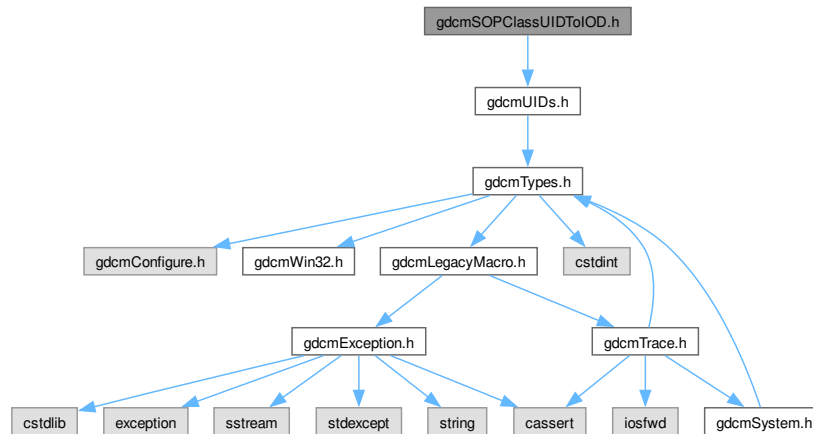
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014
00015 #ifndef GDCMGROUPDICT_H
00016 #define GDCMGROUPDICT_H
00017
00018 #include "gdcmTypes.h"
00019
00020 #include <assert.h>
00021 #include <vector>
00022 #include <string>
00023 #include <iostream>
00024 #include <iomanip>
00025
00026 namespace gdcm
00027 {
00033 class GDCM_EXPORT GroupDict
00034 {
00035 public:
00036   typedef std::vector<std::string> GroupStringVector;
00037   GroupDict() { FillDefaultGroupName(); }
00038   ~GroupDict() = default;
00039
00040   friend std::ostream& operator<<(std::ostream& _os, const GroupDict &_val);
00041
00042   size_t Size() const
00043   {
00044     assert( Names.size() == Abbreviations.size() );
00045     return Names.size(); }
00046
00047   std::string const &GetAbbreviation(uint16_t num) const;
00048
00049   std::string const &GetName(uint16_t num) const;
00050
00051 protected:
00052   void Add(std::string const &abbreviation, std::string const &name);
00053   void Insert(uint16_t num, std::string const &abbreviation, std::string const &name);
00054
00055 private:
00056   // Generated implementation, see gdcmDefaultGroupNames
00057   void FillDefaultGroupName();
00058
00059   GroupDict &operator=(const GroupDict &_val); // purposely not implemented
00060   GroupDict(const GroupDict &_val); // purposely not implemented
00061
00062   GroupStringVector Abbreviations;
00063   GroupStringVector Names;
00064 };
00065 //-----
00066 inline std::ostream& operator<<(std::ostream& _os, const GroupDict &_val)
00067 {
00068   size_t size = _val.Size();
00069   for(size_t i=0; i<size; ++i)
00070   {
00071     _os << std::hex << std::setw(4) << std::setfill( '0' ) << i << ", "
00072     << _val.GetAbbreviation((uint16_t)i) << ", " << _val.GetName((uint16_t)i) << "\n";
00073   }
00074   return _os;
00075 }
00076
00077 } // end namespace gdcm
00078
00079 #endif //GDCMGROUPDICT_H

```

## 13.105 gdcmSOPClassUIDToIOD.h File Reference

```
#include "gdcmUIDs.h"
```

Include dependency graph for gdcmSOPClassUIDToIOD.h:



### Classes

- class [gdcm::SOPClassUIDToIOD](#)  
Class convert a class SOP Class UID into *IOD*.

### Namespaces

- namespace [gdcm](#)

## 13.106 gdcmSOPClassUIDToIOD.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014
00015 #ifndef GDCMSOPCLASSUIDTOIOD_H
00016 #define GDCMSOPCLASSUIDTOIOD_H
00017

```



```

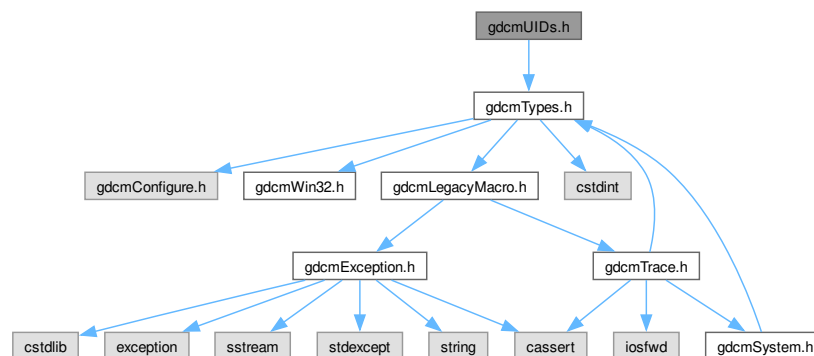
00018 #include "gdcmUIDs.h"
00019
00020 namespace gdcm
00021 {
00022
00028 class GDCM_EXPORT SOPClassUIDToIOD
00029 {
00030 public:
00033     static const char *GetIOD(UIDs const & uid);
00034
00036     static unsigned int GetNumberOfSOPClassToIOD();
00037
00038     typedef const char* const (SOPClassUIDToIODType)[2];
00039     static SOPClassUIDToIODType* GetSOPClassUIDToIODs();
00040
00041     static SOPClassUIDToIODType& GetSOPClassUIDToIOD(unsigned int i);
00042
00043     static const char *GetSOPClassUIDFromIOD(const char *iod);
00044     static const char *GetIODFromSOPClassUID(const char *sopclassuid);
00045 };
00046
00047 } // end namespace gdcm
00048
00049 #endif //GDCMSOPCLASSUIDTOIOD_H

```

## 13.107 gdcmUIDs.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmUIDs.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::UIDs](#)  
*all known uids*

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const UIDs &uid)`

## 13.108 gdcmUIDs.h

[Go to the documentation of this file.](#)

```

00001
00002 // GENERATED FILE DO NOT EDIT
00003 // $ xsltproc UIDToC++.xsl Part6.xml > gdcmUIDs.h
00004
00005 /*=====
00006
00007 Program: GDCM (Grassroots DICOM). A DICOM library
00008
00009 Copyright (c) 2006-2011 Mathieu Malaterre
00010 All rights reserved.
00011 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00012
00013 This software is distributed WITHOUT ANY WARRANTY; without even
00014 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00015 PURPOSE. See the above copyright notice for more information.
00016
00017 =====*/
00018
00019 #ifndef GDCMUIDS_H
00020 #define GDCMUIDS_H
00021
00022 #include "gdcmTypes.h"
00023
00024 namespace gdcm
00025 {
00026
00027 class GDCM_EXPORT UIDs
00028 {
00029 public:
00030     typedef enum {
00031         uid_1_2_840_10008_1_1 = 1, // Verification SOP Class
00032         uid_1_2_840_10008_1_2 = 2, // Implicit VR Little Endian: Default Transfer Syntax for DICOM
00033         uid_1_2_840_10008_1_2_1 = 3, // Explicit VR Little Endian
00034         uid_1_2_840_10008_1_2_1_99 = 4, // Deflated Explicit VR Little Endian
00035         uid_1_2_840_10008_1_2_2 = 5, // Explicit VR Big Endian
00036         uid_1_2_840_10008_1_2_4_50 = 6, // JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit
00037         uid_1_2_840_10008_1_2_4_51 = 7, // JPEG Extended (Process 2 & 4): Default Transfer Syntax for Lossy JPEG
00038         uid_1_2_840_10008_1_2_4_52 = 8, // JPEG Extended (Process 3 & 5)
00039         uid_1_2_840_10008_1_2_4_53 = 9, // JPEG Spectral Selection, Non-Hierarchical (Process 6 & 8)
00040         uid_1_2_840_10008_1_2_4_54 = 10, // JPEG Spectral Selection, Non-Hierarchical (Process 7 & 9)
00041         uid_1_2_840_10008_1_2_4_55 = 11, // JPEG Full Progression, Non-Hierarchical (Process 10 & 12)
00042         uid_1_2_840_10008_1_2_4_56 = 12, // JPEG Full Progression, Non-Hierarchical (Process 11 & 13)
00043         uid_1_2_840_10008_1_2_4_57 = 13, // JPEG Lossless, Non-Hierarchical (Process 14)
00044         uid_1_2_840_10008_1_2_4_58 = 14, // JPEG Lossless, Non-Hierarchical (Process 15)
00045         uid_1_2_840_10008_1_2_4_59 = 15, // JPEG Extended, Hierarchical (Process 16 & 18)
00046         uid_1_2_840_10008_1_2_4_60 = 16, // JPEG Extended, Hierarchical (Process 17 & 19)
00047         uid_1_2_840_10008_1_2_4_61 = 17, // JPEG Spectral Selection, Hierarchical (Process 20 & 22)
00048         uid_1_2_840_10008_1_2_4_62 = 18, // JPEG Spectral Selection, Hierarchical (Process 21 & 23)
00049         uid_1_2_840_10008_1_2_4_63 = 19, // JPEG Full Progression, Hierarchical (Process 24 & 26)
00050         uid_1_2_840_10008_1_2_4_64 = 20, // JPEG Full Progression, Hierarchical (Process 25 & 27)
00051         uid_1_2_840_10008_1_2_4_65 = 21, // JPEG Lossless, Hierarchical (Process 28)
00052         uid_1_2_840_10008_1_2_4_66 = 22, // JPEG Lossless, Hierarchical (Process 29)
00053         uid_1_2_840_10008_1_2_4_70 = 23, // JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14
00054         [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression
00055         uid_1_2_840_10008_1_2_4_80 = 24, // JPEG-LS Lossless Image Compression
00056         uid_1_2_840_10008_1_2_4_81 = 25, // JPEG-LS Lossy (Near-Lossless) Image Compression
00057         uid_1_2_840_10008_1_2_4_90 = 26, // JPEG 2000 Image Compression (Lossless Only)
00058
00059     };

```

```
00060 uid_1_2_840_10008_1_2_4_91 = 27, // JPEG 2000 Image Compression
00061 uid_1_2_840_10008_1_2_4_92 = 28, // JPEG 2000 Part 2 Multi-component Image Compression (Lossless Only)
00062 uid_1_2_840_10008_1_2_4_93 = 29, // JPEG 2000 Part 2 Multi-component Image Compression
00063 uid_1_2_840_10008_1_2_4_94 = 30, // JPIP Referenced
00064 uid_1_2_840_10008_1_2_4_95 = 31, // JPIP Referenced Deflate
00065 uid_1_2_840_10008_1_2_4_100 = 32, // MPEG2 Main Profile @ Main Level
00066 uid_1_2_840_10008_1_2_5 = 33, // RLE Lossless
00067 uid_1_2_840_10008_1_2_6_1 = 34, // RFC 2557 MIME encapsulation
00068 uid_1_2_840_10008_1_2_6_2 = 35, // XML Encoding
00069 uid_1_2_840_10008_1_3_10 = 36, // Media Storage Directory Storage
00070 uid_1_2_840_10008_1_4_1_1 = 37, // Talairach Brain Atlas Frame of Reference
00071 uid_1_2_840_10008_1_4_1_2 = 38, // SPM2 T1 Frame of Reference
00072 uid_1_2_840_10008_1_4_1_3 = 39, // SPM2 T2 Frame of Reference
00073 uid_1_2_840_10008_1_4_1_4 = 40, // SPM2 PD Frame of Reference
00074 uid_1_2_840_10008_1_4_1_5 = 41, // SPM2 EPI Frame of Reference
00075 uid_1_2_840_10008_1_4_1_6 = 42, // SPM2 FIL T1 Frame of Reference
00076 uid_1_2_840_10008_1_4_1_7 = 43, // SPM2 PET Frame of Reference
00077 uid_1_2_840_10008_1_4_1_8 = 44, // SPM2 TRANSM Frame of Reference
00078 uid_1_2_840_10008_1_4_1_9 = 45, // SPM2 SPECT Frame of Reference
00079 uid_1_2_840_10008_1_4_1_10 = 46, // SPM2 GRAY Frame of Reference
00080 uid_1_2_840_10008_1_4_1_11 = 47, // SPM2 WHITE Frame of Reference
00081 uid_1_2_840_10008_1_4_1_12 = 48, // SPM2 CSF Frame of Reference
00082 uid_1_2_840_10008_1_4_1_13 = 49, // SPM2 BRAINMASK Frame of Reference
00083 uid_1_2_840_10008_1_4_1_14 = 50, // SPM2 AVG305T1 Frame of Reference
00084 uid_1_2_840_10008_1_4_1_15 = 51, // SPM2 AVG152T1 Frame of Reference
00085 uid_1_2_840_10008_1_4_1_16 = 52, // SPM2 AVG152T2 Frame of Reference
00086 uid_1_2_840_10008_1_4_1_17 = 53, // SPM2 AVG152PD Frame of Reference
00087 uid_1_2_840_10008_1_4_1_18 = 54, // SPM2 SINGLESUBJT1 Frame of Reference
00088 uid_1_2_840_10008_1_4_2_1 = 55, // ICBM 452 T1 Frame of Reference
00089 uid_1_2_840_10008_1_4_2_2 = 56, // ICBM Single Subject MRI Frame of Reference
00090 uid_1_2_840_10008_1_9 = 57, // Basic Study Content Notification SOP Class
00091 uid_1_2_840_10008_1_20_1 = 58, // Storage Commitment Push Model SOP Class
00092 uid_1_2_840_10008_1_20_1_1 = 59, // Storage Commitment Push Model SOP Instance
00093 uid_1_2_840_10008_1_20_2 = 60, // Storage Commitment Pull Model SOP Class
00094 uid_1_2_840_10008_1_20_2_1 = 61, // Storage Commitment Pull Model SOP Instance
00095 uid_1_2_840_10008_1_40 = 62, // Procedural Event Logging SOP Class
00096 uid_1_2_840_10008_1_40_1 = 63, // Procedural Event Logging SOP Instance
00097 uid_1_2_840_10008_1_42 = 64, // Substance Administration Logging SOP Class
00098 uid_1_2_840_10008_1_42_1 = 65, // Substance Administration Logging SOP Instance
00099 uid_1_2_840_10008_2_6_1 = 66, // DICOM UID Registry
00100 uid_1_2_840_10008_2_16_4 = 67, // DICOM Controlled Terminology
00101 uid_1_2_840_10008_3_1_1_1 = 68, // DICOM Application Context Name
00102 uid_1_2_840_10008_3_1_2_1_1 = 69, // Detached Patient Management SOP Class
00103 uid_1_2_840_10008_3_1_2_1_4 = 70, // Detached Patient Management Meta SOP Class
00104 uid_1_2_840_10008_3_1_2_2_1 = 71, // Detached Visit Management SOP Class
00105 uid_1_2_840_10008_3_1_2_3_1 = 72, // Detached Study Management SOP Class
00106 uid_1_2_840_10008_3_1_2_3_2 = 73, // Study Component Management SOP Class
00107 uid_1_2_840_10008_3_1_2_3_3 = 74, // Modality Performed Procedure Step SOP Class
00108 uid_1_2_840_10008_3_1_2_3_4 = 75, // Modality Performed Procedure Step Retrieve SOP Class
00109 uid_1_2_840_10008_3_1_2_3_5 = 76, // Modality Performed Procedure Step Notification SOP Class
00110 uid_1_2_840_10008_3_1_2_5_1 = 77, // Detached Results Management SOP Class
00111 uid_1_2_840_10008_3_1_2_5_4 = 78, // Detached Results Management Meta SOP Class
00112 uid_1_2_840_10008_3_1_2_5_5 = 79, // Detached Study Management Meta SOP Class
00113 uid_1_2_840_10008_3_1_2_6_1 = 80, // Detached Interpretation Management SOP Class
00114 uid_1_2_840_10008_4_2 = 81, // Storage Service Class
00115 uid_1_2_840_10008_5_1_1_1 = 82, // Basic Film Session SOP Class
00116 uid_1_2_840_10008_5_1_1_2 = 83, // Basic Film Box SOP Class
00117 uid_1_2_840_10008_5_1_1_4 = 84, // Basic Grayscale Image Box SOP Class
00118 uid_1_2_840_10008_5_1_1_4_1 = 85, // Basic Color Image Box SOP Class
00119 uid_1_2_840_10008_5_1_1_4_2 = 86, // Referenced Image Box SOP Class
00120 uid_1_2_840_10008_5_1_1_9 = 87, // Basic Grayscale Print Management Meta SOP Class
00121 uid_1_2_840_10008_5_1_1_9_1 = 88, // Referenced Grayscale Print Management Meta SOP Class
00122 uid_1_2_840_10008_5_1_1_14 = 89, // Print Job SOP Class
00123 uid_1_2_840_10008_5_1_1_15 = 90, // Basic Annotation Box SOP Class
00124 uid_1_2_840_10008_5_1_1_16 = 91, // Printer SOP Class
00125 uid_1_2_840_10008_5_1_1_16_376 = 92, // Printer Configuration Retrieval SOP Class
00126 uid_1_2_840_10008_5_1_1_17 = 93, // Printer SOP Instance
00127 uid_1_2_840_10008_5_1_1_17_376 = 94, // Printer Configuration Retrieval SOP Instance
00128 uid_1_2_840_10008_5_1_1_18 = 95, // Basic Color Print Management Meta SOP Class
00129 uid_1_2_840_10008_5_1_1_18_1 = 96, // Referenced Color Print Management Meta SOP Class
00130 uid_1_2_840_10008_5_1_1_22 = 97, // VOI LUT Box SOP Class
00131 uid_1_2_840_10008_5_1_1_23 = 98, // Presentation LUT SOP Class
00132 uid_1_2_840_10008_5_1_1_24 = 99, // Image Overlay Box SOP Class
00133 uid_1_2_840_10008_5_1_1_24_1 = 100, // Basic Print Image Overlay Box SOP Class
00134 uid_1_2_840_10008_5_1_1_25 = 101, // Print Queue SOP Instance
00135 uid_1_2_840_10008_5_1_1_26 = 102, // Print Queue Management SOP Class
00136 uid_1_2_840_10008_5_1_1_27 = 103, // Stored Print Storage SOP Class
00137 uid_1_2_840_10008_5_1_1_29 = 104, // Hardcopy Grayscale Image Storage SOP Class
00138 uid_1_2_840_10008_5_1_1_30 = 105, // Hardcopy Color Image Storage SOP Class
00139 uid_1_2_840_10008_5_1_1_31 = 106, // Pull Print Request SOP Class
00140 uid_1_2_840_10008_5_1_1_32 = 107, // Pull Stored Print Management Meta SOP Class
```

```
00141 uid_1_2_840_10008_5_1_1_33 = 108, // Media Creation Management SOP Class UID
00142 uid_1_2_840_10008_5_1_4_1_1_1 = 109, // Computed Radiography Image Storage
00143 uid_1_2_840_10008_5_1_4_1_1_1_1 = 110, // Digital X-Ray Image Storage - For Presentation
00144 uid_1_2_840_10008_5_1_4_1_1_1_1_1 = 111, // Digital X-Ray Image Storage - For Processing
00145 uid_1_2_840_10008_5_1_4_1_1_1_2 = 112, // Digital Mammography X-Ray Image Storage - For Presentation
00146 uid_1_2_840_10008_5_1_4_1_1_1_2_1 = 113, // Digital Mammography X-Ray Image Storage - For Processing
00147 uid_1_2_840_10008_5_1_4_1_1_1_3 = 114, // Digital Intra-oral X-Ray Image Storage - For Presentation
00148 uid_1_2_840_10008_5_1_4_1_1_1_3_1 = 115, // Digital Intra-oral X-Ray Image Storage - For Processing
00149 uid_1_2_840_10008_5_1_4_1_1_2 = 116, // CT Image Storage
00150 uid_1_2_840_10008_5_1_4_1_1_2_1 = 117, // Enhanced CT Image Storage
00151 uid_1_2_840_10008_5_1_4_1_1_3 = 118, // Ultrasound Multi-frame Image Storage
00152 uid_1_2_840_10008_5_1_4_1_1_3_1 = 119, // Ultrasound Multi-frame Image Storage
00153 uid_1_2_840_10008_5_1_4_1_1_4 = 120, // MR Image Storage
00154 uid_1_2_840_10008_5_1_4_1_1_4_1 = 121, // Enhanced MR Image Storage
00155 uid_1_2_840_10008_5_1_4_1_1_4_2 = 122, // MR Spectroscopy Storage
00156 uid_1_2_840_10008_5_1_4_1_1_5 = 123, // Nuclear Medicine Image Storage
00157 uid_1_2_840_10008_5_1_4_1_1_6 = 124, // Ultrasound Image Storage
00158 uid_1_2_840_10008_5_1_4_1_1_6_1 = 125, // Ultrasound Image Storage
00159 uid_1_2_840_10008_5_1_4_1_1_7 = 126, // Secondary Capture Image Storage
00160 uid_1_2_840_10008_5_1_4_1_1_7_1 = 127, // Multi-frame Single Bit Secondary Capture Image Storage
00161 uid_1_2_840_10008_5_1_4_1_1_7_2 = 128, // Multi-frame Grayscale Byte Secondary Capture Image Storage
00162 uid_1_2_840_10008_5_1_4_1_1_7_3 = 129, // Multi-frame Grayscale Word Secondary Capture Image Storage
00163 uid_1_2_840_10008_5_1_4_1_1_7_4 = 130, // Multi-frame True Color Secondary Capture Image Storage
00164 uid_1_2_840_10008_5_1_4_1_1_8 = 131, // Standalone Overlay Storage
00165 uid_1_2_840_10008_5_1_4_1_1_9 = 132, // Standalone Curve Storage
00166 uid_1_2_840_10008_5_1_4_1_1_9_1 = 133, // Waveform Storage - Trial
00167 uid_1_2_840_10008_5_1_4_1_1_9_1_1 = 134, // 12-lead ECG Waveform Storage
00168 uid_1_2_840_10008_5_1_4_1_1_9_1_2 = 135, // General ECG Waveform Storage
00169 uid_1_2_840_10008_5_1_4_1_1_9_1_3 = 136, // Ambulatory ECG Waveform Storage
00170 uid_1_2_840_10008_5_1_4_1_1_9_2_1 = 137, // Hemodynamic Waveform Storage
00171 uid_1_2_840_10008_5_1_4_1_1_9_3_1 = 138, // Cardiac Electrophysiology Waveform Storage
00172 uid_1_2_840_10008_5_1_4_1_1_9_4_1 = 139, // Basic Voice Audio Waveform Storage
00173 uid_1_2_840_10008_5_1_4_1_1_10 = 140, // Standalone Modality LUT Storage
00174 uid_1_2_840_10008_5_1_4_1_1_11 = 141, // Standalone VOI LUT Storage
00175 uid_1_2_840_10008_5_1_4_1_1_11_1 = 142, // Grayscale Softcopy Presentation State Storage SOP Class
00176 uid_1_2_840_10008_5_1_4_1_1_11_2 = 143, // Color Softcopy Presentation State Storage SOP Class
00177 uid_1_2_840_10008_5_1_4_1_1_11_3 = 144, // Pseudo-Color Softcopy Presentation State Storage SOP Class
00178 uid_1_2_840_10008_5_1_4_1_1_11_4 = 145, // Blending Softcopy Presentation State Storage SOP Class
00179 uid_1_2_840_10008_5_1_4_1_1_12_1 = 146, // X-Ray Angiographic Image Storage
00180 uid_1_2_840_10008_5_1_4_1_1_12_1_1 = 147, // Enhanced XA Image Storage
00181 uid_1_2_840_10008_5_1_4_1_1_12_2 = 148, // X-Ray Radiofluoroscopic Image Storage
00182 uid_1_2_840_10008_5_1_4_1_1_12_2_1 = 149, // Enhanced XRF Image Storage
00183 uid_1_2_840_10008_5_1_4_1_1_13_1_1 = 150, // X-Ray 3D Angiographic Image Storage
00184 uid_1_2_840_10008_5_1_4_1_1_13_1_2 = 151, // X-Ray 3D Craniofacial Image Storage
00185 uid_1_2_840_10008_5_1_4_1_1_12_3 = 152, // X-Ray Angiographic Bi-Plane Image Storage
00186 uid_1_2_840_10008_5_1_4_1_1_20 = 153, // Nuclear Medicine Image Storage
00187 uid_1_2_840_10008_5_1_4_1_1_66 = 154, // Raw Data Storage
00188 uid_1_2_840_10008_5_1_4_1_1_66_1 = 155, // Spatial Registration Storage
00189 uid_1_2_840_10008_5_1_4_1_1_66_2 = 156, // Spatial Fiducials Storage
00190 uid_1_2_840_10008_5_1_4_1_1_66_3 = 157, // Deformable Spatial Registration Storage
00191 uid_1_2_840_10008_5_1_4_1_1_66_4 = 158, // Segmentation Storage
00192 uid_1_2_840_10008_5_1_4_1_1_67 = 159, // Real World Value Mapping Storage
00193 uid_1_2_840_10008_5_1_4_1_1_77_1 = 160, // VL Image Storage - Trial
00194 uid_1_2_840_10008_5_1_4_1_1_77_2 = 161, // VL Multi-frame Image Storage - Trial
00195 uid_1_2_840_10008_5_1_4_1_1_77_1_1 = 162, // VL Endoscopic Image Storage
00196 uid_1_2_840_10008_5_1_4_1_1_77_1_1_1 = 163, // Video Endoscopic Image Storage
00197 uid_1_2_840_10008_5_1_4_1_1_77_1_2 = 164, // VL Microscopic Image Storage
00198 uid_1_2_840_10008_5_1_4_1_1_77_1_2_1 = 165, // Video Microscopic Image Storage
00199 uid_1_2_840_10008_5_1_4_1_1_77_1_3 = 166, // VL Slide-Coordinates Microscopic Image Storage
00200 uid_1_2_840_10008_5_1_4_1_1_77_1_4 = 167, // VL Photographic Image Storage
00201 uid_1_2_840_10008_5_1_4_1_1_77_1_4_1 = 168, // Video Photographic Image Storage
00202 uid_1_2_840_10008_5_1_4_1_1_77_1_5_1 = 169, // Ophthalmic Photography 8 Bit Image Storage
00203 uid_1_2_840_10008_5_1_4_1_1_77_1_5_2 = 170, // Ophthalmic Photography 16 Bit Image Storage
00204 uid_1_2_840_10008_5_1_4_1_1_77_1_5_3 = 171, // Stereometric Relationship Storage
00205 uid_1_2_840_10008_5_1_4_1_1_77_1_5_4 = 172, // Ophthalmic Tomography Image Storage
00206 uid_1_2_840_10008_5_1_4_1_1_88_1 = 173, // Text SR Storage - Trial
00207 uid_1_2_840_10008_5_1_4_1_1_88_2 = 174, // Audio SR Storage - Trial
00208 uid_1_2_840_10008_5_1_4_1_1_88_3 = 175, // Detail SR Storage - Trial
00209 uid_1_2_840_10008_5_1_4_1_1_88_4 = 176, // Comprehensive SR Storage - Trial
00210 uid_1_2_840_10008_5_1_4_1_1_88_11 = 177, // Basic Text SR Storage
00211 uid_1_2_840_10008_5_1_4_1_1_88_22 = 178, // Enhanced SR Storage
00212 uid_1_2_840_10008_5_1_4_1_1_88_33 = 179, // Comprehensive SR Storage
00213 uid_1_2_840_10008_5_1_4_1_1_88_40 = 180, // Procedure Log Storage
00214 uid_1_2_840_10008_5_1_4_1_1_88_50 = 181, // Mammography CAD SR Storage
00215 uid_1_2_840_10008_5_1_4_1_1_88_59 = 182, // Key Object Selection Document Storage
00216 uid_1_2_840_10008_5_1_4_1_1_88_65 = 183, // Chest CAD SR Storage
00217 uid_1_2_840_10008_5_1_4_1_1_88_67 = 184, // X-Ray Radiation Dose SR Storage
00218 uid_1_2_840_10008_5_1_4_1_1_104_1 = 185, // Encapsulated PDF Storage
00219 uid_1_2_840_10008_5_1_4_1_1_104_2 = 186, // Encapsulated CDA Storage
00220 uid_1_2_840_10008_5_1_4_1_1_128 = 187, // Positron Emission Tomography Image Storage
00221 uid_1_2_840_10008_5_1_4_1_1_129 = 188, // Standalone PET Curve Storage
```

```
00222 uid_1_2_840_10008_5_1_4_1_1_481_1 = 189, // RT Image Storage
00223 uid_1_2_840_10008_5_1_4_1_1_481_2 = 190, // RT Dose Storage
00224 uid_1_2_840_10008_5_1_4_1_1_481_3 = 191, // RT Structure Set Storage
00225 uid_1_2_840_10008_5_1_4_1_1_481_4 = 192, // RT Beams Treatment Record Storage
00226 uid_1_2_840_10008_5_1_4_1_1_481_5 = 193, // RT Plan Storage
00227 uid_1_2_840_10008_5_1_4_1_1_481_6 = 194, // RT Brachy Treatment Record Storage
00228 uid_1_2_840_10008_5_1_4_1_1_481_7 = 195, // RT Treatment Summary Record Storage
00229 uid_1_2_840_10008_5_1_4_1_1_481_8 = 196, // RT Ion Plan Storage
00230 uid_1_2_840_10008_5_1_4_1_1_481_9 = 197, // RT Ion Beams Treatment Record Storage
00231 uid_1_2_840_10008_5_1_4_1_2_1_1 = 198, // Patient Root Query/Retrieve Information Model - FIND
00232 uid_1_2_840_10008_5_1_4_1_2_1_2 = 199, // Patient Root Query/Retrieve Information Model - MOVE
00233 uid_1_2_840_10008_5_1_4_1_2_1_3 = 200, // Patient Root Query/Retrieve Information Model - GET
00234 uid_1_2_840_10008_5_1_4_1_2_2_1 = 201, // Study Root Query/Retrieve Information Model - FIND
00235 uid_1_2_840_10008_5_1_4_1_2_2_2 = 202, // Study Root Query/Retrieve Information Model - MOVE
00236 uid_1_2_840_10008_5_1_4_1_2_2_3 = 203, // Study Root Query/Retrieve Information Model - GET
00237 uid_1_2_840_10008_5_1_4_1_2_3_1 = 204, // Patient/Study Only Query/Retrieve Information Model - FIND
00238 uid_1_2_840_10008_5_1_4_1_2_3_2 = 205, // Patient/Study Only Query/Retrieve Information Model - MOVE
00239 uid_1_2_840_10008_5_1_4_1_2_3_3 = 206, // Patient/Study Only Query/Retrieve Information Model - GET
00240 uid_1_2_840_10008_5_1_4_31 = 207, // Modality Worklist Information Model - FIND
00241 uid_1_2_840_10008_5_1_4_32_1 = 208, // General Purpose Worklist Information Model - FIND
00242 uid_1_2_840_10008_5_1_4_32_2 = 209, // General Purpose Scheduled Procedure Step SOP Class
00243 uid_1_2_840_10008_5_1_4_32_3 = 210, // General Purpose Performed Procedure Step SOP Class
00244 uid_1_2_840_10008_5_1_4_32 = 211, // General Purpose Worklist Management Meta SOP Class
00245 uid_1_2_840_10008_5_1_4_33 = 212, // Instance Availability Notification SOP Class
00246 uid_1_2_840_10008_5_1_4_34_1 = 213, // RT Beams Delivery Instruction Storage (Supplement 74 Frozen Draft)
00247 uid_1_2_840_10008_5_1_4_34_2 = 214, // RT Conventional Machine Verification (Supplement 74 Frozen Draft)
00248 uid_1_2_840_10008_5_1_4_34_3 = 215, // RT Ion Machine Verification (Supplement 74 Frozen Draft)
00249 uid_1_2_840_10008_5_1_4_34_4 = 216, // Unified Worklist and Procedure Step Service Class
00250 uid_1_2_840_10008_5_1_4_34_4_1 = 217, // Unified Procedure Step - Push SOP Class
00251 uid_1_2_840_10008_5_1_4_34_4_2 = 218, // Unified Procedure Step - Watch SOP Class
00252 uid_1_2_840_10008_5_1_4_34_4_3 = 219, // Unified Procedure Step - Pull SOP Class
00253 uid_1_2_840_10008_5_1_4_34_4_4 = 220, // Unified Procedure Step - Event SOP Class
00254 uid_1_2_840_10008_5_1_4_34_5 = 221, // Unified Worklist and Procedure Step SOP Instance
00255 uid_1_2_840_10008_5_1_4_37_1 = 222, // General Relevant Patient Information Query
00256 uid_1_2_840_10008_5_1_4_37_2 = 223, // Breast Imaging Relevant Patient Information Query
00257 uid_1_2_840_10008_5_1_4_37_3 = 224, // Cardiac Relevant Patient Information Query
00258 uid_1_2_840_10008_5_1_4_38_1 = 225, // Hanging Protocol Storage
00259 uid_1_2_840_10008_5_1_4_38_2 = 226, // Hanging Protocol Information Model - FIND
00260 uid_1_2_840_10008_5_1_4_38_3 = 227, // Hanging Protocol Information Model - MOVE
00261 uid_1_2_840_10008_5_1_4_41 = 228, // Product Characteristics Query SOP Class
00262 uid_1_2_840_10008_5_1_4_42 = 229, // Substance Approval Query SOP Class
00263 uid_1_2_840_10008_15_0_3_1 = 230, // dicomDeviceName
00264 uid_1_2_840_10008_15_0_3_2 = 231, // dicomDescription
00265 uid_1_2_840_10008_15_0_3_3 = 232, // dicomManufacturer
00266 uid_1_2_840_10008_15_0_3_4 = 233, // dicomManufacturerModelName
00267 uid_1_2_840_10008_15_0_3_5 = 234, // dicomSoftwareVersion
00268 uid_1_2_840_10008_15_0_3_6 = 235, // dicomVendorData
00269 uid_1_2_840_10008_15_0_3_7 = 236, // dicomAETitle
00270 uid_1_2_840_10008_15_0_3_8 = 237, // dicomNetworkConnectionReference
00271 uid_1_2_840_10008_15_0_3_9 = 238, // dicomApplicationCluster
00272 uid_1_2_840_10008_15_0_3_10 = 239, // dicomAssociationInitiator
00273 uid_1_2_840_10008_15_0_3_11 = 240, // dicomAssociationAcceptor
00274 uid_1_2_840_10008_15_0_3_12 = 241, // dicomHostname
00275 uid_1_2_840_10008_15_0_3_13 = 242, // dicomPort
00276 uid_1_2_840_10008_15_0_3_14 = 243, // dicomSOPClass
00277 uid_1_2_840_10008_15_0_3_15 = 244, // dicomTransferRole
00278 uid_1_2_840_10008_15_0_3_16 = 245, // dicomTransferSyntax
00279 uid_1_2_840_10008_15_0_3_17 = 246, // dicomPrimaryDeviceType
00280 uid_1_2_840_10008_15_0_3_18 = 247, // dicomRelatedDeviceReference
00281 uid_1_2_840_10008_15_0_3_19 = 248, // dicomPreferredCalledAETitle
00282 uid_1_2_840_10008_15_0_3_20 = 249, // dicomTLSCyphersuite
00283 uid_1_2_840_10008_15_0_3_21 = 250, // dicomAuthorizedNodeCertificateReference
00284 uid_1_2_840_10008_15_0_3_22 = 251, // dicomThisNodeCertificateReference
00285 uid_1_2_840_10008_15_0_3_23 = 252, // dicomInstalled
00286 uid_1_2_840_10008_15_0_3_24 = 253, // dicomStationName
00287 uid_1_2_840_10008_15_0_3_25 = 254, // dicomDeviceSerialNumber
00288 uid_1_2_840_10008_15_0_3_26 = 255, // dicomInstitutionName
00289 uid_1_2_840_10008_15_0_3_27 = 256, // dicomInstitutionAddress
00290 uid_1_2_840_10008_15_0_3_28 = 257, // dicomInstitutionDepartmentName
00291 uid_1_2_840_10008_15_0_3_29 = 258, // dicomIssuerOfPatientID
00292 uid_1_2_840_10008_15_0_3_30 = 259, // dicomPreferredCallingAETitle
00293 uid_1_2_840_10008_15_0_3_31 = 260, // dicomSupportedCharacterSet
00294 uid_1_2_840_10008_15_0_4_1 = 261, // dicomConfigurationRoot
00295 uid_1_2_840_10008_15_0_4_2 = 262, // dicomDevicesRoot
00296 uid_1_2_840_10008_15_0_4_3 = 263, // dicomUniqueAETitlesRegistryRoot
00297 uid_1_2_840_10008_15_0_4_4 = 264, // dicomDevice
00298 uid_1_2_840_10008_15_0_4_5 = 265, // dicomNetworkAE
00299 uid_1_2_840_10008_15_0_4_6 = 266, // dicomNetworkConnection
00300 uid_1_2_840_10008_15_0_4_7 = 267, // dicomUniqueAETitle
00301 uid_1_2_840_10008_15_0_4_8 = 268, // dicomTransferCapability
00302 //
```

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00303 uid_1_2_840_10008_5_1_4_1_1_77_1_6 = 269, // VL Whole Slide Microscopy
00304 uid_1_2_840_10008_5_1_4_1_1_6_2 = 270, // Enhanced US Volume Storage
00305 uid_1_2_840_10008_5_1_4_1_1_66_5 = 271, // Surface Segmentation Storage
00306 uid_1_2_840_10008_5_1_4_1_1_13_1_3 = 272, // Breast Tomosynthesis Image Storage
00307 uid_1_2_840_10008_5_1_4_1_1_2_2 = 273, // Legacy Converted Enhanced CT
00308 uid_1_2_840_10008_5_1_4_1_1_4_4 = 274, // Legacy Converted Enhanced MR
00309 uid_1_2_840_10008_5_1_4_1_1_128_1 = 275, // Legacy Converted Enhanced PET
00310 uid_1_2_840_10008_1_2_4_101 = 276, // MPEG2 Main Profile High Level
00311 uid_1_2_840_10008_1_2_4_102 = 277, // MPEG-4 AVC/H.264 High Profile Lev. 4.1
00312 uid_1_2_840_10008_1_2_4_103 = 278, // MPEG-4 AVC/H.264 BD-comp High Profile Lev. 4.1
00313
00315 //
00316 // 2019b
00317 //
00318 uid_1_2_840_10008_1_5_2 = 279,
00319 uid_1_2_840_10008_1_5_3 = 280,
00320 uid_1_2_840_10008_1_5_4 = 281,
00321 uid_1_2_840_10008_1_5_5 = 282,
00322 uid_1_2_840_10008_1_5_6 = 283,
00323 uid_1_2_840_10008_1_5_7 = 284,
00324 uid_1_2_840_10008_1_5_8 = 285,
00325 uid_1_2_840_10008_1_20 = 286,
00326 uid_1_2_840_10008_2_16_5 = 287,
00327 uid_1_2_840_10008_2_16_6 = 288,
00328 uid_1_2_840_10008_2_16_7 = 289,
00329 uid_1_2_840_10008_2_16_8 = 290,
00330 uid_1_2_840_10008_2_16_9 = 291,
00331 uid_1_2_840_10008_2_16_10 = 292,
00332 uid_1_2_840_10008_2_16_11 = 293,
00333 uid_1_2_840_10008_2_16_12 = 294,
00334 uid_1_2_840_10008_2_16_13 = 295,
00335 uid_1_2_840_10008_2_16_14 = 296,
00336 uid_1_2_840_10008_5_1_1_40 = 297,
00337 uid_1_2_840_10008_5_1_1_40_1 = 298,
00338 uid_1_2_840_10008_5_1_4_1_1_9_4_2 = 299,
00339 uid_1_2_840_10008_5_1_4_1_1_9_5_1 = 300,
00340 uid_1_2_840_10008_5_1_4_1_1_9_6_1 = 301,
00341 uid_1_2_840_10008_5_1_4_1_1_11_5 = 302,
00342 uid_1_2_840_10008_5_1_4_1_1_11_6 = 303,
00343 uid_1_2_840_10008_1_2_4_104 = 304,
00344 uid_1_2_840_10008_1_2_4_105 = 305,
00345 uid_1_2_840_10008_1_2_4_106 = 306,
00346 uid_1_2_840_10008_1_2_4_107 = 307,
00347 uid_1_2_840_10008_1_2_4_108 = 308,
00348 uid_1_2_840_10008_1_5_1 = 309,
00349 uid_1_2_840_10008_5_1_4_1_1_11_7 = 310,
00350 uid_1_2_840_10008_5_1_4_1_1_11_8 = 311,
00351 uid_1_2_840_10008_5_1_4_1_1_11_9 = 312,
00352 uid_1_2_840_10008_5_1_4_1_1_11_10 = 313,
00353 uid_1_2_840_10008_5_1_4_1_1_11_11 = 314,
00354 uid_1_2_840_10008_5_1_4_1_1_12_77 = 315,
00355 uid_1_2_840_10008_5_1_4_1_1_13_1_4 = 316,
00356 uid_1_2_840_10008_5_1_4_1_1_13_1_5 = 317,
00357 uid_1_2_840_10008_5_1_4_1_1_14_1 = 318,
00358 uid_1_2_840_10008_5_1_4_1_1_14_2 = 319,
00359 uid_1_2_840_10008_5_1_4_1_1_30 = 320,
00360 uid_1_2_840_10008_5_1_4_1_1_40 = 321,
00361 uid_1_2_840_10008_5_1_4_1_1_66_6 = 322,
00362 uid_1_2_840_10008_5_1_4_1_1_68_1 = 323,
00363 uid_1_2_840_10008_5_1_4_1_1_68_2 = 324,
00364 uid_1_2_840_10008_5_1_4_1_1_77_1_5_5 = 325,
00365 uid_1_2_840_10008_5_1_4_1_1_77_1_5_6 = 326,
00366 uid_1_2_840_10008_5_1_4_1_1_77_1_5_7 = 327,
00367 uid_1_2_840_10008_5_1_4_1_1_77_1_5_8 = 328,
00368 uid_1_2_840_10008_5_1_4_1_1_78_1 = 329,
00369 uid_1_2_840_10008_5_1_4_1_1_78_2 = 330,
00370 uid_1_2_840_10008_5_1_4_1_1_78_3 = 331,
00371 uid_1_2_840_10008_5_1_4_1_1_78_4 = 332,
00372 uid_1_2_840_10008_5_1_4_1_1_78_5 = 333,
00373 uid_1_2_840_10008_5_1_4_1_1_78_6 = 334,
00374 uid_1_2_840_10008_5_1_4_1_1_78_7 = 335,
00375 uid_1_2_840_10008_5_1_4_1_1_78_8 = 336,
00376 uid_1_2_840_10008_5_1_4_1_1_79_1 = 337,
00377 uid_1_2_840_10008_5_1_4_1_1_80_1 = 338,
00378 uid_1_2_840_10008_5_1_4_1_1_81_1 = 339,
00379 uid_1_2_840_10008_5_1_4_1_1_82_1 = 340,
00380 uid_1_2_840_10008_5_1_4_1_1_88_34 = 341,
00381 uid_1_2_840_10008_5_1_4_1_1_88_35 = 342,
00382 uid_1_2_840_10008_5_1_4_1_1_88_68 = 343,
00383 uid_1_2_840_10008_5_1_4_1_1_88_69 = 344,
00384 uid_1_2_840_10008_5_1_4_1_1_88_70 = 345,
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00385 uid_1_2_840_10008_5_1_4_1_1_88_71 = 346,
00386 uid_1_2_840_10008_5_1_4_1_1_88_72 = 347,
00387 uid_1_2_840_10008_5_1_4_1_1_88_73 = 348,
00388 uid_1_2_840_10008_5_1_4_1_1_88_74 = 349,
00389 uid_1_2_840_10008_5_1_4_1_1_88_75 = 350,
00390 uid_1_2_840_10008_5_1_4_1_1_90_1 = 351,
00391 uid_1_2_840_10008_5_1_4_1_1_104_3 = 352,
00392 uid_1_2_840_10008_5_1_4_1_1_130 = 353,
00393 uid_1_2_840_10008_5_1_4_1_1_131 = 354,
00394 uid_1_2_840_10008_5_1_4_1_1_200_1 = 355,
00395 uid_1_2_840_10008_5_1_4_1_1_200_2 = 356,
00396 uid_1_2_840_10008_5_1_4_1_1_200_3 = 357,
00397 uid_1_2_840_10008_5_1_4_1_1_200_4 = 358,
00398 uid_1_2_840_10008_5_1_4_1_1_200_5 = 359,
00399 uid_1_2_840_10008_5_1_4_1_1_200_6 = 360,
00400 uid_1_2_840_10008_5_1_4_1_1_481_10 = 361,
00401 uid_1_2_840_10008_5_1_4_1_1_481_11 = 362,
00402 uid_1_2_840_10008_5_1_4_1_1_501_1 = 363,
00403 uid_1_2_840_10008_5_1_4_1_1_501_2_1 = 364,
00404 uid_1_2_840_10008_5_1_4_1_1_501_2_2 = 365,
00405 uid_1_2_840_10008_5_1_4_1_1_501_3 = 366,
00406 uid_1_2_840_10008_5_1_4_1_1_501_4 = 367,
00407 uid_1_2_840_10008_5_1_4_1_1_501_5 = 368,
00408 uid_1_2_840_10008_5_1_4_1_1_501_6 = 369,
00409 uid_1_2_840_10008_5_1_4_1_1_601_1 = 370,
00410 uid_1_2_840_10008_5_1_4_1_1_601_2 = 371,
00411 uid_1_2_840_10008_5_1_4_1_2_4_2 = 372,
00412 uid_1_2_840_10008_5_1_4_1_2_4_3 = 373,
00413 uid_1_2_840_10008_5_1_4_1_2_5_3 = 374,
00414 uid_1_2_840_10008_5_1_4_20_1 = 375,
00415 uid_1_2_840_10008_5_1_4_20_2 = 376,
00416 uid_1_2_840_10008_5_1_4_20_3 = 377,
00417 uid_1_2_840_10008_5_1_4_34_5_1 = 378,
00418 uid_1_2_840_10008_5_1_4_34_6 = 379,
00419 uid_1_2_840_10008_5_1_4_34_6_1 = 380,
00420 uid_1_2_840_10008_5_1_4_34_6_2 = 381,
00421 uid_1_2_840_10008_5_1_4_34_6_3 = 382,
00422 uid_1_2_840_10008_5_1_4_34_6_4 = 383,
00423 uid_1_2_840_10008_5_1_4_34_7 = 384,
00424 uid_1_2_840_10008_5_1_4_34_8 = 385,
00425 uid_1_2_840_10008_5_1_4_34_9 = 386,
00426 uid_1_2_840_10008_5_1_4_34_10 = 387,
00427 uid_1_2_840_10008_5_1_4_38_4 = 388,
00428 uid_1_2_840_10008_5_1_4_39_1 = 389,
00429 uid_1_2_840_10008_5_1_4_39_2 = 390,
00430 uid_1_2_840_10008_5_1_4_39_3 = 391,
00431 uid_1_2_840_10008_5_1_4_39_4 = 392,
00432 uid_1_2_840_10008_5_1_4_43_1 = 393,
00433 uid_1_2_840_10008_5_1_4_43_2 = 394,
00434 uid_1_2_840_10008_5_1_4_43_3 = 395,
00435 uid_1_2_840_10008_5_1_4_43_4 = 396,
00436 uid_1_2_840_10008_5_1_4_44_1 = 397,
00437 uid_1_2_840_10008_5_1_4_44_2 = 398,
00438 uid_1_2_840_10008_5_1_4_44_3 = 399,
00439 uid_1_2_840_10008_5_1_4_44_4 = 400,
00440 uid_1_2_840_10008_5_1_4_45_1 = 401,
00441 uid_1_2_840_10008_5_1_4_45_2 = 402,
00442 uid_1_2_840_10008_5_1_4_45_3 = 403,
00443 uid_1_2_840_10008_5_1_4_45_4 = 404,
00444 uid_1_2_840_10008_7_1_1 = 405,
00445 uid_1_2_840_10008_7_1_2 = 406,
00446 uid_1_2_840_10008_8_1_1 = 407,
00447 uid_1_2_840_10008_5_1_4_1_1_4_3 = 408,
00448 uid_1_2_840_10008_15_1_1 = 409
00449 //
00450 //
00452 //
00454 //
00455 // Optionally private UIDs
00456 //
00457 #if 0
00458 uid_1_2_840_113619_4_2,
00459 uid_1_2_840_113619_4_3,
00460 uid_1_3_12_2_1107_5_9_1,
00461 uid_1_2_840_113619_4_26,
00462 uid_1_2_840_113619_4_30,
00463 uid_2_16_840_1_113709_1_5_1,
00464 uid_2_16_840_1_113709_1_2_2,
00465 uid_1_2_840_113543_6_6_1_3_10002,
00466 uid_1_2_392_200036_9116_7_8_1_1_1,
00467 uid_1_2_392_200036_9125_1_1_2,
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00468 uid_1_2_840_113619_4_27,
00469 uid_1_3_46_670589_11_0_0_12_1,
00470 uid_1_3_46_670589_11_0_0_12_2,
00471 uid_1_3_46_670589_11_0_0_12_4,
00472 uid_1_3_46_670589_2_3_1_1,
00473 uid_1_3_46_670589_2_4_1_1,
00474 uid_1_3_46_670589_2_5_1_1,
00475 uid_1_3_46_670589_5_0_1,
00476 uid_1_3_46_670589_5_0_1_1,
00477 uid_1_3_46_670589_5_0_10,
00478 uid_1_3_46_670589_5_0_11,
00479 uid_1_3_46_670589_5_0_11_1,
00480 uid_1_3_46_670589_5_0_12,
00481 uid_1_3_46_670589_5_0_13,
00482 uid_1_3_46_670589_5_0_14,
00483 uid_1_3_46_670589_5_0_2,
00484 uid_1_3_46_670589_5_0_2_1,
00485 uid_1_3_46_670589_5_0_3,
00486 uid_1_3_46_670589_5_0_3_1,
00487 uid_1_3_46_670589_5_0_4,
00488 uid_1_3_46_670589_5_0_7,
00489 uid_1_3_46_670589_5_0_8,
00490 uid_1_3_46_670589_5_0_9,
00491 uid_1_2_752_24_3_7_6,
00492 uid_1_2_752_24_3_7_7,
00493 uid_1_2_840_113619_5_2,
00494 uid_1_3_46_670589_33_1_4_1
00495 #endif
00496 //
00497 //
00499
00500 } TSType;
00501 typedef enum {
00502 VerificationSOPClass = 1, // Verification SOP Class
00503 ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM = 2, // Implicit VR Little Endian: Default Transfer
    Syntax for DICOM
00504 ExplicitVRLittleEndian = 3, // Explicit VR Little Endian
00505 DeflatedExplicitVRLittleEndian = 4, // Deflated Explicit VR Little Endian
00506 ExplicitVRBigEndian = 5, // Explicit VR Big Endian
00507 JPEGBaselineProcess1DefaultTransferSyntaxforLossyJPEG8BitImageCompression = 6, // JPEG Baseline (Process
    1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression
00508 JPEGExtendedProcess24DefaultTransferSyntaxforLossyJPEG12BitImageCompressionProcess4only = 7, // JPEG
    Extended (Process 2 & 4): Default Transfer Syntax for Lossy JPEG 12 Bit Image Compression (Process 4 only)
00509 JPEGExtendedProcess35Retired = 8, // JPEG Extended (Process 3 & 5)
00510 JPEGSpectralSelectionNonHierarchicalProcess68Retired = 9, // JPEG Spectral Selection, Non-Hierarchical
    (Process 6 & 8)
00511 JPEGSpectralSelectionNonHierarchicalProcess79Retired = 10, // JPEG Spectral Selection, Non-Hierarchical
    (Process 7 & 9)
00512 JPEGFullProgressionNonHierarchicalProcess1012Retired = 11, // JPEG Full Progression, Non-Hierarchical
    (Process 10 & 12)
00513 JPEGFullProgressionNonHierarchicalProcess1113Retired = 12, // JPEG Full Progression, Non-Hierarchical
    (Process 11 & 13)
00514 JPEGLosslessNonHierarchicalProcess14 = 13, // JPEG Lossless, Non-Hierarchical (Process 14)
00515 JPEGLosslessNonHierarchicalProcess15Retired = 14, // JPEG Lossless, Non-Hierarchical (Process 15)
00516 JPEGExtendedHierarchicalProcess1618Retired = 15, // JPEG Extended, Hierarchical (Process 16 & 18)
00517 JPEGExtendedHierarchicalProcess1719Retired = 16, // JPEG Extended, Hierarchical (Process 17 & 19)
00518 JPEGSpectralSelectionHierarchicalProcess2022Retired = 17, // JPEG Spectral Selection, Hierarchical
    (Process 20 & 22)
00519 JPEGSpectralSelectionHierarchicalProcess2123Retired = 18, // JPEG Spectral Selection, Hierarchical
    (Process 21 & 23)
00520 JPEGFullProgressionHierarchicalProcess2426Retired = 19, // JPEG Full Progression, Hierarchical (Process 24
    & 26)
00521 JPEGFullProgressionHierarchicalProcess2527Retired = 20, // JPEG Full Progression, Hierarchical (Process 25
    & 27)
00522 JPEGLosslessHierarchicalProcess28Retired = 21, // JPEG Lossless, Hierarchical (Process 28)
00523 JPEGLosslessHierarchicalProcess29Retired = 22, // JPEG Lossless, Hierarchical (Process 29)
00524
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    = 23, // JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default
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00525 JPEGLSLosslessImageCompression = 24, // JPEG-LS Lossless Image Compression
00526 JPEGLSLossyNearLosslessImageCompression = 25, // JPEG-LS Lossy (Near-Lossless) Image Compression
00527 JPEG2000ImageCompressionLosslessOnly = 26, // JPEG 2000 Image Compression (Lossless Only)
00528 JPEG2000ImageCompression = 27, // JPEG 2000 Image Compression
00529 JPEG2000Part2MultiComponentImageCompressionLosslessOnly = 28, // JPEG 2000 Part 2 Multi-component Image
    Compression (Lossless Only)
00530 JPEG2000Part2MultiComponentImageCompression = 29, // JPEG 2000 Part 2 Multi-component Image Compression
00531 JPIPReferenced = 30, // JPIP Referenced
00532 JPIPReferencedDeflate = 31, // JPIP Referenced Deflate
00533 MPEG2MainProfileMainLevel = 32, // MPEG2 Main Profile @ Main Level
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00538 TalairachBrainAtlasFrameofReference = 37, // Talairach Brain Atlas Frame of Reference
00539 SPM2T1FrameofReference = 38, // SPM2 T1 Frame of Reference
00540 SPM2T2FrameofReference = 39, // SPM2 T2 Frame of Reference
00541 SPM2PDFFrameofReference = 40, // SPM2 PD Frame of Reference
00542 SPM2EPIFrameofReference = 41, // SPM2 EPI Frame of Reference
00543 SPM2FILTI1FrameofReference = 42, // SPM2 FIL T1 Frame of Reference
00544 SPM2PETFrameofReference = 43, // SPM2 PET Frame of Reference
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00548 SPM2WHITEFrameofReference = 47, // SPM2 WHITE Frame of Reference
00549 SPM2CSFFFrameofReference = 48, // SPM2 CSF Frame of Reference
00550 SPM2BRAINMASKFrameofReference = 49, // SPM2 BRAINMASK Frame of Reference
00551 SPM2AVG305T1FrameofReference = 50, // SPM2 AVG305T1 Frame of Reference
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00553 SPM2AVG152T2FrameofReference = 52, // SPM2 AVG152T2 Frame of Reference
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00557 ICBMSingleSubjectMRIFrameofReference = 56, // ICBM Single Subject MRI Frame of Reference
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00562 StorageCommitmentPullModelSOPInstanceRetired = 61, // Storage Commitment Pull Model SOP Instance
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00630 MultiframeGrayscaleWordSecondaryCaptureImageStorage = 129, // Multi-frame Grayscale Word Secondary Capture
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00631 MultiframeTrueColorSecondaryCaptureImageStorage = 130, // Multi-frame True Color Secondary Capture Image
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00700 PatientRootQueryRetrieveInformationModelMOVE = 199, // Patient Root Query/Retrieve Information Model -
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00701 PatientRootQueryRetrieveInformationModelGET = 200, // Patient Root Query/Retrieve Information Model - GET
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00703 StudyRootQueryRetrieveInformationModelMOVE = 202, // Study Root Query/Retrieve Information Model - MOVE
00704 StudyRootQueryRetrieveInformationModelGET = 203, // Study Root Query/Retrieve Information Model - GET
00705 PatientStudyOnlyQueryRetrieveInformationModelFINDRetired = 204, // Patient/Study Only Query/Retrieve
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00707 PatientStudyOnlyQueryRetrieveInformationModelGETRetired = 206, // Patient/Study Only Query/Retrieve
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00923 // Optionally private UIDs
00924 //
00925 #if 0
00926 Private_1_2_840_113619_4_2,
00927 Private_1_2_840_113619_4_3,
00928 Private_1_3_12_2_1107_5_9_1,
00929 Private_1_2_840_113619_4_26,
00930 Private_1_2_840_113619_4_30,
00931 Private_2_16_840_1_113709_1_5_1,
00932 Private_2_16_840_1_113709_1_2_2,
00933 Private_1_2_840_113543_6_6_1_3_10002,
00934 Private_1_2_392_200036_9116_7_8_1_1_1,
00935 Private_1_2_392_200036_9125_1_1_2,
00936 Private_1_2_840_113619_4_27,
00937 Private_1_3_46_670589_11_0_0_12_1,
00938 Private_1_3_46_670589_11_0_0_12_2,
00939 Private_1_3_46_670589_11_0_0_12_4,
00940 Private_1_3_46_670589_2_3_1_1,
00941 Private_1_3_46_670589_2_4_1_1,
00942 Private_1_3_46_670589_2_5_1_1,
00943 Private_1_3_46_670589_5_0_1,
00944 Private_1_3_46_670589_5_0_1_1,
00945 Private_1_3_46_670589_5_0_10,
00946 Private_1_3_46_670589_5_0_11,
00947 Private_1_3_46_670589_5_0_11_1,
00948 Private_1_3_46_670589_5_0_12,
00949 Private_1_3_46_670589_5_0_13,
00950 Private_1_3_46_670589_5_0_14,
00951 Private_1_3_46_670589_5_0_2,
00952 Private_1_3_46_670589_5_0_2_1,
00953 Private_1_3_46_670589_5_0_3,
00954 Private_1_3_46_670589_5_0_3_1,
00955 Private_1_3_46_670589_5_0_4,
00956 Private_1_3_46_670589_5_0_7,
00957 Private_1_3_46_670589_5_0_8,
00958 Private_1_3_46_670589_5_0_9,
00959 Private_1_2_752_24_3_7_6,
00960 Private_1_2_752_24_3_7_7,
00961 Private_1_2_840_113619_5_2,
00962 Private_1_3_46_670589_33_1_4_1
00963 #endif
00964 //
00965 //
00967
00968 } TSName;
00969
00970
00971 typedef const char* const (*TransferSyntaxStringsType)[2];
00972 static TransferSyntaxStringsType GetTransferSyntaxStrings();
00973 static const char * const *GetTransferSyntaxString(unsigned int ts);
00974 static unsigned int GetNumberOfTransferSyntaxStrings();
00975
00976
00977 // TODO: Because I would like a dual signature for TSType and TSName, C++ won't let me do it...
00978 static const char* GetUIDString(/*TSType*/ unsigned int ts);
00979 static const char* GetUIDName(/*TSType*/ unsigned int ts);
00980
00981 bool SetFromUID(const char *str);
00982
00983 const char *GetName() const;
00984
00985 const char *GetString() const;
00986
00987 operator TSType () const { return TSField; }
00988
00989 private:
00990 TSField TSField;
00991 };
00992 //-----
00993 inline std::ostream &operator<<(std::ostream &_os, const UIDs &uid)
00994 {
00995     _os << uid.GetString() << " -> " << uid.GetName();
00996     return _os;
00997 }
00998 }
00999 } // end namespace gdcmm

```



### 13.109 gdcmAttribute.h File Reference

[illegible]

```
graph BT; gdcmspacing[gdcmspacing.h] --> gdcmattribute[gdcmattribute.h];
```

## Classes

- class `gdcmm::Attribute< Group, Element, TVR, TVM >`  
*Attribute class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.*
- class `gdcmm::Attribute< Group, Element, TVR, VM::VM1 >`
- class `gdcmm::Attribute< Group, Element, TVR, VM::VM1_3 >`
- class `gdcmm::Attribute< Group, Element, TVR, VM::VM1_8 >`
- class `gdcmm::Attribute< Group, Element, TVR, VM::VM1_n >`
- class `gdcmm::Attribute< Group, Element, TVR, VM::VM2_2n >`
- class `gdcmm::Attribute< Group, Element, TVR, VM::VM2_n >`
- class `gdcmm::Attribute< Group, Element, TVR, VM::VM3_3n >`
- class `gdcmm::Attribute< Group, Element, TVR, VM::VM3_n >`
- class `gdcmm::VRVLSIZE< 0 >`
- class `gdcmm::VRVLSIZE< 1 >`

## Namespaces

- namespace `gdcmm`

## 13.110 gdcmmAttribute.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcmm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMMATTRIBUTE_H
00015 #define GDCMMATTRIBUTE_H
00016
00017 #include "gdcmmTypes.h"
00018 #include "gdcmmVR.h"
00019 #include "gdcmmTagToType.h"
00020 #include "gdcmmVM.h"
00021 #include "gdcmmElement.h"
00022 #include "gdcmmDataElement.h"
00023 #include "gdcmmDataSet.h"
00024 #include "gdcmmStaticAssert.h"
00025
00026 #include <string>
00027 #include <vector>
00028 #include <sstream>
00029
00030 namespace gdcmm_ns
00031 {
00032
00033   struct void_;
00034
00035   // Declaration, also serve as forward declaration
00036   template<int T> class VRVLSIZE;
00037
00038   // Implementation when VL is coded on 16 bits:
00039   template<> class VRVLSIZE<0> {

```



```

00040 public:
00041     static inline uint16_t Read(std::istream &_is) {
00042         uint16_t l;
00043         _is.read((char*)&l, 2);
00044         return l;
00045     }
00046
00047     static inline void Write(std::ostream &os) { (void)os;
00048     }
00049 };
00050 // Implementation when VL is coded on 32 bits:
00051 template<> class VRVLSize<1> {
00052 public:
00053     static inline uint32_t Read(std::istream &_is) {
00054         char dummy[2];
00055         _is.read(dummy, 2);
00056
00057         uint32_t l;
00058         _is.read((char*)&l, 4);
00059         return l;
00060     }
00061
00062     static inline void Write(std::ostream &os) { (void)os;
00063     }
00064 };
00065
00081 template<uint16_t Group, uint16_t Element,
00082     long long TVR = TagToType<Group, Element>::VRType, // can the user override this value ?
00083     int TVM = TagToType<Group, Element>::VMType // can the user override this value ?
00084     /*typename SQAttribute = void*/ > // if only I had variadic template...
00085 class Attribute
00086 {
00087 public:
00088     typedef typename VRToType<TVR>::Type ArrayType;
00089     enum { VMType = VMToLength<TVM>::Length };
00090     ArrayType Internal[VMToLength<TVM>::Length];
00091
00092     // Make sure that user specified VR/VM are compatible with the public dictionary:
00093     GDCM_STATIC_ASSERT( ((VR::VRType)TVR & (VR::VRType)(TagToType<Group, Element>::VRType)) );
00094     GDCM_STATIC_ASSERT( ((VM::VMType)TVM & (VM::VMType)(TagToType<Group, Element>::VMType)) );
00095     GDCM_STATIC_ASSERT( (((VR::VRType)TVR & VR::VR_VM1) && ((VM::VMType)TVM == VM::VM1) )
00096         || !((VR::VRType)TVR & VR::VR_VM1) );
00097
00098     static Tag GetTag() { return Tag(Group,Element); }
00099     static VR GetVR() { return (VR::VRType)TVR; }
00100     static VM GetVM() { return (VM::VMType)TVM; }
00101
00102     // The following two methods do make sense only in case of public element,
00103     // when the template is intanciated with private element the VR/VM are simply
00104     // defaulted to allow everything (see gdcmTagToType.h default template for TagToType)
00105     static VR GetDictVR() { return (VR::VRType)(TagToType<Group, Element>::VRType); }
00106     static VM GetDictVM() { return (VM::VMType)(TagToType<Group, Element>::VMType); }
00107
00108     // Some extra dummy checks:
00109     // Data Elements with a VR of SQ, OF, OW, OB or UN shall always have a Value Multiplicity of one.
00110
00111     unsigned int GetNumberOfValues() const {
00112         return VMToLength<TVM>::Length;
00113     }
00114     // Implementation of Print is common to all Mode (ASCII/Binary)
00115     // TODO: Can we print a \ when in ASCII...well I don't think so
00116     // it would mean we used a bad VM then, right ?
00117     void Print(std::ostream &os) const {
00118         os << GetTag() << " ";
00119         os << TagToType<Group,Element>::GetVRString() << " ";
00120         os << TagToType<Group,Element>::GetVMString() << " ";
00121         os << Internal[0]; // VM is at least guarantee to be one
00122         for(unsigned int i=1; i<GetNumberOfValues(); ++i)
00123             os << "," << Internal[i];
00124     }
00125
00126     // copy:
00127     //ArrayType GetValue(unsigned int idx = 0) {
00128     //    assert( idx < GetNumberOfValues() );
00129     //    return Internal[idx];
00130     //}
00131     //ArrayType operator[] (unsigned int idx) {
00132     //    return GetValue(idx);
00133     //}
00134     // FIXME: is this always a good idea ?
00135     // I do not think so, I prefer operator

```

```

00136 //operator ArrayType () const { return Internal[0]; }
00137
00138 bool operator==(const Attribute &att) const
00139 {
00140     return std::equal(Internal, Internal+GetNumberOfValues(),
00141         att.GetValues());
00142 }
00143 bool operator!=(const Attribute &att) const
00144 {
00145     return !std::equal(Internal, Internal+GetNumberOfValues(),
00146         att.GetValues());
00147 }
00148 bool operator<(const Attribute &att) const
00149 {
00150     return std::lexicographical_compare(Internal, Internal+GetNumberOfValues(),
00151         att.GetValues(), att.GetValues() + att.GetNumberOfValues() );
00152 }
00153
00154 ArrayType &GetValue(unsigned int idx = 0) {
00155     assert( idx < GetNumberOfValues() );
00156     return Internal[idx];
00157 }
00158 ArrayType & operator[] (unsigned int idx) {
00159     return GetValue(idx);
00160 }
00161 // const reference
00162 ArrayType const &GetValue(unsigned int idx = 0) const {
00163     assert( idx < GetNumberOfValues() );
00164     return Internal[idx];
00165 }
00166 ArrayType const & operator[] (unsigned int idx) const {
00167     return GetValue(idx);
00168 }
00169 void SetValue(ArrayType v, unsigned int idx = 0) {
00170     assert( idx < GetNumberOfValues() );
00171     Internal[idx] = v;
00172 }
00173 void SetValues(const ArrayType* array, unsigned int numel = VMType ) {
00174     assert( array && numel && numel == GetNumberOfValues() );
00175     // std::copy is smarter than a memcpy, and will call memcpy when POD type
00176     std::copy(array, array+numel, Internal);
00177 }
00178 const ArrayType* GetValues() const {
00179     return Internal;
00180 }
00181
00182 // API to talk to the run-time layer: gdcmm::DataElement
00183 DataElement GetAsDataElement() const {
00184     DataElement ret( GetTag() );
00185     std::ostringstream os;
00186     // os.imbue(std::locale::classic()); // This is not required AFAIK
00187     EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00188         GetNumberOfValues(), os);
00189     ret.SetVR( GetVR() );
00190     assert( ret.GetVR() != VR::SQ );
00191     if( (VR::VRType)VRToEncoding<TVR>::Mode == VR::VRASCII )
00192     {
00193         if( GetVR() != VR::UI )
00194         {
00195             if( os.str().size() % 2 )
00196             {
00197                 os << " ";
00198             }
00199         }
00200     }
00201     VL::Type osStrSize = (VL::Type)os.str().size();
00202     ret.SetByteValue( os.str().c_str(), osStrSize );
00203     return ret;
00204 }
00205
00206 void SetFromDataElement(DataElement const &de) {
00207     // This is kind of hackish but since I do not generate other element than the first one: 0x6000 I
    should be ok:
00208     assert( Tag(Group,Element) == de.GetTag() || Group == 0x6000 || Group == 0x5000 );
00209     assert( GetVR() != VR::INVALID );
00210     assert( GetVR().Compatible( de.GetVR() ) || de.GetVR() == VR::INVALID ); // In case of VR::INVALID
    cannot use the & operator
00211     if( de.IsEmpty() ) return;
00212     const ByteValue *bv = de.GetByteValue();
00213 #ifdef GDCM_WORDS_BIGENDIAN
00214     if( de.GetVR() == VR::UN /*|| de.GetVR() == VR::INVALID*/ )

```

```

00215 #else
00216     if( de.GetVR() == VR::UN || de.GetVR() == VR::INVALID )
00217 #endif
00218     {
00219         SetByteValue(bv);
00220     }
00221     else
00222     {
00223         SetByteValueNoSwap(bv);
00224     }
00225 }
00226 void Set(DataSet const &ds) {
00227     SetFromDataElement( ds.GetDataElement( Tag(Group,Element) ) );
00228 }
00229 void SetFromDataSet(DataSet const &ds) {
00230     if( ds.FindDataElement( Tag(Group,Element) ) &&
00231         !ds.GetDataElement( Tag(Group,Element) ).IsEmpty() )
00232     {
00233         SetFromDataElement( ds.GetDataElement( Tag(Group,Element) ) );
00234     }
00235 }
00236 protected:
00237 void SetByteValueNoSwap(const ByteValue *bv) {
00238     if( !bv ) return; // That would be bad...
00239     assert( bv->GetPointer() && bv->GetLength() ); // [123]C element can be empty
00240     //if( VRToEncoding<TVR>::Mode == VR::VRBINARY )
00241     // {
00242     // // always do a copy !
00243     // SetValues(bv->GetPointer(), bv->GetLength());
00244     // }
00245     //else
00246     {
00247         std::stringstream ss;
00248         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
00249         ss.str( s );
00250         EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadNoSwap(Internal,
00251             GetNumberOfValues(),ss);
00252     }
00253 }
00254 void SetByteValue(const ByteValue *bv) {
00255     if( !bv ) return; // That would be bad...
00256     assert( bv->GetPointer() && bv->GetLength() ); // [123]C element can be empty
00257     //if( VRToEncoding<TVR>::Mode == VR::VRBINARY )
00258     // {
00259     // // always do a copy !
00260     // SetValues(bv->GetPointer(), bv->GetLength());
00261     // }
00262     //else
00263     {
00264         std::stringstream ss;
00265         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
00266         ss.str( s );
00267         EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
00268             GetNumberOfValues(),ss);
00269     }
00270 }
00271 #if 0 // TODO FIXME the implicit way:
00272 // explicit:
00273 void Read(std::istream &_is) {
00274     const uint16_t cref[] = { Group, Element };
00275     uint16_t c[2];
00276     _is.read((char*)&c, sizeof(c));
00277     assert( c[0] == cref[0] && c[1] == cref[1] );
00278     char vr[2];
00279     _is.read(vr, 2); // Check consistency ?
00280     const uint32_t lref = GetLength() * sizeof( typename VRToType<TVR>::Type );
00281     uint32_t l = VRVLSize< (TVR & VR::VL32) >::Read(_is);
00282     l /= sizeof( typename VRToType<TVR>::Type );
00283     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
00284         l,_is);
00285 }
00286 void Write(std::ostream &_os) const {
00287     uint16_t c[] = { Group, Element };
00288     _os.write((char*)&c, 4);
00289     uint32_t l = GetLength() * sizeof( typename VRToType<TVR>::Type );
00290     _os.write((char*)&l, 4);
00291     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00292         GetLength(),_os);
00293 }
00294 void Read(std::istream &_is) {
00295     uint16_t cref[] = { Group, Element };

```

```

00296     uint16_t c[2];
00297     _is.read((char*)&c, 4);
00298     const uint32_t lref = GetLength() * sizeof( typename VRToType<TVR>::Type );
00299     uint32_t l;
00300     _is.read((char*)&l, 4);
00301     l /= sizeof( typename VRToType<TVR>::Type );
00302     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
00303         l,_is);
00304 }
00305 void Write(std::ostream &_os) const {
00306     uint16_t c[] = { Group, Element };
00307     _os.write((char*)&c, 4);
00308     uint32_t l = GetLength() * sizeof( typename VRToType<TVR>::Type );
00309     _os.write((char*)&l, 4);
00310     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00311         GetLength(),_os);
00312 }
00313 #endif
00314 };
00315 };
00316
00317 template<uint16_t Group, uint16_t Element, long long TVR >
00318 class Attribute<Group,Element,TVR,VM::VM1>
00319 {
00320 public:
00321     typedef typename VRToType<TVR>::Type ArrayType;
00322     enum { VMType = VMToLength<VM::VM1>::Length };
00323     //ArrayType Internal[VMToLength<TVM>::Length];
00324     ArrayType Internal;
00325     GDCM_STATIC_ASSERT( VMToLength<VM::VM1>::Length == 1 );
00326
00327     // Make sure that user specified VR/VM are compatible with the public dictionary:
00328     GDCM_STATIC_ASSERT( ((VR::VRType)TVR & (VR::VRType)(TagToType<Group, Element>::VRType)) );
00329     GDCM_STATIC_ASSERT( ((VM::VMType)VM::VM1 & (VM::VMType)(TagToType<Group, Element>::VMType)) );
00330     GDCM_STATIC_ASSERT( (((VR::VRType)TVR & VR::VR_VM1) && ((VM::VMType)VM::VM1 == VM::VM1) )
00331         || !((VR::VRType)TVR & VR::VR_VM1) );
00332
00333     static Tag GetTag() { return Tag(Group,Element); }
00334     static VR GetVR() { return (VR::VRType)TVR; }
00335     static VM GetVM() { return (VM::VMType)VM::VM1; }
00336
00337     // The following two methods do make sense only in case of public element,
00338     // when the template is intanciated with private element the VR/VM are simply
00339     // defaulted to allow everything (see gdcmTagToType.h default template for TagToType)
00340     static VR GetDictVR() { return (VR::VRType)(TagToType<Group, Element>::VRType); }
00341     static VM GetDictVM() { return (VM::VMType)(TagToType<Group, Element>::VMType); }
00342
00343     // Some extra dummy checks:
00344     // Data Elements with a VR of SQ, OF, OW, OB or UN shall always have a Value Multiplicity of one.
00345
00346     unsigned int GetNumberOfValues() const {
00347         return VMToLength<VM::VM1>::Length;
00348     }
00349     // Implementation of Print is common to all Mode (ASCII/Binary)
00350     // TODO: Can we print a \ when in ASCII...well I don't think so
00351     // it would mean we used a bad VM then, right ?
00352     void Print(std::ostream &os) const {
00353         os << GetTag() << " ";
00354         os << TagToType<Group,Element>::GetVRString() << " ";
00355         os << TagToType<Group,Element>::GetVMString() << " ";
00356         os << Internal; // VM is at least guarantee to be one
00357     }
00358     // copy:
00359     //ArrayType GetValue(unsigned int idx = 0) {
00360     //    assert( idx < GetNumberOfValues() );
00361     //    return Internal[idx];
00362     //}
00363     //ArrayType operator[] (unsigned int idx) {
00364     //    return GetValue(idx);
00365     //}
00366     // FIXME: is this always a good idea ?
00367     // I do not think so, I prefer operator
00368     //operator ArrayType () const { return Internal[0]; }
00369
00370     bool operator==(const Attribute &att) const
00371     {
00372         return std::equal(&Internal, &Internal+GetNumberOfValues(),
00373             att.GetValues());
00374     }
00375     bool operator!=(const Attribute &att) const
00376     {

```

```

00377     return !std::equal(&Internal, &Internal+GetNumberOfValues(),
00378         att.GetValues());
00379     }
00380     bool operator<(const Attribute &att) const
00381     {
00382         return std::lexicographical_compare(&Internal, &Internal+GetNumberOfValues(),
00383             att.GetValues(), att.GetValues() + att.GetNumberOfValues() );
00384     }
00385
00386     ArrayType &GetValue() {
00387         // assert( idx < GetNumberOfValues() );
00388         return Internal;
00389     }
00390     // ArrayType & operator[] (unsigned int idx) {
00391     //     return GetValue(idx);
00392     // }
00393     // const reference
00394     ArrayType const &GetValue() const {
00395         //assert( idx < GetNumberOfValues() );
00396         return Internal;
00397     }
00398     //ArrayType const & operator[] () const {
00399     //     return GetValue();
00400     //}
00401     void SetValue(ArrayType v) {
00402         // assert( idx < GetNumberOfValues() );
00403         Internal = v;
00404     }
00405     /* void SetValues(const ArrayType* array, unsigned int numel = VMType ) {
00406         assert( array && numel && numel == GetNumberOfValues() );
00407         // std::copy is smarter than a memcpy, and will call memcpy when POD type
00408         std::copy(array, array+numel, Internal);
00409     }
00410     */
00411
00412     // FIXME Should we remove this function ?
00413     const ArrayType* GetValues() const {
00414         return &Internal;
00415     }
00416
00417     // API to talk to the run-time layer: gdcm::DataElement
00418     DataElement GetAsDataElement() const {
00419         DataElement ret( Tag(Group,Element) );
00420         std::ostream os;
00421         // os.imbue(std::locale::classic()); // This is not required AFAIK
00422         EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(&Internal,
00423             GetNumberOfValues(),os);
00424         ret.SetVR( GetVR() );
00425         assert( ret.GetVR() != VR::SQ );
00426         if( (VR::VRType)VRToEncoding<TVR>::Mode == VR::VRASCII )
00427         {
00428             if( GetVR() != VR::UI )
00429             {
00430                 if( os.str().size() % 2 )
00431                 {
00432                     os << " ";
00433                 }
00434             }
00435         }
00436         VL::Type osStrSize = (VL::Type)os.str().size();
00437         ret.SetByteValue( os.str().c_str(), osStrSize );
00438         return ret;
00439     }
00440
00441     void SetFromDataElement(DataElement const &de) {
00442         // This is kind of hackish but since I do not generate other element than the first one: 0x6000 I
00443         // should be ok:
00444         assert( Tag(Group,Element) == de.GetTag() || Group == 0x6000 || Group == 0x5000 );
00445         assert( GetVR() != VR::INVALID );
00446         assert( GetVR().Compatible( de.GetVR() ) || de.GetVR() == VR::INVALID ); // In case of VR::INVALID
00447         // cannot use the & operator
00448         if( de.IsEmpty() ) return;
00449         const ByteValue *bv = de.GetByteValue();
00450         #ifdef GDCM_WORDS_BIGENDIAN
00451         if( de.GetVR() == VR::UN /*|| de.GetVR() == VR::INVALID*/ )
00452         #else
00453         if( de.GetVR() == VR::UN || de.GetVR() == VR::INVALID )
00454         #endif
00455         {
00456             SetByteValue(bv);
00457         }
00458     }

```

```

00456     else
00457     {
00458         SetByteValueNoSwap(bv);
00459     }
00460 }
00461 void Set(DataSet const &ds) {
00462     SetFromDataElement( ds.GetDataElement( Tag(Group,Element) ) );
00463 }
00464 void SetFromDataSet(DataSet const &ds) {
00465     if( ds.FindDataElement( Tag(Group,Element) ) &&
00466         !ds.GetDataElement( Tag(Group,Element) ).IsEmpty() )
00467     {
00468         SetFromDataElement( ds.GetDataElement( Tag(Group,Element) ) );
00469     }
00470 }
00471 protected:
00472 void SetByteValueNoSwap(const ByteValue *bv) {
00473     if( !bv ) return; // That would be bad...
00474     assert( bv->GetPointer() && bv->GetLength() ); // [123]C element can be empty
00475     //if( VRToEncoding<TVR>::Mode == VR::VRBINARY )
00476     // {
00477     //     // always do a copy !
00478     //     SetValues(bv->GetPointer(), bv->GetLength());
00479     // }
00480     //else
00481     {
00482         std::stringstream ss;
00483         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
00484         ss.str( s );
00485         EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadNoSwap(&Internal,
00486             GetNumberOfValues(),ss);
00487     }
00488 }
00489 void SetByteValue(const ByteValue *bv) {
00490     if( !bv ) return; // That would be bad...
00491     assert( bv->GetPointer() && bv->GetLength() ); // [123]C element can be empty
00492     //if( VRToEncoding<TVR>::Mode == VR::VRBINARY )
00493     // {
00494     //     // always do a copy !
00495     //     SetValues(bv->GetPointer(), bv->GetLength());
00496     // }
00497     //else
00498     {
00499         std::stringstream ss;
00500         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
00501         ss.str( s );
00502         EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(&Internal,
00503             GetNumberOfValues(),ss);
00504     }
00505 }
00506 #if 0 // TODO FIXME the implicit way:
00507 // explicit:
00508 void Read(std::istream &_is) {
00509     const uint16_t cref[] = { Group, Element };
00510     uint16_t c[2];
00511     _is.read((char*)&c, sizeof(c));
00512     assert( c[0] == cref[0] && c[1] == cref[1] );
00513     char vr[2];
00514     _is.read(vr, 2); // Check consistency ?
00515     const uint32_t lref = GetLength() * sizeof( typename VRToType<TVR>::Type );
00516     uint32_t l = VRVLSize< (TVR & VR::VL32) >::Read(_is);
00517     l /= sizeof( typename VRToType<TVR>::Type );
00518     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
00519         l,_is);
00520 }
00521 void Write(std::ostream &_os) const {
00522     uint16_t c[] = { Group, Element };
00523     _os.write((char*)&c, 4);
00524     uint32_t l = GetLength() * sizeof( typename VRToType<TVR>::Type );
00525     _os.write((char*)&l, 4);
00526     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00527         GetLength(),_os);
00528 }
00529 void Read(std::istream &_is) {
00530     uint16_t cref[] = { Group, Element };
00531     uint16_t c[2];
00532     _is.read((char*)&c, 4);
00533     const uint32_t lref = GetLength() * sizeof( typename VRToType<TVR>::Type );
00534     uint32_t l;
00535     _is.read((char*)&l, 4);
00536     l /= sizeof( typename VRToType<TVR>::Type );

```

```

00537         return EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
00538             l,_is);
00539     }
00540     void Write(std::ostream &_os) const {
00541         uint16_t c[] = { Group, Element };
00542         _os.write((char*)&c, 4);
00543         uint32_t l = GetLength() * sizeof( typename VRToType<TVR>::Type );
00544         _os.write((char*)&l, 4);
00545         return EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00546             GetLength(),_os);
00547     }
00548 #endif
00549 };
00550 };
00551
00552 // No need to repeat default template arg, since primary template
00553 // will be used to generate the default arguments
00554 template<uint16_t Group, uint16_t Element, long long TVR >
00555 class Attribute<Group,Element,TVR,VM::VM1_n>
00556 {
00557 public:
00558     typedef typename VRToType<TVR>::Type ArrayType;
00559
00560     // Make sure that user specified VR/VM are compatible with the public dictionary:
00561     GDCM_STATIC_ASSERT( ((VR::VRType)TVR & (VR::VRType)(TagToType<Group, Element>::VRType)) );
00562     GDCM_STATIC_ASSERT( (VM::VM1_n & (VM::VMType)(TagToType<Group, Element>::VMType)) );
00563     GDCM_STATIC_ASSERT( (((VR::VRType)TVR & VR::VR_VM1) && ((VM::VMType)TagToType<Group,Element>::VMType ==
VM::VM1) )
00564         || !((VR::VRType)TVR & VR::VR_VM1) ) );
00565
00566     static Tag GetTag() { return Tag(Group,Element); }
00567     static VR GetVR() { return (VR::VRType)TVR; }
00568     static VM GetVM() { return VM::VM1_n; }
00569
00570     static VR GetDictVR() { return (VR::VRType)(TagToType<Group, Element>::VRType); }
00571     static VM GetDictVM() { return GetVM(); }
00572
00573     // This the way to prevent default initialization
00574     explicit Attribute() { Internal=NULLPTR; Length=0; Own = true; }
00575     ~Attribute() {
00576         if( Own ) {
00577             delete[] Internal;
00578         }
00579         Internal = NULLPTR; // paranoid
00580     }
00581
00582     unsigned int GetNumberOfValues() const { return Length; }
00583
00584     void SetNumberOfValues(unsigned int numel)
00585     {
00586         SetValues(NULLPTR, numel, true);
00587     }
00588
00589     const ArrayType* GetValues() const {
00590         return Internal;
00591     }
00592     void Print(std::ostream &os) const {
00593         os << GetTag() << " ";
00594         os << GetVR() << " ";
00595         os << GetVM() << " ";
00596         os << Internal[0]; // VM is at least guarantee to be one
00597         for(unsigned int i=1; i<GetNumberOfValues(); ++i)
00598             os << "," << Internal[i];
00599     }
00600     ArrayType &GetValue(unsigned int idx = 0) {
00601         assert( idx < GetNumberOfValues() );
00602         return Internal[idx];
00603     }
00604     ArrayType &operator[] (unsigned int idx) {
00605         return GetValue(idx);
00606     }
00607     // const reference
00608     ArrayType const &GetValue(unsigned int idx = 0) const {
00609         assert( idx < GetNumberOfValues() );
00610         return Internal[idx];
00611     }
00612     ArrayType const &operator[] (unsigned int idx) const {
00613         return GetValue(idx);
00614     }
00615     void SetValue(unsigned int idx, ArrayType v) {
00616         assert( idx < GetNumberOfValues() );

```

```

00617     Internal[idx] = v;
00618 }
00619 void SetValue(ArrayType v) { SetValue(0, v); }
00620
00621 void SetValues(const ArrayType *array, unsigned int numel, bool own = false)
00622 {
00623     if( Internal ) // were we used before ?
00624     {
00625         // yes !
00626         if( Own ) delete[] Internal;
00627         Internal = nullptr;
00628     }
00629     Own = own;
00630     Length = numel;
00631     assert( Internal == nullptr );
00632     if( own ) // make a copy:
00633     {
00634         Internal = new ArrayType[numel];
00635         if( array && numel )
00636             std::copy(array, array+numel, Internal);
00637     }
00638     else // pass pointer
00639     {
00640         Internal = const_cast<ArrayType*>(array);
00641     }
00642     // postcondition
00643     assert( numel == GetNumberOfValues() );
00644 }
00645
00646 DataElement GetAsDataElement() const {
00647     DataElement ret( GetTag() );
00648     std::ostringstream os;
00649     if( Internal )
00650     {
00651         EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00652             GetNumberOfValues(), os);
00653         if( (VR::VRType)VRToEncoding<TVR>::Mode == VR::VRASCII )
00654         {
00655             if( GetVR() != VR::UI )
00656             {
00657                 if( os.str().size() % 2 )
00658                 {
00659                     os << " ";
00660                 }
00661             }
00662         }
00663     }
00664     ret.SetVR( GetVR() );
00665     assert( ret.GetVR() != VR::SQ );
00666     VL::Type osStrSize = (VL::Type) os.str().size();
00667     ret.SetByteValue( os.str().c_str(), osStrSize);
00668     return ret;
00669 }
00670 void SetFromDataElement(DataElement const &de) {
00671     // This is kind of hackish but since I do not generate other element than the first one: 0x6000 I
    should be ok:
00672     assert( GetTag() == de.GetTag() || GetTag().GetGroup() == 0x6000
00673         || GetTag().GetGroup() == 0x5000 );
00674     assert( GetVR().Compatible( de.GetVR() ) ); // In case of VR::INVALID cannot use the & operator
00675     assert( !de.IsEmpty() );
00676     const ByteValue *bv = de.GetByteValue();
00677     SetByteValue(bv);
00678 }
00679 void Set(DataSet const &ds) {
00680     SetFromDataElement( ds.GetDataElement( GetTag() ) );
00681 }
00682 void SetFromDataSet(DataSet const &ds) {
00683     if( ds.FindDataElement( GetTag() ) &&
00684         !ds.GetDataElement( GetTag() ).IsEmpty() )
00685     {
00686         SetFromDataElement( ds.GetDataElement( GetTag() ) );
00687     }
00688 }
00689 protected:
00690 void SetByteValue(const ByteValue *bv) {
00691     assert( bv ); // FIXME
00692     std::stringstream ss;
00693     std::string s = std::string( bv->GetPointer(), bv->GetLength() );
00694     Length = bv->GetLength(); // HACK FIXME
00695     ss.str( s );
00696     ArrayType *internal;

```



```

00697     ArrayType buffer[256];
00698     if( bv->GetLength() < 256 )
00699     {
00700         internal = buffer;
00701     }
00702     else
00703     {
00704         internal = new ArrayType[ (VL::Type)bv->GetLength() ]; // over allocation
00705     }
00706     EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadComputeLength(internal, Length, ss);
00707     SetValues( internal, Length, true );
00708     if( !(bv->GetLength() < 256) )
00709     {
00710         delete[] internal;
00711     }
00712     //EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
00713     // GetNumberOfValues(),ss);
00714 }
00715
00716 private:
00717     ArrayType *Internal;
00718     unsigned int Length;
00719     bool Own : 1;
00720 };
00721
00722 template<uint16_t Group, uint16_t Element, long long TVR>
00723 class Attribute<Group,Element,TVR,VM::VM1_3> : public Attribute<Group,Element,TVR,VM::VM1_n>
00724 {
00725 public:
00726     VM GetVM() const { return VM::VM1_3; }
00727 };
00728
00729 template<uint16_t Group, uint16_t Element, long long TVR>
00730 class Attribute<Group,Element,TVR,VM::VM1_8> : public Attribute<Group,Element,TVR,VM::VM1_n>
00731 {
00732 public:
00733     VM GetVM() const { return VM::VM1_8; }
00734 };
00735
00736 template<uint16_t Group, uint16_t Element, long long TVR>
00737 class Attribute<Group,Element,TVR,VM::VM2_n> : public Attribute<Group,Element,TVR,VM::VM1_n>
00738 {
00739 public:
00740     VM GetVM() const { return VM::VM2_n; }
00741 };
00742
00743 template<uint16_t Group, uint16_t Element, long long TVR>
00744 class Attribute<Group,Element,TVR,VM::VM2_2n> : public Attribute<Group,Element,TVR,VM::VM2_n>
00745 {
00746 public:
00747     static VM GetVM() { return VM::VM2_2n; }
00748 };
00749
00750 template<uint16_t Group, uint16_t Element, long long TVR>
00751 class Attribute<Group,Element,TVR,VM::VM3_n> : public Attribute<Group,Element,TVR,VM::VM1_n>
00752 {
00753 public:
00754     static VM GetVM() { return VM::VM3_n; }
00755 };
00756
00757 template<uint16_t Group, uint16_t Element, long long TVR>
00758 class Attribute<Group,Element,TVR,VM::VM3_3n> : public Attribute<Group,Element,TVR,VM::VM3_n>
00759 {
00760 public:
00761     static VM GetVM() { return VM::VM3_3n; }
00762 };
00763
00764
00765 // For particular case for ASCII string
00766 // WARNING: This template explicitly instantiates a particular
00767 // EncodingImplementation THEREFORE it is required to be declared after the
00768 // EncodingImplementation is needs (doh!)
00769 #if 0
00770 template<int TVM>
00771 class Attribute<TVM>
00772 {
00773 public:
00774     Attribute(const char array[])
00775     {
00776         unsigned int i = 0;
00777         const char sep = '\\';

```

```

00778     std::string sarray = array;
00779     std::string::size_type pos1 = 0;
00780     std::string::size_type pos2 = sarray.find(sep, pos1+1);
00781     while(pos2 != std::string::npos)
00782     {
00783         Internal[i++] = sarray.substr(pos1, pos2-pos1);
00784         pos1 = pos2+1;
00785         pos2 = sarray.find(sep, pos1+1);
00786     }
00787     Internal[i] = sarray.substr(pos1, pos2-pos1);
00788     // Shouldn't we do the contrary, since we know how many separators
00789     // (and default behavior is to discard anything after the VM declared
00790     assert( GetLength()-1 == i );
00791 }
00792
00793 unsigned long GetLength() const {
00794     return VMToLength<TVM>::Length;
00795 }
00796 // Implementation of Print is common to all Mode (ASCII/Binary)
00797 void Print(std::ostream &_os) const {
00798     _os << Internal[0]; // VM is at least guarantee to be one
00799     for(int i=1; i<VMToLength<TVM>::Length; ++i)
00800         _os << "," << Internal[i];
00801 }
00802
00803 void Read(std::istream &_is) {
00804     EncodingImplementation<VR::VRASCII>::Read(Internal, GetLength(), _is);
00805 }
00806 void Write(std::ostream &_os) const {
00807     EncodingImplementation<VR::VRASCII>::Write(Internal, GetLength(), _os);
00808 }
00809 private:
00810     typename String Internal[VMToLength<TVM>::Length];
00811 };
00812
00813 template< int TVM>
00814 class Attribute<VR::PN, TVM> : public StringAttribute<TVM>
00815 {
00816 };
00817 #endif
00818
00819 #if 0
00820
00821 // Implementation for the undefined length (dynamically allocated array)
00822 template<int TVR>
00823 class Attribute<TVR, VM::VM1_n>
00824 {
00825 public:
00826     // This the way to prevent default initialization
00827     explicit Attribute() { Internal=0; Length=0; }
00828     ~Attribute() {
00829         delete[] Internal;
00830         Internal = 0;
00831     }
00832
00833     // Length manipulation
00834     // SetLength should really be protected anyway...all operation
00835     // should go through SetArray
00836     unsigned long GetLength() const { return Length; }
00837     typedef typename VRToType<TVR>::Type ArrayType;
00838     void SetLength(unsigned long len) {
00839         const unsigned int size = sizeof(ArrayType);
00840         if( len ) {
00841             if( len > Length ) {
00842                 // perform realloc
00843                 assert( (len / size) * size == len );
00844                 ArrayType *internal = new ArrayType[len / size];
00845                 memcpy(internal, Internal, Length * size);
00846                 delete[] Internal;
00847                 Internal = internal;
00848             }
00849             Length = len / size;
00850         }
00851     }
00852
00853     // If save is set to zero user should not delete the pointer
00854     //void SetArray(const typename VRToType<TVR>::Type *array, int len, bool save = false)
00855     void SetArray(const ArrayType *array, unsigned long len,
00856         bool save = false) {
00857         if( save ) {
00858             SetLength(len); // realloc

```

```

00859     memcpy(Internal, array, len/*sizeof(ArrayType)*/);
00860 }
00861 else {
00862     // TODO rewrite this stupid code:
00863     Length = len;
00864     //Internal = array;
00865     assert(0);
00866 }
00867 }
00868 // Implementation of Print is common to all Mode (ASCII/Binary)
00869 void Print(std::ostream &_os) const {
00870     assert( Length );
00871     assert( Internal );
00872     _os << Internal[0]; // VM is at least guarantee to be one
00873     const unsigned long length = GetLength() < 25 ? GetLength() : 25;
00874     for(unsigned long i=1; i<length; ++i)
00875         _os << ", " << Internal[i];
00876 }
00877 void Read(std::istream &_is) {
00878     EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
00879         GetLength(), _is);
00880 }
00881 void Write(std::ostream &_os) const {
00882     EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00883         GetLength(), _os);
00884 }
00885
00886 Attribute(const Attribute&_val) {
00887     if( this != &_amp;_val) {
00888         *_this = _val;
00889     }
00890 }
00891
00892 Attribute &operator=(const Attribute &_val) {
00893     Length = 0; // SYITF
00894     Internal = 0;
00895     SetArray(_val.Internal, _val.Length, true);
00896     return *_this;
00897 }
00898
00899 private:
00900     typename VRTToType<TVR>::Type *Internal;
00901     unsigned long Length; // unsigned int ??
00902 };
00903
00904 //template <int TVM = VM::VM1_n>
00905 //class Attribute<VR::OB, TVM > : public Attribute<VR::OB, VM::VM1_n> {};
00906
00907 // Partial specialization for derivatives of 1-n : 2-n, 3-n ...
00908 template<int TVR>
00909 class Attribute<TVR, VM::VM2_n> : public Attribute<TVR, VM::VM1_n>
00910 {
00911 public:
00912     typedef Attribute<TVR, VM::VM1_n> Parent;
00913     void SetLength(int len) {
00914         if( len <= 1 ) return;
00915         Parent::SetLength(len);
00916     }
00917 };
00918 template<int TVR>
00919 class Attribute<TVR, VM::VM2_2n> : public Attribute<TVR, VM::VM2_n>
00920 {
00921 public:
00922     typedef Attribute<TVR, VM::VM2_n> Parent;
00923     void SetLength(int len) {
00924         if( len % 2 ) return;
00925         Parent::SetLength(len);
00926     }
00927 };
00928 template<int TVR>
00929 class Attribute<TVR, VM::VM3_n> : public Attribute<TVR, VM::VM1_n>
00930 {
00931 public:
00932     typedef Attribute<TVR, VM::VM1_n> Parent;
00933     void SetLength(int len) {
00934         if( len <= 2 ) return;
00935         Parent::SetLength(len);
00936     }
00937 };
00938 template<int TVR>
00939 class Attribute<TVR, VM::VM3_3n> : public Attribute<TVR, VM::VM3_n>

```

```

00940 {
00941 public:
00942     typedef Attribute<TVR, VM::VM3_n> Parent;
00943     void SetLength(int len) {
00944         if( len % 3 ) return;
00945         Parent::SetLength(len);
00946     }
00947 };
00948
00949
00950 //template<int T> struct VRToLength;
00951 //template<> struct VRToLength<VR::AS>
00952 //{ enum { Length = VM::VM1 }; }
00953 //template<>
00954 //class Attribute<VR::AS> : public Attribute<VR::AS, VRToLength<VR::AS>::Length >
00955
00956 // only 0010 1010 AS 1 Patient's Age
00957 template<>
00958 class Attribute<VR::AS, VM::VM5>
00959 {
00960 public:
00961     char Internal[VRToLength<VM::VM5>::Length];
00962     void Print(std::ostream &_os) const {
00963         _os << Internal;
00964     }
00965 };
00966
00967 template<>
00968 class Attribute<VR::OB, VM::VM1> : public Attribute<VR::OB, VM::VM1_n> {};
00969 // Make it impossible to compile any other cases:
00970 template<int TVM> class Attribute<VR::OB, TVM>;
00971
00972 // Same for OW:
00973 template<>
00974 class Attribute<VR::OW, VM::VM1> : public Attribute<VR::OW, VM::VM1_n> {};
00975 // Make it impossible to compile any other cases:
00976 template<int TVM> class Attribute<VR::OW, TVM>;
00977 #endif
00978
00979 #if 0
00980 template<>
00981 class Attribute<0x7fe0,0x0010, VR::OW, VM::VM1>
00982 {
00983 public:
00984     char *Internal;
00985     unsigned long Length; // unsigned int ??
00986
00987     void Print(std::ostream &_os) const {
00988         _os << Internal[0];
00989     }
00990     void SetBytes(char *bytes, unsigned long length) {
00991         Internal = bytes;
00992         Length = length;
00993     }
00994     void Read(std::istream &_is) {
00995         uint16_t c[2];
00996         _is.read((char*)&c, 4);
00997         uint32_t l;
00998         _is.read((char*)&l, 4);
00999         Length = l;
01000         _is.read( Internal, Length );
01001     }
01002     void Write(std::ostream &_os) const {
01003         uint16_t c[] = {0x7fe0, 0x0010};
01004         _os.write((char*)&c, 4);
01005         _os.write((char*)&Length, 4);
01006         _os.write( Internal, Length );
01007     }
01008 };
01009 #endif
01010
01011 /*
01012 // Removing Attribute for SQ for now...
01013 template<uint16_t Group, uint16_t Element, typename SQA>
01014 class Attribute<Group,Element, VR::SQ, VM::VM1, SQA>
01015 {
01016 public:
01017     SQA sqa;
01018     void Print(std::ostream &_os) const {
01019         _os << Tag(Group,Element);
01020         sqa.Print(_os << std::endl << '\t');

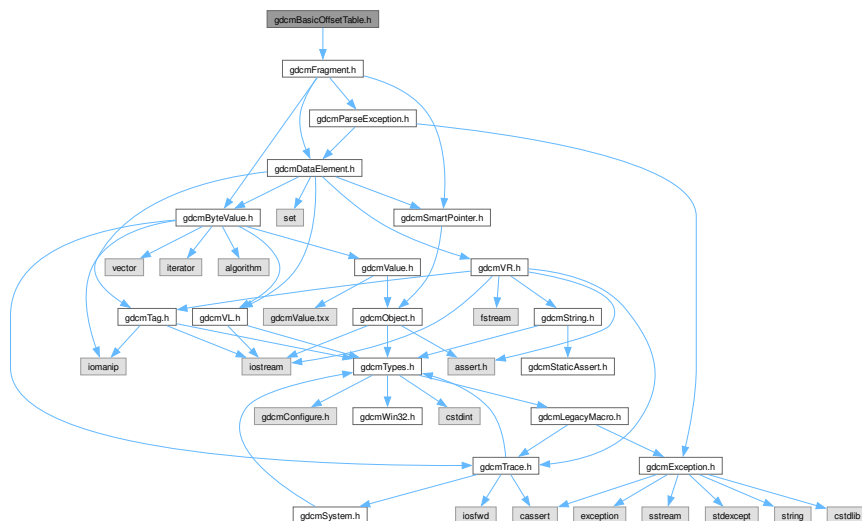
```

```

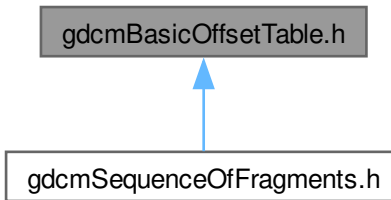
01021     }
01022     void Write(std::ostream &_os) const {
01023         uint16_t c[] = {Group, Element};
01024         _os.write((char*)c, 4);
01025         uint32_t undef = 0xffffffff;
01026         _os.write((char*)&undef, 4);
01027         uint16_t item_beg[] = {0xfffe, 0xe000};
01028         _os.write((char*)&item_beg, 4);
01029         _os.write((char*)&undef, 4);
01030         sqs.Write(_os);
01031         uint16_t item_end[] = {0xfffe, 0xe00d};
01032         _os.write((char*)&item_end, 4);
01033         uint32_t zero = 0x0;
01034         _os.write((char*)&zero, 4);
01035         uint16_t seq_end[] = {0xfffe, 0xe0dd};
01036         _os.write((char*)&seq_end, 4);
01037         _os.write((char*)&zero, 4);
01038     }
01039 };
01040 */
01041
01042
01043 } // namespace gdcm_ns
01044
01045 #endif //GDCMATTRIBUTE_H

```

```
#include "gdcmFragment.h"
Include dependency graph for gdcmBasicOffsetTable.h:
```



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcM::BasicOffsetTable](#)  
Class to represent a *BasicOffsetTable*.

## Namespaces

- namespace [gdcM](#)

## Functions

- `std::ostream & gdcM::operator<< (std::ostream &os, const BasicOffsetTable &val)`

## 13.112 gdcMBasicOffsetTable.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcM.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012  =====*/
00013
00014
00015  #ifndef GDCMBASICOFFSETTABLE_H
00016  #define GDCMBASICOFFSETTABLE_H
00017
00018  #include "gdcMFragment.h"
00019
00020  namespace gdcM_ns
00021  {
00025
  
```

```

00026 class GDCM_EXPORT BasicOffsetTable : public Fragment
00027 {
00028 //protected:
00029 // void SetTag(const Tag &t);
00030 public:
00031 BasicOffsetTable() : Fragment() {}
00032 friend std::ostream &operator<<(std::ostream &os, const BasicOffsetTable &val);
00033
00034 /*
00035 VL GetLength() const {
00036     assert( !ValueLengthField.IsUndefined() );
00037     assert( !ValueField || ValueField->GetLength() == ValueLengthField );
00038     return TagField.GetLength() + ValueLengthField.GetLength()
00039         + ValueLengthField;
00040 }
00041 */
00042
00043 template <typename TSwap>
00044 std::istream &Read(std::istream &is) {
00045     // Superclass
00046     const Tag itemStart(0xffff, 0xe000);
00047     if( !TagField.Read<TSwap>(is) )
00048     {
00049         assert(0 && "Should not happen");
00050         return is;
00051     }
00052     //assert( TagField == itemStart );
00053     if( TagField != itemStart )
00054     {
00055         // Bug_Siemens_PrivateIconNoItem.dcm
00056         //gdcmDebugMacro( "Could be Bug_Siemens_PrivateIconNoItem.dcm" );
00057         ParseException pe;
00058         pe.SetLastElement(*this);
00059         //throw "SIEMENS Icon thingy";
00060         throw pe;
00061     }
00062     if( !ValueLengthField.Read<TSwap>(is) )
00063     {
00064         assert(0 && "Should not happen");
00065         return is;
00066     }
00067     // Self
00068     SmartPointer<ByteValue> bv = new ByteValue;
00069     bv->SetLength(ValueLengthField);
00070     if( !bv->Read<TSwap>(is) )
00071     {
00072         gdcmAssertAlwaysMacro(0 && "Should not happen");
00073         return is;
00074     }
00075     ValueField = bv;
00076     return is;
00077 }
00078
00079 /*
00080 template <typename TSwap>
00081 std::ostream &Write(std::ostream &os) const {
00082     const Tag itemStart(0xffff, 0xe000);
00083     const Tag seqDelItem(0xffff, 0xe0dd);
00084     if( !TagField.Write<TSwap>(os) )
00085     {
00086         assert(0 && "Should not happen");
00087         return os;
00088     }
00089     assert( TagField == itemStart );
00090     if( !ValueLengthField.Write<TSwap>(os) )
00091     {
00092         assert(0 && "Should not happen");
00093         return os;
00094     }
00095     if( ValueLengthField )
00096     {
00097         // Self
00098         const ByteValue *bv = GetByteValue();
00099         assert( bv );
00100         assert( bv->GetLength() == ValueLengthField );
00101         if( !bv->Write<TSwap>(os) )
00102         {
00103             assert(0 && "Should not happen");
00104             return os;
00105         }
00106     }

```

```

00107     return os;
00108 }
00109 */
00110 };
00111 //-----
00112 inline std::ostream &operator<<(std::ostream &os, const BasicOffsetTable &val)
00113 {
00114     os << " BasicOffsetTable Length=" << val.ValueLengthField << std::endl;
00115     if( val.ValueField )
00116     {
00117         const ByteValue *bv = val.GetByteValue();
00118         assert( bv );
00119         os << *bv;
00120     }
00121 }
00122 return os;
00123 }
00124
00125
00126 } // end namespace gdcms_ns
00127
00128 #endif //GDCMBASICOFFSETTABLE_H

```

### 13.113 gdcmsByteBuffer.h File Reference

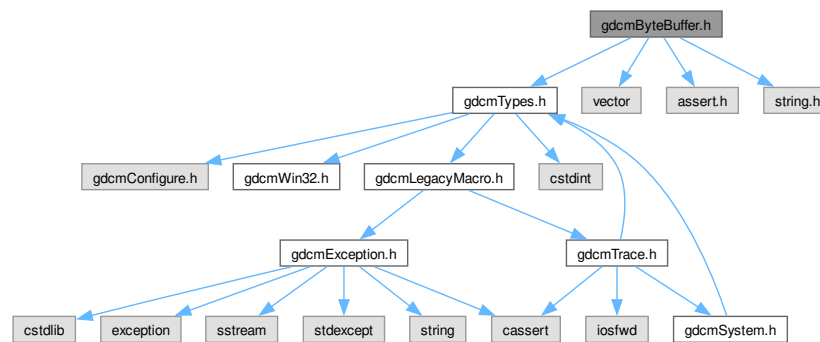
```
#include "gdcmsTypes.h"
```

```
#include <vector>
```

```
#include <assert.h>
```

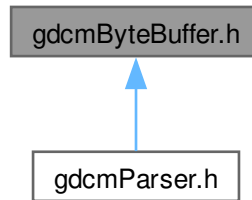
```
#include <string.h>
```

Include dependency graph for gdcmsByteBuffer.h:





This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::ByteBuffer`  
*ByteBuffer.*

## Namespaces

- namespace `gdcm`

## 13.114 gdcmByteBuffer.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMBYTEBUFFER_H
00015 #define GDCMBYTEBUFFER_H
00016
00017 #include "gdcmTypes.h"
00018 #include <vector>
00019 #include <assert.h>
00020 #include <string.h> // memmove
00021
00022 #error should not be used
00023
00024 namespace gdcm
00025 {
00034   class ByteBuffer
00035   {
00036   public:
00037     static const int InitBufferSize = 1024;
00038     ByteBuffer() : Start(0), End(0), Limit(0) {}
  
```

```

00039 char *Get(int len)
00040 {
00041     char *buffer = &Internal[0];
00042     if (len > Limit - End)
00043     {
00044         // FIXME avoid integer overflow
00045         int neededSize = len + (End - Start);
00046         if (neededSize <= Limit - buffer)
00047         {
00048             memmove(buffer, Start, End - Start);
00049             End = buffer + (End - Start);
00050             Start = buffer;
00051         }
00052     else
00053     {
00054         char *newBuf;
00055         int bufferSize = Limit - Start;
00056         if ( bufferSize == 0 )
00057         {
00058             bufferSize = InitBufferSize;
00059         }
00060         do
00061         {
00062             bufferSize *= 2;
00063         } while (bufferSize < neededSize);
00064         //newBuf = malloc(bufferSize);
00065         try
00066         {
00067             Internal.reserve(bufferSize);
00068             newBuf = &Internal[0];
00069         }
00070         catch(...)
00071         {
00072             //errorCode = NoMemoryError;
00073             return 0;
00074         }
00075         Limit = newBuf + bufferSize;
00076
00077         if (Start)
00078         {
00079             memcpy(newBuf, Start, End - Start);
00080         }
00081         End = newBuf + (End - Start);
00082         Start = /*buffer =*/ newBuf;
00083     }
00084 }
00085 assert( (int)Internal.capacity() >= len );
00086 return End;
00087 }
00088
00089 void UpdatePosition() {}
00090 void ShiftEnd(int len) {
00091     End += len;
00092 }
00093 const char *GetStart() const {
00094     return Start;
00095 }
00096
00097 private:
00098     typedef std::vector<char> CharVector;
00099     const char *Start;
00100     char *End;
00101     const char *Limit;
00102     CharVector Internal;
00103 };
00104
00105 } // end namespace gdcmm
00106
00107 #endif //GDCMBYTEBUFFER_H

```



```

00029 public:
00030     ByteSwapFilter(DataSet& ds):DS(ds),ByteSwapTag(false) {}
00031     ~ByteSwapFilter() = default;
00032     ByteSwapFilter(const ByteSwapFilter &) = delete;
00033     ByteSwapFilter& operator=(const ByteSwapFilter &) = delete;
00034
00035     bool ByteSwap();
00036     void SetByteSwapTag(bool b) { ByteSwapTag = b; }
00037
00038 private:
00039     DataSet &DS;
00040     bool ByteSwapTag;
00041
00042 };
00043
00044 } // end namespace gdcm
00045
00046 #endif //GDCMBYTESWAPFILTER_H

```

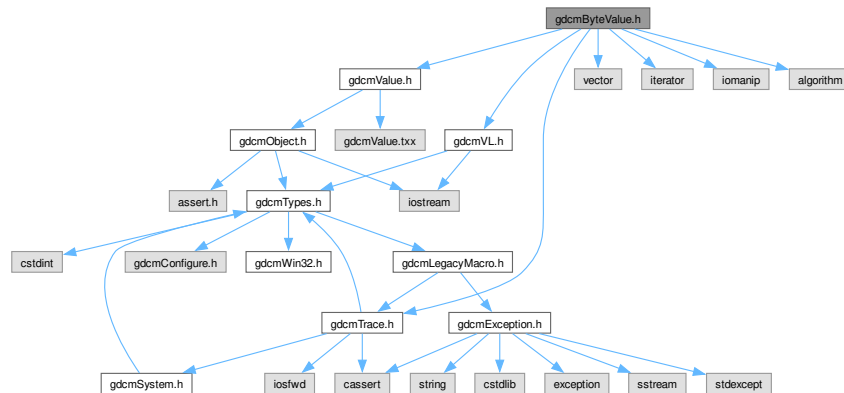
### 13.117 gdcmByteValue.h File Reference

```

#include "gdcmValue.h"
#include "gdcmTrace.h"
#include "gdcmVL.h"
#include <vector>
#include <iterator>
#include <iomanip>
#include <algorithm>

```

Include dependency graph for gdcmByteValue.h:



This graph shows which files directly or indirectly include this file:



#### Classes

- class [gdcm::ByteValue](#)  
Class to represent binary value (array of bytes).

## Namespaces

- namespace `gdcm`

## 13.118 gdcmByteValue.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMBYTEVALUE_H
00015 #define GDCMBYTEVALUE_H
00016
00017 #include "gdcmValue.h"
00018 #include "gdcmTrace.h"
00019 #include "gdcmVL.h"
00020
00021 #include <vector>
00022 #include <iterator>
00023 #include <iomanip>
00024 #include <algorithm>
00025
00026 namespace gdcm_ns
00027 {
00028   #if !defined(SWIGPYTHON) && !defined(SWIGSHARP) && !defined(SWIGJAVA) && !defined(SWIGPHP)
00029     using namespace gdcm;
00030   #endif
00031   class GDCM_EXPORT ByteValue : public Value
00032   {
00033   public:
00034     ByteValue(const char* array = nullptr, VL const &vl = 0):
00035       Internal(array, array+vl), Length(vl) {
00036         if( vl.IsOdd() )
00037         {
00038           gdcmDebugMacro( "Odd length" );
00039           Internal.resize(vl+1);
00040           ++Length;
00041         }
00042       }
00043
00044     ByteValue(std::vector<char> &v):Internal(v),Length((uint32_t)v.size()) {}
00045     //ByteValue(std::ostream const &os) {
00046     //  (void)os;
00047     //  assert(0); // TODO
00048     //}
00049     ~ByteValue() override {
00050       Internal.clear();
00051     }
00052
00053     // When 'dumping' dicom file we still have some information from
00054     // Either the VR: eg LO (private tag)
00055     void PrintASCII(std::ostream &os, VL maxlength) const;
00056
00057     void PrintHex(std::ostream &os, VL maxlength) const;
00058
00059     // Either from Element Number (== 0x0000)
00060     void PrintGroupLength(std::ostream &os) {
00061       assert( Length == 2 );
00062       (void)os;
00063     }
00064
00065     bool IsEmpty() const {
00066       #if 0

```

```

00071     if( Internal.empty() ) assert( Length == 0 );
00072     return Internal.empty();
00073 #else
00074     return Length == 0;
00075 #endif
00076 }
00077 VL GetLength() const override { return Length; }
00078
00079 VL ComputeLength() const { return Length + Length % 2; }
00080 // Does a reallocation
00081 void SetLength(VL vl) override;
00082
00083 operator const std::vector<char>& () const { return Internal; }
00084
00085 ByteValue &operator=(const ByteValue &val) {
00086     Internal = val.Internal;
00087     Length = val.Length;
00088     return *this;
00089 }
00090
00091 bool operator==(const ByteValue &val) const {
00092     if( Length != val.Length )
00093         return false;
00094     if( Internal == val.Internal )
00095         return true;
00096     return false;
00097 }
00098 bool operator==(const Value &val) const override
00099 {
00100     const ByteValue &bv = dynamic_cast<const ByteValue>(val);
00101     return Length == bv.Length && Internal == bv.Internal;
00102 }
00103
00104 void Append(ByteValue const & bv);
00105
00106 void Clear() override {
00107     Internal.clear();
00108 }
00109 // Use that only if you understand what you are doing
00110 const char *GetPointer() const {
00111     if(!Internal.empty()) return &Internal[0];
00112     return nullptr;
00113 }
00114 // Use that only if you really understand what you are doing
00115 const void *GetVoidPointer() const {
00116     if(!Internal.empty()) return &Internal[0];
00117     return nullptr;
00118 }
00119 void *GetVoidPointer() {
00120     if(!Internal.empty()) return &Internal[0];
00121     return nullptr;
00122 }
00123 void Fill(char c) {
00124     //if( Internal.empty() ) return;
00125     std::vector<char>::iterator it = Internal.begin();
00126     for(; it != Internal.end(); ++it) *it = c;
00127 }
00128 bool GetBuffer(char *buffer, unsigned long length) const;
00129 bool WriteBuffer(std::ostream &os) const {
00130     if( Length ) {
00131         //assert( Internal.size() <= Length );
00132         assert( !(Internal.size() % 2) );
00133         os.write(&Internal[0], Internal.size() );
00134     }
00135     return true;
00136 }
00137
00138 template <typename TSwap, typename TType>
00139 std::istream &Read(std::istream &is, bool readvalues = true) {
00140     // If Length is odd we have detected that in SetLength
00141     // and calling std::vector::resize make sure to allocate *AND*
00142     // initialize values to 0 so we are sure to have a \0 at the end
00143     // even in this case
00144     if(Length)
00145     {
00146         if( readvalues )
00147         {
00148             is.read(&Internal[0], Length);
00149             assert( Internal.size() == Length || Internal.size() == Length + 1 );
00150             TSwap::SwapArray((TType*)GetVoidPointer(), Internal.size() / sizeof(TType) );
00151         }
00152     }

```

```

00152         else
00153         {
00154             is.seekg(Length, std::ios::cur);
00155         }
00156     }
00157     return is;
00158 }
00159
00160 template <typename TSwap>
00161 std::istream &Read(std::istream &is) {
00162     return Read<TSwap,uint8_t>(is);
00163 }
00164
00165
00166 template <typename TSwap, typename TType>
00167 std::ostream const &Write(std::ostream &os) const {
00168     assert( !(Internal.size() % 2) );
00169     if( !Internal.empty() ) {
00170         //os.write(&Internal[0], Internal.size());
00171         std::vector<char> copy = Internal;
00172         TSwap::SwapArray( (TType*) (void*)&copy[0], Internal.size() / sizeof(TType) );
00173         os.write(&copy[0], copy.size());
00174     }
00175     return os;
00176 }
00177
00178 template <typename TSwap>
00179 std::ostream const &Write(std::ostream &os) const {
00180     return Write<TSwap,uint8_t>(os);
00181 }
00182
00183 bool IsPrintable(VL length) const {
00184     assert( length <= Length );
00185     for(unsigned int i=0; i<length; i++)
00186     {
00187         if ( i == (length-1) && Internal[i] == '\0' ) continue;
00188         if ( !( isprint((unsigned char)Internal[i]) || isspace((unsigned char)Internal[i]) ) )
00189         {
00190             //gdcmWarningMacro( "Cannot print : " << i );
00191             return false;
00192         }
00193     }
00194     return true;
00195 }
00196
00197 void PrintPNXML(std::ostream &os) const;
00198 void PrintASCIIXML(std::ostream &os) const;
00199 void PrintHexXML(std::ostream &os) const;
00200
00201 protected:
00202 void Print(std::ostream &os) const override {
00203     // This is perfectly valid to have a Length = 0 , so we cannot check
00204     // the length for printing
00205     if( !Internal.empty() )
00206     {
00207         if( IsPrintable(Length) )
00208         {
00209             // WARNING: Internal.end() != Internal.begin()+Length
00210             std::vector<char>::size_type length = Length;
00211             if( Internal.back() == 0 ) --length;
00212             std::copy(Internal.begin(), Internal.begin()+length,
00213                 std::ostream_iterator<char>(os));
00214         }
00215         else
00216             os << "Loaded:" << Internal.size();
00217     }
00218     else
00219     {
00220         //os << "Not Loaded";
00221         os << "(no value available)";
00222     }
00223 }
00224
00225 /*
00226 //Introduce check for invalid XML characters
00227 friend std::ostream& operator<<(std::ostream &os,const char c);
00228 */
00229 void SetLengthOnly(VL vl) override {
00230     Length = vl;
00231 }
00232
00233 private:

```

```

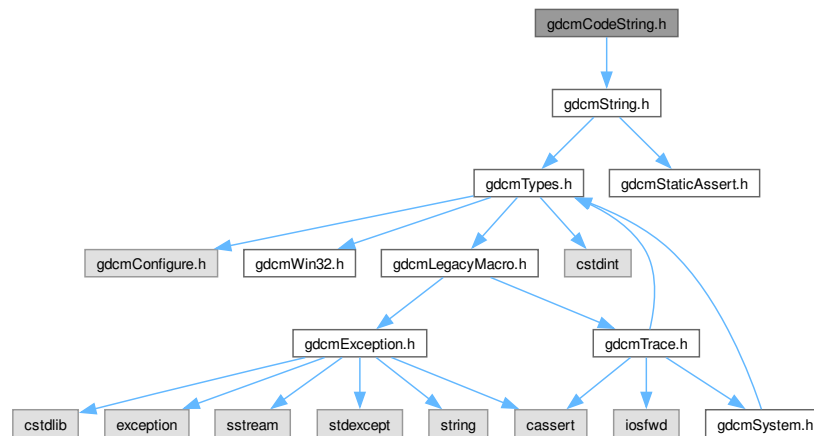
00240     std::vector<char> Internal;
00241
00242     // WARNING Length IS NOT Internal.size() some *featured* DICOM
00243     // implementation define odd length, we always load them as even number
00244     // of byte, so we need to keep the right Length
00245     VL Length;
00246 };
00247
00248 } // end namespace gdcM_ns
00249
00250 #endif //GDCMBYTEVALUE_H

```

## 13.119 gdcMCodeString.h File Reference

```
#include "gdcMString.h"
```

Include dependency graph for gdcMCodeString.h:



### Classes

- class [gdcM::CodeString](#)  
*CodeString.*

### Namespaces

- namespace [gdcM](#)

### Functions

- bool [gdcM::operator!=](#) (const [CodeString](#) &ref, const [CodeString](#) &cs)
- std::ostream & [gdcM::operator<<](#) (std::ostream &os, const [CodeString](#) &str)
- bool [gdcM::operator==](#) (const [CodeString](#) &ref, const [CodeString](#) &cs)



## 13.120 gdcmCodeString.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCODESTRING_H
00015 #define GDCMCODESTRING_H
00016
00017 #include "gdcmString.h"
00018
00019 namespace gdcm
00020 {
00021
00022 // Note to myself: because not all wrapped language support exception
00023 // we could not support throwing an exception during object construction.
00024 class GDCM_EXPORT CodeString
00025 {
00026     friend std::ostream& operator<< (std::ostream& os, const CodeString& str);
00027     friend bool operator==(const CodeString &ref, const CodeString& cs);
00028     friend bool operator!=(const CodeString &ref, const CodeString& cs);
00029     typedef String<'\\',16> InternalClass;
00030 public:
00031     typedef InternalClass::value_type      value_type;
00032     typedef InternalClass::pointer         pointer;
00033     typedef InternalClass::reference       reference;
00034     typedef InternalClass::const_reference const_reference;
00035     typedef InternalClass::size_type      size_type;
00036     typedef InternalClass::difference_type difference_type;
00037     typedef InternalClass::iterator       iterator;
00038     typedef InternalClass::const_iterator const_iterator;
00039     typedef InternalClass::reverse_iterator reverse_iterator;
00040     typedef InternalClass::const_reverse_iterator const_reverse_iterator;
00041
00042     CodeString(): Internal() {}
00043     CodeString(const value_type* s): Internal(s) { Internal = Internal.Trim(); }
00044     CodeString(const value_type* s, size_type n): Internal(s, n) {
00045         Internal = Internal.Trim(); }
00046     CodeString(const InternalClass& s, size_type pos=0, size_type n=InternalClass::npos):
00047         Internal(s, pos, n) { Internal = Internal.Trim(); }
00048
00049     bool IsValid() const;
00050
00051     std::string GetAsString() const {
00052         return Internal;
00053     }
00054
00055     size_type Size() const { return Internal.size(); }
00056
00057 protected:
00058     std::string TrimInternal() const {
00059         return Internal.Trim();
00060     }
00061
00062 private:
00063     String<'\\',16> Internal;
00064 };
00065
00066 inline std::ostream& operator<< (std::ostream& os, const CodeString& str)
00067 {
00068     os << str.Internal;
00069     return os;
00070 }
00071
00072 inline bool operator==(const CodeString &ref, const CodeString& cs)
00073 {
00074     return ref.Internal == cs.Internal;
00075 }
00076

```

### 13.121 gdcMCP246ExplicitDataElement.h File Reference

- class `gdcm::CP246ExplicitDataElement`  
*Class to read/write a [DataElement](#) as CP246Explicit Data [Element](#).*

- namespace **gdcm**

```
00001 /*****
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
```

```

00004
00005 Copyright (c) 2006-2011 Mathieu Malaterre
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00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCP246EXPLICITDATAELEMENT_H
00015 #define GDCMCP246EXPLICITDATAELEMENT_H
00016
00017 #include "gdcmDataElement.h"
00018
00019 namespace gdcm
00020 {
00021 // Data Element (CP246Explicit)
00027 class GDCM_EXPORT CP246ExplicitDataElement : public DataElement
00028 {
00029 public:
00030     VL GetLength() const;
00031
00032     template <typename TSwap>
00033     std::istream &Read(std::istream &is);
00034
00035     template <typename TSwap>
00036     std::istream &ReadPreValue(std::istream &is);
00037
00038     template <typename TSwap>
00039     std::istream &ReadValue(std::istream &is, bool readvalues = true);
00040
00041     template <typename TSwap>
00042     std::istream &ReadWithLength(std::istream &is, VL & length);
00043
00044     // PURPOSELY do not provide an implementation for writing !
00045     //template <typename TSwap>
00046     //const std::ostream &Write(std::ostream &os) const;
00047 };
00048
00049 } // end namespace gdcm
00050
00051 #include "gdcmCP246ExplicitDataElement.txx"
00052
00053 #endif //GDCMCP246EXPLICITDATAELEMENT_H

```

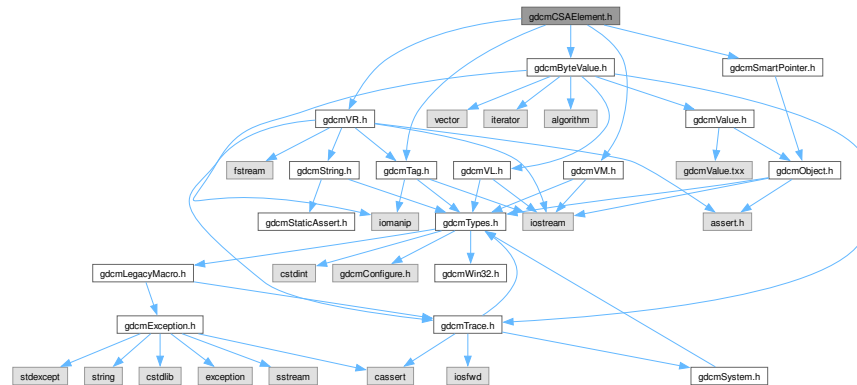
## 13.123 gdcmCSAElement.h File Reference

```

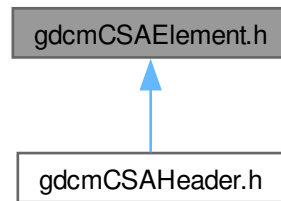
#include "gdcmTag.h"
#include "gdcmVM.h"
#include "gdcmVR.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"

```

Include dependency graph for `gdcmCSAElement.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::CSAElement`  
*Class to represent a CSA [Element](#).*

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const CSAElement &val)`

## 13.124 gdcmCSAElement.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCSAELEMENT_H
00015 #define GDCMCSAELEMENT_H
00016
00017 #include "gdcmTag.h"
00018 #include "gdcmVM.h"
00019 #include "gdcmVR.h"
00020 #include "gdcmByteValue.h"
00021 #include "gdcmSmartPointer.h"
00022
00023 namespace gdcm
00024 {
00025     class GDCM_EXPORT CSAElement
00026     {
00027     public:
00028         CSAElement(unsigned int kf = 0):KeyField(kf) {}
00029
00030         friend std::ostream& operator<<(std::ostream &os, const CSAElement &val);
00031
00032         unsigned int GetKey() const { return KeyField; }
00033         void SetKey(unsigned int key) { KeyField = key; }
00034
00035         const char *GetName() const { return NameField.c_str(); }
00036         void SetName(const char *name) { NameField = name; }
00037
00038         const VM& GetVM() const { return ValueMultiplicityField; }
00039         void SetVM(const VM &vm) { ValueMultiplicityField = vm; }
00040
00041         VR const &GetVR() const { return VRField; }
00042         void SetVR(VR const &vr) { VRField = vr; }
00043
00044         unsigned int GetSyngoDT() const { return SyngoDTField; }
00045         void SetSyngoDT(unsigned int syngodt) { SyngoDTField = syngodt; }
00046
00047         unsigned int GetNoOfItems() const { return NoOfItemsField; }
00048         void SetNoOfItems(unsigned int items) { NoOfItemsField = items; }
00049
00050         Value const &GetValue() const { return *DataField; }
00051         Value &GetValue() { return *DataField; }
00052         void SetValue(Value const &vl) {
00053             //assert( DataField == 0 );
00054             DataField = vl;
00055         }
00056         bool IsEmpty() const { return DataField == nullptr; }
00057
00058         void SetByteValue(const char *array, VL length)
00059         {
00060             ByteValue *bv = new ByteValue(array,length);
00061             SetValue( *bv );
00062         }
00063         const ByteValue* GetByteValue() const {
00064             // Get the raw pointer from the gdcm::SmartPointer
00065             const ByteValue *bv = dynamic_cast<const ByteValue*>(DataField.GetPointer());
00066             return bv; // Will return NULL if not ByteValue
00067         }
00068
00069         CSAElement(const CSAElement &_val)
00070         {
00071             if( this != &_amp;_val)
00072             {
00073                 *this = _val;
00074             }
00075         }
00076     };

```

```

00091
00092 bool operator<(const CSAElement &de) const
00093 {
00094     return GetKey() < de.GetKey();
00095 }
00096 CSAElement &operator=(const CSAElement &de)
00097     = default;
00098
00099 bool operator==(const CSAElement &de) const
00100 {
00101     return KeyField == de.KeyField
00102         && NameField == de.NameField
00103         && ValueMultiplicityField == de.ValueMultiplicityField
00104         && VRField == de.VRField
00105         && SyngoDTField == de.SyngoDTField
00106         //&& ValueField == de.ValueField;
00107     ;
00108 }
00109
00110 protected:
00111     unsigned int KeyField;
00112     std::string NameField;
00113     VM ValueMultiplicityField;
00114     VR VRField;
00115     unsigned int SyngoDTField;
00116     unsigned int NoOfItemsField;
00117     typedef SmartPointer<Value> DataPtr;
00118     DataPtr DataField;
00119 };
00120 //-----
00121 inline std::ostream& operator<(std::ostream &os, const CSAElement &val)
00122 {
00123     os << val.KeyField;
00124     os << " - '" << val.NameField;
00125     os << "' VM " << val.ValueMultiplicityField;
00126     os << ", VR " << val.VRField;
00127     os << ", SyngoDT " << val.SyngoDTField;
00128     os << ", NoOfItems " << val.NoOfItemsField;
00129     os << ", Data ";
00130     if( val.DataField )
00131     {
00132         //val.DataField->Print( os << "' " );
00133         const ByteValue * bv = dynamic_cast<ByteValue*>(&*val.DataField);
00134         assert( bv );
00135         const char * p = bv->GetPointer();
00136         std::string str(p, p + bv->GetLength() );
00137         if( val.ValueMultiplicityField == VM::VM1 )
00138         {
00139             os << "' " << str.c_str() << "' ";
00140         }
00141         else
00142         {
00143             std::istringstream is( str );
00144             std::string s;
00145             bool sep = false;
00146             while( std::getline(is, s, '\\') )
00147             {
00148                 if( sep )
00149                 {
00150                     os << '\\';
00151                 }
00152                 sep = true;
00153                 os << "' " << s.c_str() << "' ";
00154             }
00155             //bv->Print( os << "' " );
00156             //os << "' ";
00157         }
00158     }
00159     return os;
00160 }
00161
00162 } // end namespace gdcmm
00163
00164 #endif //GDCMCSAELEMENT_H

```



```

00011     PURPOSE.  See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCSAHEADER_H
00015 #define GDCMCSAHEADER_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmDataSet.h"
00019 #include "gdcmCSAElement.h"
00020 #include "gdcmMrProtocol.h"
00021
00022 namespace gdcm
00023 {
00024 /*
00025  * Everything done in this code is for the sole purpose of writing interoperable
00026  * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
00027  * If you believe anything in this code violates any law or any of your rights,
00028  * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
00029  * find a solution.
00030  */
00031 //-----
00032
00033 class DataElement;
00034 class PrivateTag;
00063 class GDCM_EXPORT CSAHeader
00064 {
00065     friend std::ostream& operator<<(std::ostream &_os, const CSAHeader &d);
00066 public :
00067     CSAHeader():InternalDataSet(),InternalType(UNKNOWN),InterfileData(nullptr) {}
00068     ~CSAHeader() = default;
00069
00071     typedef enum {
00072         UNKNOWN = 0,
00073         SV10,
00074         NOMAGIC,
00075         DATASET_FORMAT,
00076         INTERFILE,
00077         ZEROED_OUT
00078     } CSAHeaderType;
00079
00081     bool LoadFromDataElement(DataElement const &de);
00082
00084     void Print(std::ostream &os) const;
00085
00087     const DataSet& GetDataSet() const { return InternalDataSet; }
00088
00090     const char * GetInterfile() const { return InterfileData; }
00091
00094     CSAHeaderType GetFormat() const;
00095
00098     static const PrivateTag & GetCSAImageHeaderInfoTag();
00099
00102     static const PrivateTag & GetCSASeriesHeaderInfoTag();
00103
00106     static const PrivateTag & GetCSADataInfo();
00107
00110     const CSAElement &GetCSAElementByName(const char *name);
00111
00114     bool FindCSAElementByName(const char *name);
00115
00117     bool GetMrProtocol( const DataSet & ds, MrProtocol & mrProtocol );
00118
00119 protected:
00120     const CSAElement& GetCSAEnd() const;
00121
00122 private:
00123     std::set<CSAElement> InternalCSADataSet;
00124     DataSet InternalDataSet;
00125     CSAHeaderType InternalType;
00126     Tag DataElementTag;
00127     static CSAElement CSAEEnd;
00128     const char *InterfileData;
00129 };
00130 //-----
00131 inline std::ostream& operator<<(std::ostream &os, const CSAHeader &d)
00132 {
00133     d.Print( os );
00134     return os;
00135 }
00136
00137 } // end namespace gdcm

```

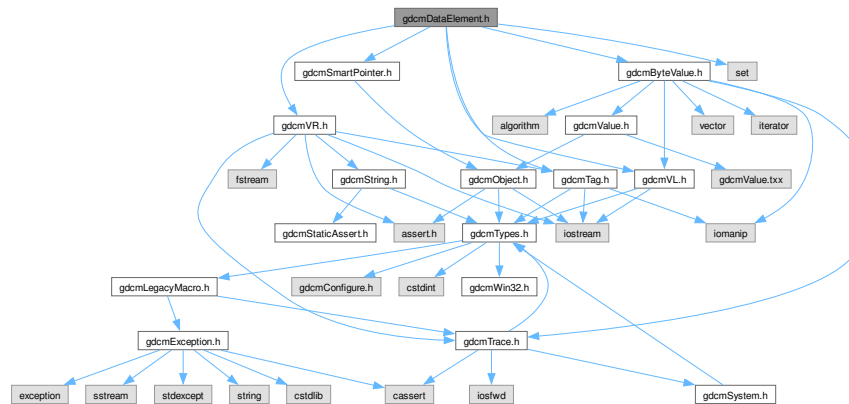


```
00138 //-----
00139 #endif //GDCMCSAHEADER_H
```

## 13.127 gdcmDataElement.h File Reference

```
#include "gdcmTag.h"
#include "gdcmVL.h"
#include "gdcmVR.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"
#include <set>
```

Include dependency graph for gdcmDataElement.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::DataElement](#)  
Class to represent a Data [Element](#) either *Implicit* or *Explicit*.

### Namespaces

- namespace [gdcm](#)

## Functions

- bool `gdcm::operator!=` (const `DataElement` &lhs, const `DataElement` &rhs)
- `std::ostream` & `gdcm::operator<<` (`std::ostream` &os, const `DataElement` &val)

## 13.128 gdcmDataElement.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMDATAELEMENT_H
00015 #define GDCMDATAELEMENT_H
00016
00017 #include "gdcmTag.h"
00018 #include "gdcmVL.h"
00019 #include "gdcmVR.h"
00020 #include "gdcmByteValue.h"
00021 #include "gdcmSmartPointer.h"
00022
00023 #include <set>
00024
00025 namespace gdcm_ns
00026 {
00027     // Data Element
00028     // Contains multiple fields:
00029     // -> Tag
00030     // -> Optional VR (Explicit Transfer Syntax)
00031     // -> ValueLength
00032     // -> Value
00033     // TODO: This class SHOULD be pure virtual. I don't want a user
00034     // to shoot himself in the foot.
00035
00036     class SequenceOfItems;
00037     class SequenceOfFragments;
00038     class GDCM_EXPORT DataElement
00039     {
00040     public:
00041         DataElement(const Tag& t = Tag(0), const VL& vl = 0, const VR &vr =
VR::INVALID):TagField(t),ValueLengthField(vl),VRField(vr),ValueField(nullptr) {}
00042         //DataElement( Attribute const &att );
00043
00044         friend std::ostream& operator<<(std::ostream &_os, const DataElement &_val);
00045
00046         const Tag& GetTag() const { return TagField; }
00047         Tag& GetTag() { return TagField; }
00048         void SetTag(const Tag &t) { TagField = t; }
00049
00050         const VL& GetVL() const { return ValueLengthField; }
00051         VL& GetVL() { return ValueLengthField; }
00052         void SetVL(const VL &vl) { ValueLengthField = vl; }
00053         void SetVLToUndefined();
00054
00055         VR const &GetVR() const { return VRField; }
00056         void SetVR(VR const &vr) {
00057             if( vr.IsVRFile() )
00058                 VRField = vr;
00059         }
00060
00061         Value const &GetValue() const { gdcmAssertAlwaysMacro(ValueField); return *ValueField; }
00062         Value &GetValue() {
00063             gdcmAssertAlwaysMacro(ValueField);
00064             return *ValueField;
00065         }
00066     };
00067
00068 }
00069
00070 #endif

```

```

00098     }
00100     void SetValue(Value const & v1) {
00101         //assert( ValueField == 0 );
00102         ValueField = v1;
00103         ValueLengthField = v1.GetLength();
00104     }
00106     bool IsEmpty() const { return ValueField == nullptr || (GetByteValue() && GetByteValue()->IsEmpty()); }
00107
00109     void Empty() { ValueField = nullptr; ValueLengthField = 0; }
00110
00112     void Clear()
00113     {
00114         TagField = 0;
00115         VRField = VR::INVALID;
00116         ValueField = nullptr;
00117         ValueLengthField = 0;
00118     }
00119
00120     // Helper:
00126     void SetByteValue(const char *array, VL length)
00127     {
00128         ByteValue *bv = new ByteValue(array,length);
00129         SetValue( *bv );
00130     }
00133     const ByteValue* GetByteValue() const {
00134         // Get the raw pointer from the gdcm::SmartPointer
00135         const ByteValue *bv = dynamic_cast<const ByteValue*>(ValueField.GetPointer());
00136         return bv; // Will return NULL if not ByteValue
00137     }
00138
00145     SmartPointer<SequenceOfItems> GetValueAsSQ() const;
00146
00149     const SequenceOfFragments* GetSequenceOfFragments() const;
00150     SequenceOfFragments* GetSequenceOfFragments();
00151
00153     bool IsUndefinedLength() const {
00154         return ValueLengthField.IsUndefined();
00155     }
00156
00157     DataElement(const DataElement &_val)
00158     {
00159         if( this != &_amp;_val)
00160         {
00161             *this = _val;
00162         }
00163     }
00164
00165     bool operator<(const DataElement &de) const
00166     {
00167         return GetTag() < de.GetTag();
00168     }
00169     DataElement &operator=(const DataElement &)
00170     = default;
00171
00172     bool operator==(const DataElement &de) const
00173     {
00174         bool b = TagField == de.TagField
00175             && ValueLengthField == de.ValueLengthField
00176             && VRField == de.VRField;
00177         if( !ValueField && !de.ValueField )
00178         {
00179             return b;
00180         }
00181         if( ValueField && de.ValueField )
00182         {
00183             return b && (*ValueField == *de.ValueField);
00184         }
00185         // ValueField != de.ValueField
00186         return false;
00187     }
00188
00189     // The following functionalities are dependent on:
00190     // # The Transfer Syntax: Explicit or Implicit
00191     // # The Byte encoding: Little Endian / Big Endian
00192
00193     /*
00194     * The following was inspired by a C++ idiom: Curiously Recurring Template Pattern
00195     * Ref: http://en.wikipedia.org/wiki/Curiously\_Recurring\_Template\_Pattern
00196     * The typename TDE is typically a derived class *without* any data
00197     * while TSwap is a simple template parameter to achieve byteswapping (and allow factorization of
00198     * highly identical code)

```

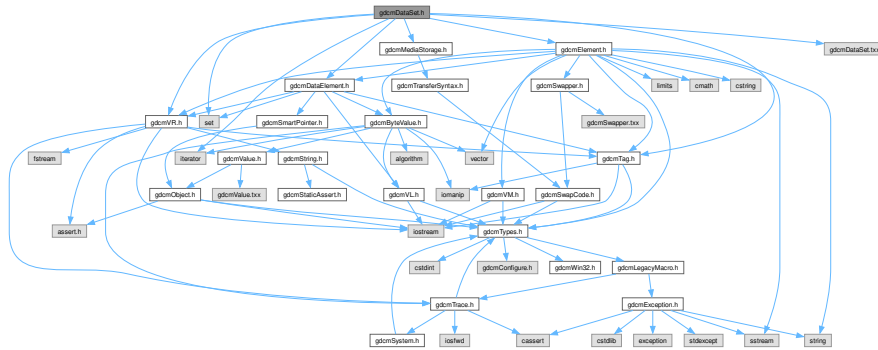
```

00199     */
00200     template <typename TDE>
00201     VL GetLength() const {
00202         return static_cast<const TDE*>(this)->GetLength();
00203     }
00204
00205     template <typename TDE, typename TSwap>
00206     std::istream &Read(std::istream &is) {
00207         return static_cast<TDE*>(this)->template Read<TSwap>(is);
00208     }
00209
00210     template <typename TDE, typename TSwap>
00211     std::istream &ReadOrSkip(std::istream &is, std::set<Tag> const &skiptags) {
00212         (void)skiptags;
00213         return static_cast<TDE*>(this)->template Read<TSwap>(is);
00214     }
00215
00216     template <typename TDE, typename TSwap>
00217     std::istream &ReadPreValue(std::istream &is, std::set<Tag> const &skiptags) {
00218         (void)skiptags;
00219         return static_cast<TDE*>(this)->template ReadPreValue<TSwap>(is);
00220     }
00221     template <typename TDE, typename TSwap>
00222     std::istream &ReadValue(std::istream &is, std::set<Tag> const &skiptags) {
00223         (void)skiptags;
00224         return static_cast<TDE*>(this)->template ReadValue<TSwap>(is);
00225     }
00226     template <typename TDE, typename TSwap>
00227     std::istream &ReadValueWithLength(std::istream &is, VL & length, std::set<Tag> const &skiptags) {
00228         (void)skiptags;
00229         return static_cast<TDE*>(this)->template ReadValueWithLength<TSwap>(is, length);
00230     }
00231
00232     template <typename TDE, typename TSwap>
00233     std::istream &ReadWithLength(std::istream &is, VL &length) {
00234         return static_cast<TDE*>(this)->template ReadWithLength<TSwap>(is, length);
00235     }
00236
00237     template <typename TDE, typename TSwap>
00238     const std::ostream &Write(std::ostream &os) const {
00239         return static_cast<const TDE*>(this)->template Write<TSwap>(os);
00240     }
00241
00242 protected:
00243     Tag TagField;
00244     // This is the value read from the file, might be different from the length of Value Field
00245     VL ValueLengthField; // Can be 0xFFFFFFFF
00246
00247     // Value Representation
00248     VR VRField;
00249     typedef SmartPointer<Value> ValuePtr;
00250     ValuePtr ValueField;
00251
00252     void SetValueFieldLength( VL vl, bool readvalues );
00253 };
00254 //-----
00255 inline std::ostream& operator<<(std::ostream &os, const DataElement &val)
00256 {
00257     os << val.TagField;
00258     os << "\t" << val.VRField;
00259     os << "\t" << val.ValueLengthField;
00260     if( val.ValueField )
00261     {
00262         val.ValueField->Print( os << "\t" );
00263     }
00264     return os;
00265 }
00266
00267 inline bool operator!=(const DataElement& lhs, const DataElement& rhs)
00268 {
00269     return ! ( lhs == rhs );
00270 }
00271
00272 } // end namespace gdcms
00273
00274 #endif //GDCMDATAELEMENT_H

```

## 13.129 gdcmDataSet.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmTag.h"
#include "gdcmVR.h"
#include "gdcmElement.h"
#include "gdcmMediaStorage.h"
#include <set>
#include <iterator>
#include "gdcmDataSet.txx"
Include dependency graph for gdcmDataSet.h:
```



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::DataElementException](#)
- class [gdcm::DataSet](#)

*Class to represent a Data Set (which contains Data Elements).*

### Namespaces

- namespace [gdcm](#)

### Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &os, const [DataSet](#) &val)

## 13.130 gdcmDataSet.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMDATASET_H
00015  #define GDCMDATASET_H
00016
00017  #include "gdcmDataElement.h"
00018  #include "gdcmTag.h"
00019  #include "gdcmVR.h"
00020  #include "gdcmElement.h"
00021  #include "gdcmMediaStorage.h"
00022
00023  #include <set>
00024  #include <iterator>
00025
00026  namespace gdcm_ns
00027  {
00028  class GDCM_EXPORT DataElementException : public std::exception {};
00029
00030  class PrivateTag;
00055  class GDCM_EXPORT DataSet
00056  {
00057  friend class CSAHeader;
00058  public:
00059  typedef std::set<DataElement> DataElementSet;
00060  typedef DataElementSet::const_iterator ConstIterator;
00061  typedef DataElementSet::iterator Iterator;
00062  typedef DataElementSet::size_type SizeType;
00063  //typedef typename DataElementSet::iterator iterator;
00064  ConstIterator Begin() const { return DES.begin(); }
00065  Iterator Begin() { return DES.begin(); }
00066  ConstIterator End() const { return DES.end(); }
00067  Iterator End() { return DES.end(); }
00068  const DataElementSet &GetDES() const { return DES; }
00069  DataElementSet &GetDES() { return DES; }
00070  void Clear() {
00071  DES.clear();
00072  assert( DES.empty() );
00073  }
00074
00075  SizeType Size() const {
00076  return DES.size();
00077  }
00078
00079  void Print(std::ostream &os, std::string const &indent = "") const {
00080  // CT_Phillips_JPEG2K_Decompr_Problem.dcm has a SQ of length == 0
00081  //int s = DES.size();
00082  //assert( s );
00083  //std::copy(DES.begin(), DES.end(),
00084  // std::ostream_iterator<DataElement>(os, "\n"));
00085  ConstIterator it = DES.begin();
00086  for( ; it != DES.end(); ++it)
00087  {
00088  os << indent << *it << "\n";
00089  }
00090  }
00091
00092  template <typename TDE>
00093  unsigned int ComputeGroupLength(Tag const &tag) const
00094  {
00095  assert( tag.GetElement() == 0x0 );
00096  const DataElement r(tag);
00097  ConstIterator it = DES.find(r);
00098  unsigned int res = 0;
00099  for( ++it; it != DES.end()

```

```

00100     && it->GetTag().GetGroup() == tag.GetGroup(); ++it)
00101     {
00102         assert( it->GetTag().GetElement() != 0x0 );
00103         assert( it->GetTag().GetGroup() == tag.GetGroup() );
00104         res += it->GetLength<TDE>();
00105     }
00106     return res;
00107 }
00108
00109 template <typename TDE>
00110 VL GetLength() const {
00111     if( DES.empty() ) return 0;
00112     assert( !DES.empty() );
00113     VL ll = 0;
00114     assert( ll == 0 );
00115     ConstIterator it = DES.begin();
00116     for( ; it != DES.end(); ++it)
00117     {
00118         assert( !(it->GetLength<TDE>().IsUndefined()) );
00119         if ( it->GetTag() != Tag(0xfffe,0xe00d) )
00120         {
00121             ll += it->GetLength<TDE>();
00122         }
00123     }
00124     return ll;
00125 }
00126 void Insert(const DataElement& de) {
00127     // FIXME: there is a special case where a dataset can have value < 0x8, see:
00128     // $ gdcmdump --csa gdcmData/SIEMENS-JPEG-CorruptFrag.dcm
00129     if( de.GetTag().GetGroup() >= 0x0008 || de.GetTag().GetGroup() == 0x4 )
00130     {
00131         // prevent user error:
00132         if( de.GetTag() == Tag(0xfffe,0xe00d)
00133            || de.GetTag() == Tag(0xfffe,0xe0dd)
00134            || de.GetTag() == Tag(0xfffe,0xe000) )
00135         {
00136             // do nothing
00137         }
00138         else
00139         {
00140             InsertDataElement( de );
00141         }
00142     }
00143     else
00144     {
00145         gdcmErrorMacro( "Cannot add element with group < 0x0008 and != 0x4 in the dataset: " « de.GetTag()
00146     );
00147     }
00148 }
00149 void Replace(const DataElement& de) {
00150     ConstIterator it = DES.find(de);
00151     if( it != DES.end() )
00152     {
00153         // detect loop:
00154         gdcmAssertAlwaysMacro( &*it != &de );
00155         DES.erase(it);
00156     }
00157     DES.insert(de);
00158 }
00159 void ReplaceEmpty(const DataElement& de) {
00160     ConstIterator it = DES.find(de);
00161     if( it != DES.end() && it->IsEmpty() )
00162     {
00163         // detect loop:
00164         gdcmAssertAlwaysMacro( &*it != &de );
00165         DES.erase(it);
00166     }
00167     DES.insert(de);
00168 }
00169 SizeType Remove(const Tag& tag) {
00170     DataElementSet::size_type count = DES.erase(tag);
00171     assert( count == 0 || count == 1 );
00172     return count;
00173 }
00174 //DataElement& GetDataElement(const Tag &t) {
00175 //    DataElement r(t);
00176 //    Iterator it = DES.find(r);
00177 //    if( it != DES.end() )
00178 //        return *it;
00179 //    return GetDEEnd();
00180 // }

```

```

00188     const DataElement& GetDataElement(const Tag &t) const {
00189         const DataElement r(t);
00190         ConstIterator it = DES.find(r);
00191         if( it != DES.end() )
00192             return *it;
00193         return GetDEEnd();
00194     }
00195     const DataElement& operator[] (const Tag &t) const { return GetDataElement(t); }
00196     const DataElement& operator() (uint16_t group, uint16_t element) const { return GetDataElement(
Tag(group,element) ); }
00197
00200     std::string GetPrivateCreator(const Tag &t) const;
00201
00202     PrivateTag GetPrivateTag(const Tag &t) const;
00203
00204
00206     bool FindDataElement(const PrivateTag &t) const;
00208     const DataElement& GetDataElement(const PrivateTag &t) const;
00209
00210     // DUMB: this only search within the level of the current DataSet
00211     bool FindDataElement(const Tag &t) const {
00212         const auto it = GetDataElement(t);
00213         // Return if tag is found
00214         return it != GetDEEnd();
00215     }
00216
00217     // WARNING:
00218     // This only search at the same level as the DataSet is !
00219     const DataElement& FindNextDataElement(const Tag &t) const {
00220         const DataElement r(t);
00221         ConstIterator it = DES.lower_bound(r);
00222         if( it != DES.end() )
00223             return *it;
00224         return GetDEEnd();
00225     }
00226
00228     bool IsEmpty() const { return DES.empty(); }
00229
00230     DataSet& operator=(DataSet const &)
00231     = default;
00232
00233     template <typename TDE, typename TSwap>
00234     std::istream &ReadNested(std::istream &is);
00235
00236     template <typename TDE, typename TSwap>
00237     std::istream &Read(std::istream &is);
00238
00239     template <typename TDE, typename TSwap>
00240     std::istream &ReadUpToTag(std::istream &is, const Tag &t, std::set<Tag> const &skiptags);
00241
00242     template <typename TDE, typename TSwap>
00243     std::istream &ReadUpToTagWithLength(std::istream &is, const Tag &t, std::set<Tag> const &skiptags, VL &
length);
00244
00245     template <typename TDE, typename TSwap>
00246     std::istream &ReadSelectedTags(std::istream &is, const std::set<Tag> &tags, bool readvalues = true);
00247     template <typename TDE, typename TSwap>
00248     std::istream &ReadSelectedTagsWithLength(std::istream &is, const std::set<Tag> &tags, VL &length, bool
readvalues = true);
00249
00250     template <typename TDE, typename TSwap>
00251     std::istream &ReadSelectedPrivateTags(std::istream &is, const std::set<PrivateTag> &tags, bool
readvalues = true);
00252     template <typename TDE, typename TSwap>
00253     std::istream &ReadSelectedPrivateTagsWithLength(std::istream &is, const std::set<PrivateTag> &tags, VL
&length, bool readvalues = true);
00254
00255     template <typename TDE, typename TSwap>
00256     std::ostream const &Write(std::ostream &os) const;
00257
00258     template <typename TDE, typename TSwap>
00259     std::istream &ReadWithLength(std::istream &is, VL &length);
00260
00261     MediaStorage GetMediaStorage() const;
00262
00263 protected:
00264     /* GetDEEnd is a Win32 only issue, one cannot use a dllexported
00265     * static member data in an inline function, otherwise symbol
00266     * will get reported as missing in any dll using the inlined function
00267     */
00268     const DataElement& GetDEEnd() const;
00269

```



```

00270 // This function is not safe, it does not check for the value of the tag
00271 // so depending whether we are getting called from a dataset or file meta header
00272 // the condition is different
00273 void InsertDataElement(const DataElement& de) {
00274     //if( de.GetTag() == Tag(0xffff,0xe00d) ) return;
00275     //if( de.GetTag() == Tag(0xffff,0xe0dd) ) return;
00276 #ifndef NDEBUG
00277     std::pair<Iterator,bool> pr = DES.insert(de);
00278     if( pr.second == false )
00279     {
00280         gdcmWarningMacro( "DataElement: " « de « " was already found, skipping duplicate entry.\n"
00281             "Original entry kept is: " « *pr.first );
00282     }
00283 #else
00284     DES.insert(de);
00285 #endif
00286     assert( de.IsEmpty() || de.GetVL() == de.GetValue().GetLength() );
00287 }
00288
00289 protected:
00290 // Internal function, that will compute the actual Tag (if found) of
00291 // a requested Private Tag (XXXX,YY,"PRIVATE")
00292 Tag ComputeDataElement(const PrivateTag & t) const;
00293
00294 private:
00295     DataElementSet DES;
00296     static DataElement DEEnd;
00297     friend std::ostream& operator<<(std::ostream &_os, const DataSet &);
00298 };
00299 //-----
00300 inline std::ostream& operator<<(std::ostream &os, const DataSet &val)
00301 {
00302     val.Print(os);
00303     return os;
00304 }
00305
00306 #if defined(SWIGPYTHON) || defined(SWIGCSHARP) || defined(SWIGJAVA) || defined(SWIGPHP)
00307 /*
00308  * HACK: I need this temp class to be able to manipulate a std::set from python,
00309  * swig does not support wrapping of simple class like std::set...
00310  */
00311 class SWIGDataSet
00312 {
00313 public:
00314     SWIGDataSet(DataSet &des):Internal(des),it(des.Begin()) {}
00315     const DataElement& GetCurrent() const { return *it; }
00316     void Start() { it = Internal.Begin(); }
00317     bool IsAtEnd() const { return it == Internal.End(); }
00318     void Next() { ++it; }
00319 private:
00320     DataSet & Internal;
00321     DataSet::ConstIterator it;
00322 };
00323 #endif /* SWIG */
00324
00329 } // end namespace gdcm_ns
00330
00332 #include "gdcmDataSet.txx"
00333
00334 #endif //GDCMDATASET_H

```

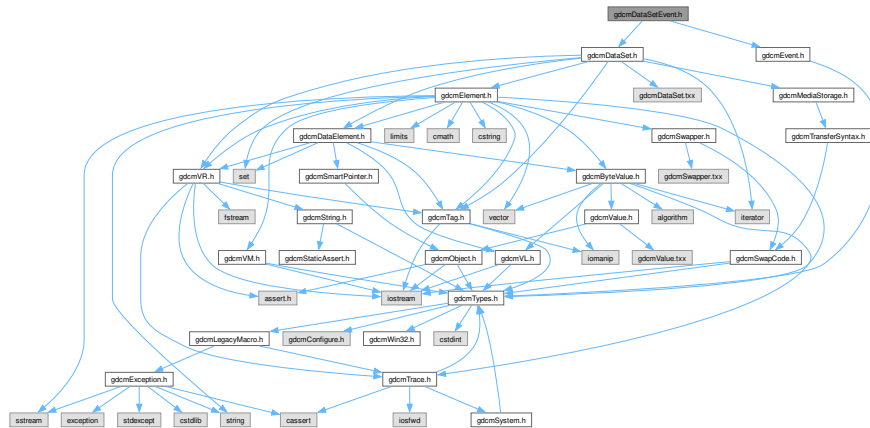
## 13.131 gdcmDataSetEvent.h File Reference

```

#include "gdcmEvent.h"
#include "gdcmDataSet.h"

```

Include dependency graph for `gdcmDataSetEvent.h`:



## Classes

- class `gdcm::DataSetEvent`  
*DataSetEvent.*

## Namespaces

- namespace `gdcm`

## 13.132 gdcmDataSetEvent.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMDATASETEVENT_H
00015 #define GDCMDATASETEVENT_H
00016
00017 #include "gdcmEvent.h"
00018 #include "gdcmDataSet.h"
00019
00020 namespace gdcm
00021 {
00022
00027     class DataSetEvent : public AnyEvent
00028     {
00029     public:
00030         typedef DataSetEvent Self;

```

```

00031  typedef AnyEvent Superclass;
00032  DataSetEvent(DataSet const *ds = nullptr):m_DataSet(ds) {}
00033  ~DataSetEvent() override = default;
00034  void operator=(const Self&) = delete;
00035  const DataSet *m_DataSet;
00036  const char * GetEventName() const override { return "DataSetEvent"; }
00037  bool CheckEvent(const ::gdcm::Event* e) const override
00038  { return (dynamic_cast<const Self*>(e) == nullptr ? false : true) ; }
00039  ::gdcm::Event* MakeObject() const override
00040  { return new Self; }
00041  DataSetEvent(const Self&s) : AnyEvent(s){}
00042
00043  DataSet const & GetDataSet() const { return *m_DataSet; }
00044 };
00045
00046
00047 } // end namespace gdcm
00048
00049 #endif //GDCMANONYMIZEEVENT_H

```

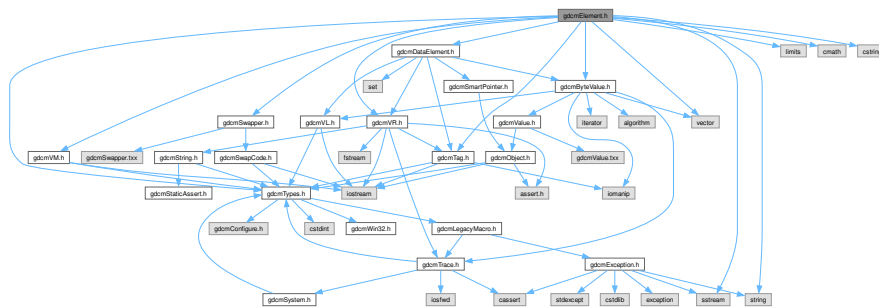
## 13.133 gdcmElement.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmVR.h"
#include "gdcmTag.h"
#include "gdcmVM.h"
#include "gdcmByteValue.h"
#include "gdcmDataElement.h"
#include "gdcmSwapper.h"
#include <string>
#include <vector>
#include <sstream>
#include <limits>
#include <cmath>
#include <cstring>

```

Include dependency graph for gdcmElement.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Element< TVR, TVM >`  
*Element class.*
- class `gdcm::Element< TVR, VM::VM1_2 >`
- class `gdcm::Element< TVR, VM::VM1_n >`
- class `gdcm::Element< TVR, VM::VM2_2n >`
- class `gdcm::Element< TVR, VM::VM2_n >`
- class `gdcm::Element< TVR, VM::VM3_3n >`
- class `gdcm::Element< TVR, VM::VM3_4 >`
- class `gdcm::Element< TVR, VM::VM3_n >`
- class `gdcm::Element< VR::AS, VM::VM5 >`
- class `gdcm::Element< VR::OB, VM::VM1 >`
- class `gdcm::Element< VR::OW, VM::VM1 >`
- class `gdcm::ElementDisableCombinations< TVR, TVM >`  
*A class which is used to produce compile errors for an invalid combination of template parameters.*
- class `gdcm::ElementDisableCombinations< VR::OB, VM::VM1_n >`
- class `gdcm::ElementDisableCombinations< VR::OW, VM::VM1_n >`
- class `gdcm::EncodingImplementation< VR::VRASCII >`
- class `gdcm::EncodingImplementation< VR::VRBINARY >`
- struct `gdcm::ignore_char`

## Namespaces

- namespace `gdcm`

## Functions

- static int `gdcm::add1` (char \*buf, int n)
- `ignore_char` const `gdcm::backslash` ("\\")
- static void `gdcm::clean` (char \*mant)
- static int `gdcm::doround` (char \*buf, unsigned int n)
- std::istream & `gdcm::operator>>` (std::istream &in, `ignore_char` const &ic)
- static int `gdcm::roundat` (char \*buf, size\_t bufLen, unsigned int i, int iexp)
- template<typename Float>  
static void `gdcm::x16printf` (char \*buf, int size, Float f)

## 13.134 gdcmElement.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR

```

```

00011     PURPOSE.  See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMELEMENT_H
00015 #define GDCMELEMENT_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmVR.h"
00019 #include "gdcmTag.h"
00020 #include "gdcmVM.h"
00021 #include "gdcmByteValue.h"
00022 #include "gdcmDataElement.h"
00023 #include "gdcmSwapper.h"
00024
00025 #include <string>
00026 #include <vector>
00027 #include <sstream>
00028 #include <limits>
00029 #include <cmath>
00030 #include <cstring>
00031
00032 namespace gdcm_ns
00033 {
00034
00035 // Forward declaration
00041 template<long long T> class EncodingImplementation;
00042
00043
00051 template <long long TVR, int TVM>
00052 class ElementDisableCombinations {};
00053 template <>
00054 class ElementDisableCombinations<VR::OB, VM::VMI_n> {};
00055 template <>
00056 class ElementDisableCombinations<VR::OW, VM::VMI_n> {};
00057 // Make it impossible to compile these other cases
00058 template <int TVM>
00059 class ElementDisableCombinations<VR::OB, TVM>;
00060 template <int TVM>
00061 class ElementDisableCombinations<VR::OW, TVM>;
00062
00068 template<long long TVR, int TVM>
00069 class Element
00070 {
00071     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, TVM> ) };
00072 public:
00073     typename VRToType<TVR>::Type Internal[VMToLength<TVM>::Length];
00074     typedef typename VRToType<TVR>::Type Type;
00075
00076     static VR GetVR() { return (VR::VRType)TVR; }
00077     static VM GetVM() { return (VM::VMType)TVM; }
00078
00079     unsigned long GetLength() const {
00080         return VMToLength<TVM>::Length;
00081     }
00082     // Implementation of Print is common to all Mode (ASCII/Binary)
00083     // TODO: Can we print a \ when in ASCII...well I don't think so
00084     // it would mean we used a bad VM then, right?
00085     void Print(std::ostream &_os) const {
00086         _os << Internal[0]; // VM is at least guarantee to be one
00087         for(int i=1; i<VMToLength<TVM>::Length; ++i)
00088             _os << "," << Internal[i];
00089     }
00090
00091     const typename VRToType<TVR>::Type *GetValues() const {
00092         return Internal;
00093     }
00094     const typename VRToType<TVR>::Type &GetValue(unsigned int idx = 0) const {
00095         assert( idx < VMToLength<TVM>::Length );
00096         return Internal[idx];
00097     }
00098     typename VRToType<TVR>::Type &GetValue(unsigned int idx = 0) {
00099         assert( idx < VMToLength<TVM>::Length );
00100         return Internal[idx];
00101     }
00102     typename VRToType<TVR>::Type operator[] (unsigned int idx) const {
00103         return GetValue(idx);
00104     }
00105     void SetValue(typename VRToType<TVR>::Type v, unsigned int idx = 0) {
00106         assert( idx < VMToLength<TVM>::Length );
00107         Internal[idx] = v;
00108     }

```

```

00109
00110     void SetFromDataElement(DataElement const &de) {
00111         const ByteValue *bv = de.GetByteValue();
00112         if( !bv ) return;
00113 #ifndef GDCM_WORDS_BIGENDIAN
00114         if( de.GetVR() == VR::UN /*|| de.GetVR() == VR::INVALID*/ )
00115 #else
00116         if( de.GetVR() == VR::UN || de.GetVR() == VR::INVALID )
00117 #endif
00118         {
00119             Set(de.GetValue());
00120         }
00121     else
00122     {
00123         SetNoSwap(de.GetValue());
00124     }
00125 }
00126
00127 DataElement GetAsDataElement() const {
00128     DataElement ret;
00129     std::ostringstream os;
00130     EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00131         GetLength(),os);
00132     ret.SetVR( (VR::VRType)TVR );
00133     assert( ret.GetVR() != VR::SQ );
00134     if( (VR::VRType)VRToEncoding<TVR>::Mode == VR::VRASCII )
00135     {
00136         if( GetVR() != VR::UI )
00137         {
00138             if( os.str().size() % 2 )
00139             {
00140                 os << " ";
00141             }
00142         }
00143     }
00144     VL::Type osStrSize = (VL::Type)os.str().size();
00145     ret.SetByteValue( os.str().c_str(), osStrSize );
00146
00147     return ret;
00148 }
00149
00150 void Read(std::istream &_is) {
00151     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
00152         GetLength(),_is);
00153 }
00154 void Write(std::ostream &_os) const {
00155     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00156         GetLength(),_os);
00157 }
00158
00159 // FIXME: remove this function
00160 // this is only used in gdcm::SplitMosaicFilter / to pass value of a CSAElement
00161 void Set(Value const &v) {
00162     const ByteValue *bv = dynamic_cast<const ByteValue*>(&v);
00163     if( bv ) {
00164         //memcpy(Internal, bv->GetPointer(), bv->GetLength());
00165         std::stringstream ss;
00166         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
00167         ss.str( s );
00168         EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
00169             GetLength(),ss);
00170     }
00171 }
00172 protected:
00173 void SetNoSwap(Value const &v) {
00174     const ByteValue *bv = dynamic_cast<const ByteValue*>(&v);
00175     assert( bv ); // That would be bad...
00176     //memcpy(Internal, bv->GetPointer(), bv->GetLength());
00177     std::stringstream ss;
00178     std::string s = std::string( bv->GetPointer(), bv->GetLength() );
00179     ss.str( s );
00180     EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadNoSwap(Internal,
00181         GetLength(),ss);
00182 }
00183 };
00184
00185 struct ignore_char {
00186     ignore_char(char c): m_char(c) {}
00187     char m_char;
00188 };
00189 ignore_char const backslash('\\');

```

```

00190
00191 inline std::istream& operator> (std::istream& in, ignore_char const& ic) {
00192     if (!in.eof())
00193         in.clear(in.rdstate() & ~std::ios_base::failbit);
00194     if (in.get() != ic.m_char)
00195         in.setstate(std::ios_base::failbit);
00196     return in;
00197 }
00198
00199
00200 // Implementation to perform formatted read and write
00201 template<> class EncodingImplementation<VR::VRASCII> {
00202 public:
00203     template<typename T> // FIXME this should be VRToType<TVR>::Type
00204     static inline void ReadComputeLength(T* data, unsigned int &length,
00205         std::istream &_is) {
00206         assert( data );
00207         //assert( length ); // != 0
00208         length = 0;
00209         assert( !_is );
00210 #if 0
00211         char sep;
00212         while( !_is >> data[length++] )
00213         {
00214             // Get the separator in between the values
00215             assert( !_is );
00216             _is.get(sep);
00217             assert( sep == '\\\\' || sep == ' ' ); // FIXME: Bad use of assert
00218             if( sep == ' ' ) length--; // FIXME
00219         }
00220 #else
00221         while( !_is >> std::ws >> data[length++] >> std::ws >> backslash )
00222         {
00223         }
00224 #endif
00225     }
00226
00227     template<typename T> // FIXME this should be VRToType<TVR>::Type
00228     static inline void Read(T* data, unsigned long length,
00229         std::istream &_is) {
00230         assert( data );
00231         assert( length ); // != 0
00232         assert( !_is );
00233         // FIXME BUG: what if >> operation fails ?
00234         // gdcmData/MR00010001.dcm / SpacingBetweenSlices
00235         _is >> std::ws >> data[0];
00236         char sep;
00237         //std::cout << "GetLength: " << af->GetLength() << std::endl;
00238         for(unsigned long i=1; i<length; ++i) {
00239             //assert( !_is );
00240             // Get the separator in between the values
00241             _is >> std::ws >> sep; // _is.get(sep);
00242             //assert( sep == '\\\\' ); // FIXME: Bad use of assert
00243             _is >> std::ws >> data[i];
00244         }
00245     }
00246
00247     template<typename T>
00248     static inline void ReadNoSwap(T* data, unsigned long length,
00249         std::istream &_is) {
00250         Read(data, length, _is);
00251 }
00252 template<typename T>
00253 static inline void Write(const T* data, unsigned long length,
00254     std::ostream &_os) {
00255     assert( data );
00256     assert( length );
00257     assert( !_os );
00258     _os << data[0];
00259     for(unsigned long i=1; i<length; ++i) {
00260         assert( !_os );
00261         _os << "\\\" << data[i];
00262     }
00263 }
00264 };
00265
00266 //define VRDS16ILLEGAL
00267
00268 #ifdef VRDS16ILLEGAL
00269 template < typename Float >
00270 std::string to_string ( Float data ) {

```

```

00271     std::stringstream in;
00272     // in.imbue(std::locale::classic()); // This is not required AFAIK
00273     int const digits =
00274         static_cast< int >(
00275             - std::log( std::numeric_limits<Float>::epsilon() )
00276             / static_cast< Float >( std::log( 10.0 ) ) );
00277     if ( in << std::dec << std::setprecision( /*2*/digits) << data ) {
00278         return ( in.str() );
00279     } else {
00280         throw "Impossible Conversion"; // should not happen ...
00281     }
00282 }
00283 #else
00284 //
00285 http://stackoverflow.com/questions/32631178/writing-ieee-754-1985-double-as-ascii-on-a-limited-16-bytes-string
00286 static inline void clean(char *mant) {
00287     char *ix = mant + strlen(mant) - 1;
00288     while (('0' == *ix) && (ix > mant)) {
00289         *ix-- = '\0';
00290     }
00291     if ('.' == *ix) {
00292         *ix = '\0';
00293     }
00294 }
00295
00296 static int addl(char *buf, int n) {
00297     if (n < 0) return 1;
00298     if (buf[n] == '9') {
00299         buf[n] = '0';
00300         return addl(buf, n-1);
00301     }
00302     else {
00303         buf[n] = (char)(buf[n] + 1);
00304     }
00305     return 0;
00306 }
00307
00308 static int doround(char *buf, unsigned int n) {
00309     char c;
00310     if (n >= strlen(buf)) return 0;
00311     c = buf[n];
00312     buf[n] = 0;
00313     if ((c >= '5') && (c <= '9')) return addl(buf, n-1);
00314     return 0;
00315 }
00316
00317 #if defined(_MSC_VER) && (_MSC_VER < 1900)
00318 #define snprintf _snprintf
00319 #endif
00320
00321 static int roundat(char *buf, size_t bufLen, unsigned int i, int iexp) {
00322     if (doround(buf, i) != 0) {
00323         iexp += 1;
00324         switch(iexp) {
00325             case -2:
00326                 strcpy(buf, ".01");
00327                 break;
00328             case -1:
00329                 strcpy(buf, ".1");
00330                 break;
00331             case 0:
00332                 strcpy(buf, "1.");
00333                 break;
00334             case 1:
00335                 strcpy(buf, "10");
00336                 break;
00337             case 2:
00338                 strcpy(buf, "100");
00339                 break;
00340             default:
00341                 snprintf(buf, bufLen, "1e%d", iexp);
00342         }
00343         return 1;
00344     }
00345     return 0;
00346 }
00347
00348 template < typename Float >
00349 static void x16printf(char *buf, int size, Float f) {
00350     char line[40];

```



```

00351 char *mant = line + 1;
00352 int iexp, lexp, i;
00353 char exp[6];
00354
00355 if (f < 0) {
00356     f = -f;
00357     size -= 1;
00358     *buf++ = '-';
00359 }
00360 snprintf(line, sizeof(line), "%1.16e", f);
00361 if (line[0] == '-') {
00362     f = -f;
00363     size -= 1;
00364     *buf++ = '-';
00365     snprintf(line, sizeof(line), "%1.16e", f);
00366 }
00367 *mant = line[0];
00368 i = (int)strcspn(mant, "eE");
00369 mant[i] = '\0';
00370 iexp = (int)strtol(mant + i + 1, nullptr, 10);
00371 lexp = snprintf(exp, sizeof(exp), "%d", iexp);
00372 if ((iexp >= size) || (iexp < -3)) {
00373     i = roundat(mant, sizeof(line) - 1, size - 1 - lexp, iexp);
00374     if (i == 1) {
00375         strcpy(buf, mant);
00376         return;
00377     }
00378     buf[0] = mant[0];
00379     buf[1] = '.';
00380     strncpy(buf + i + 2, mant + 1, size - 2 - lexp);
00381     buf[size - lexp] = 0;
00382     clean(buf);
00383     strcat(buf, exp);
00384 }
00385 else if (iexp >= size - 2) {
00386     roundat(mant, sizeof(line) - 1, iexp + 1, iexp);
00387     strcpy(buf, mant);
00388 }
00389 else if (iexp >= 0) {
00390     i = roundat(mant, sizeof(line) - 1, size - 1, iexp);
00391     if (i == 1) {
00392         strcpy(buf, mant);
00393         return;
00394     }
00395     strncpy(buf, mant, iexp + 1);
00396     buf[iexp + 1] = '.';
00397     strncpy(buf + iexp + 2, mant + iexp + 1, size - iexp - 1);
00398     buf[size] = 0;
00399     clean(buf);
00400 }
00401 else {
00402     int j;
00403     i = roundat(mant, sizeof(line) - 1, size + 1 + iexp, iexp);
00404     if (i == 1) {
00405         strcpy(buf, mant);
00406         return;
00407     }
00408     buf[0] = '.';
00409     for (j=0; j< -1 - iexp; j++) {
00410         buf[j+1] = '0';
00411     }
00412     strncpy(buf - iexp, mant, size + 1 + iexp);
00413     buf[size] = 0;
00414     clean(buf);
00415 }
00416 }
00417 #if defined(_MSC_VER) && (_MSC_VER < 1900)
00418 #undef snprintf
00419 #endif
00420
00421 #endif
00422
00423 template<> inline void EncodingImplementation<VR::VRASCII>::Write(const double* data, unsigned long
length, std::ostream &_os) {
00424     assert( data );
00425     assert( length );
00426     assert( _os );
00427 #ifndef VRDS16ILLEGAL
00428     _os << to_string(data[0]);
00429 #else
00430     char buf[16+1];

```

```

00431     x16printf(buf, 16, data[0]);
00432     _os « buf;
00433 #endif
00434     for(unsigned long i=1; i<length; ++i) {
00435         assert( _os );
00436 #ifdef VRDS16ILLEGAL
00437         _os « "\\\" « to_string(data[i]);
00438 #else
00439         x16printf(buf, 16, data[i]);
00440         _os « "\\\" « buf;
00441 #endif
00442     }
00443 }
00444
00445
00446 // Implementation to perform binary read and write
00447 // TODO rewrite operation so that either:
00448 // #1. dummy implementation use a pointer to Internal and do ++p (faster)
00449 // #2. Actually do some meta programming to unroll the loop
00450 // (no notion of order in VM ...)
00451 template<> class EncodingImplementation<VR::VRBINARY> {
00452 public:
00453     template<typename T> // FIXME this should be VRToType<TVR>::Type
00454         static inline void ReadComputeLength(T* data, unsigned int &length,
00455             std::istream &_is) {
00456             const unsigned int type_size = sizeof(T);
00457             assert( data ); // Can we read from pointer ?
00458             //assert( length );
00459             length /= type_size;
00460             assert( _is ); // Is stream valid ?
00461             _is.read( reinterpret_cast<char*>(data+0), type_size);
00462             for(unsigned long i=1; i<length; ++i) {
00463                 assert( _is );
00464                 _is.read( reinterpret_cast<char*>(data+i), type_size );
00465             }
00466         }
00467     template<typename T>
00468     static inline void ReadNoSwap(T* data, unsigned long length,
00469         std::istream &_is) {
00470         const unsigned int type_size = sizeof(T);
00471         assert( data ); // Can we read from pointer ?
00472         assert( length );
00473         assert( _is ); // Is stream valid ?
00474         _is.read( reinterpret_cast<char*>(data+0), type_size);
00475         for(unsigned long i=1; i<length; ++i) {
00476             if( _is )
00477                 _is.read( reinterpret_cast<char*>(data+i), type_size );
00478         }
00479         //ByteSwap<T>::SwapRangeFromSwapCodeIntoSystem(data,
00480         // _is.GetSwapCode(), length);
00481         //SwapperNoOp::SwapArray(data,length);
00482     }
00483     template<typename T>
00484     static inline void Read(T* data, unsigned long length,
00485         std::istream &_is) {
00486         const unsigned int type_size = sizeof(T);
00487         assert( data ); // Can we read from pointer ?
00488         assert( length );
00489         assert( _is ); // Is stream valid ?
00490         _is.read( reinterpret_cast<char*>(data+0), type_size);
00491         for(unsigned long i=1; i<length; ++i) {
00492             if( _is )
00493                 _is.read( reinterpret_cast<char*>(data+i), type_size );
00494         }
00495         //ByteSwap<T>::SwapRangeFromSwapCodeIntoSystem(data,
00496         // _is.GetSwapCode(), length);
00497         SwapperNoOp::SwapArray(data,length);
00498     }
00499     template<typename T>
00500     static inline void Write(const T* data, unsigned long length,
00501         std::ostream &_os) {
00502         const unsigned int type_size = sizeof(T);
00503         assert( data ); // Can we write into pointer ?
00504         assert( length );
00505         assert( _os ); // Is stream valid ?
00506         //ByteSwap<T>::SwapRangeFromSwapCodeIntoSystem((T*)data,
00507         // _os.GetSwapCode(), length);
00508         T swappedData = SwapperNoOp::Swap(data[0]);
00509         _os.write( reinterpret_cast<const char*>(&swappedData), type_size);
00510         for(unsigned long i=1; i<length; ++i) {
00511             assert( _os );

```

```

00512         swappedData = SwapperNoOp::Swap(data[i]);
00513         _os.write( reinterpret_cast<const char*>(&swappedData), type_size );
00514     }
00515     //ByteSwap<T>::SwapRangeFromSwapCodeIntoSystem((T*)data,
00516     // _os.GetSwapCode(), length);
00517 }
00518 };
00519
00520 // For particular case for ASCII string
00521 // WARNING: This template explicitly instantiates a particular
00522 // EncodingImplementation THEREFORE it is required to be declared after the
00523 // EncodingImplementation is needs (doh!)
00524 #if 0
00525 template<int TVM>
00526 class Element<TVM>
00527 {
00528 public:
00529     Element(const char array[])
00530     {
00531         unsigned int i = 0;
00532         const char sep = '\\';
00533         std::string sarray = array;
00534         std::string::size_type pos1 = 0;
00535         std::string::size_type pos2 = sarray.find(sep, pos1+1);
00536         while (pos2 != std::string::npos)
00537         {
00538             Internal[i++] = sarray.substr(pos1, pos2-pos1);
00539             pos1 = pos2+1;
00540             pos2 = sarray.find(sep, pos1+1);
00541         }
00542         Internal[i] = sarray.substr(pos1, pos2-pos1);
00543         // Shouldn't we do the contrary, since we know how many separators
00544         // (and default behavior is to discard anything after the VM declared
00545         assert( GetLength()-1 == i );
00546     }
00547
00548     unsigned long GetLength() const {
00549         return VMToLength<TVM>::Length;
00550     }
00551     // Implementation of Print is common to all Mode (ASCII/Binary)
00552     void Print(std::ostream &_os) const {
00553         _os << Internal[0]; // VM is at least guarantee to be one
00554         for(int i=1; i<VMToLength<TVM>::Length; ++i)
00555             _os << ", " << Internal[i];
00556     }
00557
00558     void Read(std::istream &_is) {
00559         EncodingImplementation<VR::VRASCII>::Read(Internal, GetLength(), _is);
00560     }
00561     void Write(std::ostream &_os) const {
00562         EncodingImplementation<VR::VRASCII>::Write(Internal, GetLength(), _os);
00563     }
00564 private:
00565     typename String Internal[VMToLength<TVM>::Length];
00566 };
00567
00568 template< int TVM>
00569 class Element<VR::PN, TVM> : public StringElement<TVM>
00570 {
00571     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<VR::PN, TVM> ) };
00572 };
00573 #endif
00574
00575 // Implementation for the undefined length (dynamically allocated array)
00576 template<long long TVR>
00577 class Element<TVR, VM::VM1_n>
00578 {
00579     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, VM::VM1_n> ) };
00580 public:
00581     // This the way to prevent default initialization
00582     explicit Element() { Internal=nullptr; Length=0; Save = false; }
00583     ~Element() {
00584         if( Save ) {
00585             delete[] Internal;
00586         }
00587         Internal = nullptr;
00588     }
00589
00590     static VR GetVR() { return (VR::VRType)TVR; }
00591     static VM GetVM() { return VM::VM1_n; }
00592

```

```

00593 // Length manipulation
00594 // SetLength should really be protected anyway...all operation
00595 // should go through SetArray
00596 unsigned long GetLength() const { return Length; }
00597 typedef typename VRToType<TVR>::Type Type;
00598
00599 void SetLength(unsigned long len) {
00600     const unsigned int size = sizeof(Type);
00601     if( len ) {
00602         if( len > Length ) {
00603             // perform realloc
00604             assert( (len / size) * size == len );
00605             Type *internal = new Type[len / size];
00606             assert( Save == false );
00607             Save = true; // ???
00608             if( Internal )
00609             {
00610                 memcpy(internal, Internal, len);
00611                 delete[] Internal;
00612             }
00613             Internal = internal;
00614         }
00615     }
00616     Length = len / size;
00617 }
00618
00619 // If save is set to zero user should not delete the pointer
00620 //void SetArray(const typename VRToType<TVR>::Type *array, int len, bool save = false)
00621 void SetArray(const Type *array, unsigned long len,
00622     bool save = false) {
00623     if( save ) {
00624         SetLength(len); // realloc
00625         memcpy(Internal, array, len/*sizeof(Type)*/);
00626         assert( Save == false );
00627     }
00628     else {
00629         // TODO rewrite this stupid code:
00630         assert( Length == 0 );
00631         assert( Internal == nullptr );
00632         assert( Save == false );
00633         Length = len / sizeof(Type);
00634         //assert( (len / sizeof(Type)) * sizeof(Type) == len );
00635         // MR00010001.dcm is a tough kid: 0019,105a is supposed to be VR::FL, VM::VM3 but
00636         // length is 14 bytes instead of 12 bytes. Simply consider value is total garbage.
00637         if( (len / sizeof(Type)) * sizeof(Type) != len ) { Internal = nullptr; Length = 0; }
00638         else Internal = const_cast<Type*>(array);
00639     }
00640     Save = save;
00641 }
00642 void SetValue(typename VRToType<TVR>::Type v, unsigned int idx = 0) {
00643     assert( idx < Length );
00644     Internal[idx] = v;
00645 }
00646 const typename VRToType<TVR>::Type &GetValue(unsigned int idx = 0) const {
00647     assert( idx < Length );
00648     return Internal[idx];
00649 }
00650 typename VRToType<TVR>::Type &GetValue(unsigned int idx = 0) {
00651     //assert( idx < Length );
00652     return Internal[idx];
00653 }
00654 typename VRToType<TVR>::Type operator[] (unsigned int idx) const {
00655     return GetValue(idx);
00656 }
00657 void Set(Value const &v) {
00658     const ByteValue *bv = dynamic_cast<const ByteValue*>(&v);
00659     assert( bv ); // That would be bad...
00660     if( (VR::VRType)(VRToEncoding<TVR>::Mode) == VR::VRBINARY )
00661     {
00662         const Type* array = (const Type*)bv->GetVoidPointer();
00663         if( array ) {
00664             assert( array ); // That would be bad...
00665             assert( Internal == nullptr );
00666             SetArray(array, bv->GetLength() ); }
00667     }
00668     else
00669     {
00670         std::stringstream ss;
00671         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
00672         ss.str( s );
00673         EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,

```

```

00674         GetLength(), ss);
00675     }
00676 }
00677 void SetFromDataElement(DataElement const &de) {
00678     const ByteValue *bv = de.GetByteValue();
00679     if( !bv ) return;
00680 #ifdef GDCM_WORDS_BIGENDIAN
00681     if( de.GetVR() == VR::UN /*|| de.GetVR() == VR::INVALID*/ )
00682 #else
00683     if( de.GetVR() == VR::UN || de.GetVR() == VR::INVALID )
00684 #endif
00685     {
00686         Set( de.GetValue() );
00687     }
00688     else
00689     {
00690         SetNoSwap( de.GetValue() );
00691     }
00692 }
00693
00694
00695 // Need to be placed after definition of EncodingImplementation<VR::VRASCII>
00696 void WriteASCII(std::ostream &os) const {
00697     return EncodingImplementation<VR::VRASCII>::Write(Internal, GetLength(), os);
00698 }
00699
00700 // Implementation of Print is common to all Mode (ASCII/Binary)
00701 void Print(std::ostream &_os) const {
00702     assert( Length );
00703     assert( Internal );
00704     _os << Internal[0]; // VM is at least guarantee to be one
00705     const unsigned long length = GetLength() < 25 ? GetLength() : 25;
00706     for(unsigned long i=1; i<length; ++i)
00707         _os << ", " << Internal[i];
00708 }
00709 void Read(std::istream &_is) {
00710     if( !Internal ) return;
00711     EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
00712         GetLength(), _is);
00713 }
00714 //void ReadComputeLength(std::istream &_is) {
00715 //    if( !Internal ) return;
00716 //    EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadComputeLength(Internal,
00717 //        Length, _is);
00718 // }
00719 void Write(std::ostream &_os) const {
00720     EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00721         GetLength(), _os);
00722 }
00723
00724 DataElement GetAsDataElement() const {
00725     DataElement ret;
00726     ret.SetVR( (VR::VRType)TVR );
00727     assert( ret.GetVR() != VR::SQ );
00728     if( Internal )
00729     {
00730         std::ostringstream os;
00731         EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
00732             GetLength(), os);
00733         if( (VR::VRType)VRToEncoding<TVR>::Mode == VR::VRASCII )
00734         {
00735             if( GetVR() != VR::UI )
00736             {
00737                 if( os.str().size() % 2 )
00738                 {
00739                     os << " ";
00740                 }
00741             }
00742         }
00743         VL::Type osStrSize = (VL::Type)os.str().size();
00744         ret.SetByteValue( os.str().c_str(), osStrSize );
00745     }
00746     return ret;
00747 }
00748
00749 Element(const Element&_val) {
00750     if( this != &_amp;_val ) {
00751         *this = _val;
00752     }
00753 }
00754

```

```

00755     Element &operator=(const Element &_val) {
00756         Length = 0; // SYITF
00757         Internal = 0;
00758         SetArray(_val.Internal, _val.Length, true);
00759         return *this;
00760     }
00761 protected:
00762     void SetNoSwap(Value const &v) {
00763         const ByteValue *bv = dynamic_cast<const ByteValue*>(&v);
00764         assert( bv ); // That would be bad...
00765         if( (VR::VRType)(VRToEncoding<TVR>::Mode) == VR::VRBINARY )
00766         {
00767             const Type* array = (const Type*)bv->GetPointer();
00768             if( array ) {
00769                 assert( array ); // That would be bad...
00770                 assert( Internal == nullptr );
00771                 SetArray(array, bv->GetLength() ); }
00772             }
00773         else
00774         {
00775             std::stringstream ss;
00776             std::string s = std::string( bv->GetPointer(), bv->GetLength() );
00777             ss.str( s );
00778             EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadNoSwap(Internal,
00779                 GetLength(),ss);
00780         }
00781     }
00782
00783 private:
00784     typename VRToType<TVR>::Type *Internal;
00785     unsigned long Length; // unsigned int ??
00786     bool Save;
00787 };
00788
00789 //template <int TVM = VM::VM1_n>
00790 //class Element<VR::OB, TVM > : public Element<VR::OB, VM::VM1_n> {};
00791
00792 // Partial specialization for derivatives of 1-n : 2-n, 3-n ...
00793 template<long long TVR>
00794 class Element<TVR, VM::VM1_2> : public Element<TVR, VM::VM1_n>
00795 {
00796 public:
00797     typedef Element<TVR, VM::VM1_n> Parent;
00798     void SetLength(int len) {
00799         if( len != 1 && len != 2 ) return;
00800         Parent::SetLength(len);
00801     }
00802 };
00803 template<long long TVR>
00804 class Element<TVR, VM::VM2_n> : public Element<TVR, VM::VM1_n>
00805 {
00806     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, VM::VM2_n> ) };
00807 public:
00808     typedef Element<TVR, VM::VM1_n> Parent;
00809     void SetLength(int len) {
00810         if( len <= 1 ) return;
00811         Parent::SetLength(len);
00812     }
00813 };
00814 template<long long TVR>
00815 class Element<TVR, VM::VM2_2n> : public Element<TVR, VM::VM2_n>
00816 {
00817     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, VM::VM2_2n> ) };
00818 public:
00819     typedef Element<TVR, VM::VM2_n> Parent;
00820     void SetLength(int len) {
00821         if( len % 2 ) return;
00822         Parent::SetLength(len);
00823     }
00824 };
00825 template<long long TVR>
00826 class Element<TVR, VM::VM3_n> : public Element<TVR, VM::VM1_n>
00827 {
00828     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, VM::VM3_n> ) };
00829 public:
00830     typedef Element<TVR, VM::VM1_n> Parent;
00831     void SetLength(int len) {
00832         if( len <= 2 ) return;
00833         Parent::SetLength(len);
00834     }
00835 };

```

```

00836 template<long long TVR>
00837 class Element<TVR, VM::VM3_3n> : public Element<TVR, VM::VM3_n>
00838 {
00839     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, VM::VM3_3n> ) };
00840 public:
00841     typedef Element<TVR, VM::VM3_n> Parent;
00842     void SetLength(int len) {
00843         if( len % 3 ) return;
00844         Parent::SetLength(len);
00845     }
00846 };
00847 template<long long TVR>
00848 class Element<TVR, VM::VM3_4> : public Element<TVR, VM::VM1_n>
00849 {
00850 public:
00851     typedef Element<TVR, VM::VM1_n> Parent;
00852     void SetLength(int len) {
00853         if( len != 3 && len != 4 ) return;
00854         Parent::SetLength(len);
00855     }
00856 };
00857
00858
00859 //template<int T> struct VRToLength;
00860 //template<> struct VRToLength<VR::AS>
00861 //{ enum { Length = VM::VM1 }; }
00862 //template<>
00863 //class Element<VR::AS> : public Element<VR::AS, VRToLength<VR::AS>::Length >
00864
00865 // only 0010 1010 AS 1 Patient's Age
00866 template<>
00867 class Element<VR::AS, VM::VM5>
00868 {
00869     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<VR::AS, VM::VM5> ) };
00870 public:
00871     char Internal[VMToLength<VM::VM5>::Length * sizeof( VRToType<VR::AS>::Type )];
00872     void Print(std::ostream &_os) const {
00873         _os << Internal;
00874     }
00875     unsigned long GetLength() const {
00876         return VMToLength<VM::VM5>::Length;
00877     }
00878 };
00879
00880
00881 template<>
00882 class Element<VR::OB, VM::VM1> : public Element<VR::OB, VM::VM1_n> {};
00883
00884 // Same for OW:
00885 template<>
00886 class Element<VR::OW, VM::VM1> : public Element<VR::OW, VM::VM1_n> {};
00887
00888
00889 } // namespace gdcm_ns
00890
00891 #endif //GDCMELEMENT_H

```

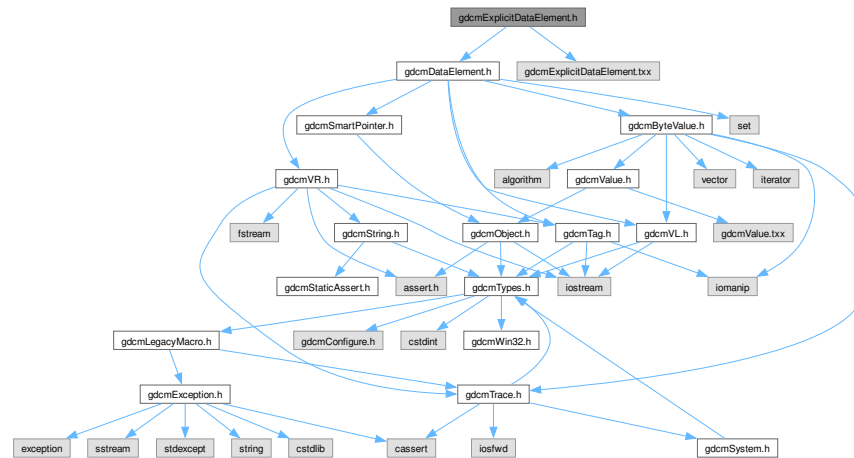
## 13.135 gdcmExplicitDataElement.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmExplicitDataElement.txx"

```

Include dependency graph for `gdcmlExplicitDataElement.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcml::ExplicitDataElement`  
Class to read/write a *DataElement* as *Explicit Data Element*.

## Namespaces

- namespace `gdcml`

## 13.136 gdcmlExplicitDataElement.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003  Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005  Copyright (c) 2006-2011 Mathieu Malaterre
00006  All rights reserved.
00007  See Copyright.txt or http://gdcml.sourceforge.net/Copyright.html for details.
00008
00009  This software is distributed WITHOUT ANY WARRANTY; without even
00010  the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR

```



```

00011     PURPOSE.  See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMEXPLICITDATAELEMENT_H
00015 #define GDCMEXPLICITDATAELEMENT_H
00016
00017 #include "gdcmDataElement.h"
00018
00019 namespace gdcm_ns
00020 {
00021     class GDCM_EXPORT ExplicitDataElement : public DataElement
00022     {
00023     public:
00024         VL GetLength() const;
00025
00026         template <typename TSwap>
00027         std::istream &Read(std::istream &is);
00028
00029         template <typename TSwap>
00030         std::istream &ReadPreValue(std::istream &is);
00031
00032         template <typename TSwap>
00033         std::istream &ReadValue(std::istream &is, bool readvalues = true);
00034
00035         template <typename TSwap>
00036         std::istream &ReadWithLength(std::istream &is, VL &length);
00037
00038         template <typename TSwap>
00039         const std::ostream &Write(std::ostream &os) const;
00040     };
00041 } // end namespace gdcm_ns
00042
00043 #include "gdcmExplicitDataElement.txx"
00044
00045 #endif //GDCMEXPLICITDATAELEMENT_H

```

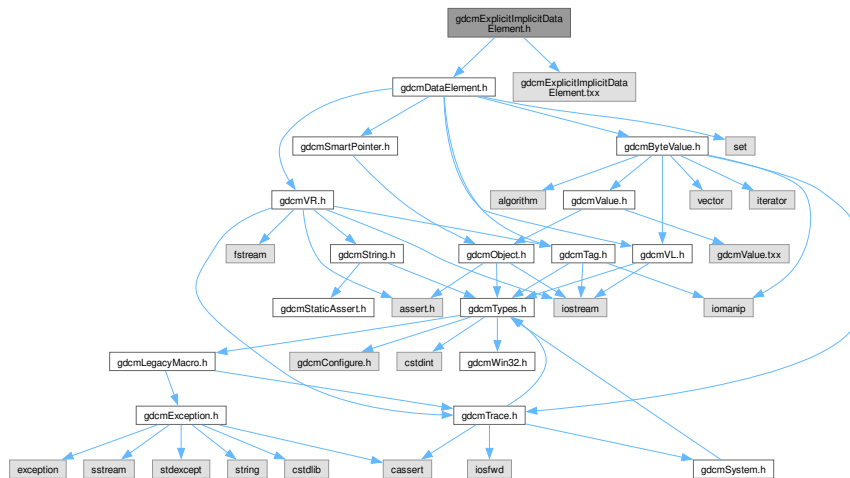
## 13.137 gdcmExplicitImplicitDataElement.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmExplicitImplicitDataElement.txx"

```

Include dependency graph for gdcmExplicitImplicitDataElement.h:



## Classes

- class [gdcm::ExplicitImplicitDataElement](#)  
*Class to read/write a [DataElement](#) as [ExplicitImplicit Data Element](#).*

## Namespaces

- namespace [gdcm](#)

## 13.138 gdcmExplicitImplicitDataElement.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMEXPLICITIMPLICITDATAELEMENT_H
00015 #define GDCMEXPLICITIMPLICITDATAELEMENT_H
00016
00017 #include "gdcmDataElement.h"
00018
00019 namespace gdcm
00020 {
00021   // Data Element (ExplicitImplicit)
00022   class GDCM_EXPORT ExplicitImplicitDataElement : public DataElement
00023   {
00024   public:
00025     VL GetLength() const;
00026
00027     template <typename TSwap>
00028     std::istream &Read(std::istream &is);
00029
00030     template <typename TSwap>
00031     std::istream &ReadPreValue(std::istream &is);
00032
00033     template <typename TSwap>
00034     std::istream &ReadValue(std::istream &is, bool readvalues = true);
00035
00036     template <typename TSwap>
00037     std::istream &ReadWithLength(std::istream &is, VL & length)
00038     {
00039       (void)length;
00040       return Read<TSwap>(is);
00041     }
00042
00043     // PURPOSELY do not provide an implementation for writing !
00044     template <typename TSwap>
00045     //const std::ostream &Write(std::ostream &os) const;
00046   };
00047
00048 } // end namespace gdcm
00049
00050 #include "gdcmExplicitImplicitDataElement.txx"
00051
00052 #endif //GDCMEXPLICITIMPLICITDATAELEMENT_H

```



## 13.140 gdcmFile.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMFILE_H
00015 #define GDCMFILE_H
00016
00017 #include "gdcmObject.h"
00018 #include "gdcmDataSet.h"
00019 #include "gdcmFileMetaInformation.h"
00020
00021 namespace gdcm_ns
00022 {
00023
00024   class GDCM_EXPORT File : public Object
00025   {
00026   public:
00027     File();
00028     ~File() override;
00029
00030     friend std::ostream &operator<<(std::ostream &os, const File &val);
00031
00032     std::istream &Read(std::istream &is);
00033
00034     std::ostream const &Write(std::ostream &os) const;
00035
00036     const FileMetaInformation &GetHeader() const { return Header; }
00037
00038     FileMetaInformation &GetHeader() { return Header; }
00039
00040     void SetHeader( const FileMetaInformation &fmi ) { Header = fmi; }
00041
00042     const DataSet &GetDataSet() const { return DS; }
00043
00044     DataSet &GetDataSet() { return DS; }
00045
00046     void SetDataSet( const DataSet &ds ) { DS = ds; }
00047
00048   private:
00049     FileMetaInformation Header;
00050     DataSet DS;
00051   };
00052
00053 //-----
00054 inline std::ostream& operator<<(std::ostream &os, const File &val)
00055 {
00056   os << val.GetHeader() << std::endl;
00057   //os << val.GetDataSet() << std::endl; // FIXME
00058   assert(0);
00059   return os;
00060 }
00061
00062 } // end namespace gdcm_ns
00063
00064 #endif //GDCMFILE_H

```

## 13.141 gdcmFileMetaInformation.h File Reference

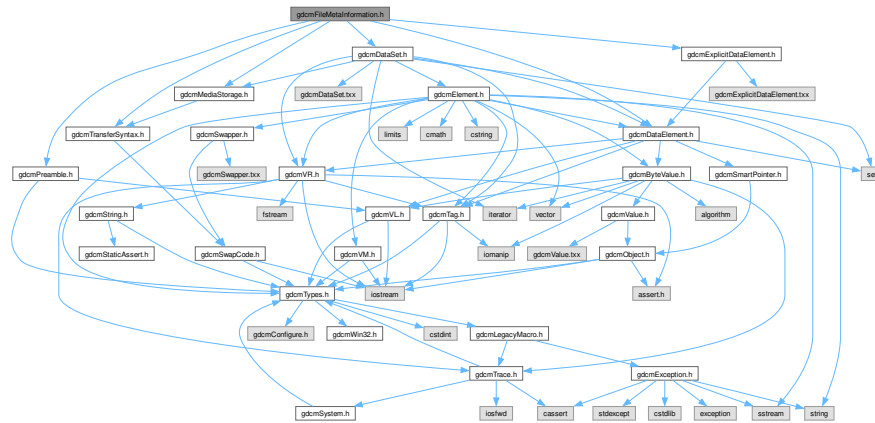
```

#include "gdcmPreamble.h"
#include "gdcmDataSet.h"

```

```
#include "gdcmDataElement.h"
#include "gdcmMediaStorage.h"
#include "gdcmTransferSyntax.h"
#include "gdcmExplicitDataElement.h"
```

Include dependency graph for gdcmFileMetaInformation.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::FileMetaInformation](#)  
*Class to represent a [File](#) Meta Information.*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const FileMetaInformation &val)`

## 13.142 gdcmFileMetaInformation.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMFILEMETAINFORMATION_H
00015 #define GDCMFILEMETAINFORMATION_H
00016
00017 #include "gdcmPreamble.h"
00018 #include "gdcmDataSet.h"
00019 #include "gdcmDataElement.h"
00020 #include "gdcmMediaStorage.h"
00021 #include "gdcmTransferSyntax.h"
00022 #include "gdcmExplicitDataElement.h"
00023
00024 namespace gdcm_ns
00025 {
00040 class GDCM_EXPORT FileMetaInformation : public DataSet
00041 {
00042 public:
00043   // FIXME: TransferSyntax::TS_END -> TransferSyntax::ImplicitDataElement
00044   FileMetaInformation();
00045   ~FileMetaInformation();
00046
00047   friend std::ostream &operator<<(std::ostream &_os, const FileMetaInformation &_val);
00048
00049   bool IsValid() const { return true; }
00050
00051   TransferSyntax::NegociatedType GetMetaInformationTS() const { return MetaInformationTS; }
00052   void SetDataSetTransferSyntax(const TransferSyntax &ts);
00053   const TransferSyntax &GetDataSetTransferSyntax() const { return DataSetTS; }
00054   MediaStorage GetMediaStorage() const;
00055   std::string GetMediaStorageAsString() const;
00056
00057   // FIXME: no virtual function means: duplicate code...
00058   void Insert(const DataElement& de) {
00059     if( de.GetTag().GetGroup() == 0x0002 )
00060     {
00061       InsertDataElement( de );
00062     }
00063     else
00064     {
00065       gdcmErrorMacro( "Cannot add element with group != 0x0002 in the file meta header: " << de );
00066     }
00067   }
00068   void Replace(const DataElement& de) {
00069     Remove(de.GetTag());
00070     Insert(de);
00071   }
00072
00074   std::istream &Read(std::istream &is);
00075   std::istream &ReadCompat(std::istream &is);
00076
00078   std::ostream &Write(std::ostream &os) const;
00079
00081   void FillFromDataSet(DataSet const &ds);
00082
00084   const Preamble &GetPreamble() const { return P; }
00085   Preamble &GetPreamble() { return P; }
00086   void SetPreamble(const Preamble &p) { P = p; }
00087
00089   static void SetImplementationClassUID(const char * imp);
00090   static void AppendImplementationClassUID(const char * imp);
00091   static const char *GetImplementationClassUID();
00092   static void SetImplementationVersionName(const char * version);
00093   static const char *GetImplementationVersionName();
00094   static void SetSourceApplicationEntityTitle(const char * title);

```

```

00095     static const char *GetSourceApplicationEntityTitle();
00096
00097     FileMetaInformation(FileMetaInformation const& fmi) = default;
00098     FileMetaInformation& operator=(const FileMetaInformation& fmi) = default;
00099
00100     VL GetFullLength() const {
00101         return P.GetLength() + DataSet::GetLength<ExplicitDataElement>();
00102     }
00103
00104 protected:
00105     void ComputeDataSetTransferSyntax(); // FIXME
00106
00107     template <typename TSwap>
00108     std::istream &ReadCompatInternal(std::istream &is);
00109
00110     void Default();
00111     void ComputeDataSetMediaStorageSOPClass();
00112
00113     TransferSyntax DataSetTS;
00114     TransferSyntax::NegociatedType MetaInformationTS;
00115     MediaStorage::MSType DataSetMS;
00116
00117 protected:
00118     static const char * GetFileMetaInformationVersion();
00119     static const char * GetGDCMImplementationClassUID();
00120     static const char * GetGDCMImplementationVersionName();
00121     static const char * GetGDCMSourceApplicationEntityTitle();
00122
00123 private:
00124     Preamble P;
00125
00126 //static stuff:
00127     static const char GDCM_FILE_META_INFORMATION_VERSION[];
00128     static const char GDCM_IMPLEMENTATION_CLASS_UID[];
00129     static const char GDCM_IMPLEMENTATION_VERSION_NAME[];
00130     static const char GDCM_SOURCE_APPLICATION_ENTITY_TITLE[];
00131     static std::string ImplementationClassUID;
00132     static std::string ImplementationVersionName;
00133     static std::string SourceApplicationEntityTitle;
00134 };
00135 //-----
00136 inline std::ostream& operator<<(std::ostream &os, const FileMetaInformation &val)
00137 {
00138     os << val.GetPreamble() << std::endl;
00139     val.Print( os );
00140     return os;
00141 }
00142
00143 } // end namespace gdcm_ns
00144
00145 #endif //GDCMFILEMETAINFORMATION_H

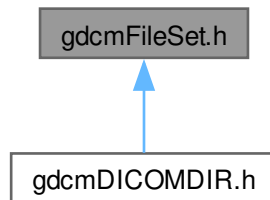
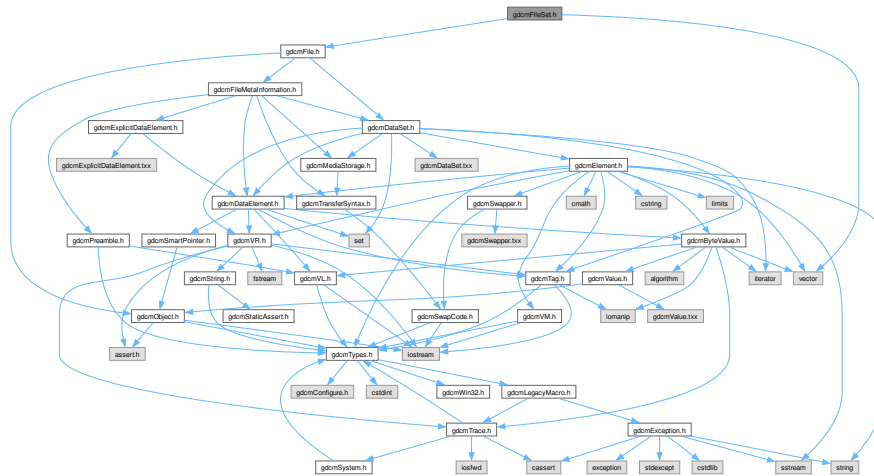
```

## 13.143 gdcmFileSet.h File Reference

```

#include "gdcmFile.h"
#include <vector>

```



- class `gdcm::FileSet`

- namespace `gdcm`

- `std::ostream & gdcm::operator<< (std::ostream &os, const FileSet &f)`



## 13.144 gdcmFileSet.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMFILESET_H
00015 #define GDCMFILESET_H
00016
00017 #include "gdcmFile.h"
00018 #include <vector>
00019
00020 namespace gdcm
00021 {
00022     class GDCM_EXPORT FileSet
00023     {
00024     public:
00025         FileSet():Files() {}
00026         typedef std::string FileType;
00027         typedef std::vector<FileType> FileTypes;
00028
00029         void AddFile(File const & ) {}
00030
00031         bool AddFile(const char *filename);
00032
00033         void SetFiles(FileTypes const &files);
00034         FileTypes const &GetFiles() const {
00035             return Files;
00036         }
00037     private:
00038         FileTypes Files;
00039     };
00040
00041 //-----
00042 inline std::ostream& operator<<(std::ostream &os, const FileSet &f)
00043 {
00044     (void)f; // FIXME
00045     return os;
00046 }
00047
00048 } // end namespace gdcm
00049
00050 #endif //GDCMFILESET_H

```

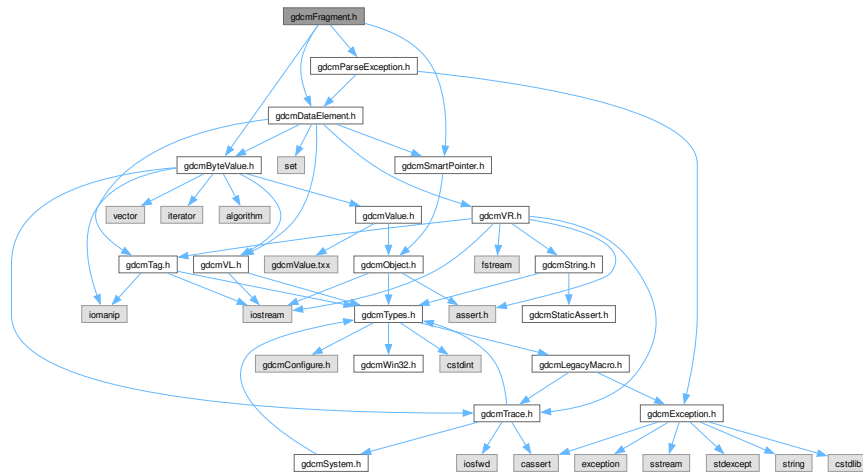
## 13.145 gdcmFragment.h File Reference

```

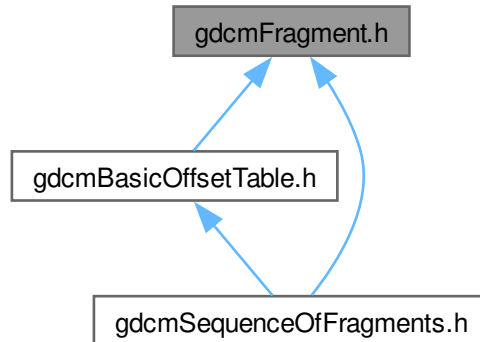
#include "gdcmDataElement.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"
#include "gdcmParseException.h"

```

Include dependency graph for `gdcmFragment.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Fragment`  
Class to represent a *Fragment*.

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Fragment &val)`

## 13.146 gdcmFragment.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMFRAGMENT_H
00015 #define GDCMFRAGMENT_H
00016
00017 #include "gdcmDataElement.h"
00018 #include "gdcmByteValue.h"
00019 #include "gdcmSmartPointer.h"
00020 #include "gdcmParseException.h"
00021
00022 namespace gdcm_ns
00023 {
00024
00025   // Implementation detail:
00026   // I think Fragment should be a protected subclass of DataElement:
00027   // looking somewhat like this:
00028   /*
00029   class GDCM_EXPORT Fragment : protected DataElement
00030   {
00031   public:
00032     using DataElement::GetTag;
00033     using DataElement::GetVL;
00034     using DataElement::SetByteValue;
00035     using DataElement::GetByteValue;
00036     using DataElement::GetValue;
00037   */
00038   // Instead I am only hiding the SetTag member...
00039
00040   class GDCM_EXPORT Fragment : public DataElement
00041   {
00042   //protected:
00043   // void SetTag(const Tag &t);
00044   public:
00045     Fragment() : DataElement(Tag(0xffff, 0xe000), 0) {}
00046     friend std::ostream &operator<<(std::ostream &os, const Fragment &val);
00047
00048     VL GetLength() const;
00049
00050     VL ComputeLength() const;
00051
00052     template <typename TSwap>
00053     std::istream &Read(std::istream &is)
00054     {
00055       ReadPreValue<TSwap>(is);
00056       return ReadValue<TSwap>(is);
00057     }
00058
00059     template <typename TSwap>
00060     std::istream &ReadPreValue(std::istream &is)
00061     {
00062       TagField.Read<TSwap>(is);
00063       if( !is )
00064       {
00065         // BogusItemStartItemEnd.dcm
00066         throw Exception( "Problem #1" );
00067       }
00068     }
00069

```

```

00070     }
00071     if( !ValueLengthField.Read<TSwap>(is) )
00072     {
00073         // GENESIS_SIGNA-JPEG-CorruptFrag.dcm
00074         // JPEG fragment is declared to have 61902, but in fact really is only 61901
00075         // so we end up reading 0xddff,0x00e0, and VL = 0x0 (1 byte)
00076         throw Exception( "Problem #2" );
00077     }
00078 #ifndef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
00079     const Tag itemStart(0xffff, 0xe000);
00080     const Tag seqDelItem(0xffff,0xe0dd);
00081     if( TagField != itemStart && TagField != seqDelItem )
00082     {
00083         throw Exception( "Problem #3" );
00084     }
00085 #endif
00086     return is;
00087 }
00088
00089 template <typename TSwap>
00090 std::istream &ReadValue(std::istream &is)
00091 {
00092     // Self
00093     SmartPointer<ByteValue> bv = new ByteValue;
00094     const std::streampos cur = is.tellg();
00095     if( cur != std::streampos(-1) )
00096     {
00097         is.seekg(0, std::ios::end);
00098         const std::streampos end = is.tellg();
00099         is.seekg(cur);
00100         if( end != std::streampos(-1) && is.good()
00101             && static_cast<uint64_t>(end - cur) < static_cast<uint32_t>(ValueLengthField) )
00102         {
00103             throw Exception( "Fragment Value Length exceeds remaining stream size" );
00104         }
00105     }
00106     bv->SetLength(ValueLengthField);
00107     if( !bv->Read<TSwap>(is) )
00108     {
00109         // Fragment is incomplete, but is a itemStart, let's try to push it anyway...
00110         gdcmWarningMacro( "Fragment could not be read" );
00111         //bv->SetLength(is.gcount());
00112         ValueField = bv;
00113         ParseException pe;
00114         pe.SetLastElement( *this );
00115         throw pe;
00116     }
00117     ValueField = bv;
00118     return is;
00119 }
00120
00121 template <typename TSwap>
00122 std::istream &ReadBacktrack(std::istream &is)
00123 {
00124     const Tag itemStart(0xffff, 0xe000);
00125     const Tag seqDelItem(0xffff,0xe0dd);
00126
00127     bool cont = true;
00128     const std::streampos start = is.tellg();
00129     const int max = 10;
00130     int offset = 0;
00131     while( cont )
00132     {
00133         TagField.Read<TSwap>(is);
00134         assert( is );
00135         if( TagField != itemStart && TagField != seqDelItem )
00136         {
00137             ++offset;
00138             is.seekg( (std::streampos)((size_t)start - offset) );
00139             gdcmWarningMacro( "Fuzzy Search, backtrack: " « (start - is.tellg()) « " Offset: " « is.tellg() );
00140             if( offset > max )
00141             {
00142                 gdcmErrorMacro( "Giving up" );
00143                 throw "Impossible to backtrack";
00144             }
00145         }
00146         else
00147         {
00148             cont = false;
00149         }
00150     }

```

```

00151     assert( TagField == itemStart || TagField == seqDelItem );
00152     if( !ValueLengthField.Read<TSwap>(is) )
00153     {
00154         return is;
00155     }
00156
00157     // Self
00158     SmartPointer<ByteValue> bv = new ByteValue;
00159     const std::streampos cur2 = is.tellg();
00160     if( cur2 != std::streampos(-1) )
00161     {
00162         is.seekg(0, std::ios::end);
00163         const std::streampos end2 = is.tellg();
00164         is.seekg(cur2);
00165         if( end2 != std::streampos(-1) && is.good()
00166             && static_cast<uint64_t>(end2 - cur2) < static_cast<uint32_t>(ValueLengthField) )
00167         {
00168             throw Exception( "Fragment Value Length exceeds remaining stream size" );
00169         }
00170     }
00171     bv->SetLength(ValueLengthField);
00172     if( !bv->Read<TSwap>(is) )
00173     {
00174         // Fragment is incomplete, but is a itemStart, let's try to push it anyway...
00175         gdcmWarningMacro( "Fragment could not be read" );
00176         //bv->SetLength(is.gcount());
00177         ValueField = bv;
00178         ParseException pe;
00179         pe.SetLastElement( *this );
00180         throw pe;
00181     }
00182     ValueField = bv;
00183     return is;
00184 }
00185
00186
00187 template <typename TSwap>
00188 std::ostream &Write(std::ostream &os) const {
00189     const Tag itemStart(0xfffe, 0xe000);
00190     const Tag seqDelItem(0xfffe, 0xe0dd);
00191     if( !TagField.Write<TSwap>(os) )
00192     {
00193         assert(0 && "Should not happen");
00194         return os;
00195     }
00196     assert( TagField == itemStart
00197         || TagField == seqDelItem );
00198     const ByteValue *bv = GetByteValue();
00199     // VL
00200     // The following piece of code is hard to read in order to support such broken file as:
00201     // CompressedLossy.dcm
00202     if( IsEmpty() )
00203     {
00204         //assert( bv );
00205         VL zero = 0;
00206         if( !zero.Write<TSwap>(os) )
00207         {
00208             assert(0 && "Should not happen");
00209             return os;
00210         }
00211     }
00212     else
00213     {
00214         assert( ValueLengthField );
00215         assert( !ValueLengthField.IsUndefined() );
00216         const VL actuallen = bv->ComputeLength();
00217         assert( actuallen == ValueLengthField || actuallen == ValueLengthField + 1 );
00218         if( !actuallen.Write<TSwap>(os) )
00219         {
00220             assert(0 && "Should not happen");
00221             return os;
00222         }
00223     }
00224     // Value
00225     if( ValueLengthField && bv )
00226     {
00227         // Self
00228         assert( bv );
00229         assert( bv->GetLength() == ValueLengthField );
00230         if( !bv->Write<TSwap>(os) )
00231         {

```

```

00232         assert(0 && "Should not happen");
00233         return os;
00234     }
00235 }
00236     return os;
00237 }
00238 };
00239 //-----
00240 inline std::ostream &operator<<(std::ostream &os, const Fragment &val)
00241 {
00242     os << "Tag: " << val.TagField;
00243     os << "\tVL: " << val.ValueLengthField;
00244     if( val.ValueField )
00245     {
00246         os << "\t" << *(val.ValueField);
00247     }
00248     return os;
00249 }
00250 }
00251 }
00252 } // end namespace gdcms_ns
00253
00254 #endif //GDCMFRAGMENT_H

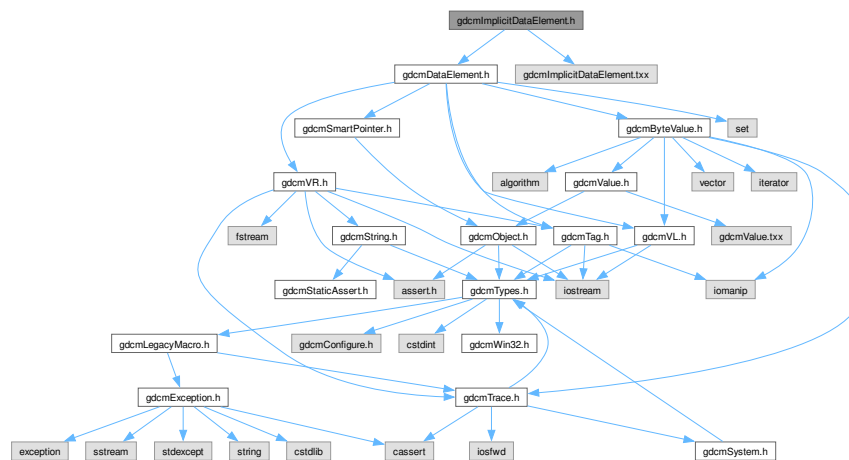
```

## 13.147 gdcmlImplicitDataElement.h File Reference

```
#include "gdcmDataElement.h"
```

```
#include "gdcmlImplicitDataElement.txx"
```

Include dependency graph for gdcmlImplicitDataElement.h:



### Classes

- class [gdcms::ImplicitDataElement](#)  
Class to represent an Implicit VR Data Element.

### Namespaces

- namespace [gdcms](#)

## 13.148 gdcmImplicitDataElement.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMIMPLICITDATAELEMENT_H
00015 #define GDCMIMPLICITDATAELEMENT_H
00016
00017 #include "gdcmDataElement.h"
00018
00019 namespace gdcm_ns
00020 {
00021
00022   class GDCM_EXPORT ImplicitDataElement : public DataElement
00023   {
00024   public:
00025     VL GetLength() const;
00026
00027     template <typename TSwap>
00028     std::istream &Read(std::istream& is);
00029
00030     template <typename TSwap>
00031     std::istream &ReadPreValue(std::istream& is);
00032
00033     template <typename TSwap>
00034     std::istream &ReadValue(std::istream& is, bool readvalues = true);
00035
00036     template <typename TSwap>
00037     std::istream &ReadValueWithLength(std::istream& is, VL & length, bool readvalues = true);
00038
00039     template <typename TSwap>
00040     std::istream &ReadWithLength(std::istream& is, VL & length, bool readvalues = true);
00041
00042     template <typename TSwap>
00043     std::istream &ReadValueWithLength(std::istream& is, VL & length, bool readvalues = true);
00044
00045     template <typename TSwap>
00046     const std::ostream &Write(std::ostream& os) const;
00047   };
00048
00049 } // end namespace gdcm_ns
00050
00051 #include "gdcmImplicitDataElement.txx"
00052
00053 #endif //GDCMIMPLICITDATAELEMENT_H

```

## 13.149 gdcmItem.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmDataSet.h"
#include "gdcmParseException.h"
#include "gdcmSwapper.h"
#include "gdcmItem.txx"

```





## 13.150 gdcmItem.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014
00015 #ifndef GDCMITEM_H
00016 #define GDCMITEM_H
00017
00018 #include "gdcmDataElement.h"
00019 #include "gdcmDataSet.h"
00020 #include "gdcmParseException.h"
00021 #include "gdcmSwapper.h"
00022
00023 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
00024 #include "gdcmByteSwapFilter.h"
00025 #endif
00026
00027 namespace gdcm_ns
00028 {
00029
00030   class DataSet;
00045   class GDCM_EXPORT Item : public DataElement
00046   {
00047   public:
00048     Item() : DataElement(Tag(0xfffe, 0xe000), 0xffffffff, NestedDataSet()) {}
00049     friend std::ostream& operator< (std::ostream &os, const Item &val);
00050
00051     void Clear() {
00052       this->DataElement::Clear();
00053       NestedDataSet.Clear();
00054     }
00055
00056     template <typename TDE>
00057     VL GetLength() const;
00058
00059     void InsertDataElement(const DataElement & de) {
00060       NestedDataSet.Insert(de);
00061       // Update the length
00062       if( !IsUndefinedLength() )
00063       {
00064         assert( 0 && "InsertDataElement" );
00065         //ValueLengthField += de.GetLength();
00066       }
00067     }
00068     const DataElement& GetDataElement(const Tag& t) const
00069     {
00070       return NestedDataSet.GetDataElement(t);
00071     }
00072
00073     // Completely defines it with the nested dataset
00074     // destroy anything present
00075     void SetNestedDataSet(const DataSet& nested)
00076     {
00077       NestedDataSet = nested;
00078     }
00079     // Return a const ref to the Nested Data Set
00080     const DataSet &GetNestedDataSet() const
00081     {
00082       return NestedDataSet;
00083     }
00084     DataSet &GetNestedDataSet()
00085     {
00086       return NestedDataSet;
00087     }
00088
00089     //Value const & GetValue() const { return *NestedDataSet; }

```

```

00090
00091     Item(Item const &val):DataElement(val)
00092     {
00093         NestedDataSet = val.NestedDataSet;
00094     }
00095
00096     template <typename TDE, typename TSwap>
00097     std::istream &Read(std::istream &is) {
00098         // Superclass
00099         {
00100             DataSet &nested = NestedDataSet;
00101             nested.Clear();
00102             assert( nested.IsEmpty() );
00103         }
00104         if( !TagField.Read<TSwap>(is) )
00105         {
00106             throw Exception("Should not happen (item)");
00107             return is;
00108         }
00109 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
00110         // MR_Philips_Intera_SwitchIndianess_noLgtSQItem_in_trueLgtSeq.dcm
00111         if( TagField == Tag(0xfeff, 0x00e0)
00112             || TagField == Tag(0xfeff, 0xdd0) )
00113         {
00114             gdcmWarningMacro( "ByteSwaping Private SQ: " « TagField );
00115             // Invert previously read TagField since wrong endianness:
00116             TagField = Tag( SwapperDoOp::Swap( TagField.GetGroup() ), SwapperDoOp::Swap( TagField.GetElement() ) );
00117         };
00118         assert ( TagField == Tag(0xfffe, 0xe000)
00119                 || TagField == Tag(0xfffe, 0xe0dd) );
00120         if( !ValueLengthField.Read<SwapperDoOp>(is) )
00121         {
00122             assert(0 && "Should not happen");
00123             return is;
00124         }
00125         // Self
00126         // Some file written by GDCM 1.0 we write 0xFFFFFFFF instead of 0x0
00127         if( TagField == Tag(0xfffe, 0xe0dd) )
00128         {
00129             if( ValueLengthField )
00130             {
00131                 gdcmErrorMacro( "ValueLengthField is not 0" );
00132             }
00133         }
00134         //else if( ValueLengthField == 0 )
00135         // {
00136         //     //assert( TagField == Tag( 0xfffe, 0xe0dd) );
00137         //     if( TagField != Tag( 0xfffe, 0xe0dd) )
00138         //     {
00139         //         gdcmErrorMacro( "SQ: " « TagField « " has a length of 0" );
00140         //     }
00141         // }
00142         else if( ValueLengthField.IsUndefined() )
00143         {
00144             DataSet &nested = NestedDataSet;
00145             nested.Clear();
00146             assert( nested.IsEmpty() );
00147             std::streampos start = is.tellg();
00148             try
00149             {
00150                 nested.template ReadNested<TDE, SwapperDoOp>(is);
00151                 ByteSwapFilter bsf(nested);
00152                 bsf.ByteSwap();
00153             }
00154             catch(ParseException &pe)
00155             {
00156                 (void)pe;
00157                 //
00158                 MR_Philips_Intera_PrivateSequenceExplicitVR_in_SQ_2001_e05f_item_wrong_lgt_use_NOSHADOWSEQ.dcm
00159                 // You have to byteswap the length but not the tag...sigh
00160                 gdcmWarningMacro( "Attempt to read nested Item without byteswapping the Value Length." );
00161                 start -= is.tellg();
00162                 assert( start < 0 );
00163                 is.seekg( start, std::ios::cur );
00164                 nested.Clear();
00165                 nested.template ReadNested<TDE, SwapperNoOp>(is);
00166                 ByteSwapFilter bsf(nested);
00167                 // Tag are read in big endian, need to byteswap them back...
00168                 bsf.SetByteSwapTag(true);
00169                 bsf.ByteSwap();

```

```

00169     }
00170     catch(Exception &e)
00171     {
00172         // MR_Philips_Intera_No_PrivateSequenceImplicitVR.dcm
00173         throw e;
00174     }
00175     catch(...)
00176     {
00177         assert(0);
00178     }
00179     }
00180     else /* if( ValueLengthField.IsUndefined() ) */
00181     {
00182         DataSet &nested = NestedDataSet;
00183         nested.Clear();
00184         assert( nested.IsEmpty() );
00185         nested.template ReadWithLength<TDE,SwapperDoOp>(is, ValueLengthField);
00186         ByteSwapFilter bsf(nested);
00187         bsf.ByteSwap();
00188     }
00189     return is;
00190 }
00191 // http://groups.google.com/group/comp.protocols.dicom/msg/c07efcf5e759fc83
00192 // Bug_Philips_ItemTag_3F3F.dcm
00193 if( TagField == Tag(0x3f3f, 0x3f00) )
00194 {
00195     //TagField = Tag(0xffff, 0xe000);
00196 }
00197 #endif
00198 if( TagField != Tag(0xffff, 0xe000) && TagField != Tag(0xffff, 0xe0dd) )
00199 {
00200     gdcmDebugMacro( "Invalid Item, found tag: " << TagField);
00201     throw Exception( "Not a valid Item" );
00202 }
00203 assert( TagField == Tag(0xffff, 0xe000) || TagField == Tag(0xffff, 0xe0dd) );
00204
00205 if( !ValueLengthField.Read<TSwap>(is) )
00206 {
00207     assert(0 && "Should not happen");
00208     return is;
00209 }
00210 // Self
00211 if( TagField == Tag(0xffff,0xe0dd) )
00212 {
00213     // Some file written by GDCM 1.0 were written with 0xFFFFFFFF instead of 0x0
00214     if( ValueLengthField )
00215     {
00216         gdcmDebugMacro( "ValueLengthField is not 0 but " << ValueLengthField );
00217     }
00218 }
00219 else if( ValueLengthField.IsUndefined() )
00220 {
00221     DataSet &nested = NestedDataSet;
00222     nested.Clear();
00223     assert( nested.IsEmpty() );
00224     nested.template ReadNested<TDE,TSwap>(is);
00225 }
00226 else /* if( ValueLengthField.IsUndefined() ) */
00227 {
00228     assert( !ValueLengthField.IsUndefined() );
00229     DataSet &nested = NestedDataSet;
00230     nested.Clear();
00231     assert( nested.IsEmpty() );
00232     nested.template ReadWithLength<TDE,TSwap>(is, ValueLengthField);
00233 }
00234
00235 return is;
00236 }
00237
00238 template <typename TDE, typename TSwap>
00239 const std::ostream &Write(std::ostream &os) const {
00240 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
00241     if( TagField == Tag(0x3f3f,0x3f00) && false )
00242     {
00243         Tag t(0xffff, 0xe000);
00244         t.Write<TSwap>(os);
00245     }
00246     else
00247 #endif
00248     {
00249         assert ( TagField == Tag(0xffff, 0xe000)

```

```

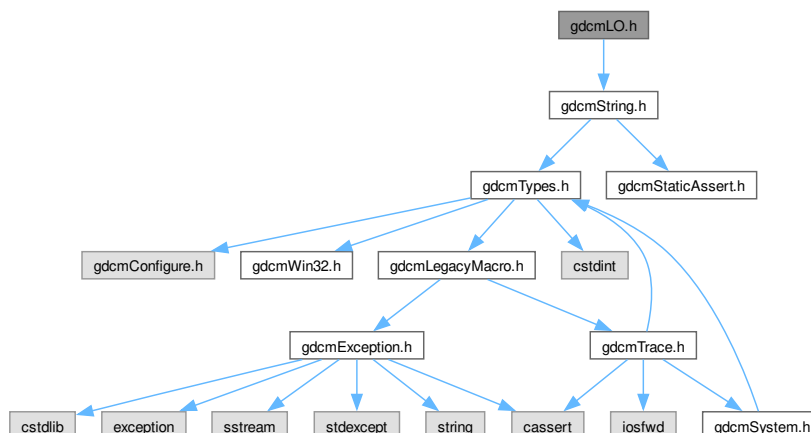
00250         || TagField == Tag(0xfffe, 0xe0dd) );
00251         // Not sure how this happen
00252         if( TagField == Tag(0xfffe, 0xe0dd) )
00253         {
00254             gdcmWarningMacro( "SeqDelItem found in defined length Sequence" );
00255             assert( ValueLengthField == 0 );
00256             assert( NestedDataSet.Size() == 0 );
00257         }
00258         if( !TagField.Write<TSwap>(os) )
00259         {
00260             assert(0 && "Should not happen");
00261             return os;
00262         }
00263     }
00264     if( ValueLengthField.IsUndefined() )
00265     {
00266         if( !ValueLengthField.Write<TSwap>(os) )
00267         {
00268             assert(0 && "Should not happen");
00269             return os;
00270         }
00271     }
00272     else
00273     {
00274         const VL dummy = NestedDataSet.GetLength<TDE>();
00275         assert( dummy % 2 == 0 );
00276         //assert( ValueLengthField == dummy );
00277         if( !dummy.Write<TSwap>(os) )
00278         {
00279             assert(0 && "Should not happen");
00280             return os;
00281         }
00282     }
00283     // Self
00284     NestedDataSet.Write<TDE,TSwap>(os);
00285     if( ValueLengthField.IsUndefined() )
00286     {
00287         const Tag itemDelItem(0xfffe,0xe00d);
00288         itemDelItem.Write<TSwap>(os);
00289         VL zero = 0;
00290         zero.Write<TSwap>(os);
00291     }
00292
00293     return os;
00294 }
00295
00296 /*
00297 There are three special SQ related Data Elements that are not ruled by the VR encoding rules conveyed
00298 by the Transfer Syntax. They shall be encoded as Implicit VR. These special Data Elements are Item
00299 (FFFE,E000), Item Delimitation Item (FFFE,E00D), and Sequence Delimitation Item (FFFE,E0DD).
00300 However, the Data Set within the Value Field of the Data Element Item (FFFE,E000) shall be encoded
00301 according to the rules conveyed by the Transfer Syntax.
00302 */
00303 bool FindDataElement(const Tag &t) const {
00304     return NestedDataSet.FindDataElement( t );
00305 }
00306
00307 private:
00308     /* NESTED DATA SET  a Data Set contained within a Data Element of an other Data Set.
00309     * May be nested recursively.
00310     * Only Data Elements with VR = SQ may, themselves, contain Data Sets
00311     */
00312     DataSet NestedDataSet;
00313 };
00314
00315 //-----
00316 inline std::ostream& operator<<(std::ostream& os, const Item &val)
00317 {
00318     os << val.TagField;
00319     os << "\t" << val.ValueLengthField << "\n";
00320     val.NestedDataSet.Print( os, "\t" );
00321
00322     return os;
00323 }
00324
00325 } // end namespace gdcm_ns
00326
00327 #include "gdcmItem.hxx"
00328
00329 #endif //GDCMITEM_H

```

## 13.151 gdcmLO.h File Reference

```
#include "gdcmString.h"
```

Include dependency graph for gdcmLO.h:



### Classes

- class [gdcm::LO](#)  
[LO](#).

### Namespaces

- namespace [gdcm](#)

## 13.152 gdcmLO.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMLO_H
00015 #define GDCMLO_H
00016
00017 #include "gdcmString.h"

```

```

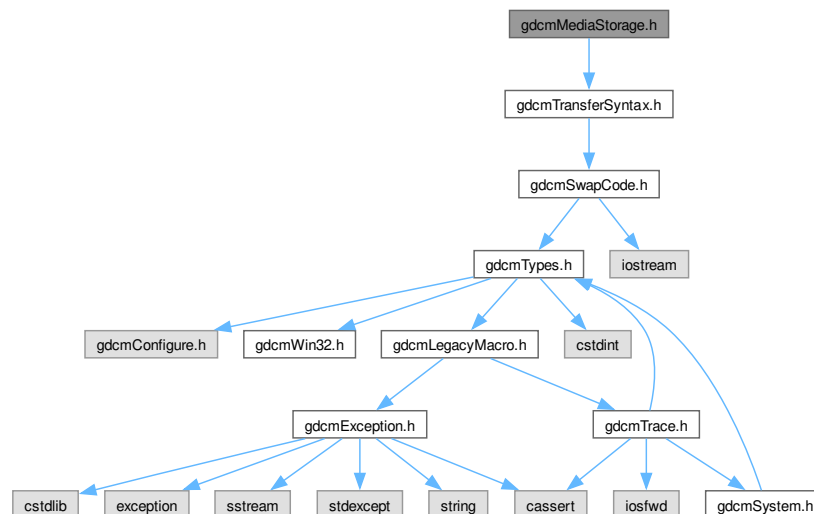
00018
00019 namespace gdcM
00020 {
00021
00027 class /*GDCM_EXPORT*/ LO : public String<'\\',64> /* PLEASE do not export me */
00028 {
00029 public:
00030     // typedef are not inherited:
00031     typedef String<'\\',64> Superclass;
00032     typedef Superclass::value_type value_type;
00033     typedef Superclass::pointer pointer;
00034     typedef Superclass::reference reference;
00035     typedef Superclass::const_reference const_reference;
00036     typedef Superclass::size_type size_type;
00037     typedef Superclass::difference_type difference_type;
00038     typedef Superclass::iterator iterator;
00039     typedef Superclass::const_iterator const_iterator;
00040     typedef Superclass::reverse_iterator reverse_iterator;
00041     typedef Superclass::const_reverse_iterator const_reverse_iterator;
00042
00043     // LO constructors.
00044     LO(): Superclass() {}
00045     LO(const value_type* s): Superclass(s) {}
00046     LO(const value_type* s, size_type n): Superclass(s, n) {}
00047     LO(const Superclass& s, size_type pos=0, size_type n=npos):
00048         Superclass(s, pos, n) {}
00049
00050     bool IsValid() const {
00051         if( !Superclass::IsValid() ) return false;
00052         // Implementation specific:
00053         return true;
00054     }
00055 };
00056
00057 } // end namespace gdcM
00058
00059 #endif //GDCMLO_H

```

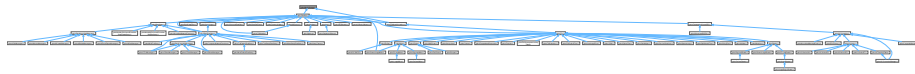
## 13.153 gdcMMediaStorage.h File Reference

#include "gdcMTransferSyntax.h"

Include dependency graph for gdcMMediaStorage.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::MediaStorage](#)  
*MediaStorage.*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const MediaStorage &ms)`

## 13.154 gdcmMediaStorage.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMMEDIASTORAGE_H
00015 #define GDCMMEDIASTORAGE_H
00016
00017 #include "gdcmTransferSyntax.h"
00018
00019 namespace gdcm { class Tag; }
00020 namespace gdcm_ns
00021 {
00022     #if !defined(SWIGPYTHON) && !defined(SWIGSHARP) && !defined(SWIGJAVA) && !defined(SWIGPHP)
00023     using namespace gdcm;
00024     #endif
00025     class DataSet;
00026     class FileMetaInformation;
00027     class File;
00028
00029     // WARNING: This class will be deprecated in the future. There is no reason to extend this class.
00030     // Please check the gdcm::UIDs class if adding new well known UID.
00031
00043     class GDCM_EXPORT MediaStorage
00044     {
00045     public:
00046         typedef enum {
00047             MediaStorageDirectoryStorage = 0,
00048             ComputedRadiographyImageStorage,
00049             DigitalXRayImageStorageForPresentation,

```

```
00050     DigitalXRayImageStorageForProcessing,
00051     DigitalMammographyImageStorageForPresentation,
00052     DigitalMammographyImageStorageForProcessing,
00053     DigitalIntraoralXrayImageStorageForPresentation,
00054     DigitalIntraoralXRayImageStorageForProcessing,
00055     CTImageStorage,
00056     EnhancedCTImageStorage,
00057     UltrasoundImageStorageRetired,
00058     UltrasoundImageStorage,
00059     UltrasoundMultiFrameImageStorageRetired,
00060     UltrasoundMultiFrameImageStorage,
00061     MRImageStorage,
00062     EnhancedMRImageStorage,
00063     MRSpectroscopyStorage,
00064     NuclearMedicineImageStorageRetired,
00065     SecondaryCaptureImageStorage,
00066     MultiframeSingleBitSecondaryCaptureImageStorage,
00067     MultiframeGrayscaleByteSecondaryCaptureImageStorage,
00068     MultiframeGrayscaleWordSecondaryCaptureImageStorage,
00069     MultiframeTrueColorSecondaryCaptureImageStorage,
00070     StandaloneOverlayStorage,
00071     StandaloneCurveStorage,
00072     LeadECGWaveformStorage, // 12-
00073     GeneralECGWaveformStorage,
00074     AmbulatoryECGWaveformStorage,
00075     HemodynamicWaveformStorage,
00076     CardiacElectrophysiologyWaveformStorage,
00077     BasicVoiceAudioWaveformStorage,
00078     StandaloneModalityLUTStorage,
00079     StandaloneVOILUTStorage,
00080     GrayscaleSoftcopyPresentationStateStorageSOPClass,
00081     XRayAngiographicImageStorage,
00082     XRayRadiofluoroscopingImageStorage,
00083     XRayAngiographicBiPlaneImageStorageRetired,
00084     NuclearMedicineImageStorage,
00085     RawDataStorage,
00086     SpacialRegistrationStorage, // Spatial
00087     SpacialFiducialsStorage, // Spatial..
00088     PETImageStorage,
00089     RTImageStorage,
00090     RTDoseStorage,
00091     RTStructureSetStorage,
00092     RTPlanStorage,
00093     CSANonImageStorage,
00094     Philips3D,
00095     EnhancedSR,
00096     BasicTextSR,
00097     HardcopyGrayscaleImageStorage,
00098     ComprehensiveSR,
00099     DetachedStudyManagementSOPClass,
00100     EncapsulatedPDFStorage,
00101     EncapsulatedCDASTorage,
00102     StudyComponentManagementSOPClass,
00103     DetachedVisitManagementSOPClass,
00104     DetachedPatientManagementSOPClass,
00105     VideoEndoscopicImageStorage,
00106     GeneralElectricMagneticResonanceImageStorage,
00107     GEPrivate3DModelStorage,
00108     ToshibaPrivateDataStorage,
00109     MammographyCADSR,
00110     KeyObjectSelectionDocument,
00111     HangingProtocolStorage,
00112     ModalityPerformedProcedureStepSOPClass,
00113     PhilipsPrivateMRSyntheticImageStorage,
00114     VLPhotographicImageStorage,
00115     SegmentationStorage, // "1.2.840.10008.5.1.4.1.1.66.4"
00116     RTIonPlanStorage, // 1.2.840.10008.5.1.4.1.1.481.8
00117     XRay3DAngiographicImageStorage, // 1.2.840.10008.5.1.4.1.1.13.1.1
00118     EnhancedXAImageStorage,
00119     RTIonBeamsTreatmentRecordStorage, // 1.2.840.10008.5.1.4.1.1.481.9
00120     SurfaceSegmentationStorage, // "1.2.840.10008.5.1.4.1.1.66.5"
00121     VLWholeSlideMicroscopyImageStorage, // 1.2.840.10008.5.1.4.1.1.77.1.6
00122     RTTreatmentSummaryRecordStorage, // 1.2.840.10008.5.1.4.1.1.481.7
00123     EnhancedUSVolumeStorage, // 1.2.840.10008.5.1.4.1.1.6.2
00124     XRayRadiationDoseSR, // 1.2.840.10008.5.1.4.1.1.88.67
00125     VLEndoscopicImageStorage, // 1.2.840.10008.5.1.4.1.1.77.1.1
00126     BreastTomosynthesisImageStorage, // 1.2.840.10008.5.1.4.1.1.13.1.3
00127     FujiPrivateCRImageStorage, // 1.2.392.200036.9125.1.1.2
00128     OphthalmicPhotography8BitImageStorage, // 1.2.840.10008.5.1.4.1.1.77.1.5.1
00129     OphthalmicTomographyImageStorage, // 1.2.840.10008.5.1.4.1.1.77.1.5.4
00130     VLMicroscopicImageStorage,
```



```

00131     EnhancedPETImageStorage,
00132     VideoPhotographicImageStorage,
00133     XRay3DCraniofacialImageStorage,
00134     IVOCForPresentation,
00135     IVOCForProcessing,
00136     LegacyConvertedEnhancedCTImageStorage,
00137     LegacyConvertedEnhancedMRImageStorage,
00138     LegacyConvertedEnhancedPETImageStorage,
00139     BreastProjectionXRayImageStorageForPresentation,
00140     BreastProjectionXRayImageStorageForProcessing,
00141     HardcopyColorImageStorage,
00142     EnhancedMRColorImageStorage,
00143     FujiPrivateMammoCRImageStorage,
00144     OphthalmicPhotographyl6BitImageStorage,
00145     VideoMicroscopicImageStorage,
00146     MS_END
00147 } MStype; // Media Storage Type
00148
00149 typedef enum {
00150     NoObject = 0, // DICOMDIR
00151     Video, // Most common, include image, video and volume
00152     Waveform, // Isn't it simply a 1D video ?
00153     Audio, // ???
00154     PDF,
00155     URI, // URL...
00156     Segmentation, // TODO
00157     ObjectEnd
00158 } ObjectType;
00159
00161 static const char* GetMSString(MStype ts);
00162
00164 const char* GetString() const;
00165 static MStype GetMStype(const char *str);
00166
00167 MediaStorage(MStype type = MS_END):MSField(type) {}
00168
00171 static bool IsImage(MStype ts);
00172
00173 operator MStype () const { return MSField; }
00174
00175 const char *GetModality() const;
00176 unsigned int GetModalityDimension() const;
00177
00178 static unsigned int GetNumberOfMStype();
00179 static unsigned int GetNumberOfMSString();
00180 static unsigned int GetNumberOfModality();
00181
00182
00187 bool SetFromFile(File const &file);
00188
00191 bool SetFromDataSet(DataSet const &ds); // Will get the SOP Class UID
00192 bool SetFromHeader(FileMetaInformation const &fmi); // Will get the Media Storage SOP Class UID
00193 bool SetFromModality(DataSet const &ds);
00194 void GuessFromModality(const char *modality, unsigned int dimension = 2);
00195
00196 friend std::ostream &operator<<(std::ostream &os, const MediaStorage &ms);
00197
00198 bool IsUndefined() const { return MSField == MS_END; }
00199
00200 protected:
00201 void SetFromSourceImageSequence(DataSet const &ds);
00202
00203 private:
00204 bool SetFromDataSetOrHeader(DataSet const &ds, const Tag &tag);
00205
00206 std::string GetFromDataSetOrHeader(DataSet const &ds, const Tag &tag);
00207 std::string GetFromHeader(FileMetaInformation const &fmi);
00208 std::string GetFromDataSet(DataSet const &ds);
00209
00210 private:
00211 MStype MSField;
00212 };
00213 //-----
00214 inline std::ostream &operator<<(std::ostream &_os, const MediaStorage &ms)
00215 {
00216     const char *msstring = MediaStorage::GetMSString(ms);
00217     _os << (msstring ? msstring : "INVALID MEDIA STORAGE");
00218     return _os;
00219 }
00220 }
00221

```



## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const MrProtocol &d)`

## 13.156 gdcmMrProtocol.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMMRPROTOCOL_H
00015 #define GDCMMRPROTOCOL_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmDataSet.h"
00019
00020 namespace gdcm
00021 {
00022     class ByteValue;
00023     /*
00024      * Everything done in this code is for the sole purpose of writing interoperable
00025      * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
00026      * If you believe anything in this code violates any law or any of your rights,
00027      * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
00028      * find a solution.
00029      */
00030     //-----
00031
00032     class DataElement;
00033     class GDCM_EXPORT MrProtocol
00034     {
00035     public:
00036         friend std::ostream& operator<<(std::ostream &os, const MrProtocol &d);
00037         MrProtocol();
00038         ~MrProtocol();
00039
00040         bool Load( const ByteValue * bv, const char * str, int version );
00041         void Print(std::ostream &os) const;
00042
00043         int GetVersion() const;
00044
00045         const char * GetMrProtocolByName(const char *name) const;
00046
00047         bool FindMrProtocolByName(const char *name) const;
00048
00049         struct Vector3
00050         {
00051             double dSag;
00052             double dCor;
00053             double dTra;
00054         };
00055         struct Slice
00056         {
00057             Vector3 Normal;
00058             Vector3 Position;
00059         };
00060     };

```

```

00063     struct SliceArray
00064     {
00065         std::vector< Slice > Slices;
00066     };
00067     bool GetSliceArray( MrProtocol::SliceArray & sa ) const;
00068
00069 private:
00070     struct Element;
00071     struct Internals;
00072     Internals *Pimpl;
00073 };
00074 //-----
00075 inline std::ostream& operator<<(std::ostream &os, const MrProtocol &d)
00076 {
00077     d.Print( os );
00078     return os;
00079 }
00080
00081 } // end namespace gdcm
00082 //-----
00083 #endif //GDCMMRPROTOCOL_H

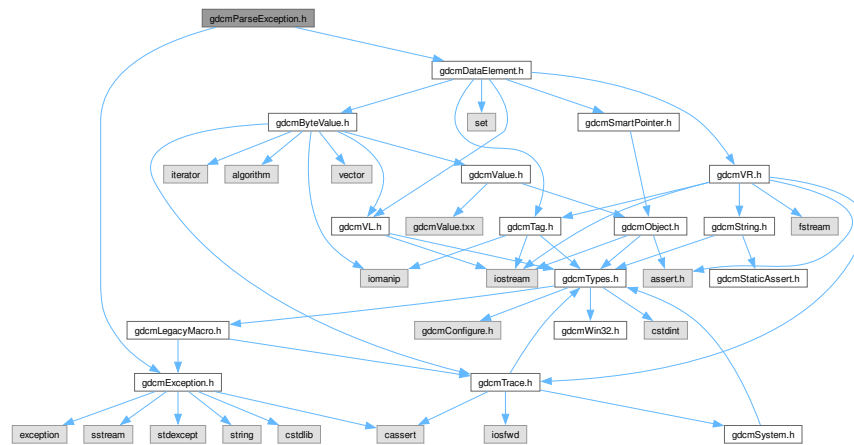
```

## 13.157 gdcmParseException.h File Reference

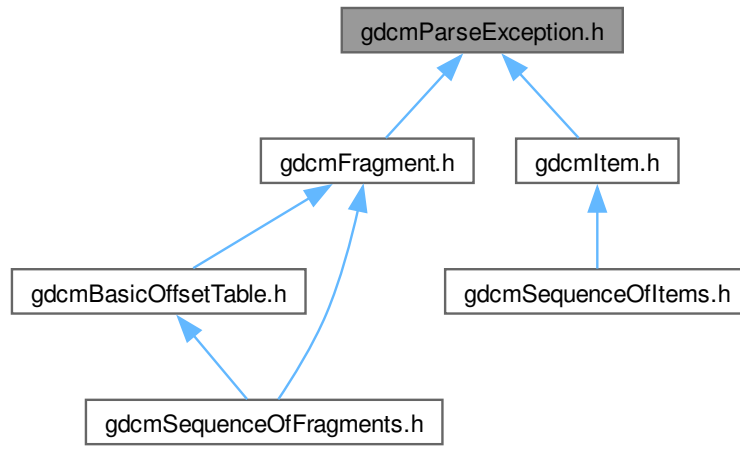
```
#include "gdcmException.h"
```

```
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmParseException.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::ParseException](#)  
*ParseException* Standard exception handling object.

## Namespaces

- namespace [gdcm](#)

## 13.158 gdcmParseException.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012  =====*/
00013  #ifndef GDCMPARSESEEXCEPTION_H
00014  #define GDCMPARSESEEXCEPTION_H
00015
00016  #include "gdcmException.h"
00017  #include "gdcmDataElement.h"
00018
00019

```

```

00020 // Disable clang warning "dynamic exception specifications are deprecated".
00021 // We need to be C++03 and C++11 compatible, and if we remove the 'throw()'
00022 // specifier we'll get an error in C++03 by not matching the superclass.
00023 #if defined(__clang__) && defined(__has_warning)
00024 # if __has_warning("-Wdeprecated")
00025 # pragma clang diagnostic push
00026 # pragma clang diagnostic ignored "-Wdeprecated"
00027 # endif
00028 #endif
00029
00030 namespace gdcm_ns
00031 {
00032 class ParseException : public Exception
00033 {
00034 public:
00035     ParseException() = default;
00036     ~ParseException() throw() override {}
00037
00038     ParseException &operator= ( const ParseException &orig )
00039     {
00040         LastElement = orig.LastElement;
00041         return *this;
00042     }
00043     ParseException(const ParseException& orig):Exception(orig)
00044     {
00045         LastElement = orig.LastElement;
00046     }
00047
00048     /* virtual bool operator==( const ParseException &orig )
00049     {
00050         return true;
00051     }*/
00052
00053     /*
00054     // Multiple calls to what ??
00055     const char* what() const throw()
00056     {
00057         static std::string strwhat;
00058         std::ostringstream oswhat;
00059         oswhat << File << ":" << Line << ":\n";
00060         oswhat << Description;
00061         strwhat = oswhat.str();
00062         return strwhat.c_str();
00063     }
00064 */
00065     void SetLastElement(DataElement& de)
00066     {
00067         LastElement = de;
00068     }
00069     const DataElement& GetLastElement() const { return LastElement; }
00070
00071 private:
00072     // Store last parsed element before error:
00073     DataElement LastElement;
00074 };
00075
00076 } // end namespace gdcm_ns
00077
00078 // Undo warning suppression.
00079 #if defined(__clang__) && defined(__has_warning)
00080 # if __has_warning("-Wdeprecated")
00081 # pragma clang diagnostic pop
00082 # endif
00083 #endif
00084
00085 #endif

```

## 13.159 gdcmParser.h File Reference

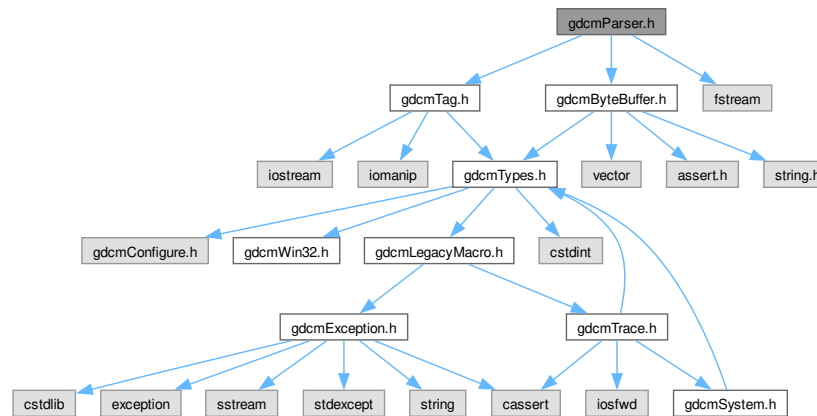
```

#include "gdcmTag.h"
#include "gdcmByteBuffer.h"

```

```
#include <fstream>
```

Include dependency graph for gdcmParser.h:



## Classes

- class [gdcm::Parser](#)  
*Parser* ala *XML\_Parser* from *expat* (SAX).

## Namespaces

- namespace [gdcm](#)

## 13.160 gdcmParser.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012 =====*/
00013
00014
00015 #ifndef GDCMPARSER_H
00016 #define GDCMPARSER_H
00017
00018 #include "gdcmTag.h"
00019 #error do not use
00020 #include "gdcmByteBuffer.h"
00021
00022 #include <fstream> // std::ifstream
00023

```

```

00024 namespace gdcmm
00025 {
00032 class GDCM_EXPORT Parser /*: private IStream*/
00033 {
00034 public:
00035     typedef enum {
00036         NoError,
00037         NoMemoryError,
00038         SyntaxError,
00039         NoElementsError,
00040         TagMismatchError,
00041         DuplicateAttributeError,
00042         JunkAfterDocElementError,
00043         UndefinedEntityError,
00044         UnexpectedStateError
00045     } ErrorType;
00046
00047     Parser() : UserData(0), Buffer(), ErrorCode(NoError) {}
00048     ~Parser() {}
00049
00050     // Parse some more of the document. The string s is a buffer containing
00051     // part (or perhaps all) of the document. The number of bytes of s that
00052     // are part of the document is indicated by len. This means that s
00053     // doesn't have to be null terminated. It also means that if len is
00054     // larger than the number of bytes in the block of memory that s points
00055     // at, then a memory fault is likely. The isFinal parameter informs the
00056     // parser that this is the last piece of the document. Frequently, the
00057     // last piece is empty (i.e. len is zero.) If a parse error occurred,
00058     // it returns 0. Otherwise it returns a non-zero value.
00059     bool Parse(const char* s, int len, bool isFinal);
00060
00061     // Set handlers for start and end tags. Attributes are passed to the
00062     // start handler as a pointer to a vector of char pointers. Each
00063     // attribute seen in a start (or empty) tag occupies 2 consecutive places
00064     // in this vector: the attribute name followed by the attribute value.
00065     // These pairs are terminated by a null pointer.
00066     typedef void (*StartElementHandler) (void *userData,
00067                                         const Tag &tag,
00068                                         const char *atts[]);
00069     typedef void (*EndElementHandler) (void *userData, const Tag &name);
00070     void SetElementHandler(StartElementHandler start, EndElementHandler end);
00071
00072     // Return what type of error has occurred.
00073     ErrorType GetErrorCode() const;
00074
00075     // Return a string describing the error corresponding to code.
00076     // The code should be one of the enums that can be returned from
00077     // GetErrorCode.
00078     static const char *GetErrorString(ErrorType const &err);
00079
00080     // Return the byte offset of the position.
00081     unsigned long GetCurrentByteIndex() const;
00082
00083     // Miscellaneous functions
00084
00085     // The functions in this section either obtain state information from
00086     // the parser or can be used to dynamically set parser options.
00087
00088     // This sets the user data pointer that gets passed to handlers.
00089     void SetUserData(void *userData);
00090
00091     // This returns the user data pointer that gets passed to handlers.
00092     void * GetUserData() const;
00093
00094 protected:
00095
00096     // This is just like Parse, except in this case expat provides the buffer.
00097     // By obtaining the buffer from expat with the GetBuffer function,
00098     // the application can avoid double copying of the input.
00099     bool ParseBuffer(int len, bool isFinal);
00100
00101     // Obtain a buffer of size len to read a piece of the document into.
00102     // A NULL value is returned if expat can't allocate enough memory for
00103     // this buffer. This has to be called prior to every call to ParseBuffer.
00104     char *GetBuffer(int len);
00105
00106     ErrorType Process();
00107
00108 private:
00109     std::ifstream Stream;
00110     void* UserData;

```



```

00111   ByteBuffer Buffer;
00112   ErrorType ErrorCode;
00113
00114   StartElementHandler StartElement;
00115   EndElementHandler EndElement;
00116 };
00117
00118 } // end namespace gdcm
00119
00120 #endif //GDCMPARSER_H

```

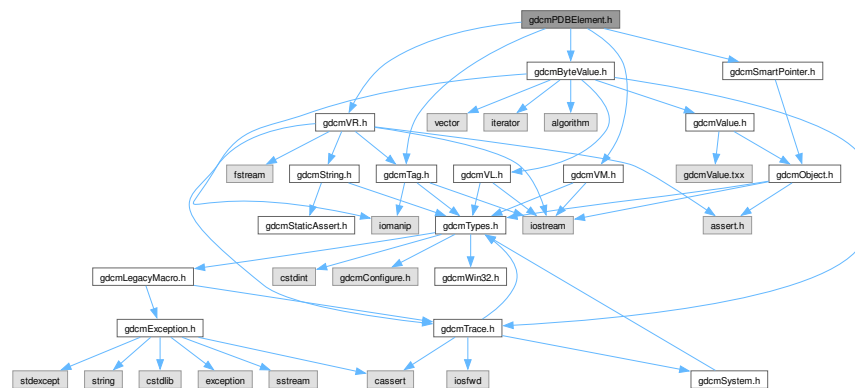
## 13.161 gdcmPDBelement.h File Reference

```

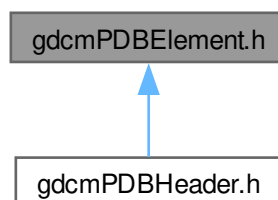
#include "gdcmTag.h"
#include "gdcmVM.h"
#include "gdcmVR.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"

```

Include dependency graph for gdcmPDBelement.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::PDBelement`  
*Class to represent a PDB Element.*

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const PDBelement &val)`

## 13.162 gdcmPDBelement.h

[Go to the documentation of this file.](#)

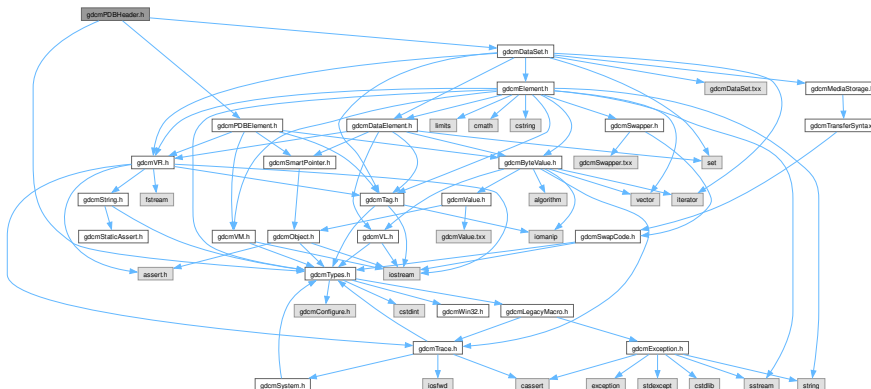
```

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00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMPDBelement_H
00015  #define GDCMPDBelement_H
00016
00017  #include "gdcmTag.h"
00018  #include "gdcmVM.h"
00019  #include "gdcmVR.h"
00020  #include "gdcmByteValue.h"
00021  #include "gdcmSmartPointer.h"
00022
00023  namespace gdcm
00024  {
00025  class GDCM_EXPORT PDBelement
00026  {
00027  public:
00028   PDBelement() = default;
00029
00030   friend std::ostream& operator<<(std::ostream &os, const PDBelement &val);
00031
00032   const char *GetName() const { return NameField.c_str(); }
00033   void SetName(const char *name) { NameField = name; }
00034
00035   const char *GetValue() const { return ValueField.c_str(); }
00036   void SetValue(const char *value) { ValueField = value; }
00037
00038   bool operator==(const PDBelement &de) const
00039   {
00040     return ValueField == de.ValueField
00041        && NameField == de.NameField;
00042   }
00043
00044 protected:
00045   std::string NameField;
00046   std::string ValueField;
00047 };
00048
00049  //-----
00050  inline std::ostream& operator<<(std::ostream &os, const PDBelement &val)

```

```
000056 }
000057 os « val.NameField;
000058 os « " \\"";
000059 os « val.ValueField;
000060 os « "\\\"";
000061
000062 return os;
000063 }
000064
000065 } // end namespace gdcmm
000066
000067 #endif //GDCMPDBELEMNT_H
```

```
#include "gdcTypes.h"
#include "gdcDataSet.h"
#include "gdcPDBElement.h"
Include dependency graph for gdcPDBHeader.h:
```



- class `gdcmm::PDBHeader`  
*Class for `PDBHeader`.*

- namespace **gdcm**

- `std::ostream & gdcm::operator<< (std::ostream &os, const PDBHeader &d)`

## 13.164 gdcmPDBHeader.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPDBHEADER_H
00015 #define GDCMPDBHEADER_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmDataSet.h"
00019 #include "gdcmPDBelement.h"
00020
00021 namespace gdcm
00022 {
00023
00024   /*
00025    * Everything done in this code is for the sole purpose of writing interoperable
00026    * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
00027    * If you believe anything in this code violates any law or any of your rights,
00028    * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
00029    * find a solution.
00030    */
00031   //-----
00032
00033   class DataElement;
00034   class PrivateTag;
00035   class GDCM_EXPORT PDBHeader
00036   {
00037   friend std::ostream& operator<(std::ostream &os, const PDBHeader &d);
00038   public :
00039     PDBHeader() = default;
00040     ~PDBHeader() = default;
00041
00042     bool LoadFromDataElement(DataElement const &de);
00043
00044     void Print(std::ostream &os) const;
00045
00046     static const PrivateTag & GetPDBInfoTag();
00047
00048     const PDBelement &GetPDBelementByName(const char *name);
00049
00050     bool FindPDBelementByName(const char *name);
00051
00052   protected:
00053     const PDBelement& GetPDBeEnd() const;
00054
00055   private:
00056     int readprotocoldatablock(const char *input, size_t inputlen, bool verbose);
00057     std::vector<PDBelement> InternalPDBDataSet;
00058     static PDBelement PDBeEnd;
00059     bool IsXML;
00060     std::string xmltxt;
00061   };
00062   //-----
00063   inline std::ostream& operator<(std::ostream &os, const PDBHeader &d)
00064   {
00065     d.Print( os );
00066     return os;
00067   }
00068 } // end namespace gdcm
00069 //-----
00070 #endif //GDCMPDBHEADER_H

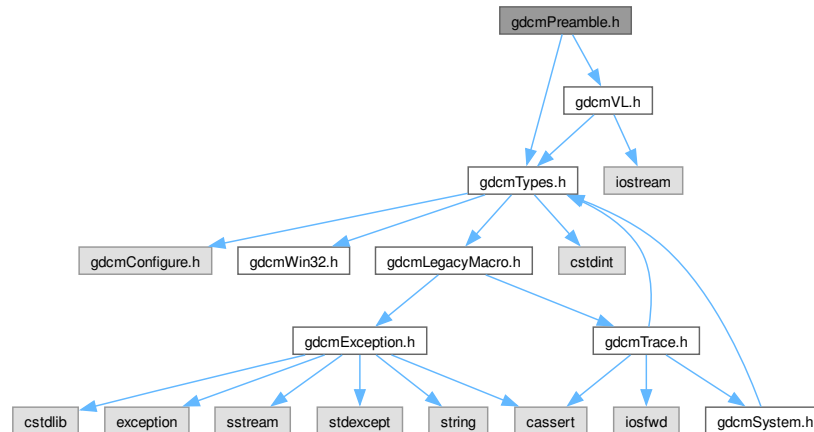
```

## 13.165 gdcmPreamble.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmVL.h"
```

Include dependency graph for gdcmPreamble.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::Preamble](#)  
*DICOM [Preamble](#) (Part 10).*

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Preamble &val)`

## 13.166 gdcmPreamble.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPREAMBLE_H
00015 #define GDCMPREAMBLE_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmVL.h"
00019
00020 namespace gdcm
00021 {
00022
00023     class GDCM_EXPORT Preamble
00024     {
00025     public:
00026         Preamble();
00027         ~Preamble();
00028
00029         friend std::ostream &operator<<(std::ostream &os, const Preamble &_val);
00030
00031         void Clear();
00032
00033         void Valid();
00034         void Create();
00035         void Remove();
00036
00037         std::istream &Read(std::istream &is);
00038
00039         std::ostream const &Write(std::ostream &os) const;
00040
00041         void Print(std::ostream &os) const;
00042
00043         const char *GetInternal() const { return Internal; }
00044
00045         bool IsEmpty() const { return !Internal; }
00046
00047         VL GetLength() const { return 128 + 4; }
00048
00049         Preamble(Preamble const &):Internal(nullptr)
00050         {
00051             Create();
00052         }
00053
00054         Preamble& operator=(Preamble const &)
00055         {
00056             Create();
00057             return *this;
00058         }
00059     protected:
00060         //
00061         bool IsValid() const {
00062             // is (IsValid == true) => Internal was read
00063             return true;
00064         }
00065     private:
00066         char *Internal;
00067     };
00068
00069 //-----
00070 inline std::ostream& operator<<(std::ostream &os, const Preamble &val)
00071 {
00072     os << val.Internal;
00073     return os;
00074 }
00075
00076 } // end namespace gdcm

```

```

00087
00088 #endif //GDCMPREAMBLE_H

```

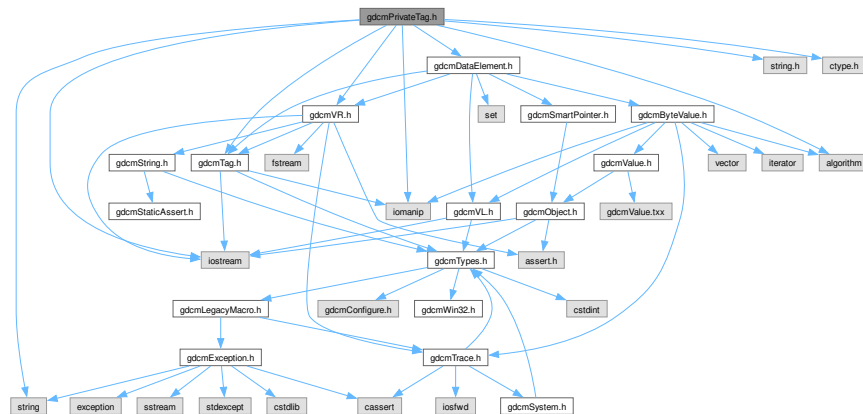
## 13.167 gdcmPrivateTag.h File Reference

```

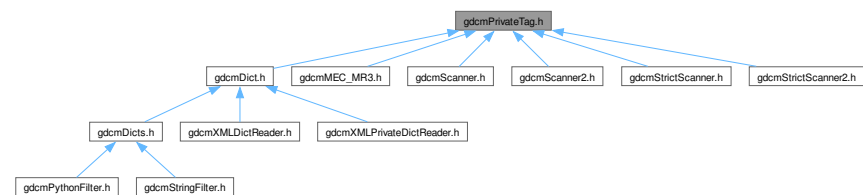
#include "gdcmTag.h"
#include "gdcmVR.h"
#include "gdcmDataElement.h"
#include <iostream>
#include <iomanip>
#include <string>
#include <algorithm>
#include <string.h>
#include <ctype.h>

```

Include dependency graph for gdcmPrivateTag.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::PrivateTag](#)

Class to represent a Private DICOM Data [Element](#) ([Attribute](#)) [Tag](#) ([Group](#), [Element](#), [Owner](#)).

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const PrivateTag &val)`

## 13.168 gdcmPrivateTag.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPRIVATETAG_H
00015 #define GDCMPRIVATETAG_H
00016
00017 #include "gdcmTag.h"
00018 #include "gdcmVR.h"
00019 #include "gdcmDataElement.h"
00020
00021 #include <iostream>
00022 #include <iomanip>
00023 #include <string>
00024 #include <algorithm>
00025
00026 #include <string.h> // strlen
00027 #include <ctype.h> // tolower
00028
00029 namespace gdcm_ns
00030 {
00031
00032
00033 // TODO: We could save some space since we only store 8bits for element
00034 class GDCM_EXPORT PrivateTag : public Tag
00035 {
00036     friend std::ostream& operator<<(std::ostream &_os, const PrivateTag &_val);
00037 public:
00038     PrivateTag(uint16_t group = 0, uint16_t element = 0, const char *owner =
00039         ""):Tag(group,element),Owner(owner ? LOComp::Trim(owner) : "") {
00040         // truncate the high bits
00041         SetElement( (uint8_t)element );
00042     }
00043     PrivateTag( Tag const & t, const char *owner = ""):Tag(t),Owner(owner ? LOComp::Trim(owner) : "") {
00044         // truncate the high bits
00045         SetElement( (uint8_t)t.GetElement());
00046     }
00047
00048     const char *GetOwner() const { return Owner.c_str(); }
00049     void SetOwner(const char *owner) { if(owner) Owner = LOComp::Trim(owner); }
00050
00051     PrivateTag &operator=(const PrivateTag &_val)
00052     {
00053         SetElementTag( _val.GetElementTag() );
00054         Owner = _val.Owner;
00055         return *this;
00056     }
00057
00058     bool operator==(const Tag &_val) const
00059     {

```

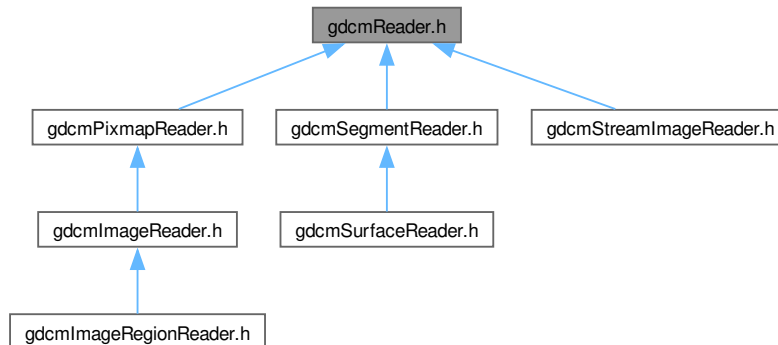


### 13.169 gdcMReader.h File Reference

Include dependency graph for `gdcmReader.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::Reader](#)  
*Reader* ala DOM (Document *Object* Model).

## Namespaces

- namespace [gdcm](#)

## 13.170 gdcmReader.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
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00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMREADER_H
00015 #define GDCMREADER_H
00016
00017 #include "gdcmFile.h"
00018
00019 #include <fstream>
00020
00021 namespace gdcm_ns
00022 {
00023     class StreamImageReader;
00053 class GDCM_EXPORT Reader
00054 {
00055 public:

```

```

00056     Reader();
00057     virtual ~Reader();
00058
00060     virtual bool Read(); // Execute()
00061
00064     void SetFileName(const char *filename_native);
00065
00067     void SetStream(std::istream &input_stream) {
00068         Stream = &input_stream;
00069     }
00070
00072     const File &GetFile() const { return *F; }
00073
00075     File &GetFile() { return *F; }
00076
00078     void SetFile(File& file) { F = &file; }
00079
00082     bool ReadUpToTag(const Tag &tag, std::set<Tag> const &skiptags = std::set<Tag>() );
00083
00085     bool ReadSelectedTags(std::set<Tag> const &tags, bool readvalues = true);
00086
00088     bool ReadSelectedPrivateTags(std::set<PrivateTag> const &ptags, bool readvalues = true);
00089
00092     bool CanRead() const;
00093
00096     size_t GetStreamCurrentPosition() const;
00097
00098 protected:
00099     bool ReadPreamble();
00100     bool ReadMetaInformation();
00101     bool ReadDataSet();
00102
00103     SmartPointer<File> F;
00104
00105     friend class StreamImageReader; //need to be friended to be able to grab the GetStreamPtr
00106
00107     //this function is added for the StreamImageReader, which needs to read
00108     //up to the pixel data and then stops right before reading the pixel data.
00109     //it's used to get that position, so that reading can continue
00110     //apace once the read function is called.
00111     //so, this function gets the stream directly, and then allows for position information
00112     //from the tellg function, and allows for stream/pointer manip in order
00113     //to read the pixel data. Note, of course, that reading pixel elements
00114     //will still have to be subject to endianness swaps, if necessary.
00115     std::istream* GetStreamPtr() const { return Stream; }
00116
00117 private:
00118     template <typename T_Caller>
00119     bool InternalReadCommon(const T_Caller &caller);
00120     TransferSyntax GuessTransferSyntax();
00121     std::istream *Stream;
00122     std::ifstream *Ifstream;
00123
00124     // prevent copy/move to avoid 2 ifstream leak
00125     Reader(const Reader &) = delete;
00126     Reader &operator=(const Reader &) = delete;
00127     Reader(const Reader &&) = delete;
00128     Reader &operator=(const Reader &&) = delete;
00129 };
00130
00136
00137 } // end namespace gdcm_ns
00138
00139
00140 #endif //GDCMREADER_H

```

## 13.171 gdcmSequenceOfFragments.h File Reference

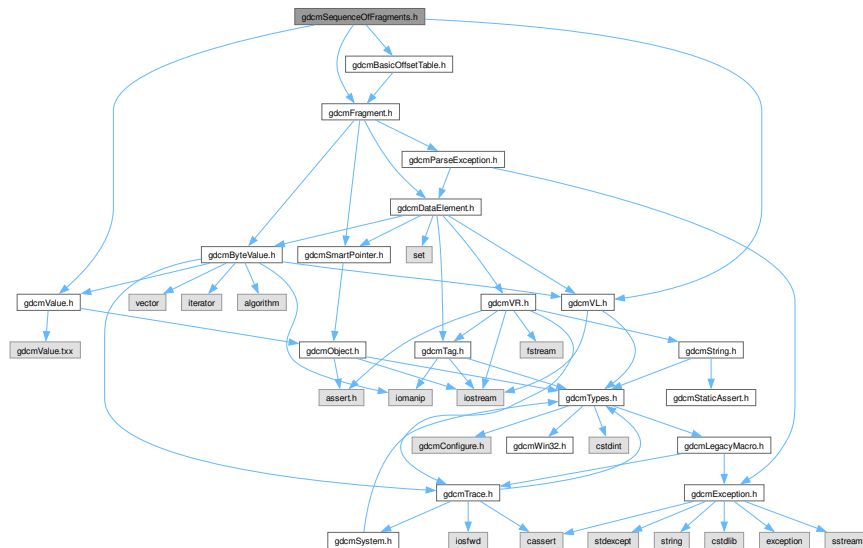
```

#include "gdcmValue.h"
#include "gdcmVL.h"
#include "gdcmFragment.h"

```

```
#include "gdcmBasicOffsetTable.h"
```

Include dependency graph for `gdcmSequenceOfFragments.h`:



## Classes

- class `gdcm::SequenceOfFragments`  
*Class to represent a Sequence Of Fragments.*

## Namespaces

- namespace `gdcm`

## 13.172 gdcmSequenceOfFragments.h

[Go to the documentation of this file.](#)

```
00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012  =====*/
00013
00014  #ifndef GDCMSEQUENCEOFFRAGMENTS_H
00015  #define GDCMSEQUENCEOFFRAGMENTS_H
00016
00017  #include "gdcmValue.h"
00018  #include "gdcmVL.h"
00019  #include "gdcmFragment.h"
```

```

00020 #include "gdcmBasicOffsetTable.h"
00021
00022 namespace gdcm_ns
00023 {
00024
00025     // FIXME gdcmSequenceOfItems and gdcmSequenceOfFragments
00026     // should be rethink (duplicate code)
00031 class GDCM_EXPORT SequenceOfFragments : public Value
00032 {
00033 public:
00034     // Typdefs:
00035     typedef std::vector<Fragment> FragmentVector;
00036     typedef FragmentVector::size_type SizeType;
00037     typedef FragmentVector::iterator Iterator;
00038     typedef FragmentVector::const_iterator ConstIterator;
00039     Iterator Begin() { return Fragments.begin(); }
00040     Iterator End() { return Fragments.end(); }
00041     ConstIterator Begin() const { return Fragments.begin(); }
00042     ConstIterator End() const { return Fragments.end(); }
00043
00045     SequenceOfFragments():Table(),SequenceLengthField(0xFFFFFFFF) { }
00046
00048     VL GetLength() const override {
00049         return SequenceLengthField;
00050     }
00051
00053     void SetLength(VL length) override {
00054         SequenceLengthField = length;
00055     }
00056
00058     void Clear() override;
00059
00061     void AddFragment(Fragment const &item);
00062
00063     // Compute the length of all fragments (and fragments only!).
00064     // Basically the size of the PixelData as stored (in bytes).
00065     unsigned long ComputeByteLength() const;
00066
00067     // Compute the length of fragments (in bytes)+ length of tag...
00068     // to be used for computation of Group Length
00069     VL ComputeLength() const;
00070
00071     // Get the buffer
00072     bool GetBuffer(char *buffer, unsigned long length) const;
00073     bool GetFragBuffer(unsigned int fragNb, char *buffer, unsigned long &length) const;
00074
00075     SizeType GetNumberOfFragments() const;
00076     const Fragment& GetFragment(SizeType num) const;
00077
00078     // Write the buffer of each fragment (call WriteBuffer on all Fragments, which are
00079     // ByteValue). No Table information is written.
00080     bool WriteBuffer(std::ostream &os) const;
00081
00082     const BasicOffsetTable &GetTable() const { return Table; }
00083     BasicOffsetTable &GetTable() { return Table; }
00084
00085 template <typename TSwap>
00086 std::istream& Read(std::istream &is, bool readvalues = true)
00087 {
00088     assert( SequenceLengthField.IsUndefined() );
00089     ReadPreValue<TSwap>(is);
00090     return ReadValue<TSwap>(is, readvalues);
00091 }
00092
00093 template <typename TSwap>
00094 std::istream& ReadPreValue(std::istream &is)
00095 {
00096     // First item is the basic offset table:
00097     #if 0
00098     try
00099     {
00100         Table.Read<TSwap>(is);
00101         gdcmDebugMacro( "Table: " « Table );
00102     }
00103     catch(...)
00104     {
00105         // throw "SIEMENS Icon thingy";
00106         // Bug_Siemens_PrivateIconNoItem.dcm
00107         // First thing first let's rewind
00108         is.seekg(-4, std::ios::cur);
00109         // FF D8 <=> Start of Image (SOI) marker

```

```

00110 // FF E0 <=> APP0 Reserved for Application Use
00111 if ( Table.GetTag() == Tag(0xd8ff,0xe0ff) )
00112 {
00113     Table = BasicOffsetTable(); // clear up stuff
00114     //Table.SetByteValue( "", 0 );
00115     Fragment frag;
00116     if( FillFragmentWithJPEG( frag, is ) )
00117     {
00118         Fragments.push_back( frag );
00119     }
00120     return is;
00121 }
00122 else
00123 {
00124     throw "Catch me if you can";
00125     //assert(0);
00126 }
00127 }
00128 #else
00129     Table.Read<TSwap>(is);
00130     gdcMDebugMacro( "Table: " « Table );
00131 #endif
00132     return is;
00133 }
00134
00135 template <typename TSwap>
00136 std::istream& ReadValue(std::istream &is, bool /*readvalues*/)
00137 {
00138     const Tag seqDelItem(0xfffe,0xe0dd);
00139     // not used for now...
00140     Fragment frag;
00141     try
00142     {
00143         while( frag.Read<TSwap>(is) && frag.GetTag() != seqDelItem )
00144         {
00145             //gdcMDebugMacro( "Frag: " « frag );
00146             Fragments.push_back( frag );
00147         }
00148         assert( frag.GetTag() == seqDelItem && frag.GetVL() == 0 );
00149     }
00150     catch(Exception &ex)
00151     {
00152         (void)ex;
00153 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
00154         // that's ok ! In all cases the whole file was read, because
00155         // Fragment::Read only fail on eof() reached 1.
00156         // SIEMENS-JPEG-CorruptFrag.dcm is more difficult to deal with, we have a
00157         // partial fragment, read we decide to add it anyway to the stack of
00158         // fragments (eof was reached so we need to clear error bit)
00159         if( frag.GetTag() == Tag(0xfffe,0xe000) )
00160         {
00161             gdcMWarningMacro( "Pixel Data Fragment could be corrupted. Use file at own risk" );
00162             Fragments.push_back( frag );
00163             is.clear(); // clear the error bit
00164         }
00165         // 2. GENESIS_SIGNA-JPEG-CorruptFrag.dcm
00166         else if ( frag.GetTag() == Tag(0xddff,0x00e0) )
00167         {
00168             assert( Fragments.size() == 1 );
00169             const ByteValue *bv = Fragments[0].GetByteValue();
00170             assert( bv->GetLength() >= 1 && (unsigned char)bv->GetPointer()[ bv->GetLength() - 1 ] == 0xfe );
00171             // Yes this is an extra copy, this is a bug anyway, go fix YOUR code
00172             Fragments[0].SetByteValue( bv->GetPointer(), bv->GetLength() - 1 );
00173             gdcMWarningMacro( "JPEG Fragment length was declared with an extra byte"
00174                             " at the end: stripped !" );
00175             is.clear(); // clear the error bit
00176         }
00177         // 3. LEICA/WSI
00178         else if ( (frag.GetTag().GetGroup() == 0x00ff)
00179                 && ((frag.GetTag().GetElement() & 0x00ff) == 0xe0) )
00180         {
00181             // Looks like there is a mess with offset and odd byte array
00182             // We are going first to backtrack one byte back, and then use a
00183             // ReadBacktrack function which in turn may backtrack up to 10 bytes
00184             // backward. This appears to be working on a set of DICOM/WSI files from
00185             // LEICA
00186             gdcMWarningMacro( "Trying to fix the even-but-odd value length bug #1" );
00187             assert( Fragments.size() );
00188             const size_t lastf = Fragments.size() - 1;
00189             const ByteValue *bv = Fragments[ lastf ].GetByteValue();
00190             const char *a = bv->GetPointer();

```

```

00191     gdcmAssertAlwaysMacro( bv->GetLength() >= 1 && (unsigned char)a[ bv->GetLength() - 1 ] == 0xfe );
00192     Fragments[ lastf ].SetByteValue( bv->GetPointer(), bv->GetLength() - 1 );
00193     is.seekg( -9, std::ios::cur );
00194     assert( is.good() );
00195     while( frag.ReadBacktrack<TSwap>(is) && frag.GetTag() != seqDelItem )
00196     {
00197         gdcmDebugMacro( "Frag: " << frag );
00198         Fragments.push_back( frag );
00199     }
00200     assert( frag.GetTag() == seqDelItem && frag.GetVL() == 0 );
00201 }
00202 // 4. LEICA/WSI (bis)
00203 else if ( frag.GetTag().GetGroup() == 0xe000 )
00204 {
00205     // Looks like there is a mess with offset and odd byte array
00206     // We are going first to backtrack one byte back, and then use a
00207     // ReadBacktrack function which in turn may backtrack up to 10 bytes
00208     // backward. This appears to be working on a set of DICOM/WSI files from
00209     // LEICA
00210     gdcmWarningMacro( "Trying to fix the even-but-odd value length bug #2" );
00211     assert( Fragments.size() );
00212     const size_t lastf = Fragments.size() - 1;
00213     const ByteValue *bv = Fragments[ lastf ].GetByteValue();
00214     const char *a = bv->GetPointer();
00215     gdcmAssertAlwaysMacro( bv->GetLength() >= 2 && (unsigned char)a[ bv->GetLength() - 2 ] == 0xfe );
00216     Fragments[ lastf ].SetByteValue( bv->GetPointer(), bv->GetLength() - 2 );
00217     is.seekg( -10, std::ios::cur );
00218     assert( is.good() );
00219     while( frag.ReadBacktrack<TSwap>(is) && frag.GetTag() != seqDelItem )
00220     {
00221         gdcmDebugMacro( "Frag: " << frag );
00222         Fragments.push_back( frag );
00223     }
00224     assert( frag.GetTag() == seqDelItem && frag.GetVL() == 0 );
00225 }
00226 // 5. LEICA/WSI (ter)
00227 else if ( (frag.GetTag().GetGroup() & 0x00ff) == 0x00e0
00228 && (frag.GetTag().GetElement() & 0xff00) == 0x0000 )
00229 {
00230     // Looks like there is a mess with offset and odd byte array
00231     // We are going first to backtrack one byte back, and then use a
00232     // ReadBacktrack function which in turn may backtrack up to 10 bytes
00233     // backward. This appears to be working on a set of DICOM/WSI files from
00234     // LEICA
00235     gdcmWarningMacro( "Trying to fix the even-but-odd value length bug #3" );
00236     assert( Fragments.size() );
00237     const size_t lastf = Fragments.size() - 1;
00238     const ByteValue *bv = Fragments[ lastf ].GetByteValue();
00239     const char *a = bv->GetPointer();
00240     gdcmAssertAlwaysMacro( bv->GetLength() >= 3 && (unsigned char)a[ bv->GetLength() - 3 ] == 0xfe );
00241     Fragments[ lastf ].SetByteValue( bv->GetPointer(), bv->GetLength() - 3 );
00242     is.seekg( -11, std::ios::cur );
00243     assert( is.good() );
00244     while( frag.ReadBacktrack<TSwap>(is) && frag.GetTag() != seqDelItem )
00245     {
00246         gdcmDebugMacro( "Frag: " << frag );
00247         Fragments.push_back( frag );
00248     }
00249     assert( frag.GetTag() == seqDelItem && frag.GetVL() == 0 );
00250 }
00251 else
00252 {
00253     // 3. gdcm-JPEG-LossLess3a.dcm: easy case, an extra tag was found
00254     // instead of terminator (eof is the next char)
00255     gdcmWarningMacro( "Reading failed at Tag:" << frag.GetTag() << " Index #"
00256 << Fragments.size() << " Offset " << is.tellg() << ". Use file at own risk."
00257 << ex.what() );
00258 }
00259 #endif /* GDCM_SUPPORT_BROKEN_IMPLEMENTATION */
00260 }
00261
00262 return is;
00263 }
00264
00265 template <typename TSwap>
00266 std::ostream const &Write( std::ostream &os ) const
00267 {
00268     if( !Table.Write<TSwap>(os) )
00269     {
00270         assert( 0 && "Should not happen" );
00271         return os;
00272     }

```

```

00272     }
00273     for(ConstIterator it = Begin(); it != End(); ++it)
00274     {
00275         it->Write<TSwap>(os);
00276     }
00277     // seq del item is not stored, write it !
00278     const Tag seqDelItem(0xfffe,0xe0dd);
00279     seqDelItem.Write<TSwap>(os);
00280     VL zero = 0;
00281     zero.Write<TSwap>(os);
00282
00283     return os;
00284 }
00285
00286 // #if defined(SWIGPYTHON) || defined(SWIGCSharp) || defined(SWIGJAVA)
00287 // For now leave it there, this does not make sense in the C++ layer
00288 // Create a new object
00289 static SmartPointer<SequenceOfFragments> New()
00290 {
00291     return new SequenceOfFragments();
00292 }
00293 // #endif
00294
00295 protected:
00296 public:
00297     void Print(std::ostream &os) const override {
00298         os << "SQ L= " << SequenceLengthField << "\n";
00299         os << "Table:" << Table << "\n";
00300         for(ConstIterator it = Begin(); it != End(); ++it)
00301         {
00302             os << " " << *it << "\n";
00303         }
00304         assert( SequenceLengthField.IsUndefined() );
00305         {
00306             const Tag seqDelItem(0xfffe,0xe0dd);
00307             VL zero = 0;
00308             os << seqDelItem;
00309             os << "\t" << zero;
00310         }
00311     }
00312     bool operator==(const Value &val) const override
00313     {
00314         const SequenceOfFragments &sqf = dynamic_cast<const SequenceOfFragments&>(val);
00315         return Table == sqf.Table &&
00316             SequenceLengthField == sqf.SequenceLengthField &&
00317             Fragments == sqf.Fragments;
00318     }
00319
00320 private:
00321     BasicOffsetTable Table;
00322     VL SequenceLengthField;
00323     FragmentVector Fragments;
00324
00325 private:
00326     bool FillFragmentWithJPEG( Fragment & frag, std::istream & is );
00327 };
00328
00329
00330
00331 } // end namespace gdcm_ns
00332
00333 #endif // GDCMSEQUENCEOFFRAGMENTS_H

```

## 13.173 gdcmSequenceOfItems.h File Reference

```

#include "gdcmValue.h"
#include "gdcmItem.h"
#include <vector>
#include <cstring>
#include "gdcmSequenceOfItems.txx"

```



[illegible]

- class `gdcm::SequenceOfItems`  
*Class to represent a Sequence Of Items.*

- namespace **gdcm**

[Go to the documentation of this file.](#)

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```

00042 // Typdefs:
00043 typedef std::vector< Item > ItemVector;
00044 typedef ItemVector::size_type SizeType;
00045 typedef ItemVector::iterator Iterator;
00046 typedef ItemVector::const_iterator ConstIterator;
00047 Iterator Begin() { return Items.begin(); }
00048 Iterator End() { return Items.end(); }
00049 ConstIterator Begin() const { return Items.begin(); }
00050 ConstIterator End() const { return Items.end(); }
00051
00053 SequenceOfItems():SequenceLengthField(0xFFFFFFFF) { }
00054 //SequenceOfItems(VL const &vl = 0xFFFFFFFF):SequenceLengthField(vl),NType(type) { }
00055
00057 VL GetLength() const override { return SequenceLengthField; }
00059 void SetLength(VL length) override {
00060     SequenceLengthField = length;
00061 }
00063 void SetLengthToUndefined();
00065 bool IsUndefinedLength() const {
00066     return SequenceLengthField.IsUndefined();
00067 }
00068
00069 template <typename TDE>
00070 VL ComputeLength() const;
00071
00073 void Clear() override;
00074
00076 void AddItem(Item const &item);
00077
00079 Item & AddNewUndefinedLengthItem();
00080
00083 bool RemoveItemByIndex( const SizeType index );
00084
00085 bool IsEmpty() const { return Items.empty(); }
00086 SizeType GetNumberOfItems() const { return Items.size(); }
00087 void SetNumberOfItems(SizeType n) { Items.resize(n); }
00088
00089 /* WARNING: first item is #1 (see DICOM standard)
00090  * Each Item shall be implicitly assigned an ordinal position starting with the value 1 for the
00091  * first Item in the Sequence, and incremented by 1 with each subsequent Item. The last Item in the
00092  * Sequence shall have an ordinal position equal to the number of Items in the Sequence.
00093  */
00094 const Item &GetItem(SizeType position) const;
00095 Item &GetItem(SizeType position);
00096
00097 SequenceOfItems &operator=(const SequenceOfItems &val) {
00098     SequenceLengthField = val.SequenceLengthField;
00099     Items = val.Items;
00100     return *this;
00101 }
00102
00103 template <typename TDE, typename TSwap>
00104 std::istream &Read(std::istream &is, bool readvalues = true)
00105 {
00106     (void)readvalues;
00107     const Tag seqDelItem(0xfffe,0xe0dd);
00108     if( SequenceLengthField.IsUndefined() )
00109     {
00110         Item item;
00111         while( item.Read<TDE,TSwap>(is) && item.GetTag() != seqDelItem )
00112         {
00113             //gdcMDebugMacro( "Item: " << item );
00114             assert( item.GetTag() != seqDelItem );
00115             Items.push_back( item );
00116             item.Clear();
00117         }
00118         //assert( item.GetTag() == seqDelItem && item.GetVL() == 0 );
00119     }
00120     else
00121     {
00122         Item item;
00123         VL l = 0;
00124         //is.seekg( SequenceLengthField, std::ios::cur ); return is;
00125         while( l != SequenceLengthField )
00126         {
00127             try
00128             {
00129                 item.Read<TDE,TSwap>(is);
00130             }
00131             catch( Exception &ex )
00132             {

```

```

00133         if( strcmp( ex.GetDescription(), "Changed Length" ) == 0 )
00134         {
00135             VL newlength = 1 + item.template GetLength<TDE>();
00136             if( newlength > SequenceLengthField )
00137             {
00138                 // BogusItemAndSequenceLength.dcm
00139                 gdcmWarningMacro( "SQ length is wrong" );
00140                 SequenceLengthField = newlength;
00141             }
00142         }
00143         else
00144         {
00145             throw ex;
00146         }
00147     }
00148 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
00149     if( item.GetTag() == seqDelItem )
00150     {
00151         gdcmWarningMacro( "SeqDelItem found in defined length Sequence. Skipping" );
00152         assert( item.GetVL() == 0 );
00153         assert( item.GetNestedDataSet().Size() == 0 );
00154         // we need to pay attention that the length of the Sequence of Items will be wrong
00155         // this way. Indeed by not adding this item we are changing the size of this sqi
00156     }
00157     else // Not a seq del item marker
00158 #endif
00159     {
00160         // By design we never load them. If we were to load those attribute
00161         // as normal item it would become very complex to convert a sequence
00162         // from defined length to undefined length with the risk to write two
00163         // seq del marker
00164         Items.push_back( item );
00165     }
00166     l += item.template GetLength<TDE>();
00167     if( l > SequenceLengthField )
00168     {
00169         gdcmDebugMacro( "Found: Length of Item larger than expected" );
00170         throw "Length of Item larger than expected";
00171     }
00172     assert( l <= SequenceLengthField );
00173     //std::cerr << "sqi debug len: " << is.tellg() << " " << l << " " << SequenceLengthField << std::endl;
00174 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
00175     // MR_Philips_Intera_No_PrivateSequenceImplicitVR.dcm
00176     // (0x2005, 0x1080): for some reason computation of length fails...
00177     if( SequenceLengthField == 778 && l == 774 )
00178     {
00179         gdcmWarningMacro( "PMS: Super bad hack" );
00180         SequenceLengthField = l;
00181         throw Exception( "Wrong Length" );
00182         //l = SequenceLengthField;
00183     }
00184     // Bug_Philips_ItemTag_3F3F
00185     // (0x2005, 0x1080): Because we do not handle fully the bug at the item
00186     // level we need to check here too
00187     else if ( SequenceLengthField == 444 && l == 3*71 )
00188     {
00189         // This one is a double bug. Item length is wrong and impact SQ length
00190         gdcmWarningMacro( "PMS: Super bad hack" );
00191         l = SequenceLengthField;
00192     }
00193 #endif
00194     }
00195     assert( l == SequenceLengthField );
00196 }
00197 return is;
00198 }
00199
00200 template <typename TDE,typename TSwap>
00201 std::ostream const &Write(std::ostream &os) const
00202 {
00203     typename ItemVector::const_iterator it = Items.begin();
00204     for(;it != Items.end(); ++it)
00205     {
00206         it->Write<TDE,TSwap>(os);
00207     }
00208     if( SequenceLengthField.IsUndefined() )
00209     {
00210         // seq del item is not stored, write it !
00211         const Tag seqDelItem(0xfffe,0xe0dd);
00212         seqDelItem.Write<TSwap>(os);
00213         VL zero = 0;

```

```

00214         zero.Write<TSwap>(os);
00215     }
00216
00217     return os;
00218 }
00219
00220 //protected:
00221 void Print(std::ostream &os) const override {
00222     os << "\\t(" << SequenceLengthField << ")\n";
00223     ItemVector::const_iterator it =
00224         Items.begin();
00225     for(;it != Items.end(); ++it)
00226     {
00227         os << " " << *it;
00228     }
00229     if( SequenceLengthField.IsUndefined() )
00230     {
00231         const Tag seqDelItem(0xffff,0xe0dd);
00232         VL zero = 0;
00233         os << seqDelItem;
00234         os << "\\t" << zero;
00235     }
00236 }
00237
00238 static SmartPointer<SequenceOfItems> New()
00239 {
00240     return new SequenceOfItems;
00241 }
00242 bool FindDataElement(const Tag &t) const;
00243
00244 bool operator==(const Value &val) const override
00245 {
00246     const SequenceOfItems &sqi = dynamic_cast<const SequenceOfItems>(val);
00247     return SequenceLengthField == sqi.SequenceLengthField &&
00248         Items == sqi.Items;
00249 }
00250
00251 private:
00252 public:
00253     VL SequenceLengthField;
00254     ItemVector Items;
00255 };
00256
00257 } // end namespace gdcm_ns
00258
00259 } // end namespace gdcm_ns
00260
00261 #include "gdcmSequenceOfItems.txx"
00262
00263 #endif //GDCMSEQUENCEOFITEMS_H

```

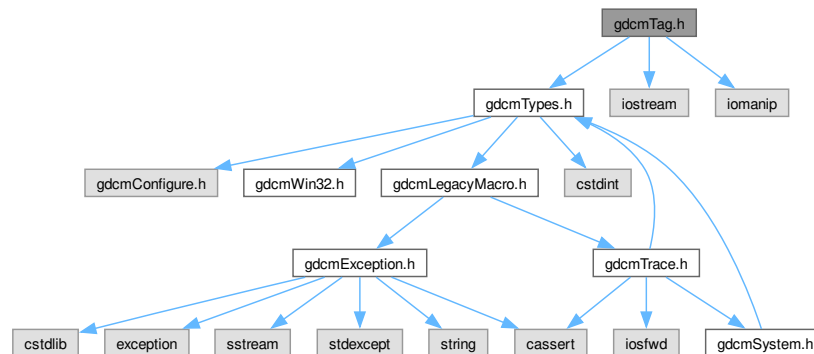
## 13.175 gdcmTag.h File Reference

```

#include "gdcmTypes.h"
#include <iostream>
#include <iomanip>

```

Include dependency graph for gdcmTag.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Tag`  
Class to represent a DICOM Data *Element (Attribute) Tag* (Group, *Element*).

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Tag &_val)`
- `std::istream & gdcm::operator>> (std::istream &_is, Tag &_val)`

## 13.176 gdcmTag.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMTAG_H
00015 #define GDCMTAG_H
00016
00017 #include "gdcmTypes.h"
00018
00019 #include <iostream>
00020 #include <iomanip>
00021
00022 namespace gdcm
00023 {
00024
00025     class GDCM_EXPORT Tag
00026     {
00027     public:
00028         Tag(uint16_t group, uint16_t element) {
00029             ElementTag.tags[0] = group; ElementTag.tags[1] = element;
00030         }
00031         Tag(uint32_t tag = 0) {
00032             SetElementTag(tag);
00033         }
00034
00035         friend std::ostream& operator<<(std::ostream &_os, const Tag &_val);
00036         friend std::istream& operator>>(std::istream &_is, Tag &_val);
00037
00038         uint16_t GetGroup() const { return ElementTag.tags[0]; }
00039         uint16_t GetElement() const { return ElementTag.tags[1]; }
00040         void SetGroup(uint16_t group) { ElementTag.tags[0] = group; }
00041         void SetElement(uint16_t element) { ElementTag.tags[1] = element; }
00042         void SetElementTag(uint16_t group, uint16_t element) {
00043             ElementTag.tags[0] = group; ElementTag.tags[1] = element;
00044         }
00045
00046         uint32_t GetElementTag() const {
00047             #ifndef GDCM_WORDS_BIGENDIAN
00048                 return (ElementTag.tag<16) | (ElementTag.tag>16);
00049             #else
00050                 return ElementTag.tag;
00051             #endif
00052         }
00053         void SetElementTag(uint32_t tag) {
00054             #ifndef GDCM_WORDS_BIGENDIAN
00055                 tag = ( (tag<16) | (tag>16) );
00056             #endif
00057             ElementTag.tag = tag;
00058         }
00059
00060         const uint16_t &operator[](const unsigned int &_id) const
00061         {
00062             assert(_id<2);
00063             return ElementTag.tags[_id];
00064         }
00065         uint16_t &operator[](const unsigned int &_id)
00066         {
00067             assert(_id<2);
00068             return ElementTag.tags[_id];
00069         }
00070
00071         Tag &operator=(const Tag &_val)
00072         {
00073             ElementTag.tag = _val.ElementTag.tag;
00074             return *this;
00075         }
00076     };
00077
00078     Tag &operator=(const Tag &_val)
00079     {
00080         ElementTag.tag = _val.ElementTag.tag;
00081         return *this;
00082     }
00083
00084     Tag &operator=(const Tag &_val)
00085     {
00086         ElementTag.tag = _val.ElementTag.tag;
00087         return *this;
00088     }
00089
00090     Tag &operator=(const Tag &_val)
00091     {
00092         ElementTag.tag = _val.ElementTag.tag;
00093         return *this;
00094     }
00095
00096     Tag &operator=(const Tag &_val)
00097     {
00098         ElementTag.tag = _val.ElementTag.tag;
00099         return *this;
00100     }

```

```

00101     }
00102
00103     bool operator==(const Tag &_val) const
00104     {
00105         return ElementTag.tag == _val.ElementTag.tag;
00106     }
00107     bool operator!=(const Tag &_val) const
00108     {
00109         return ElementTag.tag != _val.ElementTag.tag;
00110     }
00111
00114     // FIXME FIXME FIXME TODO
00115     // the following is pretty dumb. Since we have control over who is group
00116     // and who is element, we should reverse them in little endian and big endian case
00117     // since what we really want is fast comparison and not guarantee that group is in #0
00118     // ...
00119     bool operator<(const Tag &_val) const
00120     {
00121 #ifndef GDCM_WORDS_BIGENDIAN
00122         if( ElementTag.tags[0] < _val.ElementTag.tags[0] )
00123             return true;
00124         if( ElementTag.tags[0] == _val.ElementTag.tags[0]
00125             && ElementTag.tags[1] < _val.ElementTag.tags[1] )
00126             return true;
00127         return false;
00128 #else
00129         // Plain comparison is enough!
00130         return ( ElementTag.tag < _val.ElementTag.tag );
00131 #endif
00132     }
00133     bool operator<=(const Tag &t2) const
00134     {
00135         const Tag &t1 = *this;
00136         return t1 == t2 || t1 < t2;
00137     }
00138
00139     Tag(const Tag &_val)
00140     {
00141         ElementTag.tag = _val.ElementTag.tag;
00142     }
00144     uint32_t GetLength() const { return 4; }
00145
00150     bool IsPublic() const { return !(ElementTag.tags[0] % 2); }
00151
00155     bool IsPrivate() const { return !IsPublic(); }
00156
00157     //-----
00159     template <typename TSwap>
00160     std::istream &Read(std::istream &is)
00161     {
00162         if( is.read(ElementTag.bytes, 4) )
00163             TSwap::SwapArray(ElementTag.tags, 2);
00164         return is;
00165     }
00166
00168     template <typename TSwap>
00169     const std::ostream &Write(std::ostream &os) const
00170     {
00171         uint16_t copy[2];
00172         copy[0] = ElementTag.tags[0];
00173         copy[1] = ElementTag.tags[1];
00174         TSwap::SwapArray(copy, 2);
00175         return os.write((char*)(&copy), 4);
00176     }
00177
00179     Tag GetPrivateCreator() const
00180     {
00181         // See PS 3.5 - 7.8.1 PRIVATE DATA ELEMENT TAGS
00182         // eg: 0x0123,0x1425 -> 0x0123,0x0014
00183         if( IsPrivate() && !IsPrivateCreator() )
00184         {
00185             Tag r = *this;
00186             r.SetElement( (uint16_t)(GetElement() >> 8) );
00187             return r;
00188         }
00189         if( IsPrivateCreator() ) return *this;
00190         return Tag(0x0,0x0);
00191     }
00193     void SetPrivateCreator(Tag const &t)
00194     {
00195         // See PS 3.5 - 7.8.1 PRIVATE DATA ELEMENT TAGS

```

```

00196     // eg: 0x0123,0x0045 -> 0x0123,0x4567
00197     assert( t.IsPrivate() /*&& t.IsPrivateCreator()*/ );
00198     const uint16_t element = (uint16_t)(t.GetElement() << 8);
00199     const uint16_t base = (uint16_t)(GetElement() << 8);
00200     SetElement( (uint16_t)((base >> 8) + element) );
00201     SetGroup( t.GetGroup() );
00202 }
00203
00206 bool IsPrivateCreator() const
00207 {
00208     return IsPrivate() && (GetElement() <= 0xFF && GetElement() >= 0x10);
00209 }
00210
00212 bool IsIllegal() const
00213 {
00214     // DICOM reserved those groups:
00215     return GetGroup() == 0x0001 || GetGroup() == 0x0003 || GetGroup() == 0x0005 || GetGroup() == 0x0007
00216     // This is a very special case, in private group, one cannot use element [0x01,0x09] ...
00217     // || (IsPrivate() && !IsPrivateCreator() && !IsGroupLength());
00218     || (IsPrivate() && GetElement() > 0x0 && GetElement() < 0x10 );
00219 }
00220
00222 bool IsGroupLength() const
00223 {
00224     return GetElement() == 0x0;
00225 }
00226
00228 bool IsGroupXX(const Tag &t) const
00229 {
00230     if( t.GetElement() == GetElement() )
00231     {
00232         if( t.IsPrivate() ) return false;
00233         uint16_t group = (uint16_t)((GetGroup() >> 8) << 8);
00234         return group == t.GetGroup();
00235     }
00236     return false;
00237 }
00238
00244 bool ReadFromCommaSeparatedString(const char *str);
00245
00248 bool ReadFromContinuousString(const char *str);
00249
00252 std::string PrintAsContinuousString() const;
00253
00255 std::string PrintAsContinuousUpperCaseString() const;
00256
00259 bool ReadFromPipeSeparatedString(const char *str);
00260
00263 std::string PrintAsPipeSeparatedString() const;
00264
00265 private:
00266     union { uint32_t tag; uint16_t tags[2]; char bytes[4]; } ElementTag;
00267 };
00268 //-----
00269 inline std::istream& operator>(std::istream &_is, Tag &_val)
00270 {
00271     char c;
00272     _is >> c;
00273     uint16_t a, b;
00274     _is >> std::hex >> a;
00275     //_is >> std::hex >> _val[0];
00276     //_is >> std::hex >> _val.ElementTag.tags[0];
00277     _is >> c;
00278     //_is >> _val[1];
00279     //_is >> std::hex >> _val.ElementTag.tags[1];
00280     _is >> std::hex >> b;
00281     _is >> c;
00282     _val.SetGroup( a );
00283     _val.SetElement( b );
00284     return _is;
00285 }
00286
00287 inline std::ostream& operator<(std::ostream &_os, const Tag &_val)
00288 {
00289     _os.setf( std::ios::right);
00290     _os << std::hex << '(' << std::setw( 4 ) << std::setfill( '0' )
00291         << _val[0] << ',' << std::setw( 4 ) << std::setfill( '0' )
00292         << _val[1] << ')' << std::setfill( ' ' ) << std::dec;
00293     return _os;
00294 }
00295

```



```

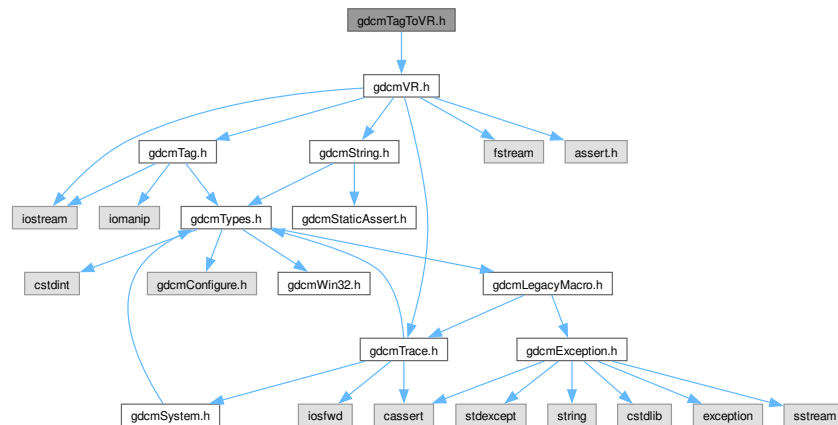
00296 } // end namespace gdcm
00297
00298 #endif //GDCMTAG_H

```

## 13.177 gdcmTagToVR.h File Reference

```
#include "gdcmVR.h"
```

Include dependency graph for gdcmTagToVR.h:



### Namespaces

- namespace [gdcm](#)

### Functions

- [VR::VRType gdcm::GetVRFromTag](#) ([Tag](#) const &tag)

## 13.178 gdcmTagToVR.h

[Go to the documentation of this file.](#)

```

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00002
00003 Program: GDCM (Grassroots DICOM). A DICOM library
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00007 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/

```

```

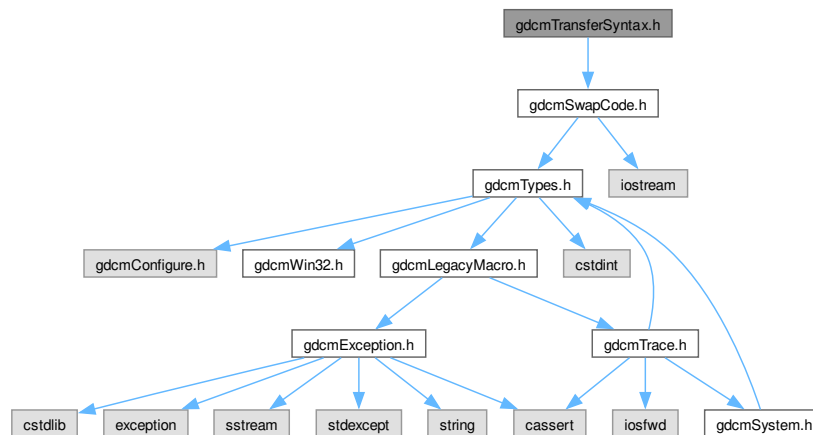
00014 #ifndef GDCMTAGTOVR_H
00015 #define GDCMTAGTOVR_H
00016
00017 #include "gdcmVR.h"
00018
00019 namespace gdcm
00020 {
00021     class Tag;
00022     VR::VRType GetVRFromTag( Tag const & tag );
00023 }
00024
00025 #endif // GDCMTAGTOVR_H

```

## 13.179 gdcmTransferSyntax.h File Reference

```
#include "gdcmSwapCode.h"
```

Include dependency graph for gdcmTransferSyntax.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::TransferSyntax](#)  
*Class to manipulate Transfer Syntax.*

### Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const TransferSyntax &ts)`

## 13.180 gdcmTransferSyntax.h

[Go to the documentation of this file.](#)

```

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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMTRANSFERSYNTAX_H
00015 #define GDCMTRANSFERSYNTAX_H
00016
00017 #include "gdcmSwapCode.h"
00018
00019 namespace gdcm
00020 {
00021
00022   class GDCM_EXPORT TransferSyntax
00023   {
00024   public:
00025     typedef enum {
00026       Unknown = 0,
00027       Explicit,
00028       Implicit
00029     } NegotiatedType;
00030
00031     #if 0
00032     //NOT FLEXIBLE, since forces user to update lib every time new module
00033     //comes out...
00034     // TODO
00035     typedef enum {
00036       NoSpacing = 0,
00037       PixelSpacing,
00038       ImagerPixelSpacing,
00039       PixelAspectRatio
00040     } ImageSpacingType;
00041     ImageSpacingType GetImageSpacing();
00042     #endif
00043
00044     typedef enum {
00045       ImplicitVRLittleEndian = 0,
00046       ImplicitVRBigEndianPrivateGE,
00047       ExplicitVRLittleEndian,
00048       DeflatedExplicitVRLittleEndian,
00049       ExplicitVRBigEndian,
00050       JPEGBaselineProcess1,
00051       JPEGExtendedProcess2_4,
00052       JPEGExtendedProcess3_5,
00053       JPEGsSpectralSelectionProcess6_8,
00054       JPEGFullProgressionProcess10_12,
00055       JPEGLosslessProcess14,
00056       JPEGLosslessProcess14_1,
00057       JPEGLSLossless,
00058       JPEGLSNearLossless,
00059       JPEG2000Lossless,
00060       JPEG2000,
00061       JPEG2000Part2Lossless,
00062       JPEG2000Part2,
00063       RLELossless,
00064       MPEG2MainProfile,
00065       ImplicitVRBigEndianACRNEEMA,
00066       WeirdPapryus,

```

```

00084     CT_private_ELE,
00085     JPIPReferenced,
00086     MPEG2MainProfileHighLevel,
00087     MPEG4AVCH264HighProfileLevel4_1,
00088     MPEG4AVCH264BDcompatibleHighProfileLevel4_1,
00089     TS_END
00090 } TSType;
00091
00092 // Return the string as written in the official DICOM dict from
00093 // a custom enum type
00094 static const char* GetTSString(TSType ts);
00095 static TSType GetTSType(const char *str);
00096
00097 NegotiatedType GetNegotiatedType() const;
00098
00102 SwapCode GetSwapCode() const;
00103
00104 bool IsValid() const { return TSField != TS_END; }
00105
00106 operator TSType () const { return TSField; }
00107
00108 // FIXME: ImplicitVRLittleEndian used to be the default, but nowadays
00109 // this is rather the ExplicitVRLittleEndian instead...should be change the default ?
00110 TransferSyntax(TSType type = ImplicitVRLittleEndian):TSField(type) {}
00111
00112 // return if dataset is encoded or not (Deflate Explicit VR)
00113 bool IsEncoded() const;
00114
00115 bool IsImplicit() const;
00116 bool IsExplicit() const;
00117
00118 bool IsEncapsulated() const;
00119
00121 bool IsLossy() const;
00123 bool IsLossless() const;
00125 bool CanStoreLossy() const;
00126
00127 const char *GetString() const { return TransferSyntax::GetTSString(TSField); }
00128
00129 friend std::ostream &operator<<(std::ostream &os, const TransferSyntax &ts);
00130 private:
00131 // DO NOT EXPOSE the following. Internal details of TransferSyntax
00132 bool IsImplicit(TSType ts) const;
00133 bool IsExplicit(TSType ts) const;
00134 bool IsLittleEndian(TSType ts) const;
00135 bool IsBigEndian(TSType ts) const;
00136
00137     TSType TSField;
00138 };
00139 //-----
00140 inline std::ostream &operator<<(std::ostream &_os, const TransferSyntax &ts)
00141 {
00142     _os << TransferSyntax::GetTSString(ts);
00143     return _os;
00144 }
00145 }
00146
00147 } // end namespace gdcm
00148
00149 #endif //GDCMTRANSFERSYNTAX_H

```

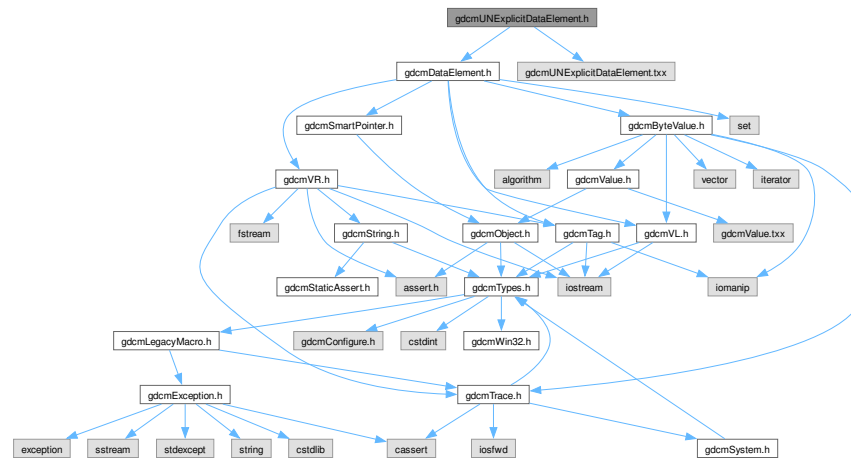
## 13.181 gdcmUNExplicitDataElement.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmUNExplicitDataElement.txx"

```

Include dependency graph for gdcmUNExplicitDataElement.h:



## Classes

- class [gdcm::UNExplicitDataElement](#)  
Class to read/write a [DataElement](#) as *UNExplicit Data Element*.

## Namespaces

- namespace [gdcm](#)

## 13.182 gdcmUNExplicitDataElement.h

[Go to the documentation of this file.](#)

```

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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMUNEXPLICITDATAELEMENT_H
00015 #define GDCMUNEXPLICITDATAELEMENT_H
00016
00017 #include "gdcmDataElement.h"
00018
00019 namespace gdcm
00020 {
00021   // Data Element (UNExplicit)
00026   class GDCM_EXPORT UNExplicitDataElement : public DataElement
00027   {
00028   public:

```

```

00029  VL GetLength() const;
00030
00031  template <typename TSwap>
00032  std::istream &Read(std::istream &is);
00033
00034  template <typename TSwap>
00035  std::istream &ReadPreValue(std::istream &is);
00036
00037  template <typename TSwap>
00038  std::istream &ReadValue(std::istream &is, bool readvalues = true);
00039
00040  template <typename TSwap>
00041  std::istream &ReadWithLength(std::istream &is, VL & length);
00042
00043  // PURPOSELY do not provide an implementation for writing !
00044  //template <typename TSwap>
00045  //const std::ostream &Write(std::ostream &os) const;
00046 };
00047
00048 } // end namespace gdcM
00049
00050 #include "gdcMUNExplicitDataElement.txx"
00051
00052 #endif //GDCMUNEXPLICITDATAELEMENT_H

```

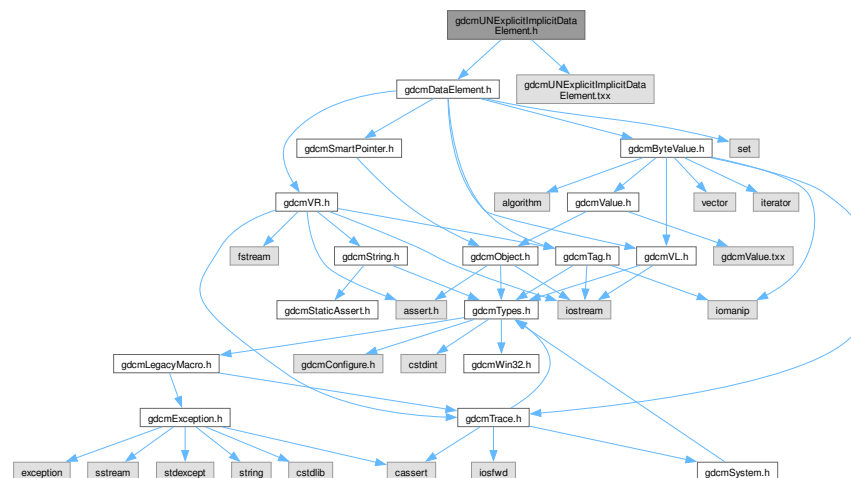
## 13.183 gdcMUNExplicitImplicitDataElement.h File Reference

```

#include "gdcMDataElement.h"
#include "gdcMUNExplicitImplicitDataElement.txx"

```

Include dependency graph for gdcMUNExplicitImplicitDataElement.h:



### Classes

- class [gdcM::UNExplicitImplicitDataElement](#)  
Class to read/write a [DataElement](#) as [ExplicitImplicit Data Element](#).

### Namespaces

- namespace [gdcM](#)

## 13.184 gdcmUNExplicitImplicitDataElement.h

[Go to the documentation of this file.](#)

```

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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMUNEXPLICITIMPLICITDATAELEMENT_H
00015 #define GDCMUNEXPLICITIMPLICITDATAELEMENT_H
00016
00017 #include "gdcmDataElement.h"
00018
00019 namespace gdcm
00020 {
00021   // Data Element (ExplicitImplicit)
00022   class GDCM_EXPORT UNExplicitImplicitDataElement : public DataElement
00023   {
00024   public:
00025     VL GetLength() const;
00026
00027     template <typename TSwap>
00028     std::istream &Read(std::istream &is);
00029
00030     template <typename TSwap>
00031     std::istream &ReadPreValue(std::istream &is);
00032
00033     template <typename TSwap>
00034     std::istream &ReadValue(std::istream &is);
00035
00036     // PURPOSELY do not provide an implementation for writing !
00037     //template <typename TSwap>
00038     //const std::ostream &Write(std::ostream &os) const;
00039   };
00040
00041 } // end namespace gdcm
00042
00043 #include "gdcmUNExplicitImplicitDataElement.txx"
00044
00045 #endif //GDCMUNEXPLICITIMPLICITDATAELEMENT_H

```

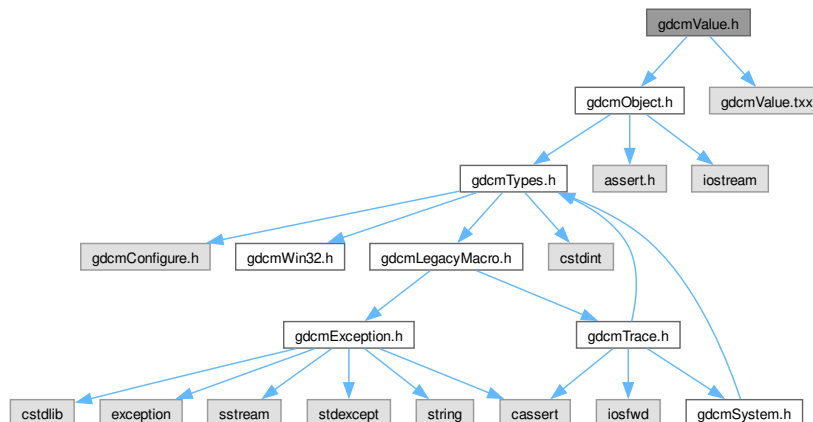
## 13.185 gdcmValue.h File Reference

```

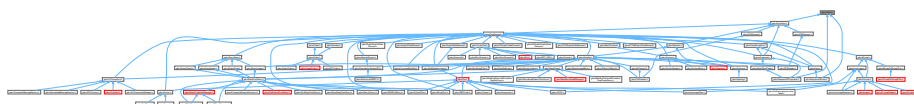
#include "gdcmObject.h"
#include "gdcmValue.txx"

```

Include dependency graph for `gdcmValue.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Value`  
Class to represent the value of a Data *Element*.

## Namespaces

- namespace `gdcm`

## 13.186 gdcmValue.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003 Program: GDCM (Grassroots DICOM). A DICOM library
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00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.

```



```

00012
00013 =====*/
00014 #ifndef GDCMVALUE_H
00015 #define GDCMVALUE_H
00016
00017 #include "gdcmObject.h"
00018
00019 namespace gdcm { class VL; }
00020 namespace gdcm_ns
00021 {
00022     #if !defined(SWIGPYTHON) && !defined(SWIGCSharp) && !defined(SWIGJAVA) && !defined(SWIGPHP)
00023     using namespace gdcm;
00024     #endif
00031     class GDCM_EXPORT Value : public Object
00032     {
00033     public:
00034         Value() = default;
00035         ~Value() override = default;
00036
00037         virtual VL GetLength() const = 0;
00038         virtual void SetLength(VL l) = 0;
00039
00040         virtual void Clear() = 0;
00041
00042         virtual bool operator==(const Value &val) const = 0;
00043
00044     protected:
00045         friend class DataElement;
00046         virtual void SetLengthOnly(VL l);
00047     };
00048
00049 } // end namespace gdcm_ns
00050
00051 #include "gdcmValue.txx"
00052
00053 #endif //GDCMVALUE_H

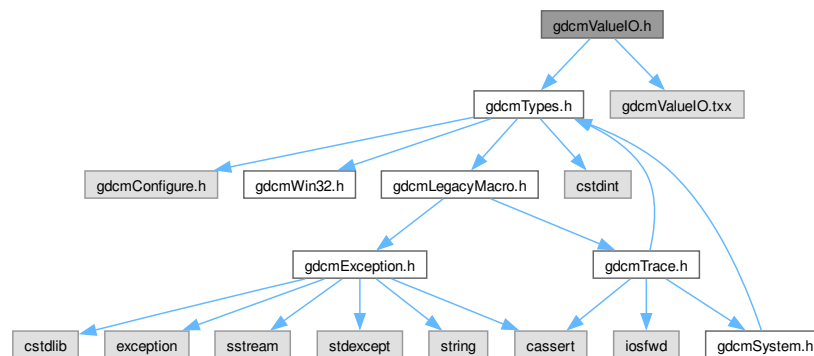
```

## 13.187 gdcmValueIO.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmValueIO.txx"
```

Include dependency graph for gdcmValueIO.h:



### Classes

- class [gdcm::ValueIO< TDE, TSwap, TType >](#)

*Class to dispatch template calls.*

## Namespaces

- namespace [gdcm](#)

## 13.188 gdcmValueIO.h

[Go to the documentation of this file.](#)

```

00001 /*=====
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMVALUEIO_H
00015 #define GDCMVALUEIO_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm_ns
00020 {
00021     template <typename TDE, typename TSwap, typename TType=uint8_t>
00022     class /*GDCM_EXPORT*/ ValueIO
00023     {
00024     public:
00025         static std::istream &Read(std::istream &is, Value& v, bool readvalues);
00026
00027         static const std::ostream &Write(std::ostream &os, const Value& v);
00028     };
00029
00030 } // end namespace gdcm_ns
00031
00032 #include "gdcmValueIO.txx"
00033
00034 #endif //GDCMVALUEIO_H

```

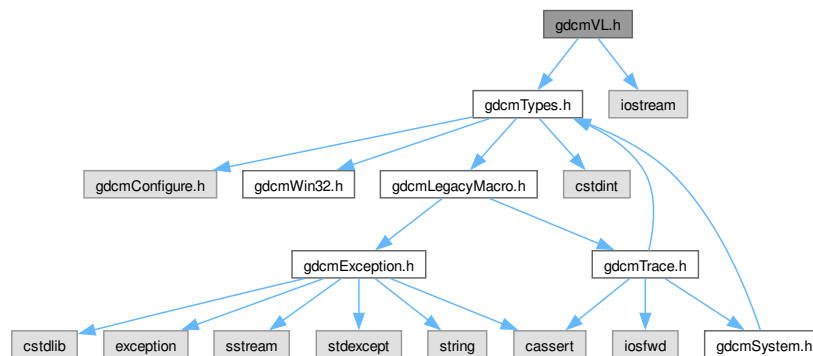
## 13.189 gdcmVL.h File Reference

```

#include "gdcmTypes.h"
#include <iostream>

```

Include dependency graph for gdcml.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcml::VL](#)  
*Value Length.*

## Namespaces

- namespace [gdcml](#)

## Functions

- `std::ostream & gdcml::operator<< (std::ostream &os, const VL &val)`

## 13.190 gdcml.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003 Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005 Copyright (c) 2006-2011 Mathieu Malaterre
00006 All rights reserved.
```

```

00007 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMVL_H
00015 #define GDCMVL_H
00016
00017 #include "gdcmTypes.h"
00018
00019 #include <iostream>
00020
00021 namespace gdcm
00022 {
00023
00024 class GDCM_EXPORT VL
00025 {
00026 public:
00027     typedef uint32_t Type;
00028     VL(uint32_t vl = 0) : ValueLength(vl) { }
00029
00030 // FIXME: ugly
00031 static uint32_t GetVL32Max() { return 0xFFFFFFFF; }
00032 static uint16_t GetVL16Max() { return 0xFFFF; }
00033
00034 bool IsUndefined() const {
00035     return ValueLength == 0xFFFFFFFF;
00036 }
00037 void SetToUndefined() {
00038     ValueLength = 0xFFFFFFFF;
00039 }
00040
00041 bool IsOdd() const {
00042     return !IsUndefined() && ValueLength % 2;
00043 }
00044
00045 VL& operator+=(VL const &vl) {
00046     ValueLength += vl.ValueLength;
00047     return *this;
00048 }
00049 VL& operator++() {
00050     ++ValueLength;
00051     return *this;
00052 }
00053 VL operator++(int) {
00054     uint32_t tmp(ValueLength);
00055     ++ValueLength;
00056     return tmp;
00057 }
00058
00059 operator uint32_t () const { return ValueLength; }
00060
00061 VL GetLength() const {
00062     // VL cannot know it's length...well in implicit yes...
00063     // TODO: need to check we cannot call this function from an Explicit element
00064     return 4;
00065 }
00066
00067 friend std::ostream& operator<<(std::ostream& os, const VL& vl);
00068
00069 // PURPOSELY not implemented (could not differentiate 16bits vs 32bits VL)
00070 //friend std::istream& operator>>(std::istream& is, VL& n);
00071
00072 template <typename TSwap>
00073 std::istream &Read(std::istream &is)
00074 {
00075     is.read((char*)(&ValueLength), sizeof(uint32_t));
00076     TSwap::SwapArray(&ValueLength,1);
00077     return is;
00078 }
00079
00080 template <typename TSwap>
00081 std::istream &Read16(std::istream &is)
00082 {
00083     uint16_t copy;
00084     is.read((char*)(&copy), sizeof(uint16_t));
00085     TSwap::SwapArray(&copy,1);
00086     ValueLength = copy;
00087     assert( ValueLength <= 65535 /*UINT16_MAX*/ ); // ?? doh !
00088 }

```

```

00095     return is;
00096 }
00097
00098 template <typename TSwap>
00099 const std::ostream &Write(std::ostream &os) const
00100 {
00101     uint32_t copy = ValueLength;
00102     if( IsOdd() )
00103     {
00104         ++copy;
00105     }
00106     TSwap::SwapArray(&copy,1);
00107     return os.write((char*)(&copy), sizeof(uint32_t));
00108 }
00109
00110 template <typename TSwap>
00111 const std::ostream &Write16(std::ostream &os) const
00112 {
00113     assert( ValueLength <= 65535 /*UINT16_MAX*/ );
00114     uint16_t copy = (uint16_t)ValueLength;
00115     if( IsOdd() )
00116     {
00117         ++copy;
00118     }
00119     TSwap::SwapArray(&copy,1);
00120     return os.write((char*)(&copy), sizeof(uint16_t));
00121 }
00122
00123 private:
00124     uint32_t ValueLength;
00125 };
00126 //-----
00127 inline std::ostream& operator<<(std::ostream& os, const VL& val)
00128 {
00129     os << /*std::hex <<*/ val.ValueLength;
00130     return os;
00131 }
00132
00133 } // end namespace gdcM
00134
00135 #endif //GDCMVL_H

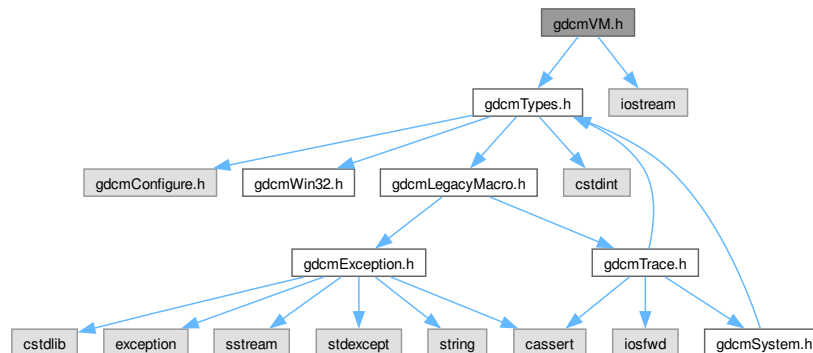
```

## 13.191 gdcVM.h File Reference

```
#include "gdcMTypes.h"
```

```
#include <iostream>
```

Include dependency graph for gdcVM.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::VM](#)

*Value Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.*

## Namespaces

- namespace [gdcm](#)

## Macros

- #define [TYPETOLENGTH](#)(type, length)

## Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &\_os, const [VM](#) &\_val)

## 13.191.1 Macro Definition Documentation

### 13.191.1.1 TYPETOLENGTH

```
#define TYPETOLENGTH(  
    type,  
    length)
```

#### Value:

```
template<> struct VMToLength<VM::type> \  
{ enum { Length = length }; };
```

## 13.192 gdcmmVM.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcmm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMMVM_H
00015 #define GDCMMVM_H
00016
00017 #include "gdcmmTypes.h"
00018 #include <iostream>
00019
00020 namespace gdcmm
00021 {
00022
00023     class GDCMM_EXPORT VM
00024     {
00025     public:
00026         typedef enum {
00027             VM0 = 0, // aka the invalid VM
00028             VM1 = 1,
00029             VM2 = 2,
00030             VM3 = 4,
00031             VM4 = 8,
00032             VM5 = 16,
00033             VM6 = 32,
00034             VM8 = 64,
00035             VM9 = 128,
00036             VM10 = 256,
00037             VM12 = 512, //1024,
00038             VM16 = 1024, //2048,
00039             VM18 = 2048, //4096,
00040             VM24 = 4096, //8192,
00041             VM28 = 8192, //16384,
00042             VM32 = 16384, //32768,
00043             VM35 = 32768, //65536,
00044             VM99 = 65536, //131072,
00045             VM256 = 131072, //262144,
00046             VM1_2 = VM1 | VM2,
00047             VM1_3 = VM1 | VM2 | VM3,
00048             VM1_4 = VM1 | VM2 | VM3 | VM4,
00049             VM1_5 = VM1 | VM2 | VM3 | VM4 | VM5,
00050             VM1_8 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8,
00051             // The following need some work:
00052             VM1_32 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32,
00053             VM1_99 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99,
00054             VM1_n = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256,
00055             VM2_2n = VM2 | VM4 | VM6 | VM8 | VM16 | VM24 | VM32 | VM99 | VM256,
00056             VM2_n = VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256,
00057             VM3_4 = VM3 | VM4,
00058             VM3_3n = VM3 | VM6 | VM9 | VM24 | VM99 | VM256,
00059             VM3_n = VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256,
00060             VM4_4n = VM4 | VM16 | VM24 | VM32 | VM256,
00061             VM6_6n = VM6 | VM12 | VM18 | VM24,
00062             VM6_n = VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256,
00063             VM7_7n,
00064             VM30_30n,
00065             VM47_47n,
00066             VM_END = VM1_n + 1 // Custom tag to count number of entry
00067         } VMType;
00068
00069         static const char* GetVMString(VMType vm);
00070         static VMType GetVMType(const char *vm);
00071
00072         static bool IsValid(int vm1, VMType vm2);
00073         //bool IsValid() { return VMField != VM0 && VMField < VM_END; }
00074
00075         bool Compatible(VM const &vm) const;
00076
00077     };
00078
00079 }

```

```

00127
00129 static VMType GetVMTypeFromLength(size_t length, unsigned int size);
00130 static size_t GetNumberOfElementsFromArray(const char *array, size_t length);
00131
00132 VM(VMType type = VM0):VMField(type) {}
00133 operator VMType () const { return VMField; }
00134 unsigned int GetLength() const;
00135
00136 friend std::ostream &operator<<(std::ostream &os, const VM &vm);
00137 protected:
00138 static unsigned int GetIndex(VMType vm);
00139
00140 private:
00141 VMType VMField;
00142 };
00143 //-----
00144 inline std::ostream& operator<<(std::ostream& _os, const VM &_val)
00145 {
00146     assert( VM::GetVMString(_val) );
00147     _os << VM::GetVMString(_val);
00148     return _os;
00149 }
00150
00151 //template <int TVM> struct LengthToVM;
00152 //template <> struct LengthToVM<1>
00153 //{ enum { TVM = VM::VM1 }; };
00154
00155 template<int T> struct VMToLength;
00156 #define TYPETOLENGTH(type,length) \
00157     template<> struct VMToLength<VM::type> \
00158     { enum { Length = length }; };
00159 // TODO: Could be generated from XML file
00160 //TYPETOLENGTH(VM0,1)
00161 TYPETOLENGTH(VM1,1)
00162 TYPETOLENGTH(VM2,2)
00163 TYPETOLENGTH(VM3,3)
00164 TYPETOLENGTH(VM4,4)
00165 TYPETOLENGTH(VM5,5)
00166 TYPETOLENGTH(VM6,6)
00167 TYPETOLENGTH(VM8,8)
00168 TYPETOLENGTH(VM9,9)
00169 TYPETOLENGTH(VM10,10)
00170 TYPETOLENGTH(VM12,12)
00171 TYPETOLENGTH(VM16,16)
00172 TYPETOLENGTH(VM18,18)
00173 TYPETOLENGTH(VM24,24)
00174 TYPETOLENGTH(VM28,28)
00175 TYPETOLENGTH(VM32,32)
00176 TYPETOLENGTH(VM35,35)
00177 TYPETOLENGTH(VM99,99)
00178 TYPETOLENGTH(VM256,256)
00179 //TYPETOLENGTH(VM1_2,2)
00180 //TYPETOLENGTH(VM1_3,3)
00181 //TYPETOLENGTH(VM1_8,8)
00182 //TYPETOLENGTH(VM1_32,32)
00183 //TYPETOLENGTH(VM1_99,99)
00184 //TYPETOLENGTH(VM1_n,
00185 //TYPETOLENGTH(VM2_2n,
00186 //TYPETOLENGTH(VM2_n,
00187 //TYPETOLENGTH(VM3_3n,
00188 //TYPETOLENGTH(VM3_n,
00189
00190 } // end namespace gdcm
00191
00192 #endif //GDCMVM_H

```

### 13.193 gdcmVR.h File Reference

```

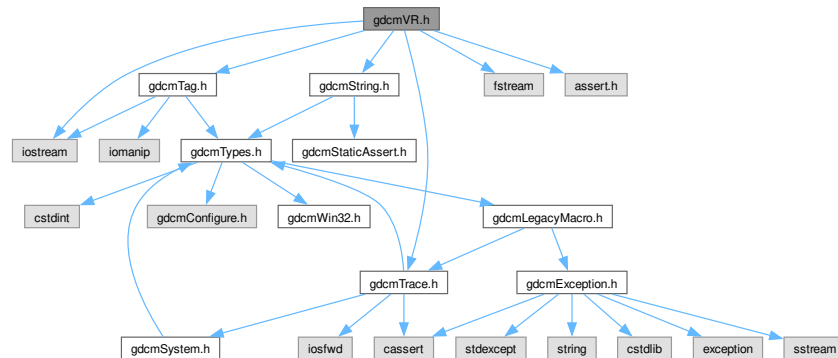
#include "gdcmTag.h"
#include "gdcmTrace.h"
#include "gdcmString.h"
#include <iostream>
#include <fstream>

```



```
#include <assert.h>
```

Include dependency graph for gdcmVR.h:



This graph shows which files directly or indirectly include this file:



## Classes

- struct [gdcm::UI](#)
- class [gdcm::VR](#)  
*VR class.*

## Namespaces

- namespace [gdcm](#)

## Macros

- #define [TYPETOENCODING](#)(type, rep, rtype)
- #define [VRTypeTemplateCase](#)(type)

## Typedefs

- typedef [String](#)<"\\", 16 > [gdcm::AECComp](#)
- typedef [String](#)<"\\", 64 > [gdcm::ASComp](#)
- typedef [String](#)<"\\", 16 > [gdcm::CSComp](#)
- typedef [String](#)<"\\", 64 > [gdcm::DAComp](#)
- typedef [String](#)<"\\", 64 > [gdcm::DTComp](#)
- typedef [String](#)<"\\", 64 > [gdcm::LOComp](#)
- typedef [String](#)<"\\", 64 > [gdcm::LTComp](#)
- typedef [String](#)<"\\", 64 > [gdcm::PNComp](#)
- typedef [String](#)<"\\", 64 > [gdcm::SHComp](#)
- typedef [String](#)<"\\", 64 > [gdcm::STComp](#)
- typedef [String](#)<"\\", 16 > [gdcm::TMComp](#)
- typedef [String](#)<"\\", 4294967294 > [gdcm::UCComp](#)
- typedef [String](#)<"\\", 64, 0 > [gdcm::UIComp](#)
- typedef [String](#)<"\\", 4294967294 > [gdcm::URComp](#)
- typedef [String](#)<"\\", 64 > [gdcm::UTComp](#)

## Functions

- [std::ostream](#) & [gdcm::operator<<](#) ([std::ostream](#) &\_os, const [UI](#) &\_val)
- [std::ostream](#) & [gdcm::operator<<](#) ([std::ostream](#) &\_os, const [VR](#) &val)

## 13.193.1 Macro Definition Documentation

### 13.193.1.1 TYPETOENCODING

```
#define TYPETOENCODING(
    type,
    rep,
    rtype)
```

#### Value:

```
template<> struct VRToEncoding<VR::type> \
{ enum:long long { Mode = VR::rep }; }; \
template<> struct VRToType<VR::type> \
{ typedef rtype Type; };
```

### 13.193.1.2 VRTypeTemplateCase

```
#define VRTypeTemplateCase(
    type)
```

#### Value:

```
case VR::type: \
    return sizeof ( VRToType<VR::type>::Type );
```

Referenced by [gdcm::VR::GetSize\(\)](#).

## 13.194 gdcmmVR.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcmm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMMVR_H
00015 #define GDCMMVR_H
00016
00017 #include "gdcmmTag.h"
00018 #include "gdcmmTrace.h"
00019 #include "gdcmmString.h"
00020
00021 #include <iostream>
00022 #include <fstream>
00023 #include <assert.h>
00024
00025 //these defines are here to ensure compilation on sunos gcc
00026 #if defined (CS)
00027 # undef CS
00028 #endif
00029 #if defined (DS)
00030 # undef DS
00031 #endif
00032 #if defined (SS)
00033 # undef SS
00034 #endif
00035
00036 namespace gdcmm
00037 {
00038
00039   class GDCMM_EXPORT VR
00040   {
00041   public:
00042     enum VRType : long long {
00043       // Warning: Do not write if ( vr & VR::INVALID ) but if ( vr == VR::INVALID )
00044       INVALID = 0, // For Item/(Seq) Item Delimitation Item
00045       AE = 1,
00046       AS = 2,
00047       AT = 4,
00048       CS = 8,
00049       DA = 16,
00050       DS = 32,
00051       DT = 64,
00052       FD = 128,
00053       FL = 256,
00054       IS = 512,
00055       LO = 1024,
00056       LT = 2048,
00057       OB = 4096,
00058       OD = 134217728, // 2^27
00059       OF = 8192,
00060       OL = 268435456, // 2^28
00061       OV = 2147483648, // 2^31
00062       OW = 16384,
00063       PN = 32768,
00064       SH = 65536,
00065       SL = 131072,
00066       SQ = 262144,
00067       SS = 524288,
00068       ST = 1048576,
00069       SV = 4294967296, // 2^32
00070       TM = 2097152,
00071       UC = 536870912, // 2^29
00072       UI = 4194304,
00073       UL = 8388608,
00074       UN = 16777216,
```

```

00090     UR = 1073741824, // 2^30
00091     US = 33554432,
00092     UT = 67108864,
00093     UV = 8589934592, // 2^33
00094     OB_OW = OB | OW,
00095     US_SS = US | SS,
00096     US_SS_OW = US | SS | OW,
00097     US_OW = US | OW,
00098     // The following do not have a VRString equivalent (ie cannot be found in PS 3.6)
00099     VL16 = AE | AS | AT | CS | DA | DS | DT | FD | FL | IS | LO | LT | PN | SH | SL | SS | ST | TM | UI |
UL | US, // if( VR & VL16 ) => VR has its VL coded over 16bits
00100     VL32 = OB | OW | OD | OF | OL | OV | SQ | SV | UC | UN | UR | UV, // if( VR & VL32 ) => VR has
its VL coded over 32bits
00101     VRASCII = AE | AS | CS | DA | DS | DT | IS | LO | LT | PN | SH | ST | TM | UC | UI | UR | UT,
00102     VRBINARY = AT | FL | FD | OB | OD | OF | OL | OV | OW | SL | SQ | SS | SV | UL | UN | US | UV, //
FIXME: UN ?
00103     // PS 3.5:
00104     // Data Elements with a VR of SQ, OD, OF, OL, OW, OB or UN shall always have a Value Multiplicity of
one.
00105     // GDCM is adding a couple more: AS, LT, ST, UT
00106     VR_VM1 = AS | LT | ST | UT | SQ | OF | OL | OV | OD | OW | OB | UN, // All those VR have a VM1
00107     VRALL = VRASCII | VRBINARY,
00108     VR_END = UV+1 // Invalid VR, need to be max(VRType)+1
00109 };
00110
00111 static const char *GetVRString(VRType vr);
00112
00113 // This function will only look at the very first two chars nothing else
00114 static VRType GetVRTypeFromFile(const char *vr);
00115
00116 // You need to make sure end of string is \0
00117 static VRType GetVRType(const char *vr);
00118 static const char *GetVRStringFromFile(VRType vr);
00119
00120 static bool IsValid(const char *vr);
00121 // Check if vr1 is valid against vr2,
00122 // Typically vr1 is read from the file and vr2 is taken from the dict
00123 static bool IsValid(const char *vr1, VRType vr2);
00124 //static bool IsValid(const VRType &vr1, const VRType &vr2);
00125 // Find out if the string read is byte swapped
00126 static bool IsSwap(const char *vr);
00127
00128 // Size read on disk
00129 // FIXME: int ?
00130 int GetLength() const {
00131     return VR::GetLength(VRField);
00132 }
00133 unsigned int GetSizeof() const;
00134 static uint32_t GetLength(VRType vr) {
00135     //if( vr == VR::INVALID ) return 4;
00136     if( vr & VL32 )
00137     {
00138         return 4;
00139     }
00140     else
00141         return 2;
00142 }
00143
00144 // Some use of template metaprograming with ugly macro
00145 static bool IsBinary(VRType vr);
00146 static bool IsASCII(VRType vr);
00147 // TODO: REMOVE ME
00148 static bool CanDisplay(VRType vr);
00149 // TODO: REMOVE ME
00150 static bool IsBinary2(VRType vr);
00151 // TODO: REMOVE ME
00152 static bool IsASCII2(VRType vr);
00153
00154 VR(VRType vr = INVALID):VRField(vr) { }
00155 //VR(VR const &vr):VRField(vr.VRField) { }
00156 std::istream &Read(std::istream &is)
00157 {
00158     char vr[2];
00159     is.read(vr, 2);
00160     VRField = GetVRTypeFromFile(vr);
00161     assert( VRField != VR::VR_END );
00162     if( VRField == VR::INVALID )
00163     {
00164         // \0\2 Data/TherapysGDCM120Bug.dcm
00165         // \0\0
Data/MR_Philips_Intera_PrivateSequenceExplicitVR_in_SQ_2001_e05f_item_wrong_lgt_use_NOSHADOWSEQ.dcm

```

```

00166         // \0\4 Data/BugGDCM2_UndefItemWrongVL.dcm
00167         // \44\0 Data/gdcm-MR-PHILIPS-16-Multi-Seq.dcm
00168         // \0\20 Data/ExplicitVRforPublicElementsImplicitVRforShadowElements.dcm
00169         // \0\3 Data/DMCPACS_ExplicitImplicit_BogusIOP.dcm
00170         // \0\4 Data/THERALYS-12-MONO2-Uncompressed-Even_Length_Tag.dcm
00171         // \0\4 Data/PrivateGEImplicitVRBigEndianTransferSyntax16Bits.dcm
00172         // \0\4 Data/GE_DLX-8-MONO2-PrivateSyntax.dcm
00173         throw Exception( "INVALID VR" );
00174     }
00175     if( VRField & VL32 )
00176     {
00177 #if 0
00178         // For some reason this seems slower on my linux box...
00179         is.seekg(2, std::ios::cur );
00180 #else
00181         char dumb[2];
00182         is.read(dumb, 2);
00183         if( !(dumb[0] == 0 && dumb[1] == 0 ) )
00184         {
00185             // JDDICOM_Sample4.dcm
00186             gdcmDebugMacro( "32bits VR contains non zero bytes. Skipped" );
00187         }
00188 #endif
00189     }
00190     return is;
00191 }
00192
00193 const std::ostream &Write(std::ostream &os) const
00194 {
00195     VRType vrfield = VRField;
00196     gdcmAssertAlwaysMacro( !IsDual() );
00197     if( vrfield == VR::INVALID )
00198     {
00199         //vrfield = VR::UN;
00200     }
00201     const char *vr = GetVRString(vrfield);
00202     //assert( strlen( vr ) == 2 );
00203     assert( vr[0] && vr[1] && vr[2] == 0 );
00204     os.write(vr, 2);
00205     // See PS 3.5, Data Element Structure With Explicit VR
00206     if( vrfield & VL32 )
00207     {
00208         const char dumb[2] = {0, 0};
00209         os.write(dumb, 2);
00210     }
00211     return os;
00212 }
00213 friend std::ostream &operator<<(std::ostream &os, const VR &vr);
00214
00215 operator VRType () const { return VRField; }
00216
00217 unsigned int GetSize() const;
00218
00219 bool Compatible(VR const &vr) const;
00220
00221 bool IsVRFile() const;
00222
00223 bool IsDual() const;
00224
00225 private:
00226     // Internal function that map a VRType to an index in the VRStrings table
00227     static unsigned int GetIndex(VRType vr);
00228     VRType VRField;
00229 };
00230 //-----
00231 inline std::ostream &operator<<(std::ostream &_os, const VR &val)
00232 {
00233     // _os << VR::GetVRStringFromFile(val.VRField);
00234     _os << VR::GetVRString(val.VRField);
00235     return _os;
00236 }
00237
00238 // Apparently SWIG is not happy with something, somewhere below...
00239 #ifndef SWIG
00240
00241 // Tells whether VR Type is ASCII or Binary
00242 template<long long T> struct VRToEncoding;
00243 // Convert from VR Type to real underlying type
00244 template<long long T> struct VRToType;
00245 #define TYPETOENCODING(type, rep, rtype) \
00246     template<> struct VRToEncoding<VR::type> \

```

```

00247     { enum:long long { Mode = VR::rep }; };
00248     template<> struct VRToType<VR::type> \
00249     { typedef rtype Type; };
00250
00251
00252 // Do not use me
00253 struct UI { char Internal[64+1];
00254     friend std::ostream& operator<<(std::ostream &_os, const UI &_val);
00255 };
00256 inline std::ostream& operator<<(std::ostream &_os, const UI &_val)
00257 {
00258     _os << _val.Internal;
00259     return _os;
00260 }
00261
00262 typedef String<'\\',16> AECComp;
00263 typedef String<'\\',64> ASCComp;
00264 typedef String<'\\',16> CSCComp;
00265 typedef String<'\\',64> DACComp;
00266 typedef String<'\\',64> DTCComp;
00267 typedef String<'\\',64> LOComp;
00268 typedef String<'\\',64> LTCComp;
00269 typedef String<'\\',64> PNCComp;
00270 typedef String<'\\',64> SHComp;
00271 typedef String<'\\',64> STComp;
00272 typedef String<'\\',4294967294> UCCComp;
00273 typedef String<'\\',4294967294> URComp;
00274 typedef String<'\\',16> TMComp;
00275 typedef String<'\\',64,0> UICComp;
00276 typedef String<'\\',64> UTCComp;
00277
00278
00279 // TODO: Could be generated from XML file
00280 TYPETOENCODING(AE,VRSCII ,AECComp)
00281 TYPETOENCODING(AS,VRSCII ,ASCComp)
00282 TYPETOENCODING(AT,VRBINARY,Tag)
00283 TYPETOENCODING(CS,VRSCII ,CSCComp)
00284 TYPETOENCODING(DA,VRSCII ,DACComp)
00285 TYPETOENCODING(DS,VRSCII ,double)
00286 TYPETOENCODING(DT,VRSCII ,DTCComp)
00287 TYPETOENCODING(FL,VRBINARY,float)
00288 TYPETOENCODING(FD,VRBINARY,double)
00289 TYPETOENCODING(IS,VRSCII ,int32_t)
00290 TYPETOENCODING(LO,VRSCII ,LOComp)
00291 TYPETOENCODING(LT,VRSCII ,LTCComp)
00292 TYPETOENCODING(OB,VRBINARY,uint8_t)
00293 TYPETOENCODING(OD,VRBINARY,double)
00294 TYPETOENCODING(OF,VRBINARY,float)
00295 TYPETOENCODING(OL,VRBINARY,uint32_t)
00296 TYPETOENCODING(OV,VRBINARY,uint64_t)
00297 TYPETOENCODING(OW,VRBINARY,uint16_t)
00298 TYPETOENCODING(PN,VRSCII ,PNCComp)
00299 TYPETOENCODING(SH,VRSCII ,SHComp)
00300 TYPETOENCODING(SL,VRBINARY,int32_t)
00301 TYPETOENCODING(SQ,VRBINARY,unsigned char) // FIXME
00302 TYPETOENCODING(SS,VRBINARY,int16_t)
00303 TYPETOENCODING(ST,VRSCII ,STComp)
00304 TYPETOENCODING(SV,VRBINARY,int64_t)
00305 TYPETOENCODING(TM,VRSCII ,TMComp)
00306 TYPETOENCODING(UC,VRSCII ,UCCComp)
00307 TYPETOENCODING(UI,VRSCII ,UICComp)
00308 TYPETOENCODING(UL,VRBINARY,uint32_t)
00309 TYPETOENCODING(UN,VRBINARY,uint8_t) // FIXME ?
00310 TYPETOENCODING(UR,VRSCII ,URComp)
00311 TYPETOENCODING(US,VRBINARY,uint16_t)
00312 TYPETOENCODING(UT,VRSCII ,UTCComp)
00313 TYPETOENCODING(UV,VRBINARY,uint64_t)
00314
00315 #define VRTypeTemplateCase(type) \
00316     case VR::type: \
00317         return sizeof ( VRToType<VR::type>::Type );
00318
00319 inline unsigned int VR::GetSize() const
00320 {
00321     switch(VRField)
00322     {
00323         VRTypeTemplateCase(AE)
00324         VRTypeTemplateCase(AS)
00325         VRTypeTemplateCase(AT)
00326         VRTypeTemplateCase(CS)
00327         VRTypeTemplateCase(DA)

```

```

00328     VRTypeTemplateCase (DS)
00329     VRTypeTemplateCase (DT)
00330     VRTypeTemplateCase (FL)
00331     VRTypeTemplateCase (FD)
00332     VRTypeTemplateCase (IS)
00333     VRTypeTemplateCase (LO)
00334     VRTypeTemplateCase (LT)
00335     VRTypeTemplateCase (OB)
00336     VRTypeTemplateCase (OD)
00337     VRTypeTemplateCase (OF)
00338     VRTypeTemplateCase (OL)
00339     VRTypeTemplateCase (OV)
00340     VRTypeTemplateCase (OW)
00341     VRTypeTemplateCase (PN)
00342     VRTypeTemplateCase (SH)
00343     VRTypeTemplateCase (SL)
00344     VRTypeTemplateCase (SQ)
00345     VRTypeTemplateCase (SS)
00346     VRTypeTemplateCase (ST)
00347     VRTypeTemplateCase (SV)
00348     VRTypeTemplateCase (TM)
00349     VRTypeTemplateCase (UC)
00350     VRTypeTemplateCase (UI)
00351     VRTypeTemplateCase (UL)
00352     VRTypeTemplateCase (UN)
00353     VRTypeTemplateCase (UR)
00354     VRTypeTemplateCase (US)
00355     VRTypeTemplateCase (UT)
00356     VRTypeTemplateCase (UV)
00357     case VR::US_SS:
00358         return 2;
00359
00360     case VR::INVALID:
00361     case VR::OB_OW:
00362     case VR::US_SS_OW:
00363     case VR::US_OW:
00364     case VR::VL16:
00365     case VR::VL32:
00366     case VR::VRASCII:
00367     case VR::VRBINARY:
00368     case VR::VR_VM1:
00369     case VR::VRALL:
00370     case VR::VR_END:
00371     default:
00372         assert( 0 && "should not" );
00373     }
00374     return 0;
00375 }
00376 #endif // SWIG
00377
00378
00379 } // end namespace gdcm
00380
00381 #endif //GDCMVR_H

```

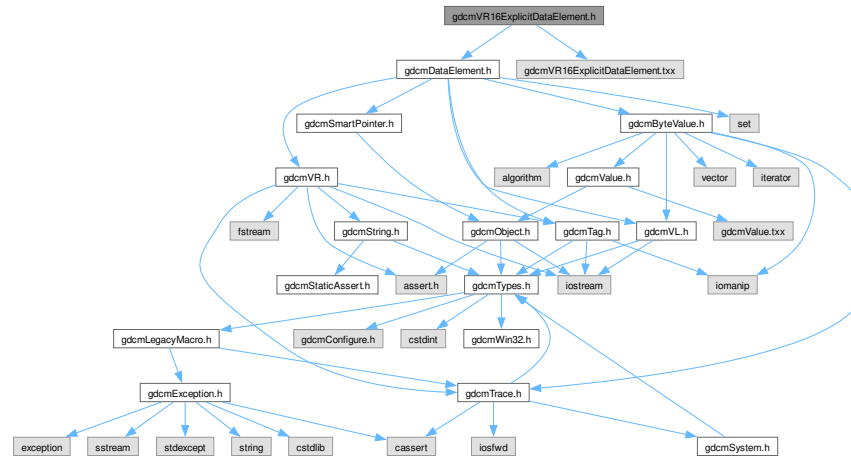
## 13.195 gdcmVR16ExplicitDataElement.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmVR16ExplicitDataElement.txx"

```

Include dependency graph for `gdcVR16ExplicitDataElement.h`:



## Classes

- class [gdc::VR16ExplicitDataElement](#)  
Class to read/write a *DataElement* as *Explicit Data Element*.

## Namespaces

- namespace [gdc](#)

## 13.196 gdcVR16ExplicitDataElement.h

[Go to the documentation of this file.](#)

```

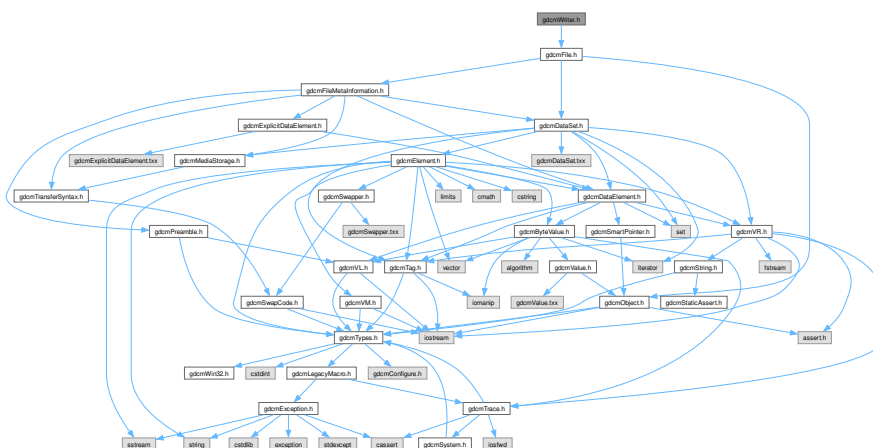
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdc.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMVR16EXPLICITDATAELEMENT_H
00015 #define GDCMVR16EXPLICITDATAELEMENT_H
00016
00017 #include "gdcDataElement.h"
00018
00019 namespace gdc
00020 {
00021   // Data Element (Explicit)
00022   class GDCM_EXPORT VR16ExplicitDataElement : public DataElement
00023   {
00024   public:

```

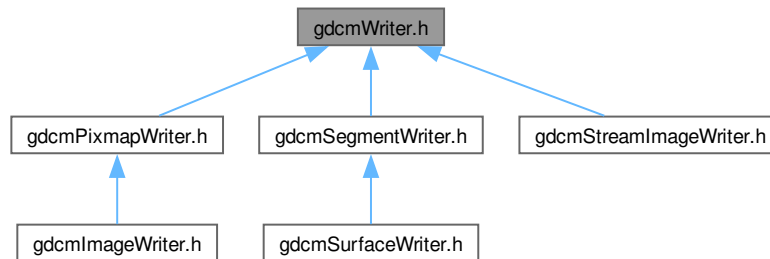


### 13.197 gdcmWriter.h File Reference

Include dependency graph for qdcmWriter.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::Writer](#)  
*Writer* *ala* DOM (Document *Object* Model).

## Namespaces

- namespace [gdcm](#)

## 13.198 gdcmWriter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014
00015 #ifndef GDCMWRITER_H
00016 #define GDCMWRITER_H
00017
00018 #include "gdcmFile.h"
00019
00020 namespace gdcm
00021 {
00022
00023     class FileMetaInformation;
00048     class GDCM_EXPORT Writer
00049     {
00050     public:
00051         Writer();
00052         virtual ~Writer();
00053     };
  
```

```

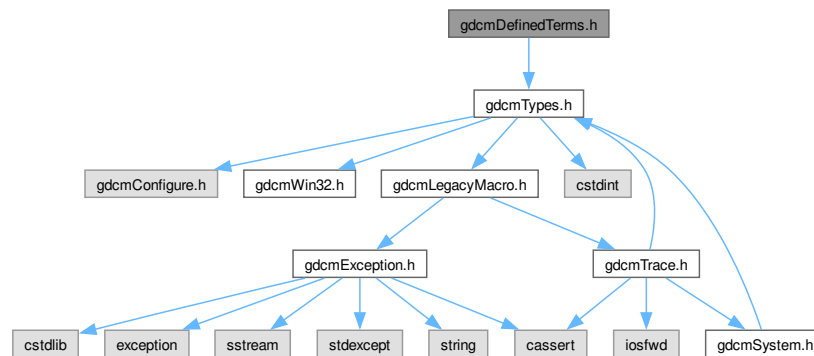
00055     virtual bool Write(); // Execute()
00056
00058     void SetFileName(const char *filename_native);
00059
00061     void SetStream(std::ostream &output_stream) {
00062         Stream = &output_stream;
00063     }
00064
00066     void SetFile(const File& f) { F = f; }
00067     File &GetFile() { return *F; }
00068
00070     void SetCheckFileMetaInformation(bool b) { CheckFileMetaInformation = b; }
00071     void CheckFileMetaInformationOff() { CheckFileMetaInformation = false; }
00072     void CheckFileMetaInformationOn() { CheckFileMetaInformation = true; }
00073
00074 protected:
00075     void SetWriteDataSetOnly(bool b) { WriteDataSetOnly = b; }
00076
00077 protected:
00078     friend class StreamImageWriter;
00079     //this function is added for the StreamImageWriter, which needs to write
00080     //up to the pixel data and then stops right before writing the pixel data.
00081     //after that, for the raw codec at least, zeros are written for the length of the data
00082     std::ostream* GetStreamPtr() const { return Stream; }
00083
00084 protected:
00085     std::ostream *Stream;
00086     std::ofstream *Ofstream;
00087     bool GetCheckFileMetaInformation() const { return CheckFileMetaInformation; }
00088
00089 private:
00090     SmartPointer<File> F;
00091     bool CheckFileMetaInformation;
00092     bool WriteDataSetOnly;
00093 };
00094
00095 } // end namespace gdcm
00096
00097 #endif //GDCMWRITER_H

```

## 13.199 gdcmDefinedTerms.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmDefinedTerms.h:



### Classes

- class [gdcm::DefinedTerms](#)

*Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data [Element](#) with Defined Terms that does not contain a [Value](#) equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation [Type](#) ID (4008,0210) is an example of a Data [Element](#) having Defined Terms. It is defined to have a [Value](#) that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data [Element](#) has Defined Terms other Interpretation [Type](#) IDs may be defined by the implementor.*

## Namespaces

- namespace [gdcm](#)

## 13.200 gdcmDefinedTerms.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMDEFINEDTERMS_H
00015 #define GDCMDEFINEDTERMS_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021     class GDCM_EXPORT DefinedTerms
00022     {
00023     public:
00024         DefinedTerms() = default;
00025     private:
00026     };
00027
00028 } // end namespace gdcm
00029
00030 #endif //GDCMDEFINEDTERMS_H

```

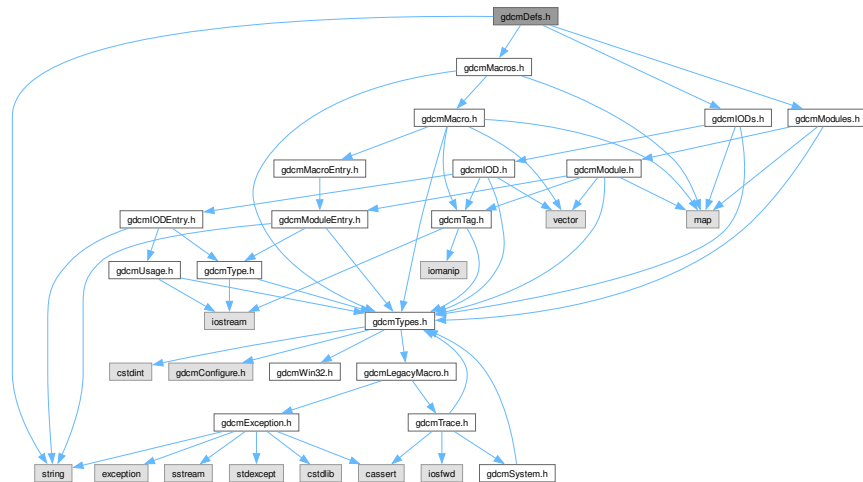
## 13.201 gdcmDefs.h File Reference

```

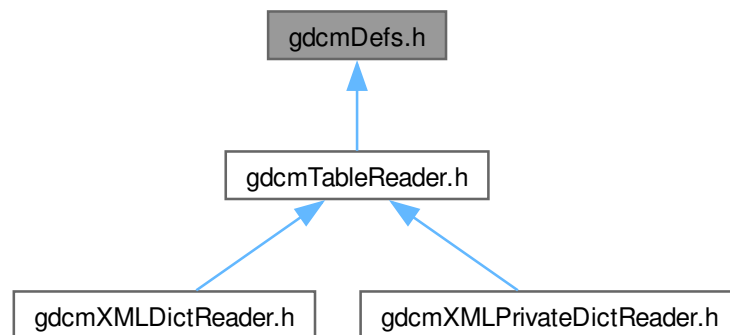
#include "gdcmModules.h"
#include "gdcmMacros.h"
#include "gdcmIODs.h"

```

Include dependency graph for gdcMDefs.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Defs`  
*FIXME I do not like the name 'Defs'.*

## Namespaces

- namespace **gdcm**

## 13.202 gdcmDefs.h

[Go to the documentation of this file.](#)

```

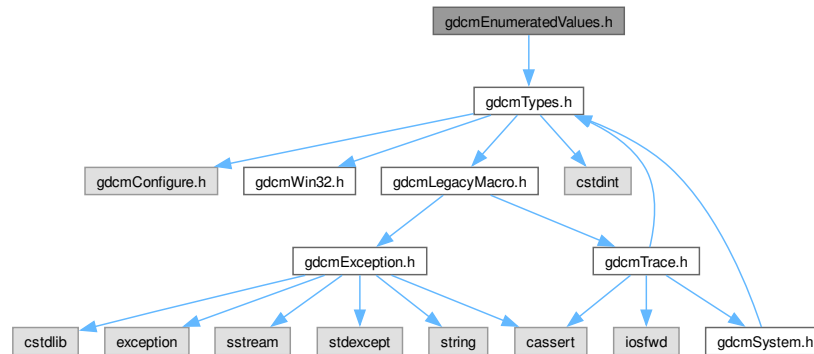
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMDEFS_H
00015 #define GDCMDEFS_H
00016
00017 #include "gdcmModules.h"
00018 #include "gdcmMacros.h"
00019 #include "gdcmIODs.h"
00020
00021 #include <string>
00022
00023 namespace gdcm
00024 {
00025   class DataSet;
00026   class File;
00027   class MediaStorage;
00032   class GDCM_EXPORT Defs
00033   {
00034   public:
00035     Defs();
00036     ~Defs();
00037     Defs &operator=(const Defs &val) = delete;
00038     Defs(const Defs &val) = delete;
00039
00040     const Modules &GetModules() const { return Part3Modules; }
00041     Modules &GetModules() { return Part3Modules; }
00042
00043     const Macros &GetMacros() const { return Part3Macros; }
00044     Macros &GetMacros() { return Part3Macros; }
00045
00046     const IODs & GetIODs() const { return Part3IODs; }
00047     IODs & GetIODs() { return Part3IODs; }
00050
00051     bool IsEmpty() const { return GetModules().IsEmpty(); }
00052
00053     bool Verify(const File& file) const;
00054
00055     // \deprecated DO NOT USE
00056     bool Verify(const DataSet& ds) const;
00057
00058     Type GetTypeFromTag(const File& file, const Tag& tag) const;
00059
00060     static const char *GetIODNameFromMediaStorage(MediaStorage const &ms);
00061
00062     const IOD& GetIODFromFile(const File& file) const;
00063
00064   protected:
00065     friend class Global;
00066     void LoadDefaults();
00067     void LoadFromFile(const char *filename);
00068
00069   private:
00070     // Part 3 stuff:
00071     Macros Part3Macros;
00072     Modules Part3Modules;
00073     IODs Part3IODs;
00074
00075   };
00076
00077 } // end namespace gdcm
00078
00080 #endif //GDCMDEFS_H

```

## 13.203 gdcmEnumeratedValues.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmEnumeratedValues.h:



### Classes

- class [gdcm::EnumeratedValues](#)

*Element.* A Data [Element](#) with Enumerated Values that does not have a [Value](#) equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:

### Namespaces

- namespace [gdcm](#)

## 13.204 gdcmEnumeratedValues.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMENUMERATEDVALUES_H
00015 #define GDCMENUMERATEDVALUES_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {

```

```

00034 class GDCM_EXPORT EnumeratedValues
00035 {
00036 public:
00037     EnumeratedValues() = default;
00038 private:
00039 };
00040
00041 } // end namespace gdcmm
00042
00043 #endif //GDCMENUMERATEDVALUES_H

```

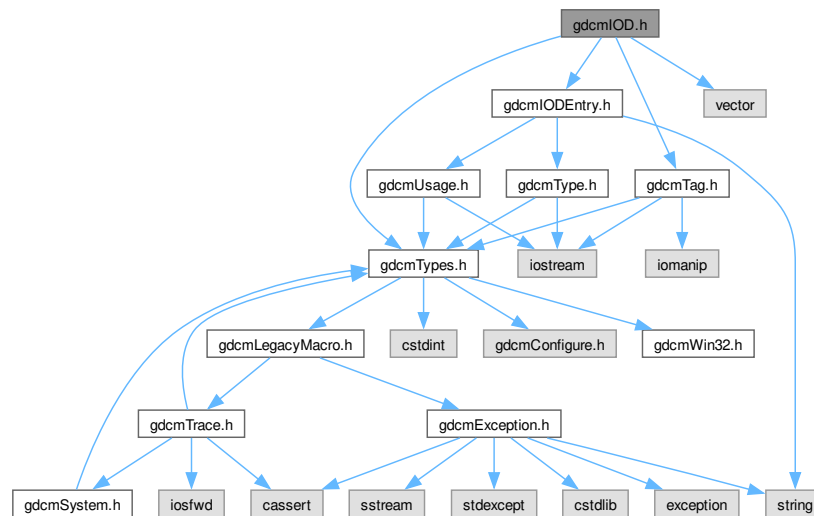
## 13.205 gdcmlOD.h File Reference

```

#include "gdcmmTypes.h"
#include "gdcmmTag.h"
#include "gdcmmIODEntry.h"
#include <vector>

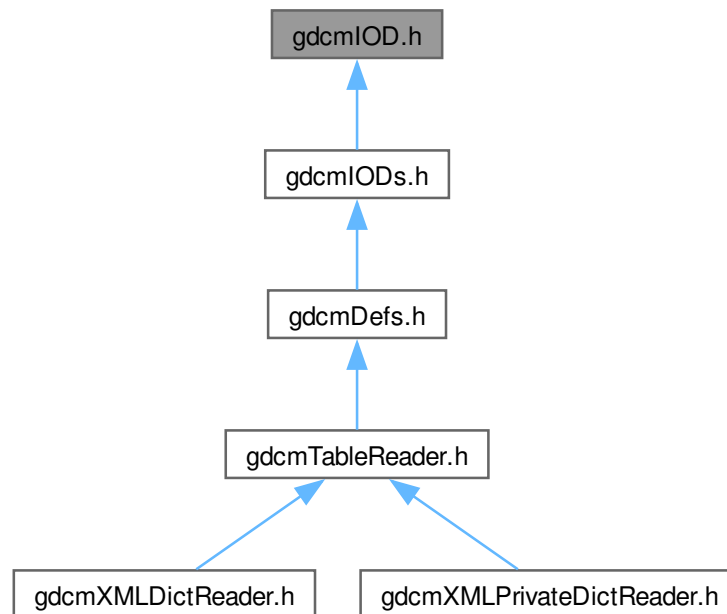
```

Include dependency graph for gdcmlOD.h:





This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::IOD`  
Class for representing a *IOD*.

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const IOD &_val)`

## 13.206 gdcmIOD.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library

```

```

00004
00005 Copyright (c) 2006-2011 Mathieu Malaterre
00006 All rights reserved.
00007 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMIOD_H
00015 #define GDCMIOD_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmTag.h"
00019 #include "gdcmIODEntry.h"
00020
00021 #include <vector>
00022
00023 namespace gdcm
00024 {
00025 class DataSet;
00026 class Defs;
00027
00034 class GDCM_EXPORT IOD
00035 {
00036 public:
00037     typedef std::vector<IODEntry> MapIODEntry;
00038     typedef MapIODEntry::size_type SizeType;
00039
00040     IOD() = default;
00041     friend std::ostream& operator<<(std::ostream& _os, const IOD &_val);
00042
00043     void Clear() { IODInternal.clear(); }
00044
00045     void AddIODEntry(const IODEntry &iode)
00046     {
00047         IODInternal.push_back(iode);
00048     }
00049
00050     SizeType GetNumberOfIODs() const {
00051         return IODInternal.size();
00052     }
00053
00054     const IODEntry& GetIODEntry(SizeType idx) const
00055     {
00056         return IODInternal[idx];
00057     }
00058
00059     Type GetTypeFromTag(const Defs &defs, const Tag& tag) const;
00060
00061 private:
00062     //IOD &operator=(const IOD &_val); // purposely not implemented
00063     //IOD(const IOD &_val); // purposely not implemented
00064
00065     MapIODEntry IODInternal;
00066 };
00067 //-----
00068 inline std::ostream& operator<<(std::ostream& _os, const IOD &_val)
00069 {
00070     IOD::MapIODEntry::const_iterator it = _val.IODInternal.begin();
00071     for(; it != _val.IODInternal.end(); ++it)
00072     {
00073         _os << *it << '\n';
00074     }
00075
00076     return _os;
00077 }
00078
00079 } // end namespace gdcm
00080
00081 #endif //GDCMIOD_H

```

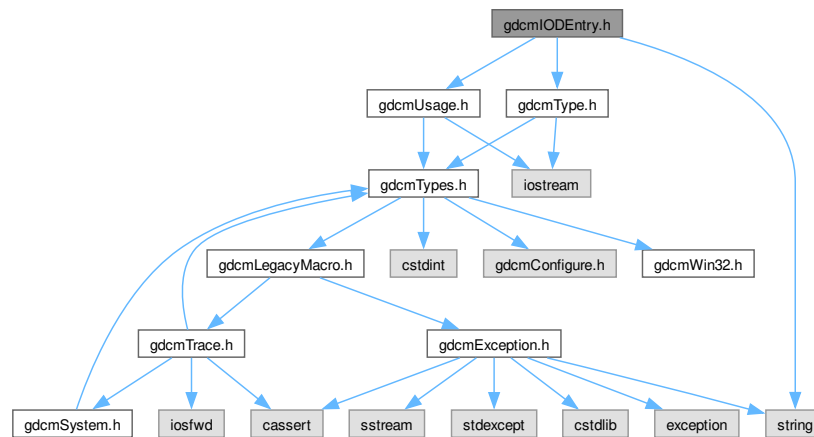
## 13.207 gdcmIODEntry.h File Reference

```
#include "gdcmUsage.h"
```

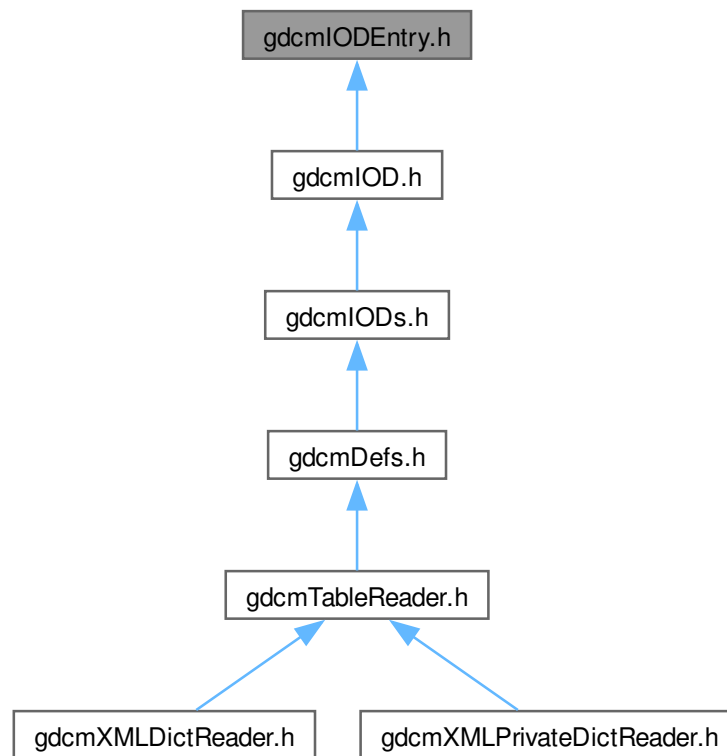
```
#include "gdcmType.h"
```

```
#include <string>
```

Include dependency graph for gdcmIODEntry.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcml::IOEntry](#)  
*Class for representing a [IOEntry](#).*

## Namespaces

- namespace [gdcml](#)

## Functions

- `std::ostream & gdcml::operator<< (std::ostream &_os, const IOEntry &_val)`

## 13.208 gdcmIODEntry.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMIODENTRY_H
00015 #define GDCMIODENTRY_H
00016
00017 #include "gdcmUsage.h"
00018 #include "gdcmType.h"
00019
00020 #include <string>
00021
00022 namespace gdcm
00023 {
00024     class GDCM_EXPORT IODEntry
00025     {
00026     public:
00027         IODEntry(const char *name = "", const char *ref = "", const char *inUsage =
00028             "") : Name(name), Ref(ref), usage(inUsage) {
00029         }
00030         friend std::ostream& operator<<(std::ostream& _os, const IODEntry &_val);
00031
00032         void SetIE(const char *ie) { IE = ie; }
00033         const char *GetIE() const { return IE.c_str(); }
00034
00035         void SetName(const char *name) { Name = name; }
00036         const char *GetName() const { return Name.c_str(); }
00037
00038         void SetRef(const char *ref) { Ref = ref; }
00039         const char *GetRef() const { return Ref.c_str(); }
00040
00041         void SetUsage(const char *inUsage) { usage = inUsage; }
00042         const char *GetUsage() const { return usage.c_str(); }
00043         Usage::UsageType GetUsageType() const;
00044
00045     private:
00046         std::string IE;
00047         std::string Name;
00048         std::string Ref;
00049         std::string usage;
00050     };
00051
00052 //-----
00053 inline std::ostream& operator<<(std::ostream& _os, const IODEntry &_val)
00054 {
00055     _os << _val.IE << "\t" << _val.Name << "\t" << _val.Ref << "\t" << _val.usage;
00056     return _os;
00057 }
00058
00059 } // end namespace gdcm
00060
00061 #endif //GDCMIODENTRY_H

```

## 13.209 gdcmIODs.h File Reference

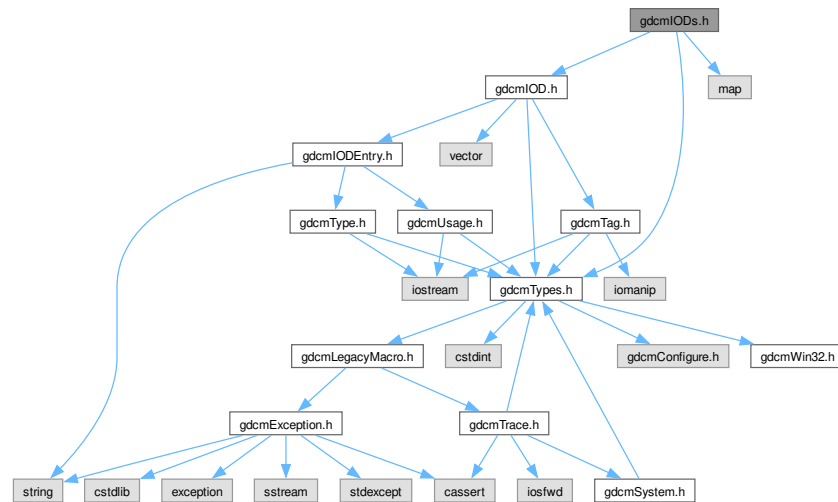
```

#include "gdcmTypes.h"
#include "gdcmIOD.h"

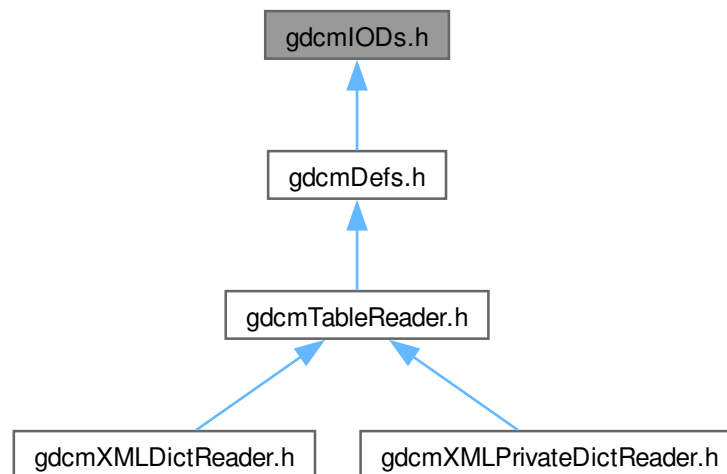
```

```
#include <map>
```

Include dependency graph for gdcmIODs.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::IODs](#)

*Class for representing a [IODs](#).*

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const IODs &_val)`

## 13.210 gdcmIODs.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMIODS_H
00015 #define GDCMIODS_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmIOD.h"
00019
00020 #include <map>
00021
00022 namespace gdcm
00023 {
00024     class GDCM_EXPORT IODs
00025     {
00026     public:
00027         typedef std::string IODName;
00028         typedef std::map<IODName, IOD> IODMapType;
00029
00030         IODs() = default;
00031         friend std::ostream& operator<<(std::ostream& _os, const IODs &_val);
00032
00033         void Clear() { IODsInternal.clear(); }
00034
00035         void AddIOD(const char *name, const IOD & module)
00036         {
00037             IODsInternal.insert(
00038                 IODMapType::value_type(name, module));
00039         }
00040         const IOD &GetIOD(const char *name) const
00041         {
00042             //return IODsInternal[name];
00043             IODMapType::const_iterator it = IODsInternal.find( name );
00044             assert( it != IODsInternal.end() );
00045             assert( it->first == name );
00046             return it->second;
00047         }
00048
00049         typedef IODMapType::const_iterator IODMapTypeConstIterator;
00050         IODMapTypeConstIterator Begin() const { return IODsInternal.begin(); }
00051         IODMapTypeConstIterator End() const { return IODsInternal.end(); }
00052
00053     private:
00054         IODMapType IODsInternal;
00055     };
00056
00057 //-----
00058 inline std::ostream& operator<<(std::ostream& _os, const IODs &_val)
00059 {
00060     IODs::IODMapType::const_iterator it = _val.IODsInternal.begin();

```

```

00065     for(; it != _val.IODsInternal.end(); ++it)
00066     {
00067         const std::string &name = it->first;
00068         const IOD &m = it->second;
00069         _os << name << " " << m << '\n';
00070     }
00071     return _os;
00072 }
00073 }
00074
00075
00076 } // end namespace gdcM
00077
00078 #endif //GDCMIODS_H

```

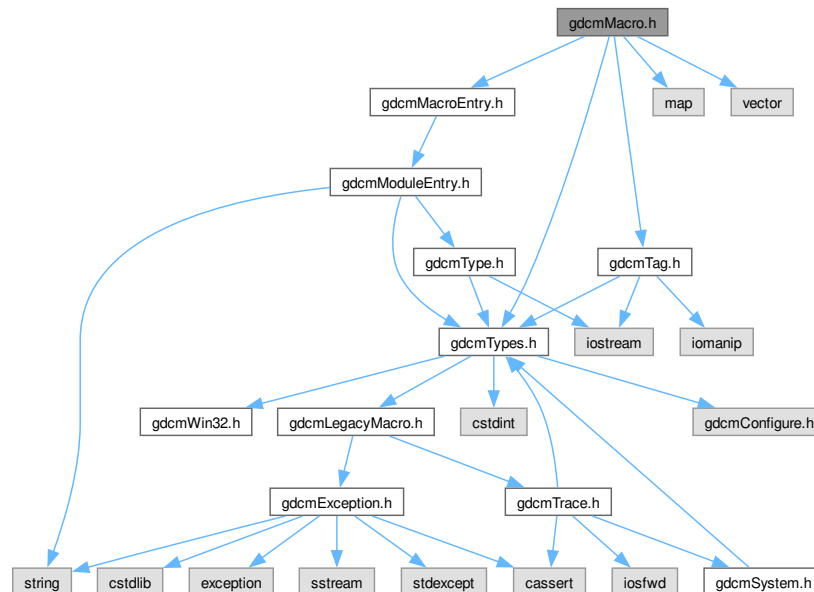
## 13.211 gdcMMacro.h File Reference

```

#include "gdcMTypes.h"
#include "gdcMTag.h"
#include "gdcMMacroEntry.h"
#include <map>
#include <vector>

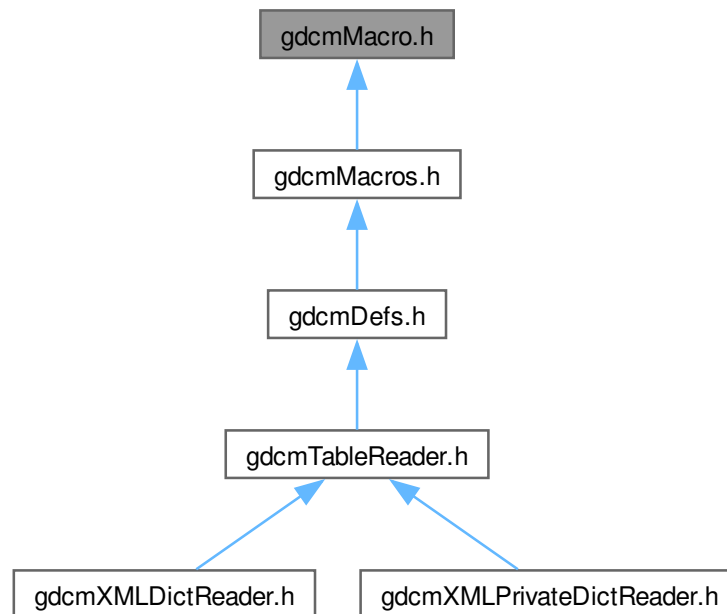
```

Include dependency graph for gdcMMacro.h:





This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Macro`  
Class for representing a *Macro*.

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Macro &_val)`

## 13.212 gdcmMacro.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003  Program: GDCM (Grassroots DICOM). A DICOM library

```

```

00004
00005 Copyright (c) 2006-2011 Mathieu Malaterre
00006 All rights reserved.
00007 See Copyright.txt or http://gdcmm.sourceforge.net/Copyright.html for details.
00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMMACRO_H
00015 #define GDCMMACRO_H
00016
00017 #include "gdcmmTypes.h"
00018 #include "gdcmmTag.h"
00019 #include "gdcmmMacroEntry.h"
00020
00021 #include <map>
00022 #include <vector>
00023
00024 namespace gdcmm
00025 {
00026
00027 class DataSet;
00028 class Usage;
00036 class GDCMM_EXPORT Macro
00037 {
00038 public:
00039     typedef std::map<Tag, MacroEntry> MapModuleEntry;
00040     typedef std::vector<std::string> ArrayIncludeMacrosType;
00041
00042     //typedef MapModuleEntry::const_iterator ConstIterator;
00043     //typedef MapModuleEntry::iterator Iterator;
00044     //ConstIterator Begin() const { return ModuleInternal.begin(); }
00045     //Iterator Begin() { return ModuleInternal.begin(); }
00046     //ConstIterator End() const { return ModuleInternal.end(); }
00047     //Iterator End() { return ModuleInternal.end(); }
00048
00049     Macro() = default;
00050     friend std::ostream& operator<<(std::ostream& _os, const Macro& _val);
00051
00052     void Clear() { ModuleInternal.clear(); }
00053
00055     void AddMacroEntry(const Tag& tag, const MacroEntry & module)
00056     {
00057         ModuleInternal.insert(
00058             MapModuleEntry::value_type(tag, module));
00059     }
00060
00063     bool FindMacroEntry(const Tag &tag) const;
00064     const MacroEntry& GetMacroEntry(const Tag &tag) const;
00065
00066     void SetName(const char *name) { Name = name; }
00067     const char *GetName() const { return Name.c_str(); }
00068
00069     // Verify will print on std::cerr for error
00070     // Upon success will return true, false otherwise
00071     bool Verify(const DataSet& ds, Usage const & usage) const;
00072
00073 private:
00074     //Module &operator=(const Module &_val); // purposely not implemented
00075     //Module(const Module &_val); // purposely not implemented
00076
00077     MapModuleEntry ModuleInternal;
00078     std::string Name;
00079 };
00080 //-----
00081 inline std::ostream& operator<<(std::ostream& _os, const Macro &_val)
00082 {
00083     _os << _val.Name << '\n';
00084     Macro::MapModuleEntry::const_iterator it = _val.ModuleInternal.begin();
00085     for(; it != _val.ModuleInternal.end(); ++it)
00086     {
00087         const Tag &t = it->first;
00088         const MacroEntry &de = it->second;
00089         _os << t << " " << de << '\n';
00090     }
00091
00092     return _os;
00093 }
00094

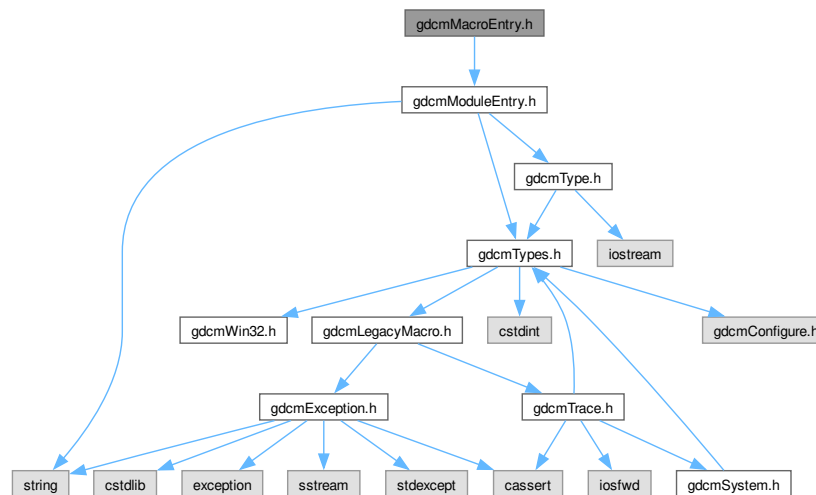
```

```
00095 } // end namespace gdcm
00096
00097 #endif //GDCMMACRO_H
```

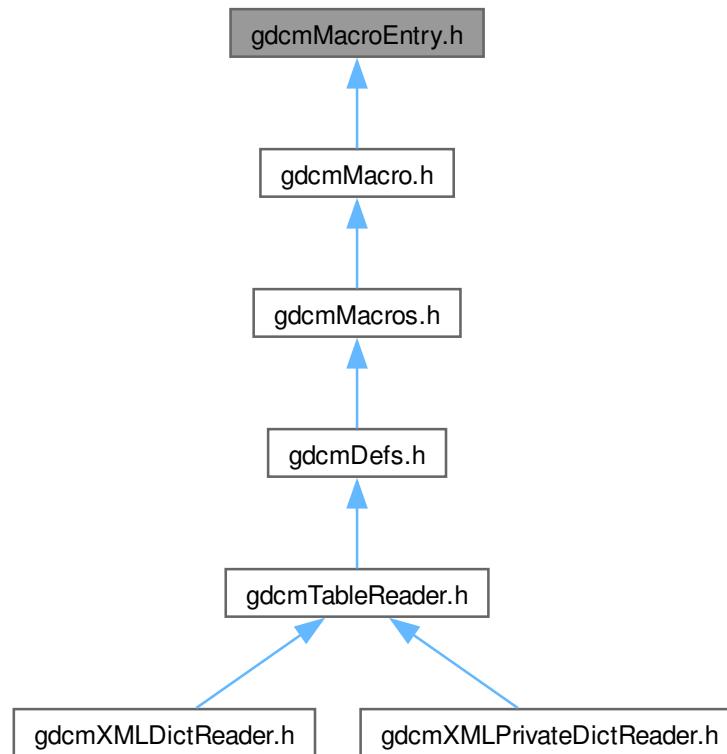
## 13.213 gdcmMacroEntry.h File Reference

```
#include "gdcmModuleEntry.h"
```

Include dependency graph for gdcmMacroEntry.h:



This graph shows which files directly or indirectly include this file:



## Macros

- `#define` [GDCMMACROENTRY\\_H](#)

## 13.213.1 Macro Definition Documentation

### 13.213.1.1 GDCMMACROENTRY\_H

```
#define GDCMMACROENTRY_H
```

## 13.214 gdcmMacroEntry.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #if 0
00015 #ifndef GDCMMACROENTRY_H
00016 #define GDCMMACROENTRY_H
00017
00018 #include "gdcmTypes.h"
00019 #include "gdcmType.h"
00020
00021 #include <string>
00022
00023 namespace gdcm
00024 {
00030 class GDCM_EXPORT MacroEntry
00031 {
00032 public:
00033   MacroEntry(const char *name = "", const char *type = "3", const char *description =
00034   ""):Name(name)/*,Type(type)*/,DescriptionField(description) {
00035     DataElementType = Type::GetTypeType(type);
00036   }
00037   virtual ~MacroEntry() {} // important
00038   friend std::ostream& operator<<(std::ostream& _os, const MacroEntry &_val);
00039
00040   void SetName(const char *name) { Name = name; }
00041   const char *GetName() const { return Name.c_str(); }
00042
00043   void SetType(const Type &type) { DataElementType = type; }
00044   const Type &GetType() const { return DataElementType; }
00045
00046   /*
00047    * WARNING: 'Description' is currently a std::string, but it might change in the future
00048    * do not expect it to remain the same, and always use the ModuleEntry::Description typedef
00049    * instead.
00050    */
00051   typedef std::string Description;
00052   void SetDescription(const char *d) { DescriptionField = d; }
00053   const Description & GetDescription() const { return DescriptionField; }
00054 protected:
00055   // PS 3.3 repeats the name of an attribute, but often contains typos
00056   // for now we will not use this info, but instead access the DataDict instead
00057   std::string Name;
00058
00059   // An attribute, encoded as a Data Element, may or may not be required in a
00060   // Data Set, depending on that Attribute's Data Element Type.
00061   Type DataElementType;
00062
00063   // TODO: for now contains the raw description (with enumerated values, defined terms...)
00064   Description DescriptionField;
00065 };
00066 //-----
00067 inline std::ostream& operator<<(std::ostream& _os, const MacroEntry &_val)
00068 {
00069   _os << _val.Name << "\t" << _val.DataElementType << "\t" << _val.DescriptionField;
00070   return _os;
00071 }
00072
00073
00074 } // end namespace gdcm
00075
00076 #endif //GDCMMODULEENTRY_H
00077 #endif
00078
00079 #ifndef GDCMMACROENTRY_H

```

```

00080 #define GDCMMACROENTRY_H
00081 #include "gdcmModuleEntry.h"
00082 #endif

```

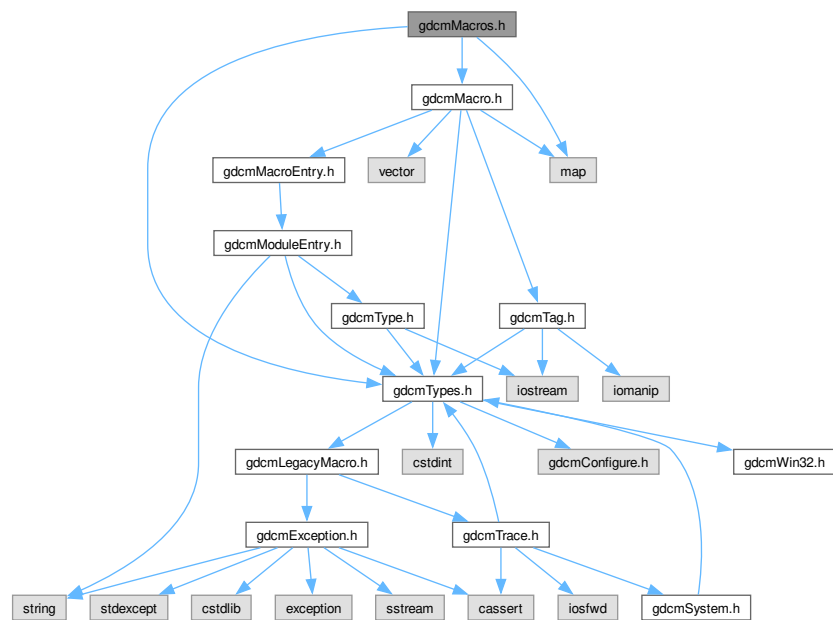
## 13.215 gdcmMacros.h File Reference

```

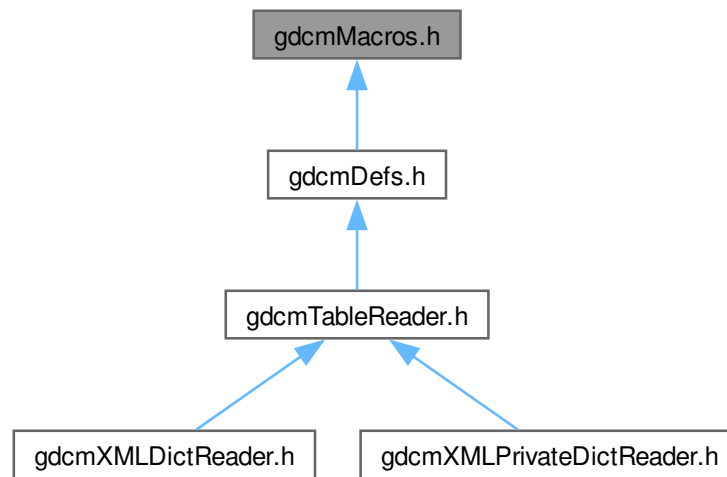
#include "gdcmTypes.h"
#include "gdcmMacro.h"
#include <map>

```

Include dependency graph for gdcmMacros.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::Macros](#)  
*Class for representing a [Modules](#).*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Macros &_val)`

## 13.216 gdcmMacros.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
  
```

```

00010         the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011         PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMMACROS_H
00015 #define GDCMMACROS_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmMacro.h"
00019
00020 #include <map>
00021
00022 namespace gdcm
00023 {
00024     class GDCM_EXPORT Macros
00025     {
00026     public:
00027         typedef std::map<std::string, Macro> ModuleMapType;
00028
00029         Macros() = default;
00030         friend std::ostream& operator<<(std::ostream& _os, const Macros& _val);
00031
00032         void Clear() { ModulesInternal.clear(); }
00033
00034         // A Module is inserted based on it's ref
00035         void AddMacro(const char *ref, const Macro & module )
00036         {
00037             assert( ref && *ref );
00038             assert( ModulesInternal.find( ref ) == ModulesInternal.end() );
00039             ModulesInternal.insert(
00040                 ModuleMapType::value_type(ref, module));
00041         }
00042         const Macro &GetMacro(const char *name) const
00043         {
00044             assert( name && *name );
00045             ModuleMapType::const_iterator it = ModulesInternal.find( name );
00046             assert( it != ModulesInternal.end() );
00047             assert( it->first == name );
00048             return it->second;
00049         }
00050
00051         bool IsEmpty() const { return ModulesInternal.empty(); }
00052
00053     private:
00054         ModuleMapType ModulesInternal;
00055     };
00056
00057 //-----
00058 inline std::ostream& operator<<(std::ostream& _os, const Macros &_val)
00059 {
00060     Macros::ModuleMapType::const_iterator it = _val.ModulesInternal.begin();
00061     for(; it != _val.ModulesInternal.end(); ++it)
00062     {
00063         const std::string &name = it->first;
00064         const Macro &m = it->second;
00065         _os << name << " " << m << '\n';
00066     }
00067
00068     return _os;
00069 }
00070
00071 } // end namespace gdcm
00072
00073 #endif //GDCMMODULES_H

```

## 13.217 gdcmModule.h File Reference

```

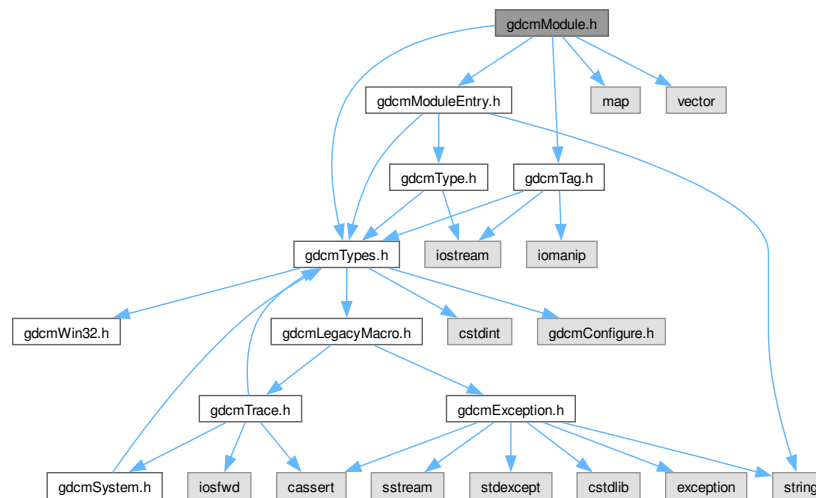
#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmModuleEntry.h"
#include <map>

```

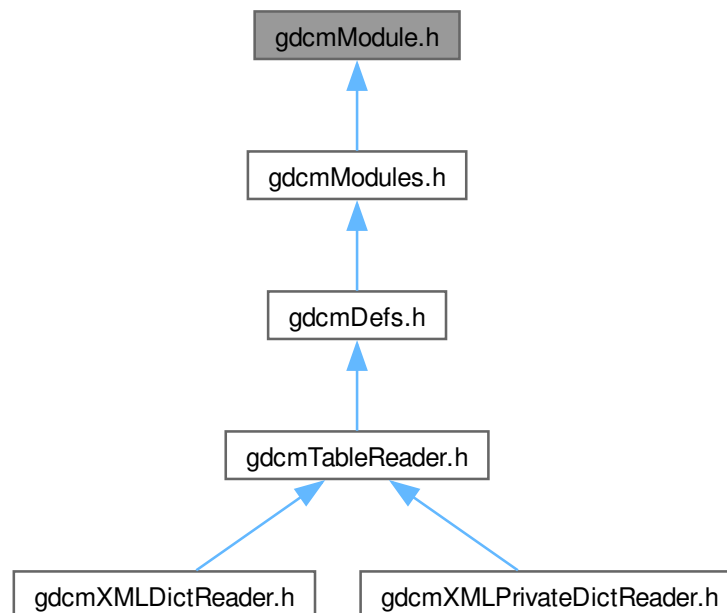


```
#include <vector>
```

Include dependency graph for gdcmModule.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::Module](#)  
*Class for representing a [Module](#).*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Module &_val)`

## 13.218 gdcmModule.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMMODULE_H
00015 #define GDCMMODULE_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmTag.h"
00019 #include "gdcmModuleEntry.h"
00020
00021 #include <map>
00022 #include <vector>
00023
00024 namespace gdcm
00025 {
00026
00027   class DataSet;
00028   class Usage;
00029   class Macros;
00037   class GDCM_EXPORT Module
00038   {
00039   public:
00040     typedef std::map<Tag, ModuleEntry> MapModuleEntry;
00041     typedef std::vector<std::string> ArrayIncludeMacroType;
00042
00043     //typedef MapModuleEntry::const_iterator ConstIterator;
00044     //typedef MapModuleEntry::iterator Iterator;
00045     //ConstIterator Begin() const { return ModuleInternal.begin(); }
00046     //Iterator Begin() { return ModuleInternal.begin(); }
00047     //ConstIterator End() const { return ModuleInternal.end(); }
00048     //Iterator End() { return ModuleInternal.end(); }
00049
00050     Module() = default;
00051     friend std::ostream& operator<<(std::ostream& _os, const Module &_val);
00052
00053     void Clear() { ModuleInternal.clear(); }
00054
00056     void AddModuleEntry(const Tag& tag, const ModuleEntry & module)
00057     {

```

```

00058     ModuleInternal.insert(
00059         MapModuleEntry::value_type(tag, module));
00060     }
00061
00062 void AddMacro(const char *include)
00063 {
00064     ArrayIncludeMacros.push_back( include );
00065 }
00066
00067 bool FindModuleEntryInMacros(Macros const &macros, const Tag &tag) const;
00070 const ModuleEntry& GetModuleEntryInMacros(Macros const &macros, const Tag &tag) const;
00071
00072 void SetName( const char *name) { Name = name; }
00073 const char *GetName() const { return Name.c_str(); }
00074
00075 // Verify will print on std::cerr for error
00076 // Upon success will return true, false otherwise
00077 bool Verify(const DataSet& ds, Usage const & usage) const;
00078
00079 private:
00080     //Module &operator=(const Module &_val); // purposely not implemented
00081     //Module(const Module &_val); // purposely not implemented
00082
00083     MapModuleEntry ModuleInternal;
00084     std::string Name;
00085     ArrayIncludeMacrosType ArrayIncludeMacros;
00086 };
00087 //-----
00088 inline std::ostream& operator<<(std::ostream& _os, const Module &_val)
00089 {
00090     _os << _val.Name << '\n';
00091     Module::MapModuleEntry::const_iterator it = _val.ModuleInternal.begin();
00092     for(; it != _val.ModuleInternal.end(); ++it)
00093     {
00094         const Tag &t = it->first;
00095         const ModuleEntry &de = it->second;
00096         _os << t << " " << de << '\n';
00097     }
00098
00099     return _os;
00100 }
00101
00102 } // end namespace gdcm
00103
00104 #endif //GDCMMODULE_H

```

## 13.219 gdcmModuleEntry.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmType.h"
#include <string>

```



*Class for representing a [ModuleEntry](#).*

## Namespaces

- namespace [gdcm](#)

## Typedefs

- typedef [ModuleEntry](#) [gdcm::MacroEntry](#)

## Functions

- [std::ostream & gdcm::operator<<](#) ([std::ostream &\\_os](#), const [ModuleEntry](#) &\_val)

## 13.220 gdcmModuleEntry.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMMODULEENTRY_H
00015  #define GDCMMODULEENTRY_H
00016
00017  #include "gdcmTypes.h"
00018  #include "gdcmType.h"
00019
00020  #include <string>
00021
00022  namespace gdcm
00023  {
00024  {
00025  class GDCM_EXPORT ModuleEntry
00026  {
00027  public:
00028  ModuleEntry(const char *name = "", const char *type = "3", const char *description =
00029  ""):Name(name),Type(type),DescriptionField(description) {
00030  DataElementType = Type::GetTypeType(type);
00031  }
00032  virtual ~ModuleEntry() = default; // important
00033  friend std::ostream& operator<<(std::ostream& _os, const ModuleEntry &_val);
00034
00035  void SetName(const char *name) { Name = name; }
00036  const char *GetName() const { return Name.c_str(); }
00037
00038  void SetType(const Type &type) { DataElementType = type; }
00039  const Type &GetType() const { return DataElementType; }
00040
00041  /*
00042   * WARNING: 'Description' is currently a std::string, but it might change in the future
00043   * do not expect it to remain the same, and always use the ModuleEntry::Description typedef
00044   * instead.
00045   */
00046  typedef std::string Description;
00047  void SetDescription(const char *d) { DescriptionField = d; }
00048

```

```

00051     const Description & GetDescription() const { return DescriptionField; }
00052
00053 protected:
00054     // PS 3.3 repeats the name of an attribute, but often contains typos
00055     // for now we will not use this info, but instead access the DataDict instead
00056     std::string Name;
00057
00058     // An attribute, encoded as a Data Element, may or may not be required in a
00059     // Data Set, depending on that Attribute's Data Element Type.
00060     Type DataElementType;
00061
00062     // TODO: for now contains the raw description (with enumerated values, defined terms...)
00063     Description DescriptionField;
00064 };
00065 //-----
00066 inline std::ostream& operator<(std::ostream& _os, const ModuleEntry &_val)
00067 {
00068     _os << _val.Name << "\t" << _val.DataElementType << "\t" << _val.DescriptionField;
00069     return _os;
00070 }
00071
00072 typedef ModuleEntry MacroEntry;
00073
00074
00075 } // end namespace gdcmm
00076
00077 #endif //GDCMMODULEENTRY_H

```

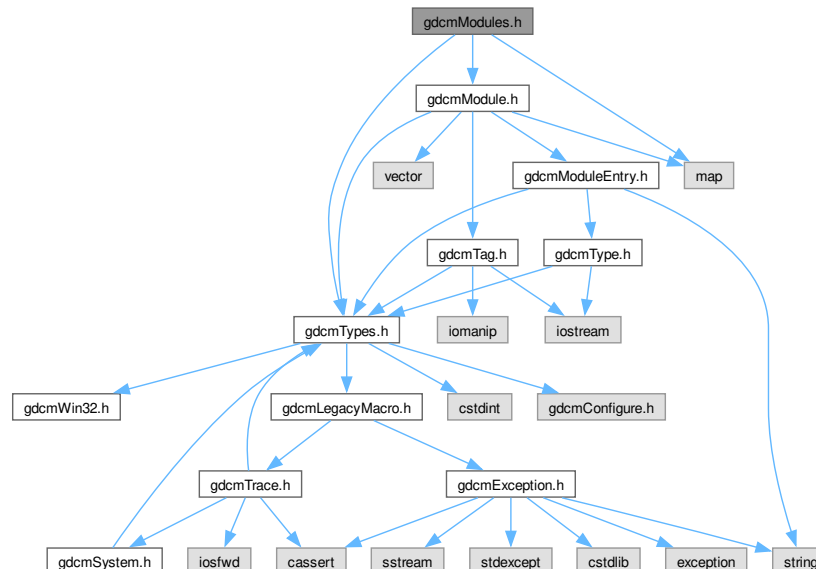
## 13.221 gdcmmModules.h File Reference

```

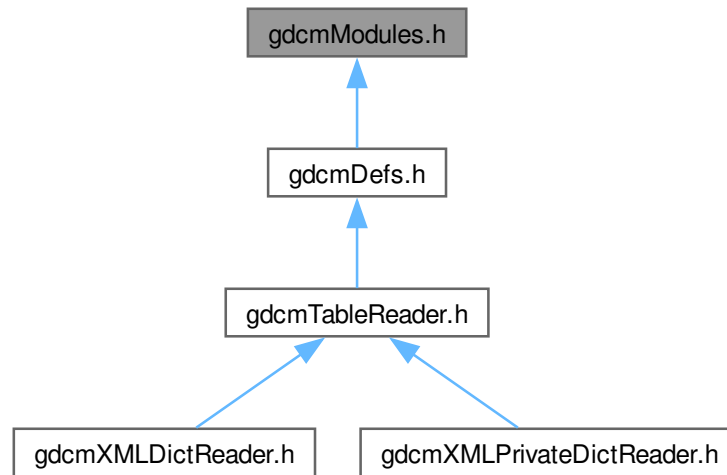
#include "gdcmmTypes.h"
#include "gdcmmModule.h"
#include <map>

```

Include dependency graph for gdcmmModules.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::Modules](#)  
*Class for representing a [Modules](#).*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Modules &_val)`

## 13.222 gdcmModules.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
  
```

```

00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMMODULES_H
00015 #define GDCMMODULES_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmModule.h"
00019
00020 #include <map>
00021
00022 namespace gdcm
00023 {
00024     class GDCM_EXPORT Modules
00025     {
00026     public:
00027         typedef std::map<std::string, Module> ModuleMapType;
00028
00029         Modules() = default;
00030         friend std::ostream& operator<<(std::ostream& _os, const Modules &_val);
00031
00032         void Clear() { ModulesInternal.clear(); }
00033
00034         // A Module is inserted based on it's ref
00035         void AddModule(const char *ref, const Module & module )
00036         {
00037             assert( ref && *ref );
00038             assert( ModulesInternal.find( ref ) == ModulesInternal.end() );
00039             ModulesInternal.insert(
00040                 ModuleMapType::value_type(ref, module));
00041         }
00042         const Module &GetModule(const char *name) const
00043         {
00044             assert( name && *name );
00045             ModuleMapType::const_iterator it = ModulesInternal.find( name );
00046             assert( it != ModulesInternal.end() );
00047             assert( it->first == name );
00048             return it->second;
00049         }
00050         bool IsEmpty() const { return ModulesInternal.empty(); }
00051     private:
00052         ModuleMapType ModulesInternal;
00053     };
00054 //-----
00055 inline std::ostream& operator<<(std::ostream& _os, const Modules &_val)
00056 {
00057     Modules::ModuleMapType::const_iterator it = _val.ModulesInternal.begin();
00058     for(; it != _val.ModulesInternal.end(); ++it)
00059     {
00060         const std::string &name = it->first;
00061         const Module &m = it->second;
00062         _os << name << " " << m << '\n';
00063     }
00064     return _os;
00065 }
00066 } // end namespace gdcm
00067 #endif //GDCMMODULES_H

```

## 13.223 gdcmNestedModuleEntries.h File Reference

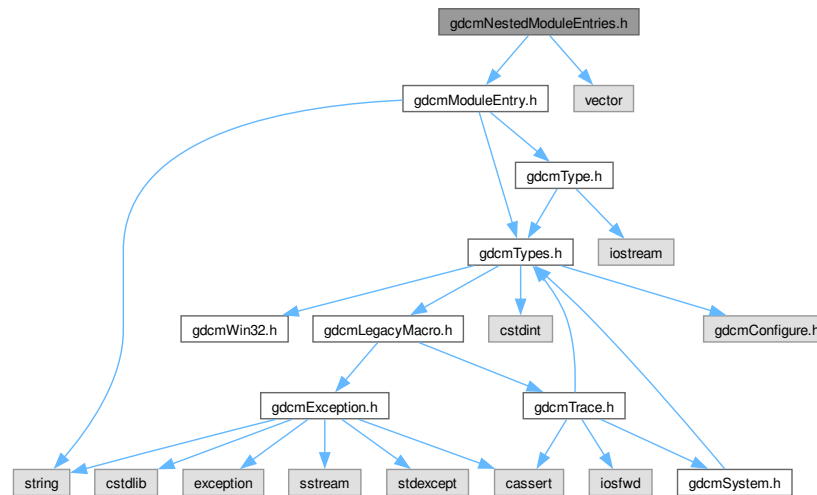
```

#include "gdcmModuleEntry.h"
#include <vector>

```



Include dependency graph for gdcmNestedModuleEntries.h:



## Classes

- class [gdcm::NestedModuleEntries](#)  
Class for representing a *NestedModuleEntries*.

## Namespaces

- namespace [gdcm](#)

## Typedefs

- typedef [NestedModuleEntries](#) [gdcm::NestedMacroEntries](#)

## Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &\_os, const [NestedModuleEntries](#) &\_val)

## 13.224 gdcmNestedModuleEntries.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMNESTEDMODULEENTRIES_H
00015 #define GDCMNESTEDMODULEENTRIES_H
00016
00017 #include "gdcmModuleEntry.h"
00018 #include <vector>
00019
00020 namespace gdcm
00021 {
00022
00027 class GDCM_EXPORT NestedModuleEntries : public ModuleEntry
00028 {
00029 public:
00030   NestedModuleEntries(const char *name = "", const char *type = "3", const char *description =
00031   ""):ModuleEntry(name,type,description) { }
00032   friend std::ostream& operator<(std::ostream& _os, const NestedModuleEntries &_val);
00033
00034   typedef std::vector<ModuleEntry>::size_type SizeType;
00035   SizeType GetNumberOfModuleEntries() { return ModuleEntriesList.size(); }
00036   const ModuleEntry &GetModuleEntry(SizeType idx) const { return ModuleEntriesList[idx]; }
00037   ModuleEntry &GetModuleEntry(SizeType idx) { return ModuleEntriesList[idx]; }
00038
00039   void AddModuleEntry(const ModuleEntry &me) { ModuleEntriesList.push_back( me ); }
00040
00041 private:
00042   std::vector<ModuleEntry> ModuleEntriesList;
00043 };
00044
00045 inline std::ostream& operator<(std::ostream& _os, const NestedModuleEntries &_val)
00046 {
00047   _os << "Nested:" << _val.Name << "\t" << _val.DataElementType << "\t" << _val.DescriptionField;
00048   return _os;
00049 }
00050
00051 typedef NestedModuleEntries NestedMacroEntries;
00052
00053 } // end namespace gdcm
00054
00055 #endif //GDCMNESTEDMODULEENTRIES_H

```

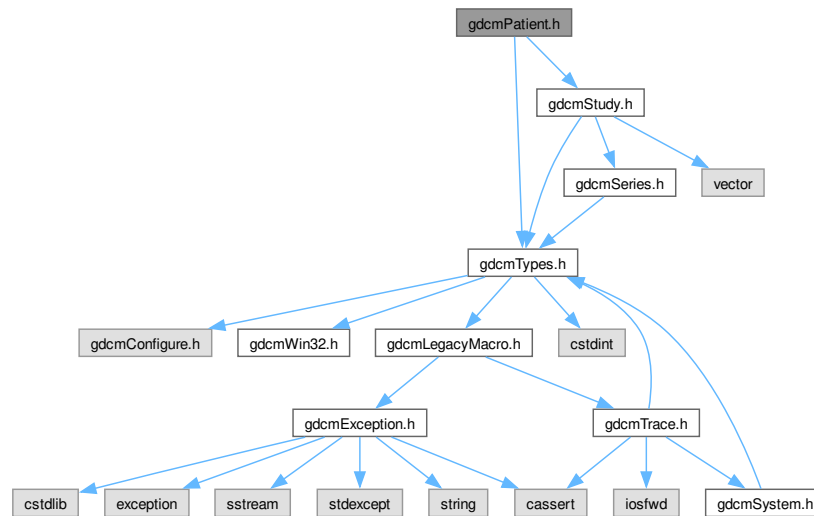
## 13.225 gdcmPatient.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmStudy.h"

```

Include dependency graph for gdcmPatient.h:



## Classes

- class [gdcm::Patient](#)

See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.

## Namespaces

- namespace [gdcm](#)

## 13.226 gdcmPatient.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012   =====*/
00013
00014 #ifndef GDCMPATIENT_H
00015 #define GDCMPATIENT_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmStudy.h"
00019

```

```

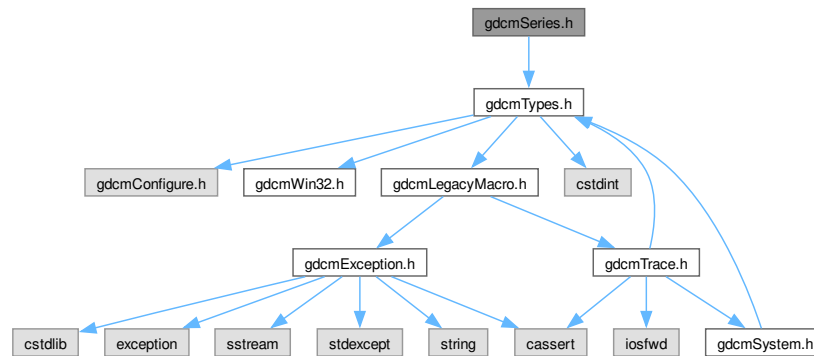
00020 namespace gdc
00021 {
00027 class GDCM_EXPORT Patient
00028 {
00029 public:
00030     Patient() = default;
00031 private:
00032     std::vector<Study> StudyList;
00033 };
00034 } // end namespace gdc
00035
00036 } // end namespace gdc
00037
00038 #endif //GDCMPATIENT_H

```

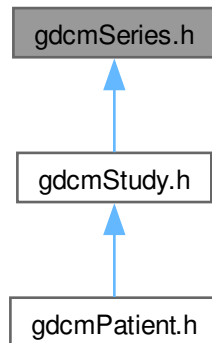
## 13.227 gdcSeries.h File Reference

```
#include "gdcTypes.h"
```

Include dependency graph for gdcSeries.h:



This graph shows which files directly or indirectly include this file:



**Classes**

- class [gdcm::Series](#)  
*Series.*

**Namespaces**

- namespace [gdcm](#)

**13.228 gdcmSeries.h**

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMSERIES_H
00015 #define GDCMSERIES_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021
00022   class GDCM_EXPORT Series
00023   {
00024   public:
00025     Series() = default;
00026   private:
00027     // Image, Waveform...
00028   };
00029
00030 } // end namespace gdcm
00031
00032 #endif //GDCMSERIES_H

```

**13.229 gdcmStudy.h File Reference**

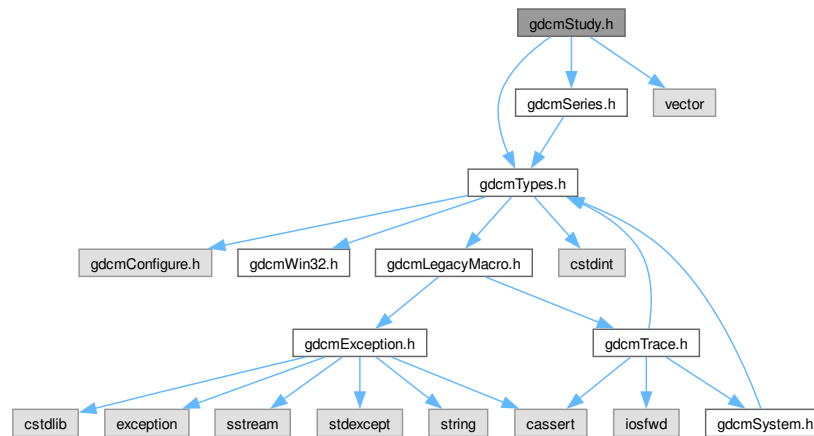
```

#include "gdcmTypes.h"
#include "gdcmSeries.h"

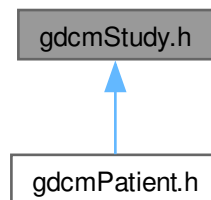
```

```
#include <vector>
```

Include dependency graph for `gdcmStudy.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Study`  
*Study.*

## Namespaces

- namespace `gdcm`

## 13.230 gdcmStudy.h

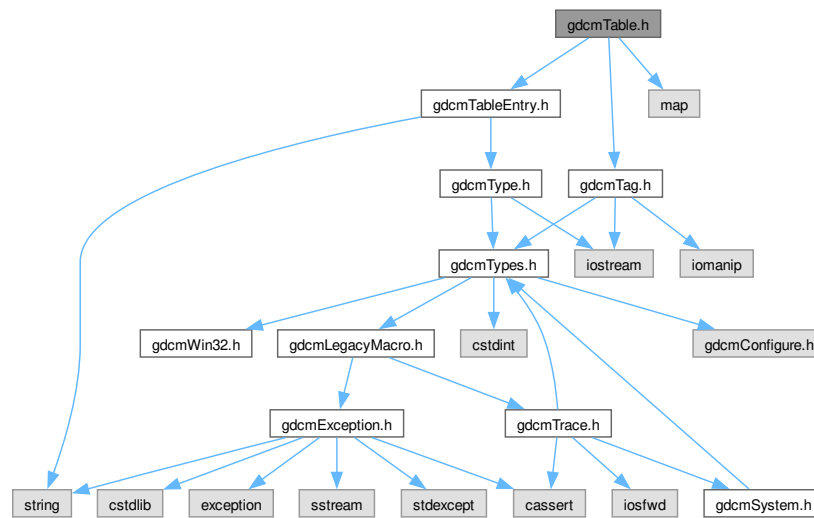
[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSTUDY_H
00015 #define GDCMSTUDY_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmSeries.h"
00019
00020 #include <vector>
00021
00022 namespace gdcm
00023 {
00024     class GDCM_EXPORT Study
00025     {
00026     public:
00027         Study() = default;
00028     private:
00029         std::vector<Series> SeriesList;
00030     };
00031 } // end namespace gdcm
00032
00033 #endif //GDCMSTUDY_H
```

## 13.231 gdcmTable.h File Reference

```
#include "gdcmTableEntry.h"
#include "gdcmTag.h"
#include <map>
```

Include dependency graph for gdcTable.h:



## Classes

- class [gdcm::Table](#)  
*Table.*

## Namespaces

- namespace [gdc](#)

## 13.232 gdcTable.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMTABLE_H
00015 #define GDCMTABLE_H
00016
00017 #include "gdcTableEntry.h"
00018 #include "gdcTag.h"
00019
00020 #include <map>

```



```

00021
00022 namespace gdcm
00023 {
00024
00028 class Table
00029 {
00030 public:
00031     typedef std::map<Tag, TableEntry> MapTableEntry;
00032     Table() = default;
00033     ~Table() = default;
00034     Table &operator=(const Table &_val) = delete;
00035     Table(const Table&_val) = delete;
00036
00037     friend std::ostream& operator<<(std::ostream& _os, const Table &_val);
00038
00039     void InsertEntry(Tag const &tag, TableEntry const &te)
00040     {
00041 #ifndef NDEBUG
00042         MapTableEntry::size_type s = TableInternal.size();
00043 #endif
00044         TableInternal.insert(
00045             MapTableEntry::value_type(tag, te));
00046         assert( s < TableInternal.size() );
00047     }
00048
00049     const TableEntry &GetTableEntry(const Tag &tag) const
00050     {
00051         MapTableEntry::const_iterator it =
00052             TableInternal.find(tag);
00053         if (it == TableInternal.end())
00054         {
00055             assert( 0 && "Impossible" );
00056             return GetTableEntry(Tag(0,0));
00057         }
00058         return it->second;
00059     }
00060
00061     MapTableEntry TableInternal;
00062 };
00063
00064 } // end namespace gdcm
00065
00066 #endif //GDCMTABLE_H

```

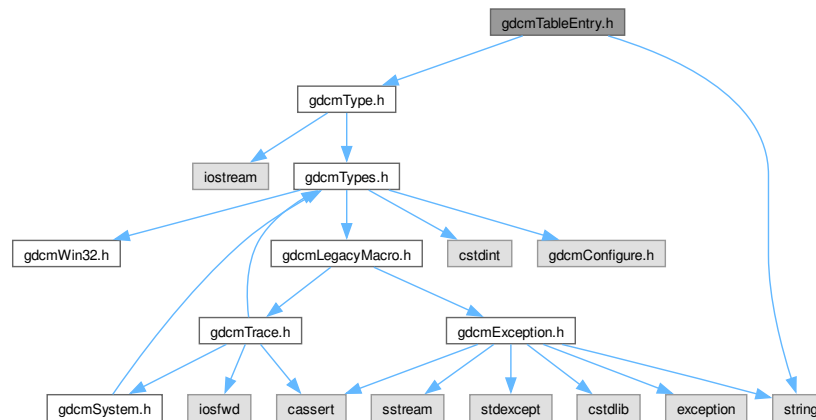
## 13.233 gdcmTableEntry.h File Reference

```

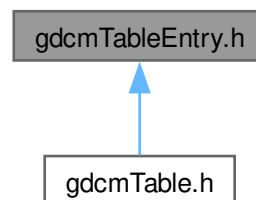
#include "gdcmType.h"
#include <string>

```

Include dependency graph for `gdcmTableEntry.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::TableEntry`  
*TableEntry*.

## Namespaces

- namespace `gdcm`

## 13.234 gdcmTableEntry.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMTABLEENTRY_H
00015 #define GDCMTABLEENTRY_H
00016
00017 #include "gdcmType.h"
00018
00019 #include <string>
00020
00021 namespace gdcm
00022 {
00023
00027   class TableEntry
00028   {
00029   public:
00030     TableEntry(const char *attribute = nullptr,
00031               Type const &type = Type(), const char *des = nullptr) :
00032       Attribute(attribute ? attribute : ""), TypeField(type), Description(des ? des : "") {}
00033     ~TableEntry() = default;
00034
00035   private:
00036     std::string Attribute;
00037     Type TypeField;
00038     std::string Description;
00039   };
00040
00041 } // end namespace gdcm
00042
00043 #endif //GDCMTABLEENTRY_H

```

## 13.235 gdcmTableReader.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmDefs.h"
#include <string>
#include <vector>
#include <map>

```



## 13.236 gdcmTableReader.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMTABLEREADER_H
00015 #define GDCMTABLEREADER_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmDefs.h"
00019 // #include "gdcmModule.h"
00020 // #include "gdcmIOD.h"
00021 // #include "gdcmIODs.h"
00022 // #include "gdcmModules.h"
00023
00024 #include <string>
00025 #include <vector>
00026 #include <map>
00027
00028 namespace gdcm
00029 {
00030     class GDCM_EXPORT TableReader
00031     {
00032     public:
00033         TableReader(Defs &defs):CurrentDefs(defs),ParsingModule(false),ParsingModuleEntry(false),
00034             ParsingModuleEntryDescription(false),
00035             ParsingMacro(false),
00036             ParsingMacroEntry(false),
00037             ParsingMacroEntryDescription(false),
00038             ParsingIOD(false),
00039             ParsingIODEntry(false),
00040             Description() {}
00041         virtual ~TableReader() = default;
00042
00043         // Set/Get filename
00044         void SetFilename(const char *filename) { Filename = filename; }
00045         const char *GetFilename() { return Filename.c_str(); }
00046
00047         int Read();
00048
00049     protected:
00050         // You need to override those function in your subclasses:
00051         virtual void StartElement(const char *name, const char **atts);
00052         virtual void EndElement(const char *name);
00053         virtual void CharacterDataHandler(const char *data, int length);
00054
00055         void HandleModuleEntry(const char **atts);
00056         void HandleModule(const char **atts);
00057         void HandleModuleEntryDescription(const char **atts);
00058         void HandleMacroEntry(const char **atts);
00059         void HandleMacro(const char **atts);
00060         void HandleMacroEntryDescription(const char **atts);
00061         void HandleModuleInclude(const char **atts);
00062         void HandleIODEntry(const char **atts);
00063         void HandleIOD(const char **atts);
00064
00065         //const Modules & GetModules() const { return CurrentModules; }
00066         //const Macros & GetMacros() const { return CurrentMacros; }
00067         //const IODs & GetIODs() const { return CurrentIODs; }
00068         const Defs & GetDefs() const { return CurrentDefs; }
00069
00070     private:
00071         std::string Filename;
00072         Defs &CurrentDefs;
00073         //Macros CurrentMacros;
00074         //Modules CurrentModules;
00075         //IODs CurrentIODs;

```

```

00080 Macro CurrentMacro;
00081 Module CurrentModule;
00082 IOD CurrentIOD;
00083 MacroEntry CurrentMacroEntry;
00084 ModuleEntry CurrentModuleEntry;
00085 IODEntry CurrentIODEntry;
00086 std::string CurrentModuleName;
00087 std::string CurrentModuleRef;
00088 std::string CurrentMacroRef;
00089 bool ParsingModule;
00090 bool ParsingModuleEntry;
00091 bool ParsingModuleEntryDescription;
00092 bool ParsingMacro;
00093 bool ParsingMacroEntry;
00094 bool ParsingMacroEntryDescription;
00095 bool ParsingIOD;
00096 bool ParsingIODEntry;
00097 Tag CurrentTag;
00098 std::string Description;
00099 };
00100
00101 } // end namespace gdcM
00102
00103 #endif //GDCMTABLEREADER_H

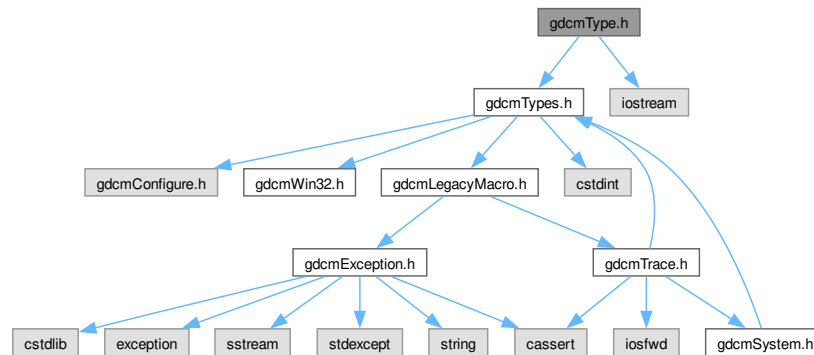
```

## 13.237 gdcMType.h File Reference

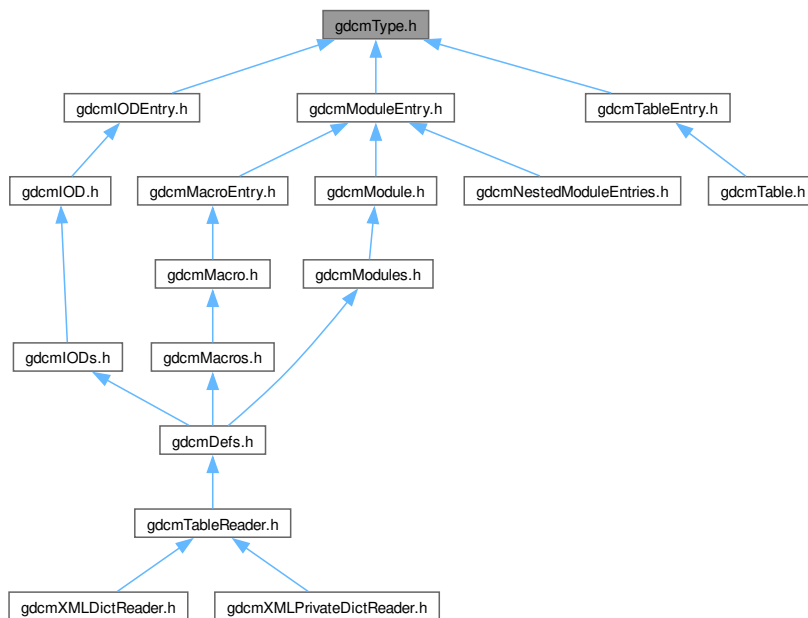
```
#include "gdcMTypes.h"
```

```
#include <iostream>
```

Include dependency graph for gdcMType.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Type`  
*Type*.

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Type &val)`

## 13.238 gdcmType.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.

```

```

00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014
00015 #ifndef GDCMTYPE_H
00016 #define GDCMTYPE_H
00017
00018 #include "gdcmTypes.h"
00019
00020 #include <iostream>
00021
00022 namespace gdcm
00023 {
00024
00041 class GDCM_EXPORT Type
00042 {
00043 public:
00044     typedef enum {
00045         T1 = 0,
00046         T1C,
00047         T2,
00048         T2C,
00049         T3,
00050         UNKNOWN
00051     } TypeType;
00052
00053     Type(TypeType type = UNKNOWN) : TypeField(type) { }
00054
00055     operator TypeType () const { return TypeField; }
00056     friend std::ostream &operator<(std::ostream &os, const Type &vr);
00057
00058     static const char *GetTypeString(TypeType type);
00059     static TypeType GetTypeType(const char *type);
00060
00061 private:
00062     TypeType TypeField;
00063 };
00064 //-----
00065 inline std::ostream &operator<(std::ostream &os, const Type &val)
00066 {
00067     _os << Type::GetTypeString(val.TypeField);
00068     return _os;
00069 }
00070
00071 } // end namespace gdcm
00072
00073 #endif //GDCMTYPE_H

```

## 13.239 gdcmUsage.h File Reference

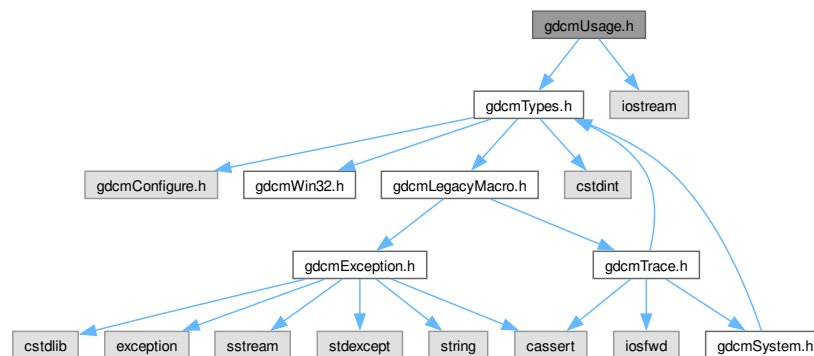
```

#include "gdcmTypes.h"
#include <iostream>

```



Include dependency graph for gdcmUsage.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcml::Usage](#)  
*Usage.*

## Namespaces

- namespace [gdcml](#)

## Functions

- `std::ostream & gdcml::operator<< (std::ostream &_os, const Usage &val)`

## 13.240 gdcmUsage.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMUSAGE_H
00015 #define GDCMUSAGE_H
00016
00017 #include "gdcmTypes.h"
00018
00019 #include <iostream>
00020
00021 namespace gdcm
00022 {
00023
00024   class GDCM_EXPORT Usage
00025   {
00026   public:
00027     typedef enum {
00028       Mandatory, // (see A.1.3.1) , abbreviated M
00029       Conditional, // (see A.1.3.2) , abbreviated C
00030       UserOption, // (see A.1.3.3) , abbreviated U
00031       Invalid
00032     } UsageType;
00033
00034     Usage(UsageType type = Invalid) : UsageField(type) { }
00035
00036     operator UsageType () const { return UsageField; }
00037     friend std::ostream &operator<<(std::ostream &os, const Usage &vr);
00038
00039     static const char *GetUsageString(UsageType type);
00040     static UsageType GetUsageType(const char *type);
00041
00042   private:
00043     UsageType UsageField;
00044   };
00045
00046   //-----
00047   inline std::ostream &operator<<(std::ostream &_os, const Usage &val)
00048   {
00049     _os << Usage::GetUsageString(val.UsageField);
00050     return _os;
00051   }
00052
00053 } // end namespace gdcm
00054
00055 #endif //GDCMUSAGE_H

```

## 13.241 gdcmXMLDictReader.h File Reference

```

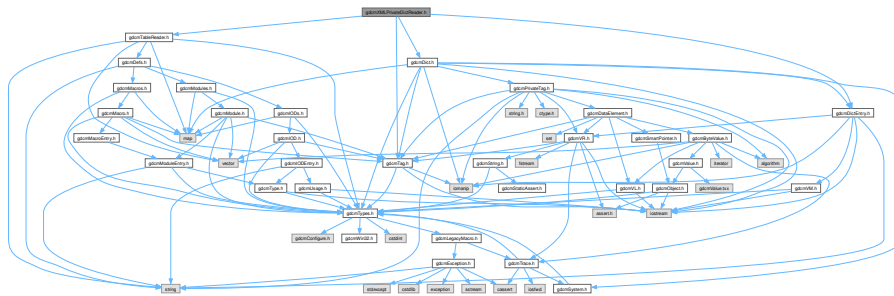
#include "gdcmTableReader.h"
#include "gdcmDict.h"
#include "gdcmDictEntry.h"
#include "gdcmTag.h"

```



### 13.243 gdcmlXMLPrivateDictReader.h File Reference

Include dependency graph for gdcmlXMLPrivateDictReader.h:



- class `gdcm::XMLPrivateDictReader`  
*Class for representing a `XMLPrivateDictReader`.*

- namespace **gdcm**

## 13.244 gdcmXMLPrivateDictReader.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMXMLPRIVATEDICTREADER_H
00015 #define GDCMXMLPRIVATEDICTREADER_H
00016
00017 #include "gdcmTableReader.h"
00018 #include "gdcmDict.h"
00019 #include "gdcmDictEntry.h"
00020 #include "gdcmTag.h"
00021
00022 namespace gdcm
00023 {
00024     class GDCM_EXPORT XMLPrivateDictReader : public TableReader
00025     {
00026     public:
00027         XMLPrivateDictReader();
00028         ~XMLPrivateDictReader() {}
00029
00030         void StartElement(const char *name, const char **atts);
00031         void EndElement(const char *name);
00032         void CharacterDataHandler(const char *data, int length);
00033
00034         const PrivateDict & GetPrivateDict() { return PDict; }
00035
00036     protected:
00037         void HandleEntry(const char **atts);
00038         void HandleDescription(const char **atts);
00039
00040     private:
00041         PrivateDict PDict;
00042         PrivateTag CurrentTag;
00043         DictEntry CurrentDE;
00044         bool ParsingDescription;
00045         std::string Description;
00046     };
00047 } // end namespace gdcm
00048
00049 #endif //GDCMXMLPRIVATEDICTREADER_H

```

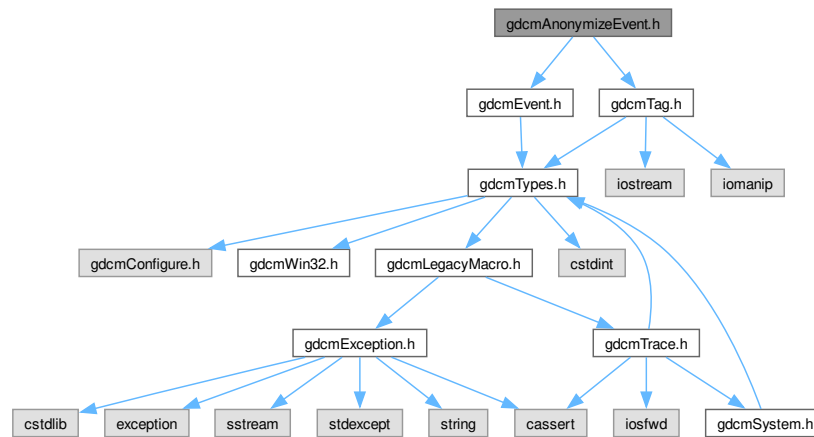
## 13.245 gdcmAnonymizeEvent.h File Reference

```

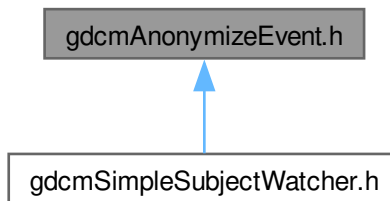
#include "gdcmEvent.h"
#include "gdcmTag.h"

```

Include dependency graph for gdcmAnonymizeEvent.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::AnonymizeEvent`  
*AnonymizeEvent.*

## Namespaces

- namespace `gdcm`

## 13.246 gdcmAnonymizeEvent.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMANONYMIZEEVENT_H
00015 #define GDCMANONYMIZEEVENT_H
00016
00017 #include "gdcmEvent.h"
00018 #include "gdcmTag.h"
00019
00020 namespace gdcm
00021 {
00022
00023   class AnonymizeEvent : public AnyEvent
00024   {
00025   public:
00026     typedef AnonymizeEvent Self;
00027     typedef AnyEvent Superclass;
00028     AnonymizeEvent(Tag const &tag = 0):m_Tag(tag) {}
00029     ~AnonymizeEvent() override = default;
00030     AnonymizeEvent(const Self&s) : AnyEvent(s){}
00031     void operator=(const Self&) = delete;
00032
00033     const char * GetEventName() const override { return "AnonymizeEvent"; }
00034     bool CheckEvent(const ::gdcm::Event* e) const override
00035     { return (dynamic_cast<const Self*>(e) == nullptr ? false : true) ; }
00036     ::gdcm::Event* MakeObject() const override
00037     { return new Self; }
00038
00039     void SetTag(const Tag& t) { m_Tag = t; }
00040     Tag const & GetTag() const { return m_Tag; }
00041   private:
00042     Tag m_Tag;
00043   };
00044
00045 } // end namespace gdcm
00046
00047 #endif //GDCMANONYMIZEEVENT_H

```

## 13.247 gdcmAnonymizer.h File Reference

```

#include "gdcmFile.h"
#include "gdcmSubject.h"
#include "gdcmEvent.h"
#include "gdcmSmartPointer.h"
#include <map>

```





```

00077 class GDCM_EXPORT Anonymizer : public Subject
00078 {
00079 public:
00080     Anonymizer():F(new File),CMS(nullptr) {}
00081     ~Anonymizer() override;
00082
00084     bool Empty( Tag const &t );
00085
00090     bool Empty( PrivateTag const &pt );
00091
00093     bool Clear( Tag const &t );
00094     bool Clear( PrivateTag const &pt );
00095
00097     bool Remove( Tag const &t );
00098
00104     bool Remove( PrivateTag const &pt );
00105
00108     bool Replace( Tag const &t, const char *value );
00109     bool Replace( PrivateTag const &t, const char *value );
00110
00113     bool Replace( Tag const &t, const char *value, VL const &vl );
00114     bool Replace( PrivateTag const &t, const char *value, VL const &vl );
00115
00117     bool RemovePrivateTags();
00118
00120     bool RemoveGroupLength();
00121
00123     bool RemoveRetired();
00124
00126     void SetFile(const File& f) { F = f; }
00127     //const File &GetFile() const { return *F; }
00128     File &GetFile() { return *F; }
00129
00134     bool BasicApplicationLevelConfidentialityProfile(bool deidentify = true);
00135
00137     void SetCryptographicMessageSyntax( CryptographicMessageSyntax *cms );
00138     const CryptographicMessageSyntax *GetCryptographicMessageSyntax() const;
00139
00141     static SmartPointer<Anonymizer> New() { return new Anonymizer; }
00142
00144     static std::vector<Tag> GetBasicApplicationLevelConfidentialityProfileAttributes();
00145
00148     static void ClearInternalUIDs();
00149
00150 protected:
00151     // Internal function used to either empty a tag or set it's value to a dummy value (Type 1 vs Type 2)
00152     bool BALCPProtect(DataSet &ds, Tag const &tag, const IOD &iod);
00153     bool CanEmptyTag(Tag const &tag, const IOD &iod) const;
00154     void RecurseDataSet( DataSet &ds );
00155
00156 private:
00157     bool BasicApplicationLevelConfidentialityProfile1();
00158     bool BasicApplicationLevelConfidentialityProfile2();
00159     bool CheckIfSequenceContainsAttributeToAnonymize(File const &file, SequenceOfItems* sqi) const;
00160
00161 private:
00162     // I would prefer to have a smart pointer to DataSet but DataSet does not derive from Object...
00163     SmartPointer<File> F;
00164     CryptographicMessageSyntax *CMS;
00165
00166     typedef std::pair< Tag, std::string > TagValueKey;
00167     typedef std::map< TagValueKey, std::string > DummyMapNonUIDTags;
00168     typedef std::map< std::string, std::string > DummyMapUIDTags;
00169     static DummyMapNonUIDTags dummyMapNonUIDTags;
00170     static DummyMapUIDTags dummyMapUIDTags;
00171 };
00172
00178
00179 } // end namespace gdcm
00180
00181 #endif //GDCMANONYMIZER_H

```

## 13.249 gdcmApplicationEntity.h File Reference

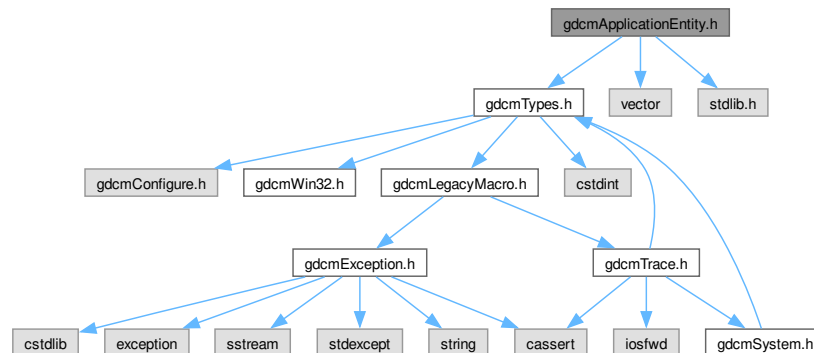
```

#include "gdcmTypes.h"
#include <vector>

```

```
#include <stdlib.h>
```

Include dependency graph for gdcmApplicationEntity.h:



## Classes

- class [gdcm::ApplicationEntity](#)  
*ApplicationEntity.*

## Namespaces

- namespace [gdcm](#)

## 13.250 gdcmApplicationEntity.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014 #ifndef GDCMAPPLICATIONENTITY_H
00015 #define GDCMAPPLICATIONENTITY_H
00016
00017 #include "gdcmTypes.h"
00018 #include <vector>
00019 #include <stdlib.h> // abort
00020
00021 namespace gdcm
00022 {
00023
00024
00025
00026
00027
00028
00029
00030
00031
00032
00033
00034
00035 class GDCM_EXPORT ApplicationEntity
00036 {

```

```

00037 public:
00038     static const unsigned int MaxNumberOfComponents = 1;
00039     static const unsigned int MaxLength = 16;
00040     std::string Internal;
00041     static const char Separator = ' ';
00042     static const char Padding = ' ';
00043     //static const char Excluded[5] = { '\\', /* 5CH */, '\n', /* LF */, '\f', /* FF */, '\r', /* CR */, 0x1b
/* ESC */};
00044
00045     bool IsValid() const {
00046         return true;
00047     }
00048     void Squeeze() {
00049         // trim leading and trailing white spaces
00050     }
00051     void SetBlob(const std::vector<char>& v) {
00052         (void)v;
00053         assert(0); //TODO
00054     }
00055     void Print(std::ostream &os) const {
00056         (void)os;
00057         assert(0); //TODO
00058     }
00059 };
00060
00061 } // end namespace gdcm
00062
00063 #endif //GDCMAPPLICATIONENTITY_H

```

## 13.251 gdcmAudioCodec.h File Reference

#include "gdcmCodec.h"

Include dependency graph for gdcmAudioCodec.h:



### Classes

- class [gdcm::AudioCodec](#)  
*AudioCodec.*

## Namespaces

- namespace `gdcm`

## 13.252 gdcmAudioCodec.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMAUDIOCODEC_H
00015 #define GDCMAUDIOCODEC_H
00016
00017 #include "gdcmCodec.h"
00018
00019 namespace gdcm
00020 {
00021
00022
00025 class GDCM_EXPORT AudioCodec : public Codec
00026 {
00027 public:
00028   AudioCodec();
00029   ~AudioCodec() override;
00030   bool CanCode(TransferSyntax const &) const override { return false; }
00031   bool CanDecode(TransferSyntax const &) const override { return false; }
00032   bool Decode(DataElement const &is, DataElement &os) override;
00033 };
00034
00035 } // end namespace gdcm
00036
00037 #endif //GDCMAUDIOCODEC_H

```

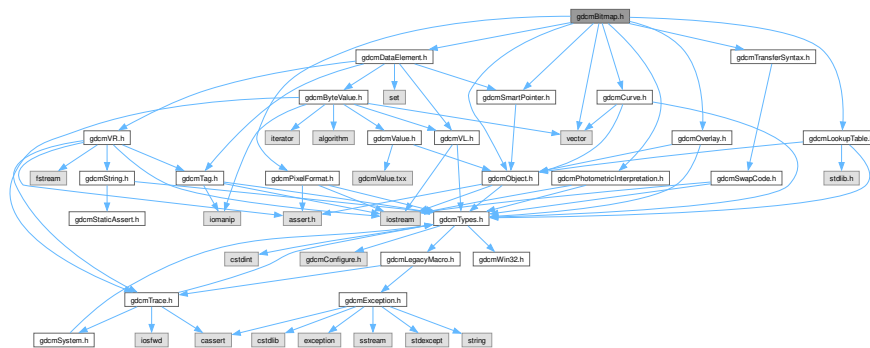
## 13.253 gdcmBitmap.h File Reference

```

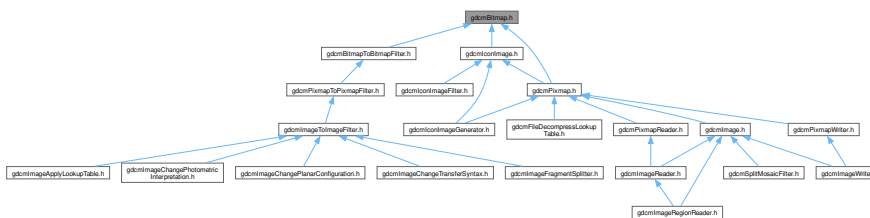
#include "gdcmObject.h"
#include "gdcmCurve.h"
#include "gdcmDataElement.h"
#include "gdcmLookupTable.h"
#include "gdcmOverlay.h"
#include "gdcmPhotometricInterpretation.h"
#include "gdcmPixelFormat.h"
#include "gdcmSmartPointer.h"
#include "gdcmTransferSyntax.h"

```

Include dependency graph for gdcmBitmap.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Bitmap`  
*Bitmap* class.

## Namespaces

- namespace **gdcm**

## 13.254 gdcmBitmap.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00007   See Copyright.txt or http://gdcml.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
```

```

00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE.  See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMBITMAP_H
00015 #define GDCMBITMAP_H
00016
00017 #include "gdcmObject.h"
00018 #include "gdcmCurve.h"
00019 #include "gdcmDataElement.h"
00020 // #include "gdcmIconImage.h"
00021 #include "gdcmLookupTable.h"
00022 #include "gdcmOverlay.h"
00023 #include "gdcmPhotometricInterpretation.h"
00024 #include "gdcmPixelFormat.h"
00025 #include "gdcmSmartPointer.h"
00026 #include "gdcmTransferSyntax.h"
00027
00028 #include <vector>
00029
00030 namespace gdcm
00031 {
00032
00033     class GDCM_EXPORT Bitmap : public Object
00034     {
00035     public:
00036         Bitmap();
00037         ~Bitmap() override;
00038         void Print(std::ostream &) const override;
00039
00040         virtual bool AreOverlaysInPixelData() const { return false; }
00041         virtual bool UnusedBitsPresentInPixelData() const { return false; }
00042
00043         unsigned int GetNumberOfDimensions() const;
00044         void SetNumberOfDimensions(unsigned int dim);
00045
00046         unsigned int GetPlanarConfiguration() const;
00047         void SetPlanarConfiguration(unsigned int pc);
00048
00049         bool GetNeedByteSwap() const
00050         {
00051             return NeedByteSwap;
00052         }
00053         void SetNeedByteSwap(bool b)
00054         {
00055             NeedByteSwap = b;
00056         }
00057
00058         void SetTransferSyntax(TransferSyntax const &ts) {
00059             TS = ts;
00060         }
00061         const TransferSyntax &GetTransferSyntax() const {
00062             return TS;
00063         }
00064         bool IsTransferSyntaxCompatible( TransferSyntax const & ts ) const;
00065         void SetDataElement(DataElement const &de) {
00066             PixelData = de;
00067         }
00068         const DataElement& GetDataElement() const { return PixelData; }
00069         DataElement& GetDataElement() { return PixelData; }
00070
00071         void SetLUT(LookupTable const &lut)
00072         {
00073             LUT = SmartPointer<LookupTable>( const_cast<LookupTable*>(&lut) );
00074         }
00075         const LookupTable &GetLUT() const
00076         {
00077             return *LUT;
00078         }
00079         LookupTable &GetLUT()
00080         {
00081             return *LUT;
00082         }
00083
00084         const unsigned int *GetDimensions() const;
00085         unsigned int GetDimension(unsigned int idx) const;
00086
00087         void SetColumns(unsigned int col) { SetDimension(0,col); }
00088         unsigned int GetColumns() const { return GetDimension(0); }
00089         void SetRows(unsigned int rows) { SetDimension(1,rows); }
00090

```

```

00103 unsigned int GetRows() const { return GetDimension(1); }
00104 void SetDimensions(const unsigned int dims[3]);
00105 void SetDimension(unsigned int idx, unsigned int dim);
00107 const PixelFormat &GetPixelFormat() const
00108 {
00109     return PF;
00110 }
00111 PixelFormat &GetPixelFormat()
00112 {
00113     return PF;
00114 }
00115 void SetPixelFormat(PixelFormat const &pf)
00116 {
00117     PF = pf;
00118     PF.Validate();
00119 }
00120
00122 const PhotometricInterpretation &GetPhotometricInterpretation() const;
00123 void SetPhotometricInterpretation(PhotometricInterpretation const &pi);
00124
00125 bool IsEmpty() const { return Dimensions.empty(); }
00126 void Clear();
00127
00131 unsigned long GetBufferLength() const;
00132
00134 bool GetBuffer(char *buffer) const;
00135
00137 bool IsLossy() const;
00138
00140 void SetLossyFlag(bool f) { LossyFlag = f; }
00141
00142 protected:
00143     bool TryRAWCodec(char *buffer, bool &lossyflag) const;
00144     bool TryJPEGCodec(char *buffer, bool &lossyflag) const;
00145     bool TryPVRGCodec(char *buffer, bool &lossyflag) const;
00146     bool TryKAKADUCodec(char *buffer, bool &lossyflag) const;
00147     bool TryJPEGLSCCodec(char *buffer, bool &lossyflag) const;
00148     bool TryJPEG2000Codec(char *buffer, bool &lossyflag) const;
00149     bool TryRLECodec(char *buffer, bool &lossyflag) const;
00150
00151     bool TryJPEGCodec2(std::ostream &os) const;
00152     bool TryJPEG2000Codec2(std::ostream &os) const;
00153
00154     bool GetBuffer2(std::ostream &os) const;
00155
00156     friend class PixmapReader;
00157     friend class ImageChangeTransferSyntax;
00158     // Function to compute the lossy flag based only on the image buffer.
00159     // Watch out that image can be lossy but in implicit little endian format...
00160     bool ComputeLossyFlag();
00161
00162 //private:
00163 protected:
00164     unsigned int PlanarConfiguration;
00165     unsigned int NumberOfDimensions;
00166     TransferSyntax TS;
00167     PixelFormat PF; // SamplesPerPixel, BitsAllocated, BitsStored, HighBit, PixelRepresentation
00168     PhotometricInterpretation PI;
00169     // Mind dump: unsigned int is required here, since we are reading (0028,0008) Number Of Frames
00170     // which is VR::IS, so I cannot simply assumed that unsigned short is enough... :(
00171     std::vector<unsigned int> Dimensions; // Col/Row
00172     DataElement PixelData; // copied from 7fe0,0010
00173
00174     typedef SmartPointer<LookupTable> LUTPtr;
00175     LUTPtr LUT;
00176     // I believe the following 3 ivars can be derived from TS ...
00177     bool NeedByteSwap; // FIXME: remove me
00178     bool LossyFlag;
00179
00180 private:
00181     bool GetBufferInternal(char *buffer, bool &lossyflag) const;
00182 };
00183
00184 } // end namespace gdcmm
00185
00186 #endif //GDCMBITMAP_H

```





## 13.256 gdcmBitmapToBitmapFilter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMBITMAPTOBITMAPFILTER_H
00015 #define GDCMBITMAPTOBITMAPFILTER_H
00016
00017 #include "gdcmBitmap.h"
00018
00019 namespace gdcm
00020 {
00021
00022     class GDCM_EXPORT BitmapToBitmapFilter
00023     {
00024     public:
00025         BitmapToBitmapFilter();
00026         ~BitmapToBitmapFilter() = default;
00027
00028         void SetInput(const Bitmap& image);
00029
00030         const Bitmap &GetOutput() const { return *Output; }
00031
00032         // SWIG/Java hack:
00033         const Bitmap &GetOutputAsBitmap() const;
00034
00035     protected:
00036         SmartPointer<Bitmap> Input;
00037         SmartPointer<Bitmap> Output;
00038     };
00039
00040 } // end namespace gdcm
00041
00042 #endif //GDCMBITMAPTOBITMAPFILTER_H

```

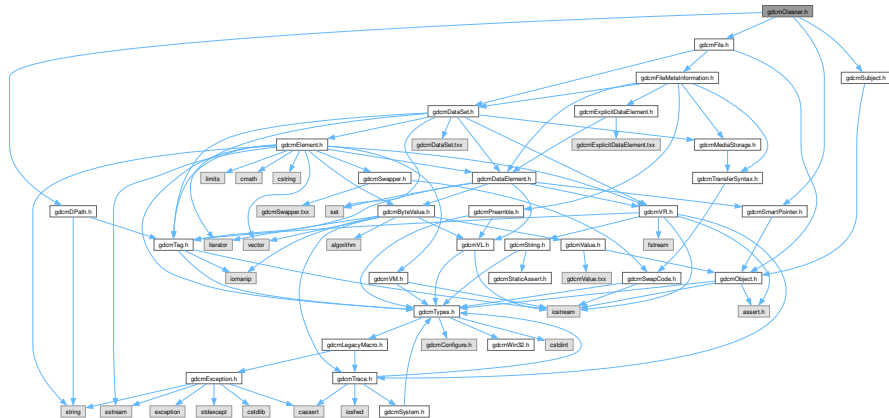
## 13.257 gdcmCleaner.h File Reference

```

#include "gdcmDPath.h"
#include "gdcmFile.h"
#include "gdcmSmartPointer.h"
#include "gdcmSubject.h"

```

Include dependency graph for gdcmCleaner.h:



## Classes

- class `gdcm::Cleaner`  
*Cleaner.*

## Namespaces

- namespace `gdcm`

## 13.258 gdcmCleaner.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMCLEANER_H
00015 #define GDCMCLEANER_H
00016
00017 #include "gdcmDPath.h"
00018 #include "gdcmFile.h"
00019 #include "gdcmSmartPointer.h"
00020 #include "gdcmSubject.h"
00021
00022 namespace gdcm {
00030 class GDCM_EXPORT Cleaner : public Subject {
00031 public:
00032   Cleaner();
00033   ~Cleaner() override;
00034

```

```

00036     bool Empty(Tag const &t);
00037     bool Empty(PrivateTag const &pt);
00038     bool Empty(DPath const &dpath);
00039     bool Empty(VR const &vr);
00040
00041     bool Remove(Tag const &t);
00042     bool Remove(PrivateTag const &pt);
00043     bool Remove(DPath const &dpath);
00044     bool Remove(VR const &vr);
00045
00047     bool Scrub(Tag const &t);
00048     bool Scrub(PrivateTag const &pt);
00049     bool Scrub(DPath const &dpath);
00050     bool Scrub(VR const &vr);
00051
00052     bool Preserve(DPath const &dpath);
00053
00056     void RemoveAllMissingPrivateCreator(bool remove);
00057
00060     bool RemoveMissingPrivateCreator(Tag const &t);
00061
00063     void RemoveAllGroupLength(bool remove);
00064
00066     void RemoveAllIllegal(bool remove);
00067
00069     void EmptyWhenScrubFails(bool empty);
00070
00072     bool Clean();
00073
00075     void SetFile(const File &f) { F = f; }
00076     // const File &GetFile() const { return *F; }
00077     File &GetFile() { return *F; }
00078
00080     static SmartPointer<Cleaner> New() { return new Cleaner; }
00081
00082 private:
00083     // I would prefer to have a smart pointer to DataSet but DataSet does not
00084     // derive from Object...
00085     SmartPointer<File> F;
00086     struct impl;
00087     // PIMPL idiom
00088     impl *pimpl;
00089 };
00090
00091 } // end namespace gdcm
00092
00093 #endif // GDCMCLEANER_H

```

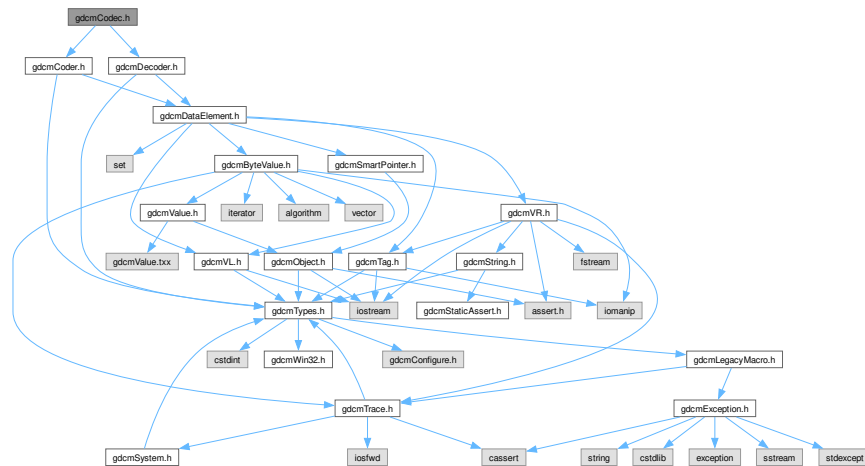
## 13.259 gdcmCodec.h File Reference

```

#include "gdcmCoder.h"
#include "gdcmDecoder.h"

```

Include dependency graph for gdcMCodec.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Codec`  
*Codec class.*

## Namespaces

- namespace **gdcm**

## 13.260 gdcmCodec.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
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00008
```

```

00009      This software is distributed WITHOUT ANY WARRANTY; without even
00010      the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011      PURPOSE. See the above copyright notice for more information.
00012
00013      =====*/
00014      #ifndef GDCMCODEC_H
00015      #define GDCMCODEC_H
00016
00017      #include "gdcmCoder.h"
00018      #include "gdcmDecoder.h"
00019
00020      namespace gdcm
00021      {
00022
00026      class GDCM_EXPORT Codec : public Coder, public Decoder
00027      {
00028      };
00029
00030      } // end namespace gdcm
00031
00032      #endif //GDCMCODEC_H

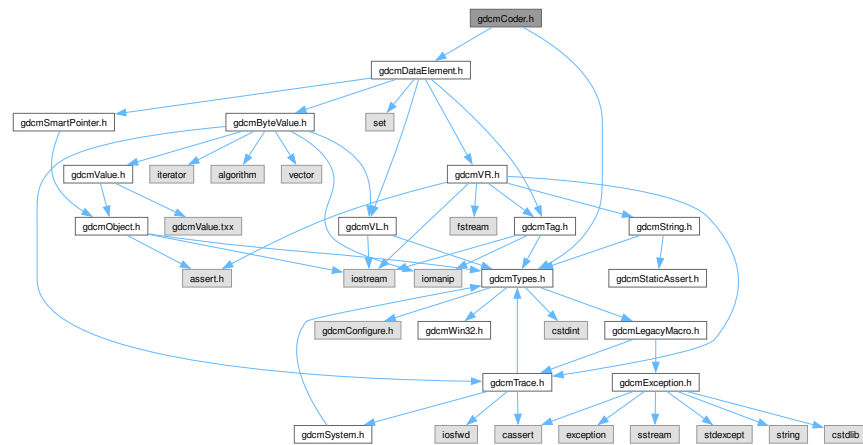
```

## 13.261 gdcmCoder.h File Reference

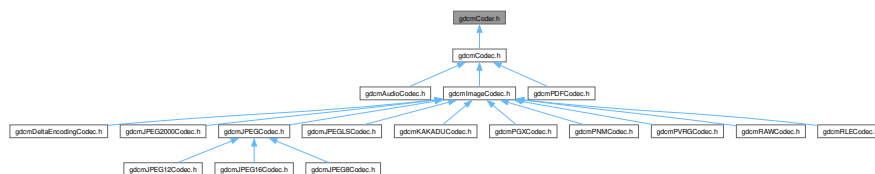
```
#include "gdcmTypes.h"
```

```
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmCoder.h:



This graph shows which files directly or indirectly include this file:



**Classes**

- class [gdcm::Coder](#)  
*Coder.*

**Namespaces**

- namespace [gdcm](#)

**13.262 gdcmCoder.h**

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMCODER_H
00015 #define GDCMCODER_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmDataElement.h" // FIXME
00019
00020 namespace gdcm
00021 {
00022
00023   class TransferSyntax;
00024   class DataElement;
00028   class GDCM_EXPORT Coder
00029   {
00030   public:
00031     virtual ~Coder() = default;
00032
00034     virtual bool CanCode(TransferSyntax const &) const = 0;
00035
00036     // Note: in / out are reserved keyword in C#. Change to in_ / out_
00037
00039     virtual bool Code(DataElement const &in_, DataElement &out_) { (void)in_; (void)out_; return false; }
00040   protected:
00041     virtual bool InternalCode(const char *bv, unsigned long len, std::ostream &os) {
00042       (void)bv; (void)os; (void)len; return false; }
00042   };
00043
00044 } // end namespace gdcm
00045
00046 #endif //GDCMCODER_H

```

**13.263 gdcmConstCharWrapper.h File Reference****Classes**

- class [gdcm::ConstCharWrapper](#)  
*Do not use me.*

## Namespaces

- namespace [gdcm](#)

## 13.264 gdcmConstCharWrapper.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCONSTCHARWRAPPER_H
00015 #define GDCMCONSTCHARWRAPPER_H
00016
00017 namespace gdcm
00018 {
00019
00020 #error
00021
00022 /*
00023  * This class is a pure hack. Its only goal is to work around a bad bug in :
00024  * $ swig -version
00025  * SWIG Version 1.3.31
00026  *
00027  * See
00028  * -
00029  * http://sourceforge.net/mailarchive/forum.php?thread_name=bf0c3b3f0802290552y5163989t76572b80a044ce28%40mail.gmail.com&forum=
00030  * As a side note there is also a problem with const reference to enum type:
00031  * -
00032  * http://sourceforge.net/mailarchive/forum.php?thread_name=bf0c3b3f0802290552y5163989t76572b80a044ce28%40mail.gmail.com&forum=
00033  * And to keep track of an issue with swig here is the last one:
00034  *
00035  * -
00036  * http://sourceforge.net/mailarchive/forum.php?thread_name=bf0c3b3f0802290552y5163989t76572b80a044ce28%40mail.gmail.com&forum=
00037  */
00038
00042 class ConstCharWrapper
00043 {
00044 public:
00045     ConstCharWrapper(const char *i=0):Internal(i) {}
00046     operator const char * () const { return Internal; }
00047 private:
00048     const char *Internal;
00049 };
00050
00051 } // end namespace gdcm
00052
00053 #endif //GDCMCONSTCHARWRAPPER_H

```

## 13.265 gdcmCurve.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmObject.h"

```



Include dependency graph for `gdcmlCurve.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdc::Curve`  
*Curve* class to handle element 50xx,3000 *Curve* Data.

## Namespaces

- namespace **gdcm**

## 13.266 gdcmCurve.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCURVE_H
00015 #define GDCMCURVE_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmObject.h"
00019
00020 #include <vector>
00021
00022 namespace gdcm
00023 {
00024
00025   class CurveInternal;
00026   class ByteValue;
00027   class DataSet;
00028   class DataElement;
00040   class GDCM_EXPORT Curve : public Object
00041   {
00042   public:
00043     Curve();
00044     ~Curve() override;
00045     void Print(std::ostream &) const override;
00046
00047     void GetAsPoints(float *array) const;
00048
00049     static unsigned int GetNumberOfCurves(DataSet const & ds);
00050
00051     // Update curve data from dataelement de:
00052     void Update(const DataElement & de);
00053
00054     void SetGroup(unsigned short group);
00055     unsigned short GetGroup() const;
00056     void SetDimensions(unsigned short dimensions);
00057     unsigned short GetDimensions() const;
00058     void SetNumberOfPoints(unsigned short numberofpoints);
00059     unsigned short GetNumberOfPoints() const;
00060     void SetTypeOfData(const char *typeofdata);
00061     const char *GetTypeOfData() const;
00062     // See PS 3.3 - 2004 - C.10.2.1.1 Type of data
00063     const char *GetTypeOfDataDescription() const;
00064     void SetCurveDescription(const char *curvedescription);
00065     void SetDataValueRepresentation(unsigned short datavaluerepresentation);
00066     unsigned short GetDataValueRepresentation() const;
00067     void SetCurveDataDescriptor(const uint16_t * values, size_t num);
00068     std::vector<unsigned short> const &GetCurveDataDescriptor() const;
00069     void SetCoordinateStartValue( unsigned short v );
00070     void SetCoordinateStepValue( unsigned short v );
00071
00072     void SetCurve(const char *array, unsigned int length);
00073
00074     bool IsEmpty() const;
00075
00076     void Decode(std::istream &is, std::ostream &os);
00077
00078     Curve(Curve const &ov);
00079   private:
00080     double ComputeValueFromStartAndStep(unsigned int idx) const;
00081     CurveInternal *Internal;
00082   };
00083
00084 } // end namespace gdcm
00085
00086 #endif //GDCMCURVE_H

```

## 13.267 gdcmDataSetHelper.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmVR.h"
```

Include dependency graph for gdcmDataSetHelper.h:



### Classes

- class [gdcm::DataSetHelper](#)  
*DataSetHelper (internal class, not intended for user level).*

### Namespaces

- namespace [gdcm](#)

## 13.268 gdcmDataSetHelper.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMDATASETHelper_H
00015 #define GDCMDATASETHelper_H
00016
00017 #include "gdcmTypes.h"

```



**Classes**

- class `gdcm::Decoder`  
*Decoder.*

**Namespaces**

- namespace `gdcm`

**13.270 gdcmDecoder.h**

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014
00015 #ifndef GDCMDECODER_H
00016 #define GDCMDECODER_H
00017
00018 #include "gdcmTypes.h"
00019 #include "gdcmDataElement.h" // FIXME
00020
00021 namespace gdcm
00022 {
00023
00024   class TransferSyntax;
00025   class DataElement;
00029   class GDCM_EXPORT Decoder
00030   {
00031   public:
00032     virtual ~Decoder() = default;
00033
00035     virtual bool CanDecode(TransferSyntax const &) const = 0;
00036
00038     virtual bool Decode(DataElement const &, DataElement &) { return false; }
00039   protected:
00040     virtual bool DecodeByStreams(std::istream &, std::ostream &) { return false; }
00041   };
00042
00043 } // end namespace gdcm
00044
00045 #endif //GDCMDECODER_H

```



### 13.273 gdcmlDICOMDIR.h File Reference

- class `gdcm::DICOMDIR`  
*DICOMDIR* class.

- namespace **gdcm**

## 13.274 gdcmDICOMDIR.h

[Go to the documentation of this file.](#)

```

00001 /*=====
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00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMDICOMDIR_H
00015 #define GDCMDICOMDIR_H
00016
00017 #include <utility>
00018 #include "gdcmFileSet.h"
00019
00020 namespace gdcm
00021 {
00022     class GDCM_EXPORT DICOMDIR
00023     {
00024     public:
00025         DICOMDIR() = default;
00026         DICOMDIR(FileSet fs):_FS(std::move(std::move(fs))) {}
00027     private:
00028         FileSet _FS;
00029         //13 sept 2010 mmr-- added the underscore to FS to compile under Sunos gcc
00030     };
00031 } // end namespace gdcm
00032
00033 #endif //GDCMDICOMDIR_H

```

## 13.275 gdcmDICOMDIRGenerator.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmTag.h"
#include <utility>

```

Include dependency graph for gdcmDICOMDIRGenerator.h:





**Classes**

- class [gdcm::DICOMDIRGenerator](#)  
*DICOMDIRGenerator* class.

**Namespaces**

- namespace [gdcm](#)

**13.276 gdcmDICOMDIRGenerator.h**

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMDICOMDIRGENERATOR_H
00015 #define GDCMDICOMDIRGENERATOR_H
00016
00017 #include "gdcmDirectory.h"
00018 #include "gdcmTag.h"
00019 #include <utility> // std::pair
00020
00021 namespace gdcm
00022 {
00023   class File;
00024   class Scanner;
00025   class SequenceOfItems;
00026   class VL;
00027   class DICOMDIRGeneratorInternal;
00028
00056   class GDCM_EXPORT DICOMDIRGenerator
00057   {
00058   public:
00059     typedef Directory::FilenameType FilenameType;
00060     typedef Directory::FilenameType FilenameType;
00061     DICOMDIRGenerator();
00062     ~DICOMDIRGenerator();
00063
00065     void SetFilenames( FilenameType const & fns );
00066
00068     void SetRootDirectory( FilenameType const & root );
00069
00072     void SetDescriptor( const char *d );
00073
00075     bool Generate();
00076
00078     void SetFile(const File& f);
00079     File &GetFile();
00080
00081   protected:
00082     Scanner &GetScanner();
00083     bool AddPatientDirectoryRecord();
00084     bool AddStudyDirectoryRecord();
00085     bool AddSeriesDirectoryRecord();
00086     bool AddImageDirectoryRecord();
00087
00088   private:
00089     const char *ComputeFileID(const char *);
00090     bool TraverseDirectoryRecords(VL start );

```



## 13.278 gdcmDictPrinter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMDICTPRINTER_H
00015 #define GDCMDICTPRINTER_H
00016
00017 #include "gdcmPrinter.h"
00018
00019 namespace gdcm
00020 {
00021
00022 // It's a sink there is no output
00023 class GDCM_EXPORT DictPrinter : public Printer
00024 {
00025 public:
00026   DictPrinter();
00027   ~DictPrinter() = default;
00028
00029   void Print(std::ostream& os);
00030
00031 protected:
00032   void PrintDataElement2(std::ostream& os, const DataSet &ds, const DataElement &ide);
00033   void PrintDataSet2(std::ostream& os, const DataSet &ds);
00034 };
00035
00036 } // end namespace gdcm
00037
00038 #endif //GDCMDICTPRINTER_H

```

## 13.279 gdcmDirectionCosines.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmDirectionCosines.h:



## Classes

- class [gdcmm::DirectionCosines](#)  
*class to handle [DirectionCosines](#)*

## Namespaces

- namespace [gdcmm](#)

## 13.280 gdcmmDirectionCosines.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00007   See Copyright.txt or http://gdcmm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMDIRECTIONCOSINES_H
00015  #define GDCMDIRECTIONCOSINES_H
00016
00017  #include "gdcmmTypes.h"
00018
00019  namespace gdcmm
00020  {
00021
00022  class GDCM_EXPORT DirectionCosines
00023  {
00024  public:
00025      DirectionCosines();
00026      DirectionCosines(const double dircos[6]);
00027      // Cannot get the following signature to be wrapped with swig...
00028      //DirectionCosines(const double *dircos = 0 );
00029      ~DirectionCosines();
00030
00031      void Print(std::ostream &) const;
00032
00033      void Cross(double z[3]) const;
00034
00035      double Dot() const;
00036
00037      static double Dot(const double x[3], const double y[3]);
00038
00039      void Normalize();
00040
00041      static void Normalize(double v[3]);
00042
00043      static double Norm(const double v[3]);
00044
00045      operator const double* () const { return Values; }
00046
00047      bool IsValid() const;
00048
00049      bool SetFromString(const char *str);
00050
00051      double CrossDot(DirectionCosines const &dc) const;
00052
00053      double ComputeDistAlongNormal(const double ipp[3]) const;
00054
00055  private:
00056      double Values[6];
00057  };
00058
00059  } // end namespace gdcmm
00060
00061  #endif //GDCMDIRECTIONCOSINES_H

```



```

00020
00035 class GDCM_EXPORT DirectoryHelper
00036 {
00037 public:
00038     //returns all series UUIDs in a given directory that match a particular SOP Instance UID
00039     static Directory::FileNamesType GetSeriesUUIDsBySOPClassUID(const std::string& inDirectory,
00040         const std::string& inSOPClassUID);
00041
00042     //specific implementations of the SOPClassUID grabber, so you don't have to
00043     //remember the SOP Class UUIDs of CT or MR images.
00044     static Directory::FileNamesType GetCTImageSeriesUUIDs(const std::string& inDirectory);
00045     static Directory::FileNamesType GetMRImageSeriesUUIDs(const std::string& inDirectory);
00046     static Directory::FileNamesType GetRTStructSeriesUUIDs(const std::string& inDirectory);
00047
00048     //given a directory and a series UID, provide all filenames with that series UID.
00049     static Directory::FileNamesType GetFilenamesFromSeriesUUIDs(const std::string& inDirectory,
00050         const std::string& inSeriesUID);
00051
00052     //given a series UID, load all the images associated with that series UID
00053     //these images will be IPP sorted, so that they can be used for gathering all
00054     //the necessary information for generating an RTStruct
00055     //this function should be called by the writer once, if the writer's dataset
00056     //vector is empty. Make sure to have a new writer for new rtstructs.
00057     static std::vector<DataSet> LoadImageFromFiles(const std::string& inDirectory,
00058         const std::string& inSeriesUID);
00059
00060     //When writing RTStructs, each contour will have z position defined.
00061     //use that z position to determine the SOPInstanceUID for that plane.
00062     static std::string RetrieveSOPInstanceUIDFromZPosition(double inZPos,
00063         const std::vector<DataSet>& inDS);
00064
00065     //When writing RTStructs, the frame of reference is done by planes to start with
00066     static std::string RetrieveSOPInstanceUIDFromIndex(int inIndex,
00067         const std::vector<DataSet>& inDS);
00068
00069     //each plane needs to know the SOPClassUID, and that won't change from image to image
00070     //so, retrieve this once at the start of writing.
00071     static std::string GetSOPClassUID(const std::vector<DataSet>& inDS);
00072
00073     //retrieve the frame of reference from the set of datasets
00074     static std::string GetFrameOfReference(const std::vector<DataSet>& inDS);
00075
00076     //both the image and polydata readers use these functions to get std::strings
00077     static std::string GetStringValueFromTag(const Tag& t, const DataSet& ds);
00078 };
00079
00080 }

```

## 13.283 gdcmDPath.h File Reference

```
#include "gdcmTag.h"
```

```
#include <string>
```

Include dependency graph for gdcmDPath.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::DPath](#)

*class to handle a DICOM path While supp 118 did introduced a notion of XPath for XML Native model this convention is too XML-centric. Instead prefer DCMTK style notation <https://groups.google.com/g/comp.protocols.dicom/c/IyIH0IOBMPA>*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const DPath &val)`

## 13.284 gdcmDPath.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMDPATH_H
00015  #define GDCMDPATH_H
00016
00017  #include "gdcmTag.h"
00018  #include <string>
00019

```





## Namespaces

- namespace `gdcm`

## 13.286 gdcmDumper.h

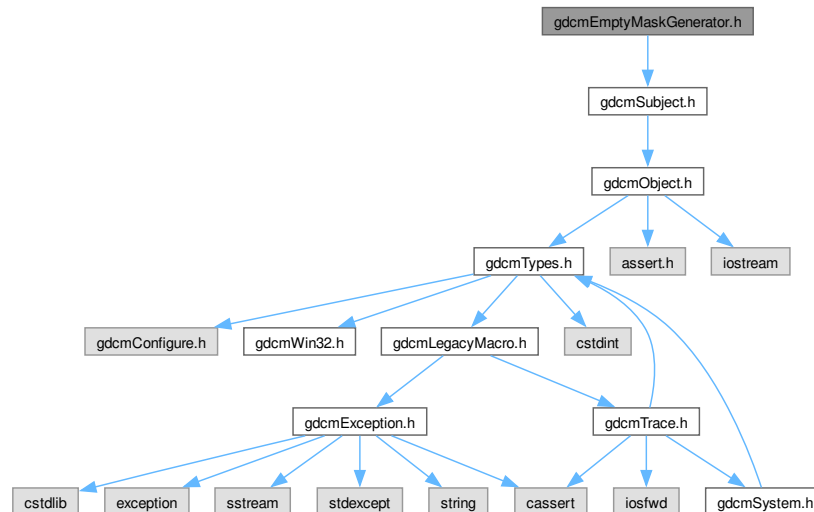
[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012 =====*/
00013 #ifndef GDCMDUMPER_H
00014 #define GDCMDUMPER_H
00015
00016 #include "gdcmPrinter.h"
00017
00018 namespace gdcm
00019 {
00020
00021 // It's a sink there is no output
00022 class GDCM_EXPORT Dumper : public Printer
00023 {
00024 public:
00025     Dumper() { PrintStyle = CONDENSED_STYLE; }
00026     ~Dumper() = default;
00027 };
00028
00029 } // end namespace gdcm
00030
00031 #endif //GDCMDUMPER_H
```

## 13.287 gdcmEmptyMaskGenerator.h File Reference

```
#include "gdcmSubject.h"
```

Include dependency graph for gdcmEmptyMaskGenerator.h:



### Classes

- class [gdcm::EmptyMaskGenerator](#)

*[EmptyMaskGenerator](#) Main class to generate a [Empty Mask Series](#) from an input [Series](#). This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM [Series](#) within the same input directory.*

### Namespaces

- namespace [gdcm](#)

## 13.288 gdcmEmptyMaskGenerator.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003 Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.

```

## 13.289 gdcMEncapsulatedDocument.h File Reference

Include dependency graph for `gdcmEncapsulatedDocument.h`:



- Generated by Doxygen

## Namespaces

- namespace `gdcm`

## 13.290 gdcmEncapsulatedDocument.h

[Go to the documentation of this file.](#)

```

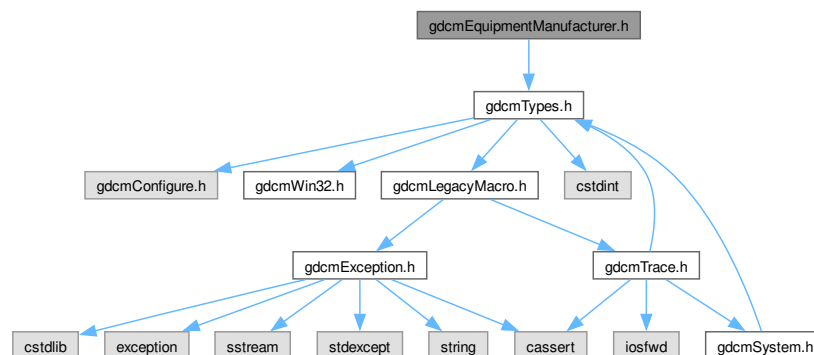
00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMENCAPSULATEDDOCUMENT_H
00015  #define GDCMENCAPSULATEDDOCUMENT_H
00016
00017  #include "gdcmFile.h"
00018
00019  namespace gdcm
00020  {
00024  class GDCM_EXPORT EncapsulatedDocument
00025  {
00026  public:
00027      EncapsulatedDocument() = default;
00028
00029  private:
00030  };
00031
00032  } // end namespace gdcm
00033
00034  #endif //GDCMENCAPSULATEDDOCUMENT_H

```

## 13.291 gdcmEquipmentManufacturer.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for `gdcmEquipmentManufacturer.h`:



**Classes**

- class [gdcm::EquipmentManufacturer](#)

**Namespaces**

- namespace [gdcm](#)

**13.292 gdcmEquipmentManufacturer.h**

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMEQUIPMENTMANUFACTURER_H
00015  #define GDCMEQUIPMENTMANUFACTURER_H
00016
00017  #include "gdcmTypes.h"
00018
00019  namespace gdcm {
00020
00021  class DataSet;
00022  class GDCM_EXPORT EquipmentManufacturer {
00023  public:
00024      typedef enum {
00025          UNKNOWN = 0,
00026          FUJI,
00027          GEMS,
00028          HITACHI,
00029          KODAK,
00030          MARCONI,
00031          PMS,
00032          SIEMENS,
00033          TOSHIBA,
00034          AGFA,
00035          SAMSUNG,
00036          UIH
00037      } Type;
00038
00039      static Type Compute(DataSet const &ds);
00040
00041      static const char *TypeToString(Type type);
00042
00043  private:
00044      static EquipmentManufacturer::Type GuessFromPrivateAttributes(
00045          DataSet const &ds);
00046  };
00047  } // end namespace gdcm
00048
00049  #endif // GDCMEQUIPMENTMANUFACTURER_H

```



```

00024 class GDCM_EXPORT Fiducials
00025 {
00026 public:
00027     Fiducials() = default;
00028
00029 private:
00030 };
00031
00032 } // end namespace gdcm
00033
00034 #endif //GDCMFIDUCIALS_H

```

## 13.295 gdcmFileAnonymizer.h File Reference

```

#include "gdcmSubject.h"
#include "gdcmEvent.h"
#include "gdcmTag.h"
#include "gdcmVL.h"

```

Include dependency graph for gdcmFileAnonymizer.h:



### Classes

- class [gdcm::FileAnonymizer](#)  
*FileAnonymizer.*

### Namespaces

- namespace [gdcm](#)

## 13.296 gdcmFileAnonymizer.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMFILEANONYMIZER_H
00015 #define GDCMFILEANONYMIZER_H
00016
00017 #include "gdcmSubject.h"
00018 #include "gdcmEvent.h"
00019 #include "gdcmTag.h"
00020 #include "gdcmVL.h"
00021
00022 namespace gdcm
00023 {
00024   class FileAnonymizerInternals;
00025
00047   class GDCM_EXPORT FileAnonymizer : public Subject
00048   {
00049   public:
00050     FileAnonymizer();
00051     ~FileAnonymizer() override;
00052
00055     void Empty( Tag const &t );
00056
00058     void Remove( Tag const &t );
00059
00063     void Replace( Tag const &t, const char *value_str );
00064
00067     void Replace( Tag const &t, const char *value_data, VL const &vl );
00068
00070     void SetInputFileName(const char *filename_native);
00071
00073     void SetOutputFileName(const char *filename_native);
00074
00076     bool Write();
00077
00078   private:
00079     bool ComputeEmptyTagPosition();
00080     bool ComputeRemoveTagPosition();
00081     bool ComputeReplaceTagPosition();
00082     FileAnonymizerInternals *Internals;
00083   };
00084
00085 } // end namespace gdcm
00086
00087 #endif //GDCMFILEANONYMIZER_H

```

## 13.297 gdcmFileChangeTransferSyntax.h File Reference

```

#include "gdcmSubject.h"
#include "gdcmSmartPointer.h"

```



Include dependency graph for gdcmFileChangeTransferSyntax.h:



## Classes

- class [gdcm::FileChangeTransferSyntax](#)  
*FileChangeTransferSyntax.*

## Namespaces

- namespace [gdcm](#)

## 13.298 gdcmFileChangeTransferSyntax.h

[Go to the documentation of this file.](#)

```

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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012  =====*/
00013
00014  #ifndef GDCMFILECHANGETRANSFERSYNTAX_H
00015  #define GDCMFILECHANGETRANSFERSYNTAX_H
00016
00017  #include "gdcmSubject.h"
00018  #include "gdcmSmartPointer.h"
00019

```



## Namespaces

- namespace `gdcm`

## 13.300 gdcmFileDecompressLookupTable.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMFILEDECOMPRESSLOOKUPTABLE_H
00015 #define GDCMFILEDECOMPRESSLOOKUPTABLE_H
00016
00017 #include "gdcmSubject.h"
00018 #include "gdcmFile.h"
00019 #include "gdcmPixmap.h"
00020
00021 namespace gdcm
00022 {
00023
00024   class DataElement;
00030   class GDCM_EXPORT FileDecompressLookupTable : public Subject
00031   {
00032   public:
00033     FileDecompressLookupTable() = default;
00034     ~FileDecompressLookupTable() override = default;
00035
00037     bool Change();
00038
00040     void SetFile(const File& f) { F = f; }
00041     File &GetFile() { return *F; }
00042
00043     const Pixmap& GetPixmap() const { return *PixelData; }
00044     Pixmap& GetPixmap() { return *PixelData; }
00045     void SetPixmap(Pixmap const &img) { PixelData = img; }
00046
00047   protected:
00048
00049   private:
00050     SmartPointer<File> F;
00051     SmartPointer<Pixmap> PixelData;
00052   };
00053
00054 } // end namespace gdcm
00055
00056 #endif //GDCMFILEDECOMPRESSLOOKUPTABLE_H

```



```
00021
00022 class FileDerivationInternals;
00023 class DataSet;
00039 class GDCM_EXPORT FileDerivation
00040 {
00041 public:
00042     FileDerivation();
00043     ~FileDerivation();
00044
00049     bool AddReference(const char *referencedsopclassuid, const char *referencedsopinstanceuid);
00050
00051     // CID 7202 Source Image Purposes of Reference
00052     // { "DCM",121320,"Uncompressed predecessor"},
00053
00055     void SetPurposeOfReferenceCodeSequenceCodeValue(unsigned int codevalue);
00056
00057     // CID 7203 Image Derivation
00058     // { "DCM",113040,"Lossy Compression" },
00059
00061     void SetDerivationCodeSequenceCodeValue(unsigned int codevalue);
00062
00064     void SetDerivationDescription( const char *dd );
00065
00069     void SetAppendDerivationHistory(bool b);
00070
00072     bool Derive();
00073
00075     void SetFile(const File& f) { F = f; }
00076     File &GetFile() { return *F; }
00077     const File &GetFile() const { return *F; }
00078
00079 protected:
00080     bool AddDerivationDescription();
00081     bool AddSourceImageSequence();
00082     bool AddPurposeOfReferenceCodeSequence(DataSet &ds);
00083
00084 private:
00085     SmartPointer<File> F;
00086     FileDerivationInternals *Internals;
00087 };
00088
00094
00095
00096 } // end namespace gdcm
00097
00098 #endif //GDCMFILEDERIVATION_H
```



```

00021 class Dicts;
00022
00038 class GDCM_EXPORT FileExplicitFilter
00039 {
00040 public:
00041     FileExplicitFilter():F(new
00042         File),ChangePrivateTags(false),UseVRUN(true),RecomputeItemLength(false),RecomputeSequenceLength(false) {}
00043     ~FileExplicitFilter() = default;
00044
00045     void SetChangePrivateTags(bool b) { ChangePrivateTags = b;}
00046
00047     void SetUseVRUN(bool b) { UseVRUN = b; }
00048
00049     void SetRecomputeItemLength(bool b);
00050     void SetRecomputeSequenceLength(bool b);
00051
00052     bool Change();
00053
00054     void SetFile(const File& f) { F = f; }
00055     File &GetFile() { return *F; }
00056
00057 protected:
00058     bool ProcessDataSet(DataSet &ds, Dicts const &dicts);
00059     bool ChangeFMI();
00060
00061 private:
00062     SmartPointer<File> F;
00063     bool ChangePrivateTags;
00064     bool UseVRUN;
00065     bool RecomputeItemLength;
00066     bool RecomputeSequenceLength;
00067 };
00068
00069 } // end namespace gdcm
00070
00071 #endif //GDCMFILEEXPLICITFILTER_H

```

## 13.305 gdcmFileStreamer.h File Reference

```

#include "gdcmSubject.h"
#include "gdcmSmartPointer.h"

```

Include dependency graph for `gdcmFileStreamer.h`:



## Classes

- class `gdcm::FileStreamer`  
*FileStreamer.*

## Namespaces

- namespace `gdcm`

## 13.306 `gdcmFileStreamer.h`

[Go to the documentation of this file.](#)

```

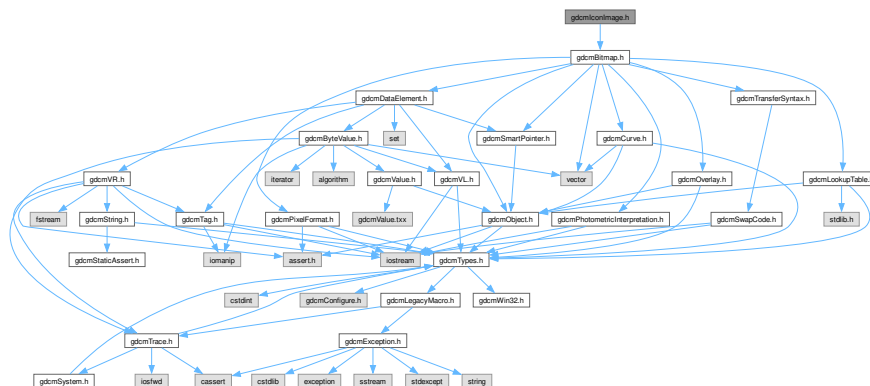
00001 /*=====
00002
00003 Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005 Copyright (c) 2006-2011 Mathieu Malaterre
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00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.
00012 =====*/
00013
00014 #ifndef GDCMFILESTREAMER_H
00015 #define GDCMFILESTREAMER_H
00016
00017 #include "gdcmSubject.h"
00018 #include "gdcmSmartPointer.h"
00019

```



### 13.307 gdcmlconImage.h File Reference

Include dependency graph for `gdcmImage.h`:





```

00036 ~IconImage();
00037 void Print(std::ostream &) const {}
00038
00040 void SetTransferSyntax(TransferSyntax const &ts) {
00041     TS = ts;
00042 }
00043 const TransferSyntax &GetTransferSyntax() const {
00044     return TS;
00045 }
00046 void SetDataElement(DataElement const &de) {
00047     PixelData = de;
00048 }
00049 const DataElement& GetDataElement() const { return PixelData; }
00050
00051 void SetColumns(unsigned int col) { SetDimension(0,col); }
00052 void SetRows(unsigned int rows) { SetDimension(1,rows); }
00053 void SetDimension(unsigned int idx, unsigned int dim);
00054 int GetColumns() const { return Dimensions[0]; }
00055 int GetRows() const { return Dimensions[1]; }
00056 // Get/Set PixelFormat
00057 const PixelFormat &GetPixelFormat() const
00058 {
00059     return PF;
00060 }
00061 void SetPixelFormat(PixelFormat const &pf)
00062 {
00063     PF = pf;
00064 }
00065
00066 const PhotometricInterpretation &GetPhotometricInterpretation() const;
00067 void SetPhotometricInterpretation(PhotometricInterpretation const &pi);
00068
00069 bool IsEmpty() const { return Dimensions.size() == 0; }
00070 void Clear();
00071
00072 bool GetBuffer(char *buffer) const;
00073
00074 private:
00075     TransferSyntax TS;
00076     PixelFormat PF; // SamplesPerPixel, BitsAllocated, BitsStored, HighBit, PixelRepresentation
00077     PhotometricInterpretation PI;
00078     std::vector<unsigned int> Dimensions; // Col/Row
00079     std::vector<double> Spacing; // PixelAspectRatio ?
00080     DataElement PixelData; // copied from 7fe0,0010
00081     static const unsigned int NumberOfDimensions = 2;
00082 };
00083
00084 } // end namespace gdcm
00085 #endif
00086 #include "gdcmBitmap.h"
00087
00088 namespace gdcm
00089 {
00090     //class GDCM_EXPORT IconImage : public Pixmap {};
00091     typedef Bitmap IconImage;
00092 }
00093
00094 #endif //GDCMICONIMAGE_H

```

## 13.309 gdcmIconImageFilter.h File Reference

```

#include "gdcmFile.h"
#include "gdcmIconImage.h"

```

- class `gdcm::IconImageFilter`  
*IconImageFilter*.

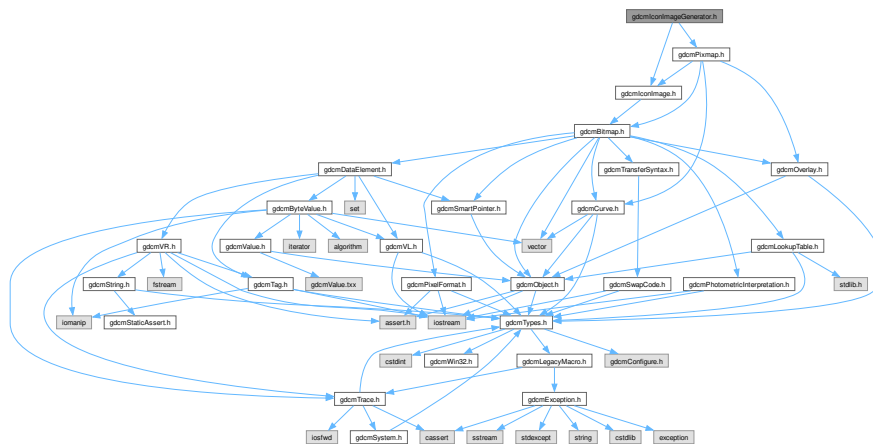
- namespace **gdcm**

[Go to the documentation of this file.](#)

Generated by Doxygen

### 13.311 gdcmlconImageGenerator.h File Reference

Include dependency graph for `gdcmlconImageGenerator.h`:



- class `gdcm::IconImageGenerator`  
*IconImageGenerator.*

- namespace **gdcm**

## 13.312 gdcmIconImageGenerator.h

[Go to the documentation of this file.](#)

```

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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMICONIMAGEGENERATOR_H
00015  #define GDCMICONIMAGEGENERATOR_H
00016
00017  #include "gdcmPixmap.h"
00018  #include "gdcmIconImage.h"
00019
00020  namespace gdcm
00021  {
00022  class IconImageGeneratorInternals;
00041  class GDCM_EXPORT IconImageGenerator
00042  {
00043  public:
00044      IconImageGenerator();
00045      ~IconImageGenerator();
00046
00048      void SetPixmap(const Pixmap& p) { P = p; }
00049      Pixmap &GetPixmap() { return *P; }
00050      const Pixmap &GetPixmap() const { return *P; }
00051
00053      void SetOutputDimensions(const unsigned int dims[2]);
00054
00058      void SetPixelMinMax(double min, double max);
00059
00063      void AutoPixelMinMax(bool b);
00064
00069      void ConvertRGBToPaletteColor(bool b);
00070
00074      void SetOutsideValuePixel(double v);
00075
00077      bool Generate();
00078
00080      const IconImage& GetIconImage() const { return *I; }
00081
00082  protected:
00083
00084  private:
00085      void BuildLUT( Bitmap & bitmap, unsigned int maxcolor );
00086
00087      SmartPointer<Pixmap> P;
00088      SmartPointer<IconImage> I;
00089      IconImageGeneratorInternals *Internals;
00090  };
00091
00092  } // end namespace gdcm
00093
00094  #endif //GDCMICONIMAGEGENERATOR_H

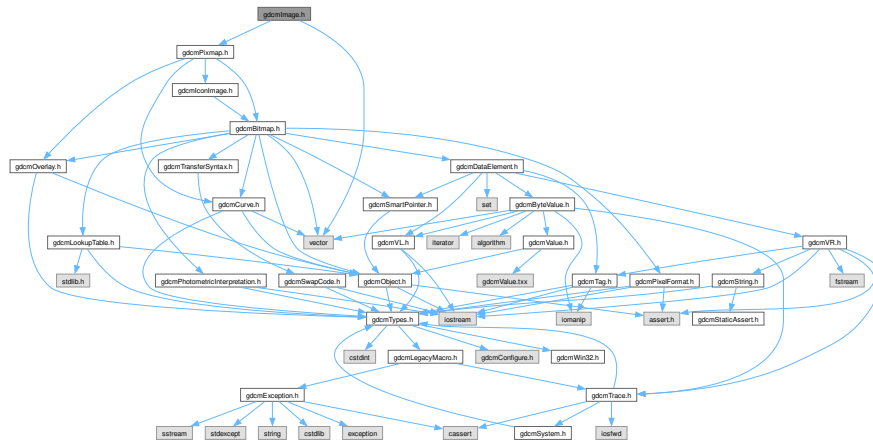
```

## 13.313 gdcmImage.h File Reference

```

#include "gdcmPixmap.h"
#include <vector>

```



## 13.314 gdcmImage.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMIMAGE_H
00015 #define GDCMIMAGE_H
00016
00017 #include "gdcmPixmap.h"
00018
00019 #include <vector>
00020
00021 namespace gdcm
00022 {
00023
00024   class GDCM_EXPORT Image : public Pixmap
00025   {
00026   public:
00027     Image () : Spacing(), SC(), Intercept(0), Slope(1) {
00028       //DirectionCosines.resize(6);
00029       Origin.resize( 3 /*NumberOfDimensions*/ ); // fill with 0
00030       DirectionCosines.resize( 6 ); // fill with 0
00031       DirectionCosines[0] = 1;
00032       DirectionCosines[4] = 1;
00033       Spacing.resize( 3 /*NumberOfDimensions*/, 1 ); // fill with 1
00034     }
00035     ~Image() override = default;
00036
00037     const double *GetSpacing() const;
00038     double GetSpacing(unsigned int idx) const;
00039     void SetSpacing(const double spacing[3]);
00040     void SetSpacing(unsigned int idx, double spacing);
00041
00042     const double *GetOrigin() const;
00043     double GetOrigin(unsigned int idx) const;
00044     void SetOrigin(const float origin[3]);
00045     void SetOrigin(const double origin[3]);
00046     void SetOrigin(unsigned int idx, double ori);
00047
00048     const double *GetDirectionCosines() const;
00049     double GetDirectionCosines(unsigned int idx) const;
00050     void SetDirectionCosines(const float dircos[6]);
00051     void SetDirectionCosines(const double dircos[6]);
00052     void SetDirectionCosines(unsigned int idx, double dircos);
00053
00054     void Print(std::ostream &os) const override;
00055
00056     void SetIntercept(double intercept) { Intercept = intercept; }
00057     double GetIntercept() const { return Intercept; }
00058
00059     void SetSlope(double slope) { Slope = slope; }
00060     double GetSlope() const { return Slope; }
00061
00062   private:
00063     std::vector<double> Spacing;
00064     std::vector<double> Origin;
00065     std::vector<double> DirectionCosines;
00066
00067     // I believe the following 3 ivars can be derived from TS ...
00068     SwapCode SC;
00069     double Intercept;
00070     double Slope;
00071   };
00072
00073 } // end namespace gdcm

```



```

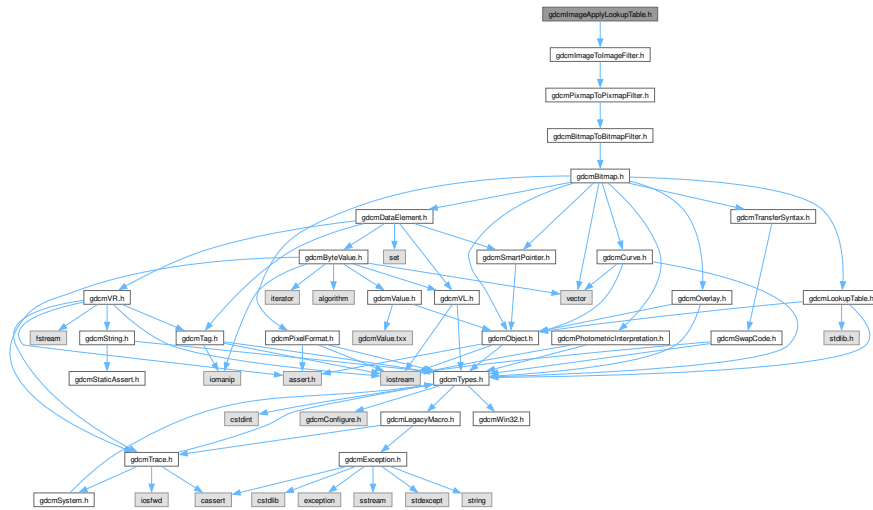
00112
00113 #endif //GDCMIMAGE_H

```

## 13.315 gdcmImageApplyLookupTable.h File Reference

```
#include "gdcmImageToImageFilter.h"
```

Include dependency graph for gdcmImageApplyLookupTable.h:



### Classes

- class [gdcm::ImageApplyLookupTable](#)  
*ImageApplyLookupTable* class.

### Namespaces

- namespace [gdcm](#)

## 13.316 gdcmImageApplyLookupTable.h

[Go to the documentation of this file.](#)

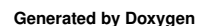
```

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```

### 13.317 gdcmlImageChangePhotometricInterpretation.h File Reference

Include dependency graph for `gdcmlImageChangePhotometricInterpretation.h`:



**Classes**

- class [gdcm::ImageChangePhotometricInterpretation](#)  
*ImageChangePhotometricInterpretation class.*

**Namespaces**

- namespace [gdcm](#)

**Functions**

- [template<typename T>](#)  
static [T gdcm::Clamp](#) (int v)
- [template<typename T>](#)  
static int [gdcm::Round](#) (T x)

**13.318 gdcmImageChangePhotometricInterpretation.h**

[Go to the documentation of this file.](#)

```

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00002
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00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMIMAGECHANGEPHOTOMETRICINTERPRETATION_H
00015 #define GDCMIMAGECHANGEPHOTOMETRICINTERPRETATION_H
00016
00017 #include "gdcmImageToImageFilter.h"
00018 #include "gdcmPhotometricInterpretation.h"
00019 #include <limits>
00020
00021 namespace gdcm
00022 {
00023
00024     class DataElement;
00029     class GDCM_EXPORT ImageChangePhotometricInterpretation : public ImageToImageFilter
00030     {
00031     public:
00032         ImageChangePhotometricInterpretation():PI() {}
00033         ~ImageChangePhotometricInterpretation() = default;
00034
00036         void SetPhotometricInterpretation(PhotometricInterpretation const &pi) { PI = pi; }
00037         const PhotometricInterpretation &GetPhotometricInterpretation() const { return PI; }
00038
00040         bool Change();
00041
00044         template <typename T>
00045         static void RGB2YBR(T ybr[3], const T rgb[3], unsigned short storedbits = 8);
00046         template <typename T>
00047         static void YBR2RGB(T rgb[3], const T ybr[3], unsigned short storedbits = 8);
00048
00049     protected:
00050         bool ChangeMonochrome();
00051         bool ChangeYBR2RGB();
00052         bool ChangeRGB2YBR();

```

```

00053
00054 private:
00055     PhotometricInterpretation PI;
00056 };
00057
00058 template <typename T>
00059 static inline int Round(T x)
00060 {
00061     return (int) (x+0.5);
00062 }
00063
00064 template <typename T>
00065 static inline T Clamp(int v)
00066 {
00067     assert( std::numeric_limits<T>::min() == 0 );
00068     return v < 0 ? 0 : (v > std::numeric_limits<T>::max() ? std::numeric_limits<T>::max() : v);
00069 }
00070
00071
00072 template <typename T>
00073 void ImageChangePhotometricInterpretation::RGB2YBR(T ybr[3], const T rgb[3], unsigned short storedbits)
00074 {
00075     // Implementation details, since the equations from:
00076     // http://dicom.nema.org/medical/dicom/current/output/chtml/part03/sect_C.7.6.3.html#sect_C.7.6.3.1.2
00077     // are rounded to the 4th decimal precision, prefer the exact equation from the original document at:
00078     // CCIR Recommendation 601-2, also found in T.871 (Section §7, page 4)
00079     const double R = rgb[0];
00080     const double G = rgb[1];
00081     const double B = rgb[2];
00082     assert( storedbits <= sizeof(T) * 8 );
00083     const int halffullscale = 1 « (storedbits - 1);
00084     const int Y = Round( 0.299 * R + 0.587 * G + 0.114 * B );
00085     const int CB = Round((-0.299 * R - 0.587 * G + 0.886 * B)/1.772 + halffullscale);
00086     const int CR = Round(( 0.701 * R - 0.587 * G - 0.114 * B)/1.402 + halffullscale);
00087     ybr[0] = Clamp<T>(Y );
00088     ybr[1] = Clamp<T>(CB);
00089     ybr[2] = Clamp<T>(CR);
00090 }
00091
00092 template <typename T>
00093 void ImageChangePhotometricInterpretation::YBR2RGB(T rgb[3], const T ybr[3], unsigned short storedbits)
00094 {
00095     const double Y = ybr[0];
00096     const double Cb = ybr[1];
00097     const double Cr = ybr[2];
00098     assert( storedbits <= sizeof(T) * 8 );
00099     const int halffullscale = 1 « (storedbits - 1);
00100     const int R = Round(Y
                                + 1.402 * (Cr-halffullscale)
                                );
00101     const int G = Round(Y -( 0.114 * 1.772 * (Cb-halffullscale) + 0.299 * 1.402 *
                                (Cr-halffullscale))/0.587);
00102     const int B = Round(Y
                                + 1.772 * (Cb-halffullscale)
                                );
00103     rgb[0] = Clamp<T>(R);
00104     rgb[1] = Clamp<T>(G);
00105     rgb[2] = Clamp<T>(B);
00106 }
00107
00108 } // end namespace gdcm
00109
00110 #endif //GDCMIMAGECHANGEPHOTOMETRICINTERPRETATION_H

```



```

00018
00019 namespace gdcm
00020 {
00021
00022 class DataElement;
00023 class GDCM_EXPORT ImageChangePlanarConfiguration : public ImageToImageFilter
00024 {
00025 public:
00026     ImageChangePlanarConfiguration():PlanarConfiguration(0) {}
00027     ~ImageChangePlanarConfiguration() = default;
00028
00029     void SetPlanarConfiguration(unsigned int pc) { PlanarConfiguration = pc; }
00030     unsigned int GetPlanarConfiguration() const { return PlanarConfiguration; }
00031
00032     template <typename T>
00033     static size_t RGBPlanesToRGBPixels(T *out, const T *r, const T *g, const T *b, size_t s);
00034
00035     template <typename T>
00036     static size_t RGBPixelsToRGBPlanes(T *r, T *g, T *b, const T *rgb, size_t s);
00037
00038     bool Change();
00039
00040 protected:
00041
00042 private:
00043     unsigned int PlanarConfiguration;
00044 };
00045
00046 template <typename T>
00047 size_t ImageChangePlanarConfiguration::RGBPlanesToRGBPixels(T *out, const T *r, const T *g, const T *b,
00048 size_t s)
00049 {
00050     T *pout = out;
00051     for(size_t i = 0; i < s; ++i )
00052     {
00053         *pout++ = *r++;
00054         *pout++ = *g++;
00055         *pout++ = *b++;
00056     }
00057
00058     assert( (size_t)(pout - out) == 3 * s );
00059     return pout - out;
00060 }
00061
00062 template <typename T>
00063 size_t ImageChangePlanarConfiguration::RGBPixelsToRGBPlanes(T *r, T *g, T *b, const T *rgb, size_t s)
00064 {
00065     const T *prgb = rgb;
00066     for(size_t i = 0; i < s; ++i )
00067     {
00068         *r++ = *prgb++;
00069         *g++ = *prgb++;
00070         *b++ = *prgb++;
00071     }
00072
00073     assert( (size_t)(prgb - rgb) == 3 * s );
00074     return prgb - rgb;
00075 }
00076
00077 } // end namespace gdcm
00078
00079 #endif //GDCMIMAGECHANGEPLANARCONFIGURATION_H

```

## 13.321 gdcmImageChangeTransferSyntax.h File Reference

```

#include "gdcmImageToImageFilter.h"
#include "gdcmTransferSyntax.h"

```

[illegible]

- class `gdcm::ImageChangeTransferSyntax`  
*ImageChangeTransferSyntax* class.

- namespace `gdcm`

[Go to the documentation of this file.](#)

```
00001  /*=====
00002
00003      Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005      Copyright (c) 2006-2011 Mathieu Malaterre
00006      All rights reserved.
00007      See Copyright.txt or http://gdcml.sourceforge.net/Copyright.html for details.
00008
00009      This software is distributed WITHOUT ANY WARRANTY; without even
00010      the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011      PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMIMAGECHANGETRANSFERSYNTAX_H
00015  #define GDCMIMAGECHANGETRANSFERSYNTAX_H
00016
00017  #include "gdcmImageToImageFilter.h"
00018  #include "gdcmTransferSyntax.h"
00019
00020  namespace gdcm
00021  {
00022
00023      class DataElement;
00024      class ImageCodec;
```

### 13.323 gdcmlImageCodec.h File Reference

Include dependency graph for `gdcmImageCodec.h`:





This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::ImageCodec`  
*ImageCodec.*

## Namespaces

- namespace `gdcm`

## 13.324 gdcmImageCodec.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMIMAGECODEC_H
00015 #define GDCMIMAGECODEC_H
00016
00017 #include "gdcmCodec.h"
00018 #include "gdcmPhotometricInterpretation.h"
00019 #include "gdcmLookupTable.h"
00020 #include "gdcmSmartPointer.h"
00021 #include "gdcmPixelFormat.h"
00022
00023 namespace gdcm
00024 {
00025
00026     class GDCM_EXPORT ImageCodec : public Codec
00027     {
00028     public:
00029         ImageCodec();
00030         ~ImageCodec() override;
00031         bool CanCode(TransferSyntax const &) const override { return false; }
00032         bool CanDecode(TransferSyntax const &) const override { return false; }
00033         bool Decode(DataElement const &is_, DataElement &os) override;
00034         bool IsLossy() const;
00035         void SetLossyFlag(bool l);
00036         bool GetLossyFlag() const;
00037
00038         virtual bool GetHeaderInfo(std::istream &is_, TransferSyntax &ts);
00039
00040         virtual ImageCodec * Clone() const = 0;
00041     };
00042
00043 }
00044
00045
00046

```

```

00047 protected:
00048     bool DecodeByStreams(std::istream &is_, std::ostream &os) override;
00049     virtual bool IsValid(PhotometricInterpretation const &pi);
00050 public:
00051
00052     unsigned int GetPlanarConfiguration() const
00053     {
00054         return PlanarConfiguration;
00055     }
00056     void SetPlanarConfiguration(unsigned int pc)
00057     {
00058         assert( pc == 0 || pc == 1 );
00059         PlanarConfiguration = pc;
00060     }
00061
00062     PixelFormat &GetPixelFormat()
00063     {
00064         return PF;
00065     }
00066     const PixelFormat &GetPixelFormat() const
00067     {
00068         return PF;
00069     }
00070     virtual void SetPixelFormat(PixelFormat const &pf)
00071     {
00072         PF = pf;
00073     }
00074     const PhotometricInterpretation &GetPhotometricInterpretation() const;
00075     void SetPhotometricInterpretation(PhotometricInterpretation const &pi);
00076
00077     bool GetNeedByteSwap() const
00078     {
00079         return NeedByteSwap;
00080     }
00081     void SetNeedByteSwap(bool b)
00082     {
00083         NeedByteSwap = b;
00084     }
00085     void SetNeedOverlayCleanup(bool b)
00086     {
00087         NeedOverlayCleanup = b;
00088     }
00089     void SetLUT(LookupTable const &lut)
00090     {
00091         LUT = SmartPointer<LookupTable>( const_cast<LookupTable*>(&lut) );
00092     }
00093     const LookupTable &GetLUT() const
00094     {
00095         return *LUT;
00096     }
00097
00098     void SetDimensions(const unsigned int d[3]);
00099     void SetDimensions(const std::vector<unsigned int> &d);
00100     const unsigned int *GetDimensions() const { return Dimensions; }
00101     void SetNumberOfDimensions(unsigned int dim);
00102     unsigned int GetNumberOfDimensions() const;
00103
00104     bool CleanupUnusedBits(char * data, size_t datalen);
00105
00106 protected:
00107     // Streaming (write) API:
00114     friend class FileChangeTransferSyntax;
00115     virtual bool StartEncode( std::ostream & os );
00116     virtual bool IsRowEncoder();
00117     virtual bool IsFrameEncoder();
00118     virtual bool AppendRowEncode( std::ostream & out, const char * data, size_t datalen );
00119     virtual bool AppendFrameEncode( std::ostream & out, const char * data, size_t datalen );
00120     virtual bool StopEncode( std::ostream & os);
00121
00122 protected:
00123     bool RequestPlanarConfiguration;
00124     bool RequestPaddedCompositePixelCode;
00125 //private:
00126     unsigned int PlanarConfiguration;
00127     PhotometricInterpretation PI;
00128     PixelFormat PF;
00129     bool NeedByteSwap;
00130     bool NeedOverlayCleanup;
00131
00132     typedef SmartPointer<LookupTable> LUTPtr;
00133     LUTPtr LUT;

```

```

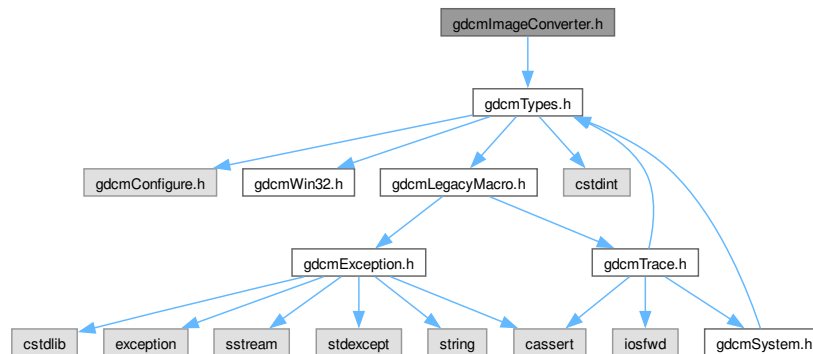
00134 unsigned int Dimensions[3]; // FIXME
00135 unsigned int NumberOfDimensions;
00136 bool LossyFlag;
00137
00138 bool DoOverlayCleanup(std::istream &is_, std::ostream &os);
00139 bool DoByteSwap(std::istream &is_, std::ostream &os);
00140 bool DoYBR(std::istream &is_, std::ostream &os);
00141 bool DoYBRFull422(std::istream &is_, std::ostream &os);
00142 bool DoPlanarConfiguration(std::istream &is_, std::ostream &os);
00143 bool DoSimpleCopy(std::istream &is_, std::ostream &os);
00144 bool DoPaddedCompositePixelCode(std::istream &is_, std::ostream &os);
00145 bool DoInvertMonochrome(std::istream &is_, std::ostream &os);
00146
00147 //template <typename T>
00148 //bool DoInvertPlanarConfiguration(T *output, const T *input, uint32_t length);
00149 };
00150
00151 } // end namespace gdcm
00152
00153 #endif //GDCMIMAGECODEC_H

```

## 13.325 gdcmImageConverter.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmImageConverter.h:



### Classes

- class `gdcm::ImageConverter`  
*Image Converter.*

### Namespaces

- namespace `gdcm`

## 13.326 gdcmImageConverter.h

[Go to the documentation of this file.](#)

```
00001 /*=====
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014
00015 #ifndef GDCMIMAGECONVERTER_H
00016 #define GDCMIMAGECONVERTER_H
00017
00018 #include "gdcmTypes.h"
00019
00020 namespace gdcm
00021 {
00022
00023   class Image;
00024   class GDCM_EXPORT ImageConverter
00025   {
00026   public:
00027     ImageConverter();
00028     ~ImageConverter();
00029
00030     void SetInput(Image const &input);
00031     const Image& GetOutput() const;
00032
00033     void Convert();
00034
00035   private:
00036     Image *Input;
00037     Image *Output;
00038   };
00039
00040 } // end namespace gdcm
00041
00042 #endif //GDCMIMAGECONVERTER_H
```



```

00018
00019 namespace gdcM
00020 {
00021
00022 class DataElement;
00027 class GDCM_EXPORT ImageFragmentSplitter : public ImageToImageFilter
00028 {
00029 public:
00030     ImageFragmentSplitter():FragmentSizeMax(0),Force(false) {}
00031     ~ImageFragmentSplitter() = default;
00032
00034     bool Split();
00035
00037     void SetFragmentSizeMax(unsigned int fragsize);
00038     unsigned int GetFragmentSizeMax() const { return FragmentSizeMax; }
00039
00042     void SetForce( bool f ) { Force = f; }
00043
00044 protected:
00045
00046 private:
00047     unsigned int FragmentSizeMax;
00048     bool Force;
00049 };
00050
00051 } // end namespace gdcM
00052
00053 #endif //GDCMIMAGEFRAGMENTSPPLITTER_H

```

## 13.329 gdcMImageHelper.h File Reference

```

#include "gdcMTypes.h"
#include "gdcMTag.h"
#include <vector>
#include "gdcMPixelFormat.h"
#include "gdcMPhotometricInterpretation.h"
#include "gdcMSmartPointer.h"
#include "gdcMLookupTable.h"

```

Include dependency graph for gdcMImageHelper.h:



### Classes

- class [gdcM::ImageHelper](#)

*ImageHelper* (internal class, not intended for user level).

- struct `gdcm::RealWorldValueMappingContent`

## Namespaces

- namespace `gdcm`

## 13.330 gdcmImageHelper.h

[Go to the documentation of this file.](#)

```

00001 /*=====
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00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMIMAGEHELPER_H
00015 #define GDCMIMAGEHELPER_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmTag.h"
00019 #include <vector>
00020 #include "gdcmPixelFormat.h"
00021 #include "gdcmPhotometricInterpretation.h"
00022 #include "gdcmSmartPointer.h"
00023 #include "gdcmLookupTable.h"
00024
00025 namespace gdcm
00026 {
00027
00028     class MediaStorage;
00029     class DataSet;
00030     class File;
00031     class Image;
00032     class Pixmap;
00033     class ByteValue;
00034
00035     // minimal struct:
00036     struct RealWorldValueMappingContent {
00037         double RealWorldValueIntercept;
00038         double RealWorldValueSlope;
00039         // http://dicom.nema.org/MEDICAL/DICOM/2014c/output/chtml/part16/sect_CID_7181.html
00040         std::string CodeValue;
00041         std::string CodeMeaning;
00042     };
00043
00044     class GDCM_EXPORT ImageHelper
00045     {
00046     public:
00047         static void SetForceRescaleInterceptSlope(bool);
00048         static bool GetForceRescaleInterceptSlope();
00049
00050         static void SetPMSRescaleInterceptSlope(bool);
00051         static bool GetPMSRescaleInterceptSlope();
00052
00053         static void SetForcePixelSpacing(bool);
00054         static bool GetForcePixelSpacing();
00055
00056         static void SetSecondaryCaptureImagePlaneModule(bool);
00057         static bool GetSecondaryCaptureImagePlaneModule();
00058
00059         static std::vector<unsigned int> GetDimensionsValue(const File& f);
00060         static void SetDimensionsValue(File& f, const Pixmap & img);
00061

```

```

00100
00103 static PixelFormat GetPixelFormatValue(const File& f);
00104
00109 static std::vector<double> GetRescaleInterceptSlopeValue(File const & f);
00110 static void SetRescaleInterceptSlopeValue(File & f, const Image & img);
00111
00112 // read only for now
00113 static bool GetRealWorldValueMappingContent(File const & f, RealWorldValueMappingContent & rwvmc);
00114
00116 static std::vector<double> GetOriginValue(File const & f);
00117 static void SetOriginValue(DataSet & ds, const Image & img);
00118
00121 static std::vector<double> GetDirectionCosinesValue(File const & f);
00127 // FIXME: There is a major issue for image with multiple IOP (eg. Enhanced * Image Storage).
00128 static void SetDirectionCosinesValue(DataSet & ds, const std::vector<double> & dircos);
00129
00131 static std::vector<double> GetSpacingValue(File const & f);
00133 static void SetSpacingValue(DataSet & ds, const std::vector<double> & spacing);
00134
00136 static bool ComputeSpacingFromImagePositionPatient(const std::vector<double> & imageposition,
std::vector<double> & spacing);
00137
00138 static bool GetDirectionCosinesFromDataSet(DataSet const & ds, std::vector<double> & dircos);
00139
00140 //functions to get more information from a file
00141 //useful for the stream image reader, which fills in necessary image information
00142 //distinctly from the reader-style data input
00143 static PhotometricInterpretation GetPhotometricInterpretationValue(File const& f);
00144 //returns the configuration of colors in a plane, either RGB RGB RGB or RRR GGG BBB
00145 static unsigned int GetPlanarConfigurationValue(const File& f);
00146
00148 static SmartPointer<LookupTable> GetLUT(File const& f);
00149
00150 // Moved from PixampReader to here. Generally used for photometric interpretation.
00151 static const ByteValue* GetPointerFromElement(Tag const &tag, File const& f);
00152
00154 static MediaStorage ComputeMediaStorageFromModality(const char *modality,
unsigned int dimension = 2, PixelFormat const & pf = PixelFormat(),
PhotometricInterpretation const & pi = PhotometricInterpretation(),
double rescaleintercept = 0, double rescaleslope = 1 );
00158
00159 protected:
00160 static Tag GetSpacingTagFromMediaStorage(MediaStorage const &ms);
00161 static Tag GetZSpacingTagFromMediaStorage(MediaStorage const &ms);
00162
00163 private:
00164 static bool ForceRescaleInterceptSlope;
00165 static bool PMSRescaleInterceptSlope;
00166 static bool ForcePixelSpacing;
00167 static bool SecondaryCaptureImagePlaneModule;
00168 };
00169
00170 } // end namespace gdcM
00171
00172 #endif // GDCMIMAGEHELPER_H

```

### 13.331 gdcmImageReader.h File Reference

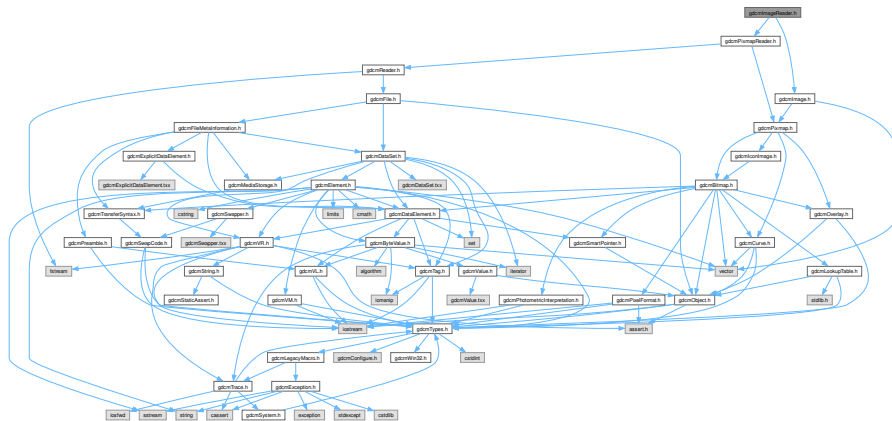
```

#include "gdcmPixmapReader.h"
#include "gdcmImage.h"

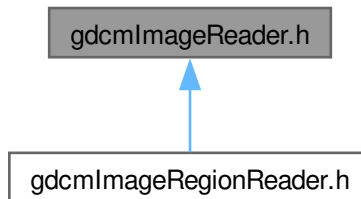
```



Include dependency graph for gdcmImageReader.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::ImageReader](#)  
*ImageReader.*

## Namespaces

- namespace [gdcm](#)

## 13.332 gdcmImageReader.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMIMAGEREADER_H
00015 #define GDCMIMAGEREADER_H
00016
00017 #include "gdcmPixmapReader.h"
00018 #include "gdcmImage.h"
00019
00020 namespace gdcm
00021 {
00022
00023   class MediaStorage;
00024   class GDCM_EXPORT ImageReader : public PixmapReader
00025   {
00026   public:
00027     ImageReader();
00028     ~ImageReader() override; //needs to be virtual to ensure lack of memory leaks
00029
00030     bool Read() override;
00031
00032     // Following methods are valid only after a call to 'Read'
00033
00034     const Image& GetImage() const;
00035     Image& GetImage();
00036     //void SetImage(Image const &img);
00037
00038   protected:
00039     bool ReadImage(MediaStorage const &ms) override;
00040     bool ReadACRNEMAIImage() override;
00041   };
00042
00043 } // end namespace gdcm
00044
00045 #endif //GDCMIMAGEREADER_H

```

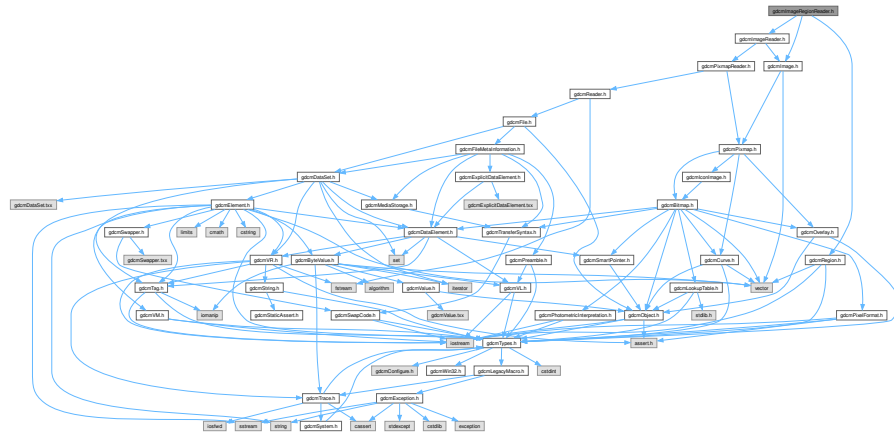
## 13.333 gdcmImageRegionReader.h File Reference

```

#include "gdcmImageReader.h"
#include "gdcmImage.h"
#include "gdcmRegion.h"

```

Include dependency graph for gdcmImageRegionReader.h:



## Classes

- class `gdcm::ImageRegionReader`  
*ImageRegionReader.*

## Namespaces

- namespace `gdcm`

## 13.334 gdcmImageRegionReader.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMIMAGEEXTENTREADER_H
00015 #define GDCMIMAGEEXTENTREADER_H
00016
00017 #include "gdcmImageReader.h"
00018 #include "gdcmImage.h"
00019 #include "gdcmRegion.h"
00020
00021 namespace gdcm
00022 {
00023
00024   class ImageRegionReaderInternals;
00034   class GDCM_EXPORT ImageRegionReader : public ImageReader
00035   {
00036   public:

```

```

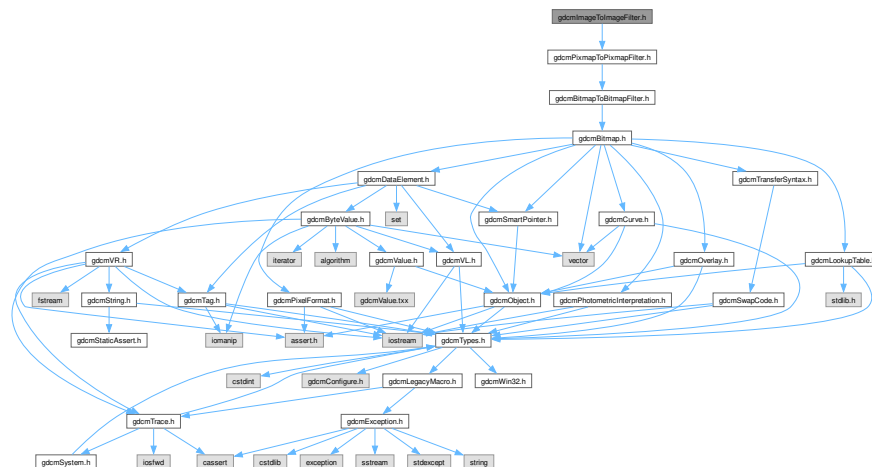
00037 ImageRegionReader();
00038 ~ImageRegionReader() override;
00039
00041 void SetRegion(Region const & region);
00042 Region const &GetRegion() const;
00043
00047 size_t ComputeBufferLength() const;
00048
00051 bool ReadInformation();
00052
00057 bool ReadIntoBuffer(char *inreadbuffer, size_t buflen);
00058
00059 protected:
00061 bool Read() override;
00062
00063 private:
00064 BoxRegion ComputeBoundingBox();
00065 bool ReadRAWIntoBuffer(char *buffer, size_t buflen);
00066 bool ReadRLEIntoBuffer(char *buffer, size_t buflen);
00067 bool ReadJPEG2000IntoBuffer(char *buffer, size_t buflen);
00068 bool ReadJPEGIntoBuffer(char *buffer, size_t buflen);
00069 bool ReadJPEGLSIntoBuffer(char *buffer, size_t buflen);
00070 ImageRegionReaderInternals *Internals;
00071 };
00072
00073 } // end namespace gdcm
00074
00075 #endif //GDCMIMAGEEXTENTREADER_H

```

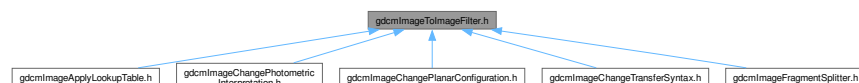
## 13.335 gdcmImageToImageFilter.h File Reference

#include "gdcmPixmapToPixmapFilter.h"

Include dependency graph for gdcmImageToImageFilter.h:



This graph shows which files directly or indirectly include this file:



**Classes**

- class [gdcm::ImageToImageFilter](#)  
*ImageToImageFilter* class.

**Namespaces**

- namespace [gdcm](#)

**13.336 gdcmImageToImageFilter.h**

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMIMAGETOIMAGEFILTER_H
00015 #define GDCMIMAGETOIMAGEFILTER_H
00016
00017 #include "gdcmPixmapToPixmapFilter.h"
00018
00019 namespace gdcm
00020 {
00021
00022   class Image;
00027   class GDCM_EXPORT ImageToImageFilter : public PixmapToPixmapFilter
00028   {
00029   public:
00030     ImageToImageFilter();
00031     ~ImageToImageFilter() = default;
00032
00033     Image &GetInput();
00034
00035     // NOTE: covariant return-type to preserve backward compatible API
00037     const Image &GetOutput() const;
00038
00039   protected:
00040   };
00041
00042 } // end namespace gdcm
00043
00044 #endif //GDCMIMAGETOIMAGEFILTER_H

```

**13.337 gdcmImageWriter.h File Reference**

```

#include "gdcmPixmapWriter.h"
#include "gdcmImage.h"

```



```

00036 ~ImageWriter() override;
00037
00041 const Image& GetImage() const override { return dynamic_cast<const Image*>(*PixelData); }
00042 Image& GetImage() override { return dynamic_cast<Image*>(*PixelData); } // FIXME
00043 //void SetImage(Image const &img);
00044
00046 bool Write() override; // Execute()
00047
00050 MediaStorage ComputeTargetMediaStorage();
00051 protected:
00052
00053 private:
00054 };
00055
00056 } // end namespace gdcm
00057
00058 #endif //GDCMIMAGEWRITER_H

```

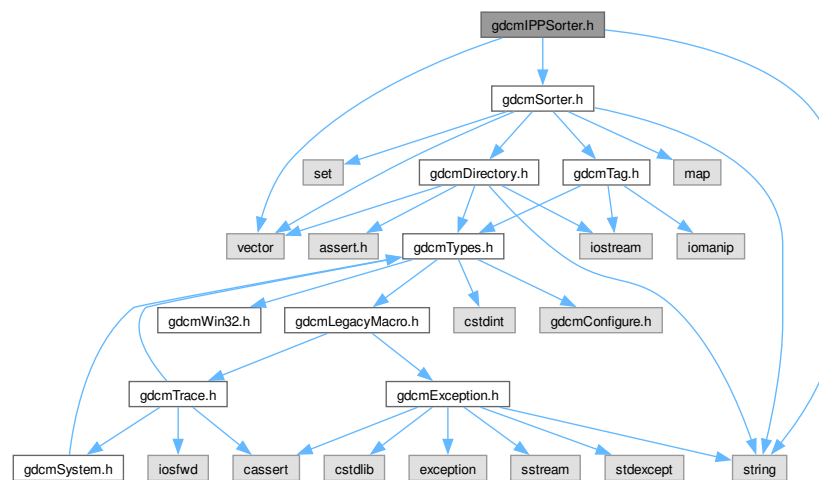
## 13.339 gdcmIPPSorter.h File Reference

```
#include "gdcmSorter.h"
```

```
#include <vector>
```

```
#include <string>
```

Include dependency graph for gdcmIPPSorter.h:



### Classes

- class [gdcm::IPPSorter](#)  
*IPPSorter.*

### Namespaces

- namespace [gdcm](#)

## 13.340 gdcmIPPSorter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMIPPSORTER_H
00015 #define GDCMIPPSORTER_H
00016
00017 #include "gdcmSorter.h"
00018
00019 #include <vector>
00020 #include <string>
00021
00022 namespace gdcm
00023 {
00024     class GDCM_EXPORT IPPSorter : public Sorter
00025     {
00026     public:
00027         IPPSorter();
00028
00029         // FIXME: I do not like public virtual function...
00030         bool Sort(std::vector<std::string> const & filenames) override;
00031
00032         void SetComputeZSpacing(bool b) { ComputeZSpacing = b; }
00033         void SetZSpacingTolerance(double tol) { ZTolerance = tol; }
00034         double GetZSpacingTolerance() const { return ZTolerance; }
00035
00036         void SetDirectionCosinesTolerance(double tol) { DirCosTolerance = tol; }
00037         double GetDirectionCosinesTolerance() const { return DirCosTolerance; }
00038
00039         void SetDropDuplicatePositions(bool b) { DropDuplicatePositions = b; }
00040
00041         double GetZSpacing() const { return ZSpacing; }
00042
00043     protected:
00044         bool ComputeZSpacing;
00045         bool DropDuplicatePositions;
00046         double ZSpacing;
00047         double ZTolerance;
00048         double DirCosTolerance;
00049
00050     private:
00051         GDCM_LEGACY(bool ComputeSpacing(std::vector<std::string> const & filenames))
00052         {};
00053
00054     } // end namespace gdcm
00055
00056 #endif //GDCMIPPSORTER_H

```





```

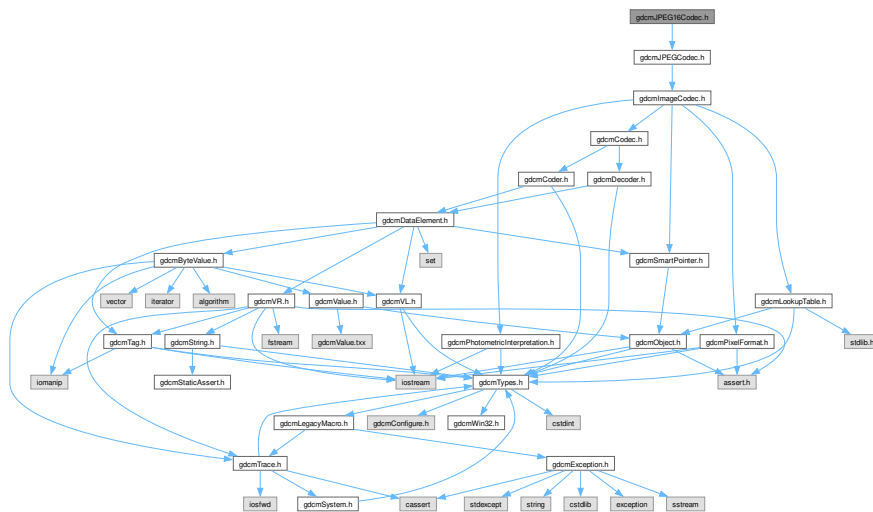
00018
00019 namespace gdcM
00020 {
00021
00022 class JPEGInternals_12BIT;
00023 class ByteValue;
00028 class JPEG12Codec : public JPEGCodec
00029 {
00030 public:
00031     JPEG12Codec();
00032     ~JPEG12Codec() override;
00033
00034     bool DecodeByStreams(std::istream &is, std::ostream &os) override;
00035     bool InternalCode(const char *input, unsigned long len, std::ostream &os) override;
00036
00037     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
00038
00039 protected:
00040     bool IsStateSuspension() const override;
00041     bool EncodeBuffer(std::ostream &os, const char *data, size_t datalen) override;
00042
00043 private:
00044     JPEGInternals_12BIT *Internals;
00045 };
00046
00047 } // end namespace gdcM
00048
00049 #endif //GDCMJPEG12CODEC_H

```

## 13.343 gdcMJPEG16Codec.h File Reference

```
#include "gdcMJPEGCodec.h"
```

Include dependency graph for gdcMJPEG16Codec.h:



### Classes

- class [gdcM::JPEG16Codec](#)  
Class to do JPEG 16bits (lossless).

## Namespaces

- namespace `gdcm`

## 13.344 gdcmJPEG16Codec.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMJPEG16CODEC_H
00015 #define GDCMJPEG16CODEC_H
00016
00017 #include "gdcmJPEGCodec.h"
00018
00019 namespace gdcm
00020 {
00021
00022   class JPEGInternals_16BIT;
00023   class ByteValue;
00024   class JPEG16Codec : public JPEGCodec
00025   {
00026   public:
00027     JPEG16Codec();
00028     ~JPEG16Codec() override;
00029
00030     bool DecodeByStreams(std::istream &is, std::ostream &os) override;
00031     bool InternalCode(const char *input, unsigned long len, std::ostream &os) override;
00032
00033     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
00034
00035   protected:
00036     bool IsStateSuspension() const override;
00037     bool EncodeBuffer(std::ostream &os, const char *data, size_t datalen) override;
00038
00039   private:
00040     JPEGInternals_16BIT *Internals;
00041   };
00042
00043 } // end namespace gdcm
00044
00045 #endif //GDCMJPEG16CODEC_H
```



```

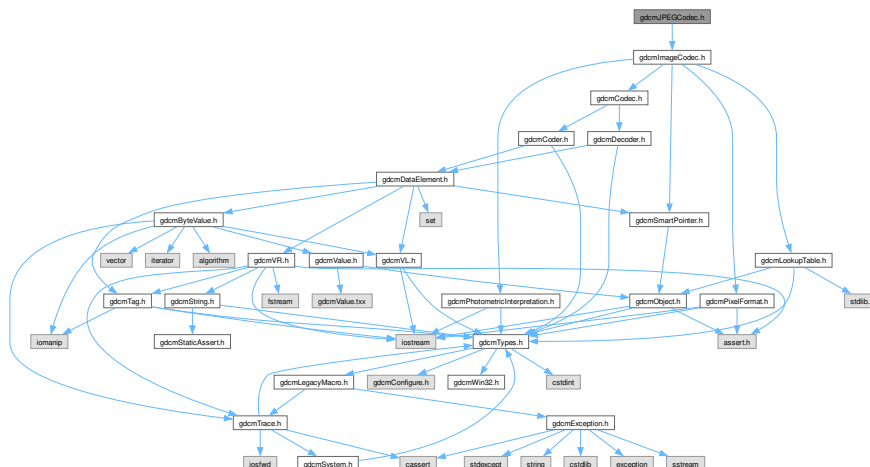
00020 {
00021
00022     class JPEG2000Internals;
00030     class GDCM_EXPORT JPEG2000Codec : public ImageCodec
00031     {
00032     friend class ImageRegionReader;
00033     friend class Bitmap;
00034     public:
00035         JPEG2000Codec();
00036         ~JPEG2000Codec() override;
00037
00038         bool CanDecode(TransferSyntax const &ts) const override;
00039         bool CanCode(TransferSyntax const &ts) const override;
00040
00041         bool Decode(DataElement const &is, DataElement &os) override;
00042         bool Code(DataElement const &in, DataElement &out) override;
00043
00044         bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
00045         ImageCodec * Clone() const override;
00046
00047         // JPEG-2000 / OpenJPEG specific way of encoding lossy-ness
00048         // ref: http://www.openjpeg.org/index.php?menu=doc#encoder
00049         void SetRate(unsigned int idx, double rate);
00050         double GetRate(unsigned int idx = 0) const;
00051
00052         void SetQuality(unsigned int idx, double q);
00053         double GetQuality(unsigned int idx = 0) const;
00054
00055         void SetTileSize(unsigned int tx, unsigned int ty);
00056
00057         void SetNumberOfResolutions(unsigned int nres);
00058
00061         void SetNumberOfThreadsForDecompression(int nThreads);
00062
00063         void SetReversible(bool res);
00064         void SetMCT(unsigned int mct);
00065
00066     protected:
00067         bool DecodeExtent(
00068             char *buffer,
00069             unsigned int xmin, unsigned int xmax,
00070             unsigned int ymin, unsigned int ymax,
00071             unsigned int zmin, unsigned int zmax,
00072             std::istream & is
00073         );
00074
00075         bool DecodeByStreams(std::istream &is, std::ostream &os) override;
00076
00077         bool StartEncode( std::ostream & ) override;
00078         bool IsRowEncoder() override;
00079         bool IsFrameEncoder() override;
00080         bool AppendRowEncode( std::ostream & out, const char * data, size_t datalen ) override;
00081         bool AppendFrameEncode( std::ostream & out, const char * data, size_t datalen ) override;
00082         bool StopEncode( std::ostream & ) override;
00083
00084     private:
00085         std::pair<char *, size_t> DecodeByStreamsCommon(char *dummy_buffer, size_t buf_size);
00086         bool CodeFrameIntoBuffer(char * outdata, size_t outlen, size_t & complen, const char * indata, size_t
inlen );
00087         bool GetHeaderInfo(const char * dummy_buffer, size_t len, TransferSyntax &ts);
00088         JPEG2000Internals *Internals;
00089     };
00090
00091 } // end namespace gdcM
00092
00093 #endif //GDCMJPEG2000CODEC_H

```



## 13.349 gdcmJPEGCodec.h File Reference

Include dependency graph for gdcMJPEGCodec.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcMJPEGCodec](#)  
*JPEG codec.*

## Namespaces

- namespace [gdcM](#)

## 13.350 gdcMJPEGCodec.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcM.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMJPEGCODEC_H
00015 #define GDCMJPEGCODEC_H
00016
00017 #include "gdcMImageCodec.h"
00018
00019 namespace gdcM
00020 {
00021
00022   class PixelFormat;
00023   class TransferSyntax;
00024   class GDCM_EXPORT JPEGCodec : public ImageCodec
00025   {
00026   friend class ImageRegionReader;
00027   public:
00028     JPEGCodec();
00029     ~JPEGCodec() override;
00030     bool CanDecode(TransferSyntax const &ts) const override;
00031     bool CanCode(TransferSyntax const &ts) const override;
00032     bool Decode(DataElement const &is, DataElement &os) override;
00033     void SetPixelFormat(PixelFormat const &pf) override;
00034
00035   };
00036
00037 }
00038
00039 #endif

```



```

00052 void ComputeOffsetTable(bool b);
00053
00055 bool Code(DataElement const &in, DataElement &out) override;
00056
00057 bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
00058 ImageCodec * Clone() const override;
00059
00060 //void SetReversible(bool res);
00061
00062 void SetQuality(double q);
00063 double GetQuality() const;
00064
00065 void SetLossless(bool l);
00066 bool GetLossless() const;
00067
00068 virtual bool EncodeBuffer( std::ostream & out,
00069     const char *inbuffer, size_t inlen);
00070
00071 protected:
00072     bool DecodeExtent(
00073         char *buffer,
00074         unsigned int xmin, unsigned int xmax,
00075         unsigned int ymin, unsigned int ymax,
00076         unsigned int zmin, unsigned int zmax,
00077         std::istream & is
00078     );
00079
00080 bool DecodeByStreams(std::istream &is, std::ostream &os) override;
00081 bool IsValid(PhotometricInterpretation const &pi) override;
00082
00083 bool StartEncode( std::ostream & ) override;
00084 bool IsRowEncoder() override;
00085 bool IsFrameEncoder() override;
00086 bool AppendRowEncode( std::ostream & out, const char * data, size_t datalen ) override;
00087 bool AppendFrameEncode( std::ostream & out, const char * data, size_t datalen ) override;
00088 bool StopEncode( std::ostream & ) override;
00089
00090 protected:
00091     // Internal method called by SetPixelFormat
00092     // Instantiate the right jpeg codec (8, 12 or 16)
00093     void SetBitSample(int bit);
00094
00095     virtual bool IsStateSuspension() const;
00096
00097 protected:
00098     int BitSample;
00099     //bool Lossless;
00100     int Quality;
00101
00102 private:
00103     void SetupJPEGBitCodec(int bit);
00104     JPEGCodec *Internal;
00105 };
00106
00107 } // end namespace gdcm
00108
00109 #endif //GDCMJPEGCODEC_H

```



```

00020 {
00021
00022 class JPEGLSInternals;
00030 class GDCM_EXPORT JPEGLSCodec : public ImageCodec
00031 {
00032 friend class ImageRegionReader;
00033 public:
00034     JPEGLSCodec();
00035     ~JPEGLSCodec() override;
00036     bool CanDecode(TransferSyntax const &ts) const override;
00037     bool CanCode(TransferSyntax const &ts) const override;
00038
00039     unsigned long GetBufferLength() const { return BufferLength; }
00040     void SetBufferLength(unsigned long l) { BufferLength = l; }
00041
00042     bool Decode(DataElement const &is, DataElement &os) override;
00043     bool Decode(DataElement const &in, char* outBuffer, size_t inBufferLength,
00044         uint32_t inXMin, uint32_t inXMax, uint32_t inYMin,
00045         uint32_t inYMax, uint32_t inZMin, uint32_t inZMax);
00046     bool Code(DataElement const &in, DataElement &out) override;
00047
00048     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
00049     ImageCodec * Clone() const override;
00050
00051     void SetLossless(bool l);
00052     bool GetLossless() const;
00053
00054     /*
00055     * test.acr can look pretty bad, even with a lossy error of 2. Explanation follows:
00056     * I agree that the test image looks ugly. In this particular case I can
00057     * explain though.
00058     *
00059     * The image is 8 bit, but it does not use the full 8 bit dynamic range. The
00060     * black pixels have value 234 and the white 255. If you set allowed lossy
00061     * error to 2, you allow an error of about 10% of the actual dynamic range.
00062     * That is of course very visible.
00063     */
00065     void SetLossyError(int error);
00066
00067 protected:
00068     bool DecodeExtent(
00069         char *buffer,
00070         unsigned int xmin, unsigned int xmax,
00071         unsigned int ymin, unsigned int ymax,
00072         unsigned int zmin, unsigned int zmax,
00073         std::istream & is
00074     );
00075
00076     bool StartEncode( std::ostream & ) override;
00077     bool IsRowEncoder() override;
00078     bool IsFrameEncoder() override;
00079     bool AppendRowEncode( std::ostream & out, const char * data, size_t datalen ) override;
00080     bool AppendFrameEncode( std::ostream & out, const char * data, size_t datalen ) override;
00081     bool StopEncode( std::ostream & ) override;
00082
00083 private:
00084     bool DecodeByStreamsCommon(const char *buffer, size_t totalLen, std::vector<unsigned char> &rgbyteOut);
00085     bool CodeFrameIntoBuffer(char * outdata, size_t outlen, size_t & complen, const char * indata, size_t
inlen );
00086
00087     unsigned long BufferLength;
00088     int LossyError;
00089 };
00090
00091 } // end namespace gdcJSON
00092
00093 #endif //GDCMJPEGLS_CODEC_H

```

## 13.353 gdcJSON.h File Reference

```

#include "gdcJSON.h"
#include "gdcJSONDataElement.h"

```



### 13.355 gdcmmKAKADUCodec.h File Reference

Include dependency graph for gdcmmKAKADUCodec.h:



- ## Namespaces

- Generated by Doxygen

## 13.356 gdcmKAKADUCodec.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMKAKADUCODEC_H
00015 #define GDCMKAKADUCODEC_H
00016
00017 #include "gdcmImageCodec.h"
00018
00019 namespace gdcm
00020 {
00021
00025 class KAKADUCodec : public ImageCodec
00026 {
00027 public:
00028   KAKADUCodec();
00029   ~KAKADUCodec() override;
00030   bool CanDecode(TransferSyntax const &ts) const override;
00031   bool CanCode(TransferSyntax const &ts) const override;
00032
00033   bool Decode(DataElement const &is, DataElement &os) override;
00034   bool Code(DataElement const &in, DataElement &out) override;
00035
00036   ImageCodec * Clone() const override;
00037 private:
00038 };
00039
00040 } // end namespace gdcm
00041
00042 #endif //GDCMKAKADUCODEC_H
```

## 13.357 gdcmLookupTable.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmObject.h"
#include <stdlib.h>
```

```

graph TD
    gdcmLookupTable.h[gdcmLookupTable.h] --> gdcmObject.h[gdcmObject.h]
    gdcmLookupTable.h --> stdlib.h[stdlib.h]
    gdcmLookupTable.h --> gdcmTypes.h[gdcmTypes.h]
    gdcmObject.h --> gdcmTypes.h
    gdcmObject.h --> assert.h[assert.h]
    gdcmObject.h --> iostream[iostream]
    gdcmTypes.h --> gdcmConfigure.h[gdcmConfigure.h]
    gdcmTypes.h --> gdcmWin32.h[gdcmWin32.h]
    gdcmTypes.h --> gdcmLegacyMacro.h[gdcmLegacyMacro.h]
    gdcmTypes.h --> cstdint[cstdint]
    gdcmTypes.h --> gdcmException.h[gdcmException.h]
    gdcmTypes.h --> gdcmTrace.h[gdcmTrace.h]
    gdcmLegacyMacro.h --> gdcmException.h
    gdcmLegacyMacro.h --> gdcmTrace.h
    gdcmException.h --> cstdlib[cstdlib]
    gdcmException.h --> exception[exception]
    gdcmException.h --> sstream[sstream]
    gdcmException.h --> stdexcept[stdexcept]
    gdcmException.h --> string[string]
    gdcmException.h --> cassert[cassert]
    gdcmException.h --> iosfwd[iosfwd]
    gdcmException.h --> gdcmSystem.h[gdcmSystem.h]
    gdcmTrace.h --> gdcmSystem.h
  
```

[illegible]

- class `gdcm::LookupTable`  
*LookupTable* class.

- namespace **gdcm**

[Go to the documentation of this file.](#)

```
00001 /*****
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
```

```

00007 See Copyright.txt or http://gdcmm.sourceforge.net/Copyright.html for details.
00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014
00015 #ifndef GDCMLOOKUPTABLE_H
00016 #define GDCMLOOKUPTABLE_H
00017
00018 #include "gdcmmTypes.h"
00019 #include "gdcmmObject.h"
00020 #include <stdlib.h>
00021
00022 namespace gdcmm
00023 {
00024
00025 class LookupTableInternal;
00026 class GDCM_EXPORT LookupTable : public Object
00027 {
00028 public:
00029     typedef enum {
00030         RED = 0, // Keep RED == 0
00031         GREEN,
00032         BLUE,
00033         GRAY,
00034         UNKNOWN
00035     } LookupTableType;
00036
00037     LookupTable();
00038     ~LookupTable() override;
00039     void Print(std::ostream &) const override;
00040
00041     void Allocate( unsigned short bitsample = 8 );
00042     //TODO: check to see if length should be unsigned short, unsigned int, or whatever
00043     void InitializeLUT(LookupTableType type, unsigned short length,
00044         unsigned short subscript, unsigned short bitsize);
00045     unsigned int GetLUTLength(LookupTableType type) const;
00046     virtual void SetLUT(LookupTableType type, const unsigned char *array,
00047         unsigned int length);
00048     void GetLUT(LookupTableType type, unsigned char *array, unsigned int &length) const;
00049     void GetLUTDescriptor(LookupTableType type, unsigned short &length,
00050         unsigned short &subscript, unsigned short &bitsize) const;
00051
00052     void InitializeRedLUT(unsigned short length, unsigned short subscript,
00053         unsigned short bitsize);
00054     void SetRedLUT(const unsigned char *red, unsigned int length);
00055     void InitializeGreenLUT(unsigned short length, unsigned short subscript,
00056         unsigned short bitsize);
00057     void SetGreenLUT(const unsigned char *green, unsigned int length);
00058     void InitializeBlueLUT(unsigned short length, unsigned short subscript,
00059         unsigned short bitsize);
00060     void SetBlueLUT(const unsigned char *blue, unsigned int length);
00061
00062     void Clear();
00063
00064     void Decode(std::istream &is, std::ostream &os) const;
00065
00066     bool Decode(char *outputbuffer, size_t outlen, const char *inputbuffer, size_t inlen) const;
00067
00068     bool IsRGB8() const;
00069
00070     bool Decode8(char *outputbuffer, size_t outlen, const char *inputbuffer, size_t inlen) const;
00071
00072     LookupTable(LookupTable const &lut):Object(lut)
00073     {
00074         assert(0);
00075     }
00076
00077     bool GetBufferAsRGBA(unsigned char *rgba) const;
00078
00079     const unsigned char *GetPointer() const;
00080
00081     bool WriteBufferAsRGBA(const unsigned char *rgba);
00082
00083     unsigned short GetBitSample() const { return BitSample; }
00084
00085     bool Initialized() const;
00086
00087 private:

```



```

00107 void Encode(std::istream &is, std::ostream &os);
00108
00109 protected:
00110     LookupTableInternal *Internal;
00111     unsigned short BitSample; // refer to the pixel type (not the bit size of LUT)
00112     bool IncompleteLUT:1;
00113 };
00114
00115 } // end namespace gdcm
00116
00117 #endif //GDCMLOOKUPTABLE_H

```

## 13.359 gdcmMEC\_MR3.h File Reference

```
#include "gdcmPrivateTag.h"
```

Include dependency graph for gdcmMEC\_MR3.h:



### Classes

- class [gdcm::MEC\\_MR3](#)  
Class for [MEC\\_MR3](#).

### Namespaces

- namespace [gdcm](#)

## 13.360 gdcmMEC\_MR3.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMMEC_MR3_H
00015  #define GDCMMEC_MR3_H
00016
00017  #include "gdcmPrivateTag.h"
00018
00019  namespace gdcm {
00024  class GDCM_EXPORT MEC_MR3 {
00025  public:
00026    static bool Print(const char *src, size_t srclen);
00027
00030    static const PrivateTag &GetPMTFInformationDataTag();
00031
00034    static const PrivateTag &GetCanonMECMR3Tag();
00035
00038    static const PrivateTag &GetToshibaMECMR3Tag();
00039  };
00040
00041  } // end namespace gdcm
00042
00043  #endif // GDCMMEC_MR3_H

```

## 13.361 gdcmMeshPrimitive.h File Reference

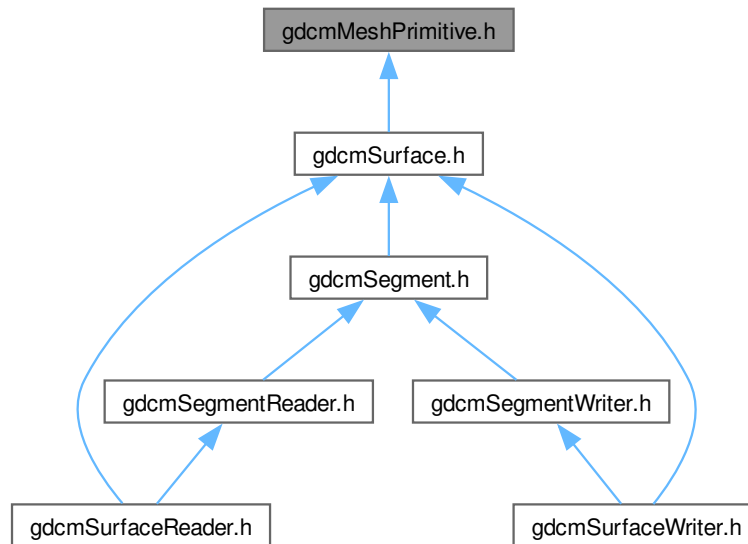
```
#include <gdcmObject.h>
```

```
#include <gdcmDataElement.h>
```

Include dependency graph for gdcmMeshPrimitive.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::MeshPrimitive](#)  
*This class defines surface mesh primitives.*

## Namespaces

- namespace [gdcm](#)

## 13.362 gdcmMeshPrimitive.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014
00015 #ifndef GDCMMESHPRIMITIVE_H

```

```
00016 #define GDCMMESHPRIMITIVE_H
00017
00018 #include <gdcmObject.h>
00019 #include <gdcmDataElement.h>
00020
00021 namespace gdcm
00022 {
00023
00030 class GDCM_EXPORT MeshPrimitive : public Object
00031 {
00032 public:
00033
00034     typedef std::vector< DataElement > PrimitivesData;
00035
00041     typedef enum {
00042         VERTEX = 0,
00043         EDGE,
00044         TRIANGLE,
00045         TRIANGLE_STRIP,
00046         TRIANGLE_FAN,
00047         LINE,
00048         FACET,
00049         MPType_END
00050     } MPType;
00051
00052     static const char * GetMPTypeString(const MPType type);
00053
00054     static MPType GetMPType(const char * type);
00055
00056     MeshPrimitive();
00057
00058     ~MeshPrimitive() override;
00059
00060     MPType GetPrimitiveType() const;
00061     void SetPrimitiveType(const MPType type);
00062
00063     const DataElement & GetPrimitiveData() const;
00064     DataElement & GetPrimitiveData();
00065     void SetPrimitiveData(DataElement const & de);
00066
00067     const PrimitivesData & GetPrimitivesData() const;
00068     PrimitivesData & GetPrimitivesData();
00069     void SetPrimitivesData(PrimitivesData const & DEs);
00070
00071     const DataElement & GetPrimitiveData(const unsigned int idx) const;
00072     DataElement & GetPrimitiveData(const unsigned int idx);
00073     void SetPrimitiveData(const unsigned int idx, DataElement const & de);
00074     void AddPrimitiveData(DataElement const & de);
00075
00076     unsigned int GetNumberOfPrimitivesData() const;
00077
00078 protected:
00079
00080     // Use to define tag where PrimitiveData will be put.
00081     MPType PrimitiveType;
00082
00083     // PrimitiveData contains point index list.
00084     // It shall have 1 or 1-n DataElement following PrimitiveType.
00085     PrimitivesData PrimitiveData;
00086 };
00087
00088 }
00089
00090 #endif // GDCMMESHPRIMITIVE_H
```

## 13.363 gdcmOrientation.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmOrientation.h:



### Classes

- class `gdcm::Orientation`  
class to handle `Orientation`

### Namespaces

- namespace `gdcm`

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Orientation &o)`

## 13.364 gdcmOrientation.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00008
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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/

```

```

00014 #ifndef GDCMORIENTATION_H
00015 #define GDCMORIENTATION_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021
00025 class GDCM_EXPORT Orientation
00026 {
00027     friend std::ostream& operator<<(std::ostream &_os, const Orientation &o);
00028 public:
00029     Orientation();
00030     ~Orientation() = default;
00031
00033     void Print(std::ostream &) const;
00034
00035     typedef enum {
00036         UNKNOWN,
00037         AXIAL,
00038         CORONAL,
00039         SAGITTAL,
00040         OBLIQUE
00041     } OrientationType;
00042
00045     static OrientationType GetType(const double dircos[6]);
00046
00048     static void SetObliquityThresholdCosineValue(double val);
00049     static double GetObliquityThresholdCosineValue();
00050
00052     static const char *GetLabel(OrientationType type);
00053
00054 protected:
00055     static char GetMajorAxisFromPatientRelativeDirectionCosine(double x, double y, double z);
00056
00057 private:
00058     static double ObliquityThresholdCosineValue;
00059 };
00060 //-----
00061 inline std::ostream& operator<<(std::ostream &os, const Orientation &o)
00062 {
00063     o.Print( os );
00064     return os;
00065 }
00066
00067 } // end namespace gdcm
00068
00069 #endif //GDCMORIENTATION_H

```

## 13.365 gdcmOverlay.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmObject.h"

```

```

graph TD
    gdcmOverlay.h --> gdcmObject.h
    gdcmOverlay.h --> gdcmTypes.h
    gdcmObject.h --> gdcmTypes.h
    gdcmObject.h --> assert.h
    gdcmObject.h --> iostream
    gdcmTypes.h --> gdcmConfigure.h
    gdcmTypes.h --> gdcmWin32.h
    gdcmTypes.h --> gdcmLegacyMacro.h
    gdcmTypes.h --> cstdint
    gdcmTypes.h --> gdcmTrace.h
    gdcmLegacyMacro.h --> gdcmException.h
    gdcmLegacyMacro.h --> gdcmTrace.h
    gdcmException.h --> cstdlib
    gdcmException.h --> exception
    gdcmException.h --> sstream
    gdcmException.h --> stdexcept
    gdcmException.h --> string
    gdcmException.h --> cassert
    gdcmException.h --> iosfwd
    gdcmException.h --> gdcmSystem.h
    gdcmTrace.h --> cstdint
    gdcmTrace.h --> iosfwd
    gdcmTrace.h --> gdcmSystem.h
    gdcmSystem.h --> gdcmTrace.h
  
```

[illegible]

- class `gdcm::Overlay`  
*Overlay* class.

- namespace **gdcm**

[Go to the documentation of this file.](#)

Generated by Doxygen

```

00003 Program: GDCM (Grassroots DICOM). A DICOM library
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00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMOVERLAY_H
00015 #define GDCMOVERLAY_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmObject.h"
00019
00020 namespace gdcm
00021 {
00022
00023 class OverlayInternal;
00024 class ByteValue;
00025 class DataSet;
00026 class DataElement;
00038 class GDCM_EXPORT Overlay : public Object
00039 {
00040 public:
00041 Overlay();
00042 ~Overlay() override;
00044 void Print(std::ostream &) const override;
00045
00047 void Update(const DataElement & de);
00048
00050 void SetGroup(unsigned short group);
00052 unsigned short GetGroup() const;
00054 void SetRows(unsigned short rows);
00056 unsigned short GetRows() const;
00058 void SetColumns(unsigned short columns);
00060 unsigned short GetColumns() const;
00062 void SetNumberOfFrames(unsigned int numberofframes);
00064 void SetDescription(const char* description);
00066 const char *GetDescription() const;
00067 typedef enum {
00068 Invalid = 0,
00069 Graphics = 1,
00070 ROI = 2
00071 } OverlayType;
00073 void SetType(const char* type);
00075 const char *GetType() const;
00076 OverlayType GetTypeAsEnum() const;
00077 static const char *GetOverlayTypeAsString(OverlayType ot);
00078 static OverlayType GetOverlayTypeFromString(const char *);
00080 void SetOrigin(const signed short origin[2]);
00082 const signed short * GetOrigin() const;
00084 void SetFrameOrigin(unsigned short frameorigin);
00086 void SetBitsAllocated(unsigned short bitsallocated);
00088 unsigned short GetBitsAllocated() const;
00090 void SetBitPosition(unsigned short bitposition);
00092 unsigned short GetBitPosition() const;
00093
00095 void SetOverlay(const char *array, size_t length);
00096
00102 bool GrabOverlayFromPixelData(DataSet const &ds);
00103
00106 const ByteValue &GetOverlayData() const;
00107
00109 bool IsEmpty() const;
00110
00112 bool IsZero() const;
00113
00115 bool IsInPixelData() const;
00116
00118 void IsInPixelData(bool b);
00119
00121 void Decompress(std::ostream &os) const;
00122
00125 size_t GetUnpackBufferLength() const;
00126
00129 bool GetUnpackBuffer(char *buffer, size_t len) const;
00130
00131 Overlay(Overlay const &ov);

```



```

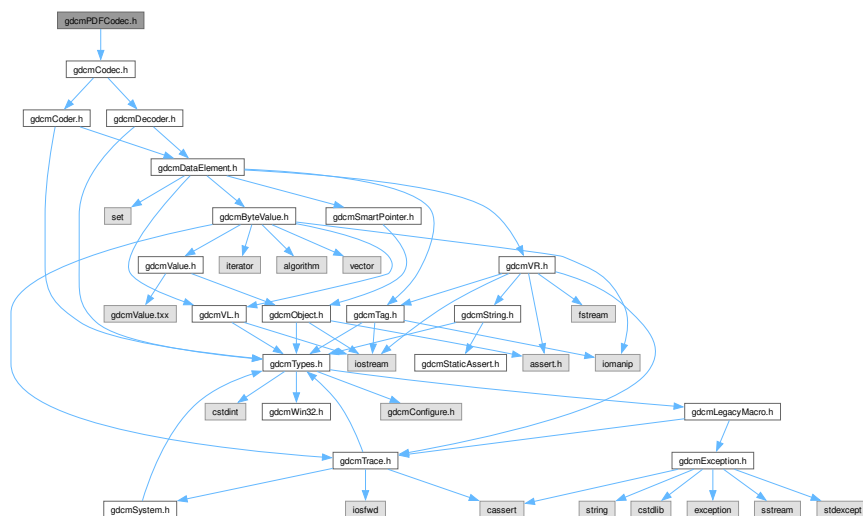
00132     Overlay &operator=(Overlay const &ov);
00133
00134 private:
00135     OverlayInternal *Internal;
00136 };
00137
00138 } // end namespace gdcm
00139
00140 #endif //GDCMOVERLAY_H

```

## 13.367 gdcmPDFCodec.h File Reference

```
#include "gdcmCodec.h"
```

Include dependency graph for gdcmPDFCodec.h:



### Classes

- class [gdcm::PDFCodec](#)  
*PDFCodec* class.

### Namespaces

- namespace [gdcm](#)

## 13.368 gdcmPDFCodec.h

[Go to the documentation of this file.](#)

```

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00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPDFCODEC_H
00015 #define GDCMPDFCODEC_H
00016
00017 #include "gdcmCodec.h"
00018
00019 namespace gdcm
00020 {
00021
00025 class GDCM_EXPORT PDFCodec : public Codec
00026 {
00027 public:
00028   PDFCodec();
00029   ~PDFCodec() override;
00030   bool CanCode(TransferSyntax const &) const override { return false; }
00031   bool CanDecode(TransferSyntax const &) const override { return false; }
00032   bool Decode(DataElement const &is, DataElement &os) override;
00033 };
00034
00035 } // end namespace gdcm
00036
00037 #endif //GDCMPDFCODEC_H

```

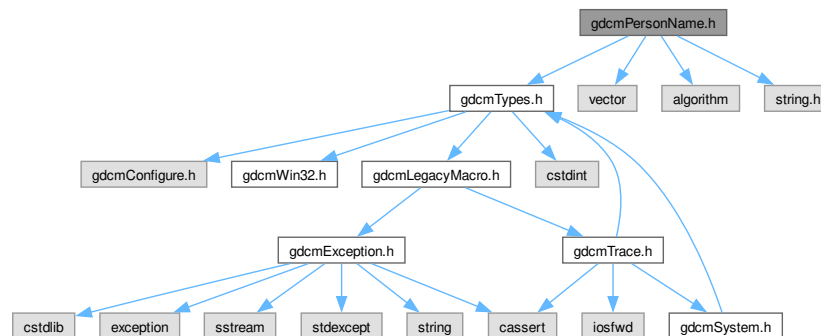
## 13.369 gdcmPersonName.h File Reference

```

#include "gdcmTypes.h"
#include <vector>
#include <algorithm>
#include <string.h>

```

Include dependency graph for gdcmPersonName.h:



**Classes**

- class [gdcm::PersonName](#)  
*PersonName* class.

**Namespaces**

- namespace [gdcm](#)

**13.370 gdcmPersonName.h**

[Go to the documentation of this file.](#)

```

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00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014
00015 #ifndef GDCMPERSONNAME_H
00016 #define GDCMPERSONNAME_H
00017
00018 #include "gdcmTypes.h"
00019 #include <vector>
00020 #include <algorithm> // std::min
00021 #include <string.h> // strlen
00022
00023 namespace gdcm
00024 {
00025
00026     class GDCM_EXPORT PersonName
00027     {
00028     public:
00029         static const unsigned int MaxNumberOfComponents = 5;
00030         static const unsigned int MaxLength = 64;
00031         char Component[MaxNumberOfComponents][MaxLength+1];
00032         static const char Separator = '^';
00033         static const char Padding = ' ';
00034
00035         unsigned int GetNumberOfComponents() const {
00036             unsigned int r = 0;
00037             for(unsigned int i = 0; i < 5; ++i) {
00038                 if( *Component[i] != '\0' ) r = i;
00039             }
00040             return r+1;
00041         }
00042         unsigned int GetMaxLength() const { return MaxLength; }
00043         void SetBlob(const std::vector<char>& v) {
00044             (void)v;
00045             //assert(0); //TODO
00046         }
00047         void SetComponents(const char *comp1 = "",
00048             const char *comp2 = "",
00049             const char *comp3 = "",
00050             const char *comp4 = "",
00051             const char *comp5 = "") {
00052             const char *components[5] = { comp1, comp2, comp3, comp4, comp5 };
00053             SetComponents( components );
00054         }
00055         void SetComponents(const char *components[]) {
00056             if( components )
00057                 for(unsigned int i = 0; i < 5; ++i) {

```

```

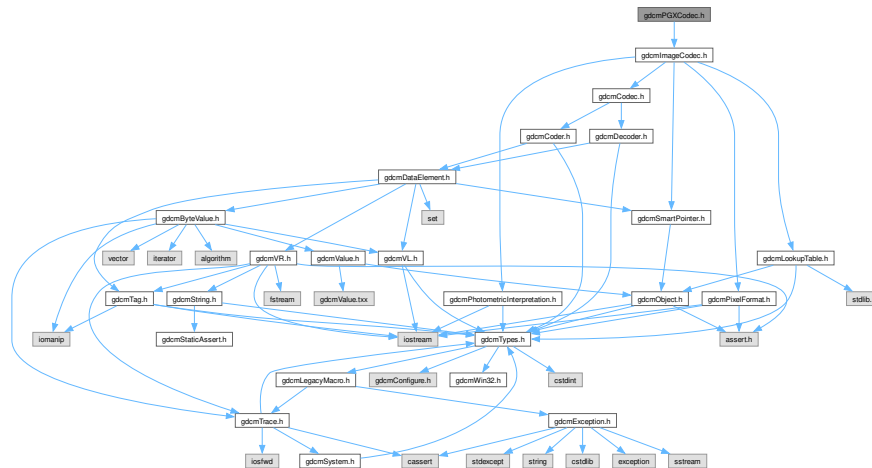
00061         if( components[i] && strlen(components[i]) < GetMaxLength() )
00062             strcpy(Component[i], components[i]);
00063         assert( strlen(Component[i]) < GetMaxLength() );
00064     }
00065 }
00066 void Print(std::ostream &os) const
00067 {
00068     //os << "Family Name Complex: " << Component[0] << std::endl;
00069     //os << "Given Name Complex: " << Component[1] << std::endl;
00070     //os << "Middle Name      : " << Component[2] << std::endl;
00071     //os << "Name Suffix       : " << Component[3] << std::endl;
00072     //os << "Name Prefix      : " << Component[4] << std::endl;
00073     os << Component[0] << '\n';
00074     os << Component[1] << '\n';
00075     os << Component[2] << '\n';
00076     os << Component[3] << '\n';
00077     os << Component[4];
00078 }
00079 };
00080
00081 } // end namespace gdcmm
00082
00083 #endif //GDCMPERSONNAME_H

```

## 13.371 gdcmmPGXCodec.h File Reference

#include "gdcmmImageCodec.h"

Include dependency graph for gdcmmPGXCodec.h:



### Classes

- class [gdcmm::PGXCodec](#)  
Class to do PGX.

### Namespaces

- namespace [gdcmm](#)

## 13.372 gdcmPGXCodec.h

[Go to the documentation of this file.](#)

```

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00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPGXCODEC_H
00015 #define GDCMPGXCODEC_H
00016
00017 #include "gdcmImageCodec.h"
00018
00019 namespace gdcm
00020 {
00021
00022 class GDCM_EXPORT PGXCodec : public ImageCodec
00023 {
00024 public:
00025 PGXCodec();
00026 ~PGXCodec() override;
00027 bool CanDecode(TransferSyntax const &ts) const override;
00028 bool CanCode(TransferSyntax const &ts) const override;
00029
00030 bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
00031 ImageCodec * Clone() const override;
00032
00033 bool Read(const char *filename, DataElement &out) const;
00034 bool Write(const char *filename, const DataElement &out) const;
00035 private:
00036 };
00037
00038 } // end namespace gdcm
00039
00040 #endif //GDCMPGXCODEC_H

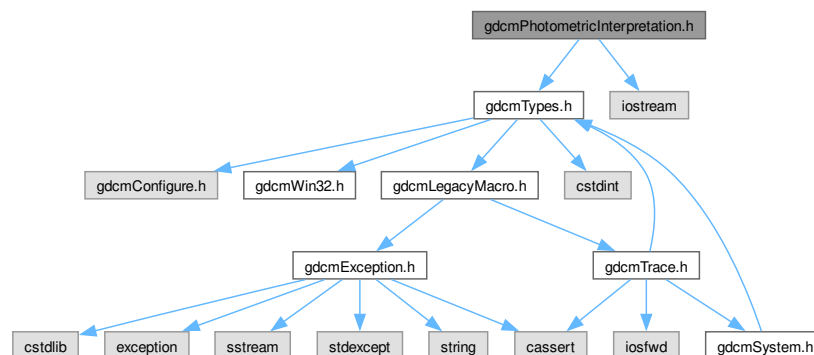
```

## 13.373 gdcmPhotometricInterpretation.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <iostream>
```

Include dependency graph for gdcmPhotometricInterpretation.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::PhotometricInterpretation](#)  
Class to represent an *PhotometricInterpretation*.

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const PhotometricInterpretation &val)`

## 13.374 gdcmPhotometricInterpretation.h

[Go to the documentation of this file.](#)

```

00001 /*=====
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00012
00013   =====*/
00014
00015 #ifndef GDCMPHOTOMETRICINTERPRETATION_H
00016 #define GDCMPHOTOMETRICINTERPRETATION_H
00017
00018 #include "gdcmTypes.h"
00019 #include <iostream>
00020
00021 namespace gdcm
00022 {
00023
00024   class TransferSyntax;
00028   class GDCM_EXPORT PhotometricInterpretation
00029   {
00030   public:
00031     typedef enum {
00032       UNKNOWN = 0,
00033       MONOCHROME1,
00034       MONOCHROME2,
00035       PALETTE_COLOR,
00036       RGB,

```

```

00037     HSV,
00038     ARGB, // retired
00039     CMYK,
00040     YBR_FULL,
00041     YBR_FULL_422,
00042     YBR_PARTIAL_422,
00043     YBR_PARTIAL_420,
00044     YBR_ICT,
00045     YBR_RCT,
00046     // PALETTE_COLOR ?
00047     // MONOCHROME = MONOCHROME1 | MONOCHROME2,
00048     // COLOR = RGB | HSV | ARGB | CMYK | YBR_FULL | YBR_FULL_422 | YBR_PARTIAL_422 | YBR_PARTIAL_420 |
YBR_ICT | YBR_RCT,
00049     PI_END // Helpful for internal implementation
00050 } PType; // PhotometricInterpretationType
00051
00052 PhotometricInterpretation(PType pi = UNKNOWN):PIField(pi) {}
00053
00054 static const char *GetPIString(PType pi);
00055
00056 const char *GetString() const;
00057
00058 // You need to make sure end of string is \0
00059 static PType GetPType(const char *pi);
00060
00061 static bool IsRetired(PType pi);
00062
00063 bool IsLossy() const;
00064 bool IsLossless() const;
00065
00066 unsigned short GetSamplesPerPixel() const;
00067
00068 // TODO
00069 // not all PhotometricInterpretation are allowed for compressed Transfer
00070 // syntax
00071 // static bool IsAllowedForCompressedTS(PType pi);
00072
00073 friend std::ostream& operator<(std::ostream& os, const PhotometricInterpretation& pi);
00074
00075 operator PType () const { return PIField; }
00076
00077 PType GetType () const { return PIField; }
00078
00079 // Will return whether current PhotometricInterpretation is the same Color Space as input:
00080 // eg. RGB and YBR_RCT are
00081 bool IsSameColorSpace( PhotometricInterpretation const &pi ) const;
00082
00083 //static PType GetEquivalent(TransferSyntax const &ts);
00084
00085 private:
00086 PType PIField;
00087 };
00088 //-----
00089 inline std::ostream& operator<(std::ostream& os, const PhotometricInterpretation &val)
00090 {
00091     const char *s = PhotometricInterpretation::GetPIString(val.PIField);
00092     os << (s ? s : "");
00093     return os;
00094 }
00095
00096
00097
00098 } // end namespace gdcm
00099
00100 #endif //GDCMPHOTOMETRICINTERPRETATION_H

```

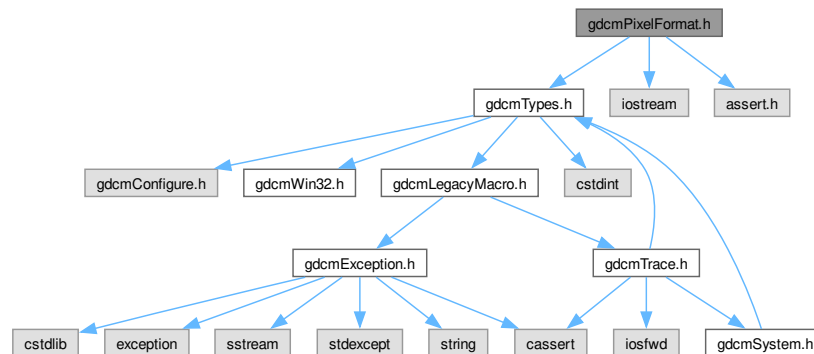
## 13.375 gdcmPixelFormat.h File Reference

```

#include "gdcmTypes.h"
#include <iostream>
#include <assert.h>

```

Include dependency graph for `gdcmPixelFormat.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::PixelFormat`  
*[PixelFormat](#)*.

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const PixelFormat &pf)`



## 13.376 gdcmPixelFormat.h

[Go to the documentation of this file.](#)

```

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00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014
00015 #ifndef GDCMPIXELFORMAT_H
00016 #define GDCMPIXELFORMAT_H
00017
00018 #include "gdcmTypes.h"
00019 #include <iostream>
00020 #include <assert.h>
00021
00022 namespace gdcm
00023 {
00024
00025   class TransferSyntax;
00026
00045   class GDCM_EXPORT PixelFormat
00046   {
00047   friend class Bitmap;
00048   friend std::ostream& operator<<(std::ostream &_os, const PixelFormat &pf);
00049   public:
00050   // When adding a type please add its dual type (its unsigned counterpart)
00051   typedef enum {
00052     UINT8,
00053     INT8,
00054     UINT12,
00055     INT12,
00056     UINT16,
00057     INT16,
00058     UINT32, // For some DICOM files (RT or SC)
00059     INT32,  // " "
00060     UINT64, // Needed when input is 32bits + intercept/slope (incomplete support)
00061     INT64,  // " "
00062     FLOAT16, // sure why not...
00063     FLOAT32, // good ol' 'float'
00064     FLOAT64, // aka 'double'
00065     SINGLEBIT, // bool / monochrome
00066     UNKNOWN // aka BitsAllocated == 0 && PixelRepresentation == 0
00067   } ScalarType;
00068
00069   // default ctor:
00070   PixelFormat () : PixelFormat(1, 8, 8, 7, 0) {}
00071
00072   explicit PixelFormat (
00073     unsigned short samplesperpixel,
00074     unsigned short bitsallocated = 8,
00075     unsigned short bitsstored = 8,
00076     unsigned short highbit = 7,
00077     unsigned short pixelrepresentation = 0 ) :
00078     SamplesPerPixel(samplesperpixel),
00079     BitsAllocated(bitsallocated),
00080     BitsStored(bitsstored),
00081     HighBit(highbit),
00082     PixelRepresentation(pixelrepresentation) {}
00083   // helper, for the common case
00084   PixelFormat(ScalarType st);
00085
00086   // For transparency of use
00087   operator ScalarType() const { return GetScalarType(); }
00088
00091   unsigned short GetSamplesPerPixel() const;
00092   void SetSamplesPerPixel(unsigned short spp)
00093   {
00094     gdcmAssertMacro( spp <= 4 );
00095     SamplesPerPixel = spp;

```

```

00096     assert( SamplesPerPixel == 1 || SamplesPerPixel == 3 || SamplesPerPixel == 4 );
00097 }
00098
00100 unsigned short GetBitsAllocated() const
00101 {
00102     return BitsAllocated;
00103 }
00104 void SetBitsAllocated(unsigned short ba)
00105 {
00106     if( ba )
00107     {
00108         switch( ba )
00109         {
00110             /* some devices (FUJIFILM CR + MONO1) incorrectly set BitsAllocated/BitsStored
00111              * as bitmask instead of value. Do what they mean instead of what they say.
00112              */
00113             case 0xffff: ba = 16; break;
00114             case 0x0fff: ba = 12; break;
00115             case 0x00ff: ba = 8; break;
00116         }
00117         BitsAllocated = ba;
00118         BitsStored = ba;
00119         HighBit = (unsigned short)(ba - 1);
00120     }
00121     else // Make the PixelFormat as UNKNOWN
00122     {
00123         BitsAllocated = 0;
00124         PixelRepresentation = 0;
00125     }
00126 }
00127
00129 unsigned short GetBitsStored() const
00130 {
00131     assert( BitsStored <= BitsAllocated );
00132     return BitsStored;
00133 }
00134 void SetBitsStored(unsigned short bs)
00135 {
00136     switch( bs )
00137     {
00138         /* see SetBitsAllocated for explanation
00139         */
00140         case 0xffff: bs = 16; break;
00141         case 0x0fff: bs = 12; break;
00142         case 0x00ff: bs = 8; break;
00143     }
00144     if( bs <= BitsAllocated && bs )
00145     {
00146         BitsStored = bs;
00147         SetHighBit( (unsigned short) (bs - 1) );
00148     }
00149 }
00150
00152 unsigned short GetHighBit() const
00153 {
00154     assert( HighBit < BitsStored );
00155     return HighBit;
00156 }
00157 void SetHighBit(unsigned short hb)
00158 {
00159     switch( hb )
00160     {
00161         /* broken implementations that use bitmask for BitsAllocated/Stored
00162          * nonetheless use (BitsStored-1) for HighBit. correct for this here.
00163          */
00164         case 0xffff: hb = 15; break;
00165         case 0x0ffe: hb = 11; break;
00166         case 0x00fe: hb = 7; break;
00167     }
00168     if( hb < BitsStored )
00169         HighBit = hb;
00170 }
00171
00173 unsigned short GetPixelRepresentation() const
00174 {
00175     return (unsigned short)(PixelRepresentation ? 1 : 0);
00176 }
00177 void SetPixelRepresentation(unsigned short pr)
00178 {
00179     PixelRepresentation = (unsigned short)(pr ? 1 : 0);
00180 }

```

```

00181
00183     ScalarType GetScalarType() const;
00184
00187     void SetScalarType(ScalarType st);
00188     const char *GetScalarTypeAsString() const;
00189
00195     uint8_t GetPixelSize() const;
00196
00198     void Print(std::ostream &os) const;
00199
00201     int64_t GetMin() const;
00202
00204     int64_t GetMax() const;
00205
00207     bool IsValid() const;
00208
00209     bool operator==(ScalarType st) const
00210     {
00211         return GetScalarType() == st;
00212     }
00213     bool operator!=(ScalarType st) const
00214     {
00215         return GetScalarType() != st;
00216     }
00217     bool operator==(const PixelFormat &pf) const
00218     {
00219         return
00220             SamplesPerPixel == pf.SamplesPerPixel &&
00221             BitsAllocated == pf.BitsAllocated &&
00222             BitsStored == pf.BitsStored &&
00223             HighBit == pf.HighBit &&
00224             PixelRepresentation == pf.PixelRepresentation;
00225     }
00226     bool operator!=(const PixelFormat &pf) const
00227     {
00228         return
00229             SamplesPerPixel != pf.SamplesPerPixel ||
00230             BitsAllocated != pf.BitsAllocated ||
00231             BitsStored != pf.BitsStored ||
00232             HighBit != pf.HighBit ||
00233             PixelRepresentation != pf.PixelRepresentation;
00234     }
00235
00236     bool IsCompatible(const TransferSyntax &ts ) const;
00237 protected:
00239     bool Validate();
00240
00241 private:
00242     // D 0028|0002 [US] [Samples per Pixel] [1]
00243     unsigned short SamplesPerPixel;
00244     // D 0028|0100 [US] [Bits Allocated] [8]
00245     unsigned short BitsAllocated;
00246     // D 0028|0101 [US] [Bits Stored] [8]
00247     unsigned short BitsStored;
00248     // D 0028|0102 [US] [High Bit] [7]
00249     unsigned short HighBit;
00250     // D 0028|0103 [US] [Pixel Representation] [0]
00251     unsigned short PixelRepresentation;
00252 };
00253 //-----
00254 inline std::ostream& operator<(std::ostream &os, const PixelFormat &pf)
00255 {
00256     pf.Print( os );
00257     return os;
00258 }
00259
00260 } // end namespace gdcm
00261
00262 #endif //GDCMPIXELFORMAT_H

```

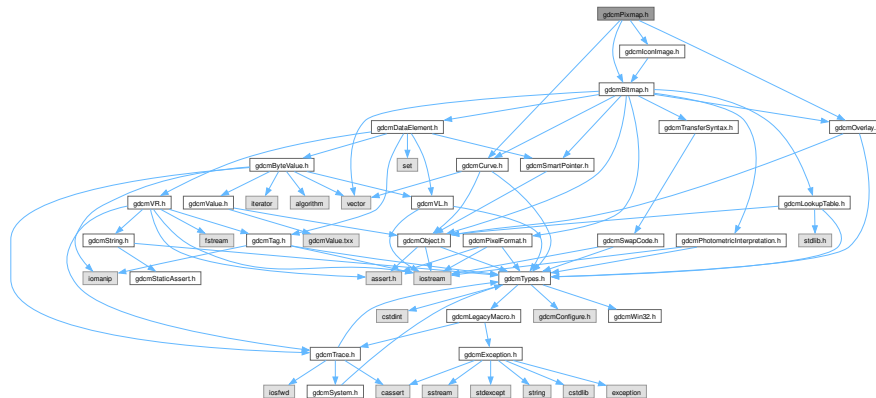
## 13.377 gdcmPixmap.h File Reference

```

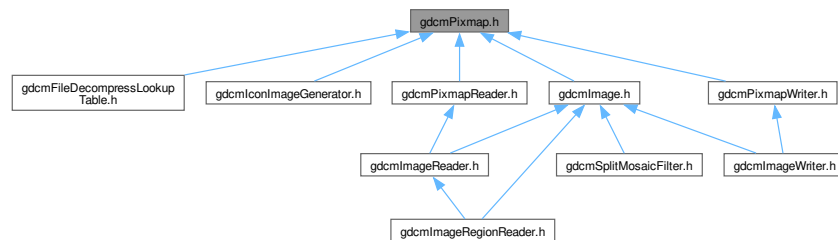
#include "gdcmBitmap.h"
#include "gdcmCurve.h"

```

```
#include "gdcmIconImage.h"
#include "gdcmOverlay.h"
```



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Pixmap`  
*Pixmap* class.

## Namespaces

- namespace **gdcm**

### 13.378 gdcmPixmap.h

[Go to the documentation of this file.](#)

00001 / ★=====

00002

```

00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009       This software is distributed WITHOUT ANY WARRANTY; without even
00010       the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011       PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014   #ifndef GDCMPIXMAP_H
00015   #define GDCMPIXMAP_H
00016
00017   #include "gdcmBitmap.h"
00018   #include "gdcmCurve.h"
00019   #include "gdcmIconImage.h"
00020   #include "gdcmOverlay.h"
00021
00022   namespace gdcm
00023   {
00024
00025   class GDCM_EXPORT Pixmap : public Bitmap
00026   {
00027   public:
00028       Pixmap();
00029       ~Pixmap() override;
00030       void Print(std::ostream &) const override;
00031
00032       bool AreOverlaysInPixelData() const override;
00033       bool UnusedBitsPresentInPixelData() const override;
00034
00035       Curve& GetCurve(size_t i = 0) {
00036           assert( i < Curves.size() );
00037           return Curves[i];
00038       }
00039       const Curve& GetCurve(size_t i = 0) const {
00040           assert( i < Curves.size() );
00041           return Curves[i];
00042       }
00043       size_t GetNumberOfCurves() const { return Curves.size(); }
00044       void SetNumberOfCurves(size_t n) { Curves.resize(n); }
00045
00046       Overlay& GetOverlay(size_t i = 0) {
00047           assert( i < Overlays.size() );
00048           return Overlays[i];
00049       }
00050       const Overlay& GetOverlay(size_t i = 0) const {
00051           assert( i < Overlays.size() );
00052           return Overlays[i];
00053       }
00054       size_t GetNumberOfOverlays() const { return Overlays.size(); }
00055       void SetNumberOfOverlays(size_t n) { Overlays.resize(n); }
00056       void RemoveOverlay(size_t i) {
00057           assert( i < Overlays.size() );
00058           Overlays.erase( Overlays.begin() + i );
00059       }
00060
00061       const IconImage &GetIconImage() const { return *Icon; }
00062       IconImage &GetIconImage() { return *Icon; }
00063       void SetIconImage(IconImage const &ii) { Icon = ii; }
00064
00065   private:
00066   protected:
00067       std::vector<Overlay> Overlays;
00068       std::vector<Curve> Curves;
00069       SmartPointer<IconImage> Icon;
00070   };
00071
00072   } // end namespace gdcm
00073
00074   #endif //GDCMPIXMAP_H

```



## 13.380 gdcmPixmapReader.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMPIXMAPREADER_H
00015  #define GDCMPIXMAPREADER_H
00016
00017  #include "gdcmReader.h"
00018  #include "gdcmPixmap.h"
00019
00020  namespace gdcm
00021  {
00022
00023  class ByteValue;
00024  class MediaStorage;
00039  class GDCM_EXPORT PixmapReader : public Reader
00040  {
00041  public:
00042      PixmapReader();
00043      ~PixmapReader() override; //needs to be virtual to ensure lack of memory leaks
00044
00048      bool Read() override;
00050
00051      // Following methods are valid only after a call to 'Read'
00052
00054      const Pixmap& GetPixmap() const;
00055      Pixmap& GetPixmap();
00056      //void SetPixamp(Pixmap const &pix);
00057
00058  protected:
00059      bool ReadImageInternal(MediaStorage const &ms, bool handlepixeldata = true);
00060      virtual bool ReadImage(MediaStorage const &ms);
00061      virtual bool ReadACRNEMAImage();
00062
00063      SmartPointer<Pixmap> PixelData;
00064  };
00065
00070
00071  } // end namespace gdcm
00072
00073  #endif //GDCMPIXMAPREADER_H

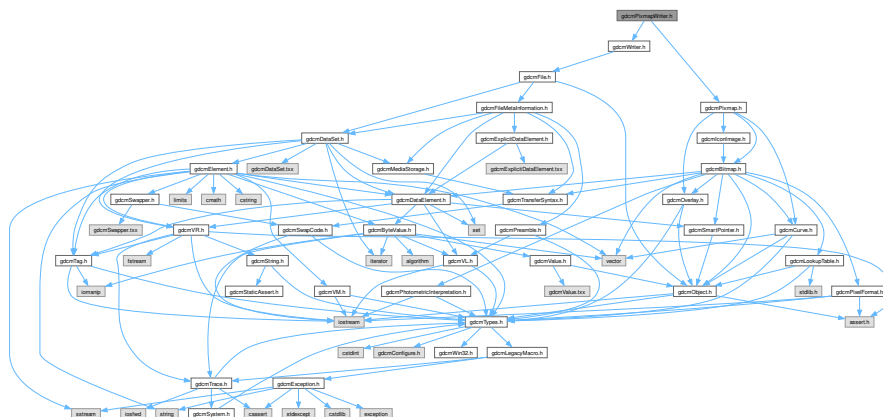
```





### 13.383 gdcmPixmapWriter.h File Reference

Include dependency graph for gdcmPidxmapWriter.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcmap::PixmapWriter](#)  
*PixmapWriter*.

## Namespaces

- namespace [gdcmap](#)

## 13.384 gdcmapPixmapWriter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
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00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPIXMAPWRITER_H
00015 #define GDCMPIXMAPWRITER_H
00016
00017 #include "gdcmapWriter.h"
00018 #include "gdcmapPixmap.h"
00019
00020 namespace gdcmap
00021 {
00022
00023   class StreamImageWriter;
00024   class Pixmap;
00025   class GDCM_EXPORT PixmapWriter : public Writer
00026   {
00027   public:
00028     PixmapWriter();
00029     ~PixmapWriter() override;
00030
00031   };
00032
00033 }
00034
00035 #endif
00036
00037
00038
00039
00040
00041

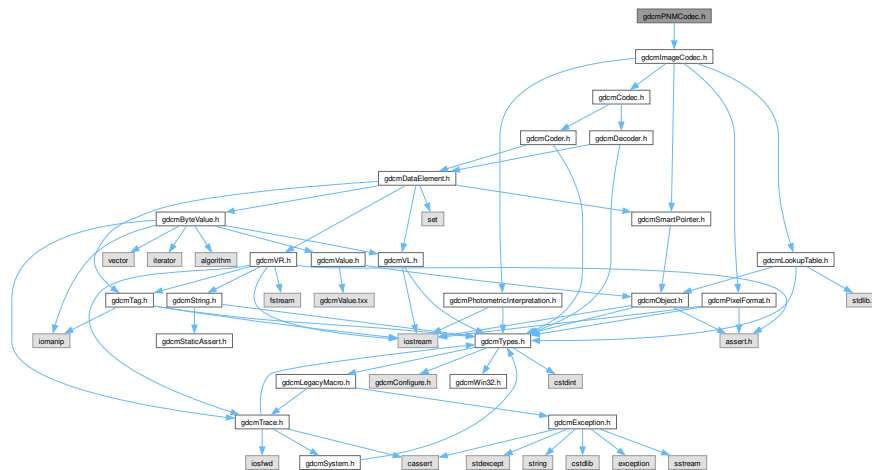
```

```
00042 const Pixmap& GetPixmap() const { return *PixelData; }
00043 Pixmap& GetPixmap() { return *PixelData; } // FIXME
00044 void SetPixmap(Pixmap const &img);
00045
00046 virtual const Pixmap& GetImage() const { return *PixelData; }
00050 virtual Pixmap& GetImage() { return *PixelData; } // FIXME
00051 virtual void SetImage(Pixmap const &img);
00052
00054 bool Write() override; // Execute()
00055
00056 protected:
00057 void DoIconImage(DataSet & ds, Pixmap const & image);
00058 bool PrepareWrite( MediaStorage const & refs );
00059
00060     SmartPointer<Pixmap> PixelData;
00061 };
00062
00063
00064 } // end namespace gdcm
00069
00070 #endif //GDCMPIXMAPWRITER_H
```

### 13.385 gdcnPnmCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for gdcnPnmCodec.h:



## Classes

- class `gdcm::PNMCodec`  
*Class to do PNM.*

## Namespaces

- namespace **gdcm**

## 13.386 gdcmPNMCodec.h

[Go to the documentation of this file.](#)

```

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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPNMCODEC_H
00015 #define GDCMPNMCODEC_H
00016
00017 #include "gdcmImageCodec.h"
00018
00019 namespace gdcm
00020 {
00021
00022     class GDCM_EXPORT PNMCodec : public ImageCodec
00023     {
00024     public:
00025         PNMCodec();
00026         ~PNMCodec() override;
00027         bool CanDecode(TransferSyntax const &ts) const override;
00028         bool CanCode(TransferSyntax const &ts) const override;
00029
00030         unsigned long GetBufferLength() const { return BufferLength; }
00031         void SetBufferLength(unsigned long l) { BufferLength = l; }
00032
00033         bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
00034         ImageCodec * Clone() const override;
00035
00036         bool Read(const char *filename, DataElement &out) const;
00037         bool Write(const char *filename, const DataElement &out) const;
00038         //bool Write(const char *filename);
00039     private:
00040         unsigned long BufferLength;
00041     };
00042
00043 } // end namespace gdcm
00044
00045 #endif //GDCMPNMCODEC_H

```

## 13.387 gdcmPrinter.h File Reference

```

#include "gdcmFile.h"
#include "gdcmDataElement.h"

```

```
graph BT; gdcDictPrinter[gdcmDictPrinter.h] --> gdcPrinter[gdcmPrinter.h]; gdcDumper[gdcmDumper.h] --> gdcPrinter
```

- class `gdcn::Printer`  
*Printer* class.

- namespace **gdcm**

## 13.388 gdcmPrinter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
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00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPRINTER_H
00015 #define GDCMPRINTER_H
00016
00017 // TODO Class to implement printing
00018 // Since DICOM does printing ?
00019 // Also I would like to encapsulate the IsCharacterPrintable thing
00020 // (to avoid printing \0 and other weird characters)
00021 // \todo I still need to implement skipping of group (shadow)
00022 // need to implement longer field to read
00023
00024 /*
00025  * Output:
00026  * For ASCII:
00027  * Typically will look like:
00028  * [ORIGINAL\PRIMARY\OTHER]
00029  * If a non printable character is found: RED and INVERSE is used:
00030  * [
00031  *
00032  * when the VR is not found (file or dict), we check if we can print the output:
00033  * on success ASCII mode is used, on failure the output is printed a series of bytes
00034  *
00035  * Special case when the data element is empty:
00036  * INVERSE < (no value)
00037  *
00038  * retired public element are printed in red and underline
00039  * unknown private element are printed in RED followed by 'UNKNOWN'
00040  *
00041  * Correct VR is printed in green just after the found VR
00042  *
00043  * length of data element is printed in bytes, followed by the VM, a green VM is appended
00044  * if this is not compatible
00045  */
00046 #include "gdcmFile.h"
00047 #include "gdcmDataElement.h"
00048
00049 namespace gdcm
00050 {
00051
00052 class DataSet;
00053 class DictEntry;
00054 class Dicts;
00055 // It's a sink there is no output
00056 class GDCM_EXPORT Printer
00057 {
00058 public:
00059     Printer();
00060     ~Printer() = default;
00061
00062     void SetFile(File const &f) { F = &f; }
00063
00064     void SetColor(bool c);
00065
00066     typedef enum {
00067         VERBOSE_STYLE = 0, // GDCM Legacy VERBOSE one
00068         CONDENSED_STYLE, //
00069         // Ok I am missing voc here ...better naming would be nice
00070         XML, //
00071         CXX
00072     } PrintStyles;
00073
00074     void SetStyle(PrintStyles ps) {
00075         PrintStyle = ps;
00076     }
00077
00078
00079
00080
00081

```

```

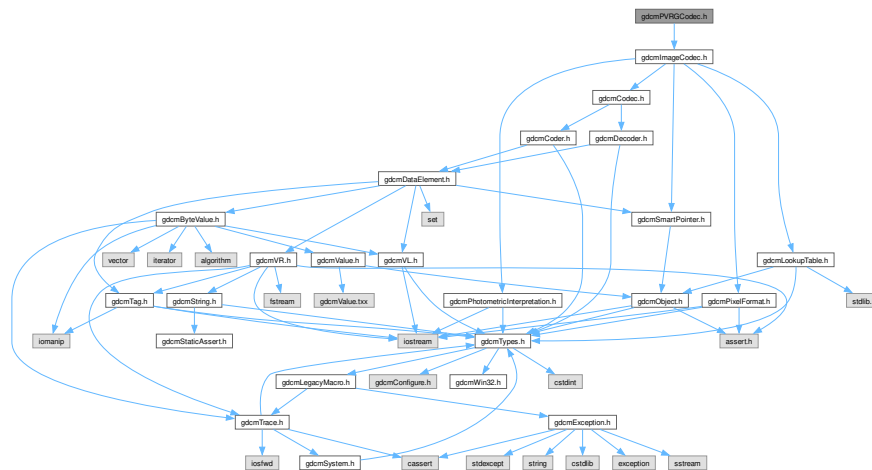
00082     }
00084     PrintStyles GetPrintStyle() const {
00085         return PrintStyle;
00086     }
00087
00089     void Print(std::ostream& os);
00090
00092     void PrintDataSet(const DataSet &ds, std::ostream& os, const std::string &s = "");
00093
00094 protected:
00095     VR PrintDataElement(std::ostringstream &os, const Dicts &dicts, const DataSet &ds, const DataElement
&de, std::ostream &out, std::string const &indent );
00096 void PrintSQ(const SequenceOfItems *sqi, std::ostream &os, std::string const &indent);
00097
00098     PrintStyles PrintStyle;
00099     const File *F;
00100     VL MaxPrintLength;
00101 };
00102
00103 } // end namespace gdcm
00104
00105 #endif //GDCMPRINTER_H

```

## 13.389 gdcmPVRGCodec.h File Reference

#include "gdcmImageCodec.h"

Include dependency graph for gdcmPVRGCodec.h:



### Classes

- class [gdcm::PVRGCodec](#)  
*PVRGCodec.*

### Namespaces

- namespace [gdcm](#)

## 13.390 gdcmPVRGCodec.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPVRGCODEC_H
00015 #define GDCMPVRGCODEC_H
00016
00017 #include "gdcmImageCodec.h"
00018
00019 namespace gdcm
00020 {
00021
00034 class PVRGCodec : public ImageCodec
00035 {
00036 public:
00037   PVRGCodec();
00038   ~PVRGCodec() override;
00039   bool CanDecode(TransferSyntax const &ts) const override;
00040   bool CanCode(TransferSyntax const &ts) const override;
00041
00042   bool Decode(DataElement const &is, DataElement &os) override;
00043   bool Code(DataElement const &in, DataElement &out) override;
00044   void SetLossyFlag( bool l );
00045
00046   ImageCodec * Clone() const override;
00047 private:
00048 };
00049
00050 } // end namespace gdcm
00051
00052 #endif //GDCMPVRGCODEC_H
```





```

00020 {
00021
00022 class RAWInternals;
00026 class GDCM_EXPORT RAWCodec : public ImageCodec
00027 {
00028 public:
00029 RAWCodec();
00030 ~RAWCodec() override;
00031 bool CanCode(TransferSyntax const &ts) const override;
00032 bool CanDecode(TransferSyntax const &ts) const override;
00033 bool Decode(DataElement const &is, DataElement &os) override;
00034 bool Code(DataElement const &in, DataElement &out) override;
00035
00036 bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
00037 ImageCodec * Clone() const override;
00038
00041 bool DecodeBytes(const char* inBytes, size_t inBufferLength,
00042 char* outBytes, size_t inOutBufferLength);
00043
00044 protected:
00045 bool DecodeByStreams(std::istream &is, std::ostream &os) override;
00046
00047 private:
00048 RAWInternals *Internals;
00049 };
00050
00051 } // end namespace gdcmm
00052
00053 #endif // GDCMRAWCODEC_H

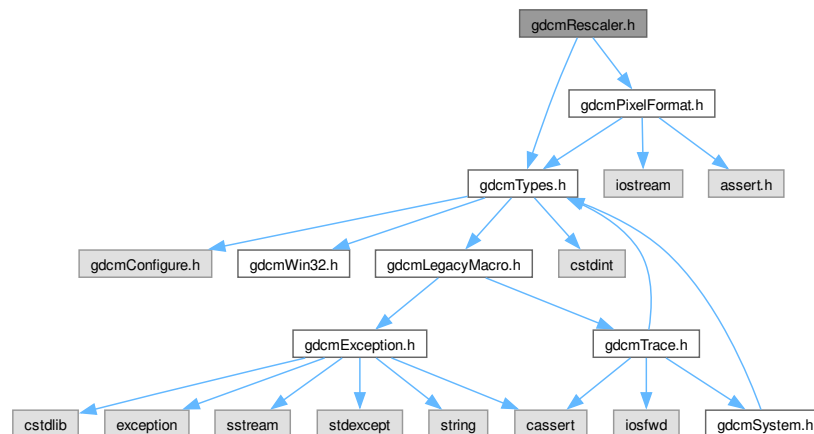
```

## 13.393 gdcmmRescaler.h File Reference

```
#include "gdcmmTypes.h"
```

```
#include "gdcmmPixelFormat.h"
```

Include dependency graph for gdcmmRescaler.h:



## Classes

- class `gdcmm::Rescaler`

*Rescale class.*

## Namespaces

- namespace `gdcm`

## 13.394 gdcmRescaler.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMRESCALER_H
00015 #define GDCMRESCALER_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmPixelFormat.h"
00019
00020 namespace gdcm
00021 {
00022
00023     class GDCM_EXPORT Rescaler
00024     {
00025     public:
00026         Rescaler(): Intercept(0), Slope(1), PF(PixelFormat::UNKNOWN), TargetScalarType(PixelFormat::UNKNOWN),
00027             ScalarRangeMin(0), ScalarRangeMax(0), UseTargetPixelType(false) {}
00028         ~Rescaler() = default;
00029
00030         bool Rescale(char *out, const char *in, size_t n);
00031         bool InverseRescale(char *out, const char *in, size_t n);
00032
00033         void SetIntercept(double i) { Intercept = i; }
00034         double GetIntercept() const { return Intercept; }
00035
00036         void SetSlope(double s) { Slope = s; }
00037         double GetSlope() const { return Slope; }
00038
00039         void SetTargetPixelType(PixelFormat const & targetst);
00040         void SetUseTargetPixelType(bool b);
00041         void SetPixelFormat(PixelFormat const & pf) { PF = pf; }
00042
00043         PixelFormat::ScalarType ComputeInterceptSlopePixelType();
00044         void SetMinMaxForPixelType(double min, double max);
00045         PixelFormat ComputePixelTypeFromMinMax();
00046
00047     protected:
00048         template <typename TIn>
00049             void RescaleFunctionIntoBestFit(char *out, const TIn *in, size_t n);
00050         template <typename TIn>
00051             void InverseRescaleFunctionIntoBestFit(char *out, const TIn *in, size_t n);
00052
00053     private:
00054         double Intercept; // 0028,1052
00055         double Slope; // 0028,1053
00056         PixelFormat PF;
00057         PixelFormat::ScalarType TargetScalarType;
00058         double ScalarRangeMin;
00059         double ScalarRangeMax;
00060         bool UseTargetPixelType;
00061     };

```



```

00011     PURPOSE.  See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMRLECODEC_H
00015 #define GDCMRLECODEC_H
00016
00017 #include "gdcmImageCodec.h"
00018
00019 namespace gdcm
00020 {
00021
00022 class Fragment;
00023 class RLEInternals;
00036 class GDCM_EXPORT RLECodec : public ImageCodec
00037 {
00038 friend class ImageRegionReader;
00039 public:
00040     RLECodec();
00041     ~RLECodec() override;
00042     bool CanCode(TransferSyntax const &ts) const override;
00043     bool CanDecode(TransferSyntax const &ts) const override;
00044     bool Decode(DataElement const &is, DataElement &os) override;
00045     unsigned long GetBufferLength() const { return BufferLength; }
00046     void SetBufferLength(unsigned long l) { BufferLength = l; }
00047
00048     bool Code(DataElement const &in, DataElement &out) override;
00049     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
00050     ImageCodec * Clone() const override;
00051
00052 protected:
00053     bool DecodeExtent(
00054         char *buffer,
00055         unsigned int XMin, unsigned int XMax,
00056         unsigned int YMin, unsigned int YMax,
00057         unsigned int ZMin, unsigned int ZMax,
00058         std::istream & is
00059     );
00060
00061     bool DecodeByStreams(std::istream &is, std::ostream &os) override;
00062 public:
00063
00064     void SetLength(unsigned long l)
00065     {
00066         Length = l;
00067     }
00068
00069 protected:
00070     bool StartEncode( std::ostream & ) override;
00071     bool IsRowEncoder() override;
00072     bool IsFrameEncoder() override;
00073     bool AppendRowEncode( std::ostream & out, const char * data, size_t datalen ) override;
00074     bool AppendFrameEncode( std::ostream & out, const char * data, size_t datalen ) override;
00075     bool StopEncode( std::ostream & ) override;
00076
00077 private:
00078     bool DecodeByStreamsCommon(std::istream &is, std::ostream &os);
00079     RLEInternals *Internals;
00080     unsigned long Length;
00081     unsigned long BufferLength;
00082     size_t DecodeFragment(Fragment const & frag, char *buffer, size_t llen);
00083 };
00084
00085 } // end namespace gdcm
00086
00087 #endif //GDCMRLECODEC_H

```

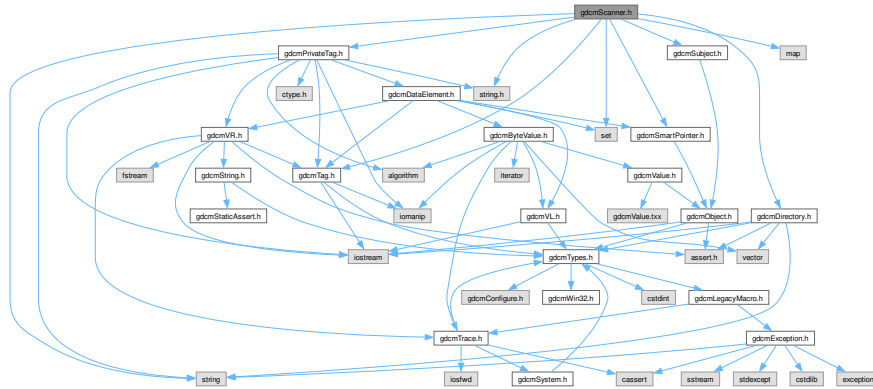
## 13.397 gdcmScanner.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmSubject.h"
#include "gdcmTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmSmartPointer.h"

```

```
#include <map>
#include <set>
#include <string>
#include <string.h>
Include dependency graph for gdcmScanner.h:
```



## Classes

- struct [gdcm::Scanner::ltstr](#)
- class [gdcm::Scanner](#)  
*Scanner.*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Scanner &s)`

## 13.398 gdcmScanner.h

[Go to the documentation of this file.](#)

```
00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
```

```

00014 #ifndef GDCMSCANNER_H
00015 #define GDCMSCANNER_H
00016
00017 #include "gdcmDirectory.h"
00018 #include "gdcmSubject.h"
00019 #include "gdcmTag.h"
00020 #include "gdcmPrivateTag.h"
00021 #include "gdcmSmartPointer.h"
00022
00023 #include <map>
00024 #include <set>
00025 #include <string>
00026
00027 #include <string.h> // strcmp
00028
00029 namespace gdcm
00030 {
00031     class StringFilter;
00032
00033     class GDCM_EXPORT Scanner : public Subject
00034     {
00035     public:
00036         Scanner():Values(), Filenames(), Mappings() {}
00037         ~Scanner() override;
00038
00039         typedef std::map<Tag, const char*> TagToValue;
00040         //typedef std::map<Tag, ConstCharWrapper> TagToValue; //StringMap;
00041         //typedef TagToStringMap TagToValue;
00042         typedef TagToValue::value_type TagToValueValueType;
00043
00044         void AddTag( Tag const & t );
00045         void ClearTags();
00046
00047         // Work in progress do not use:
00048         void AddPrivateTag( PrivateTag const & t );
00049
00050         void AddSkipTag( Tag const & t );
0051         void ClearSkipTags();
00052
00053         bool Scan( Directory::FileNamesType const & filenames );
00054
00055         Directory::FileNamesType const &GetFilenames() const { return Filenames; }
00056
00057         void Print( std::ostream & os ) const override;
00058
00059         void PrintTable( std::ostream & os ) const;
00060
00061         bool IsKey( const char * filename ) const;
00062
00063         Directory::FileNamesType GetKeys() const;
00064
00065         // struct to store all the values found:
00066         typedef std::set< std::string > ValueType;
00067
00068         ValueType const & GetValues() const { return Values; }
00069
00070         ValueType GetValues(Tag const &t) const;
00071
00072         Directory::FileNamesType GetOrderedValues(Tag const &t) const;
00073
00074         /* ltstr is CRITICAL, otherwise pointers value are used to do the key comparison */
00075         struct ltstr
00076         {
00077             bool operator()(const char* s1, const char* s2) const
00078             {
00079                 assert( s1 && s2 );
00080                 return strcmp(s1, s2) < 0;
00081             }
00082         };
00083
00084         typedef std::map<const char *, TagToValue, ltstr> MappingType;
00085         typedef MappingType::const_iterator ConstIterator;
00086         ConstIterator Begin() const { return Mappings.begin(); }
00087         ConstIterator End() const { return Mappings.end(); }
00088
00089         MappingType const & GetMappings() const { return Mappings; }
00090
00091         TagToValue const & GetMapping(const char *filename) const;
00092
00093         const char *GetFilenameFromTagToValue(Tag const &t, const char *valueref) const;
00094     };
00095 }

```

```

00143     Directory::FileNamesType GetAllFileNamesFromTagToValue(Tag const &t, const char *valueref) const;
00144
00145     // by a call to GetMapping()
00146     TagToValue const & GetMappingFromTagToValue(Tag const &t, const char *value) const;
00147
00148     const char* GetValue(const char *filename, Tag const &t) const;
00149
00150     static SmartPointer<Scanner> New() { return new Scanner; }
00151
00152 protected:
00153     void ProcessPublicTag(StringFilter &sf, const char *filename);
00154 private:
00155     // struct to store all uniq tags in ascending order:
00156     typedef std::set< Tag > TagsType;
00157     typedef std::set< PrivateTag > PrivateTagsType;
00158     std::set< Tag > Tags;
00159     std::set< PrivateTag > PrivateTags;
00160     std::set< Tag > SkipTags;
00161     ValuesType Values;
00162     Directory::FileNamesType FileNames;
00163
00164     // Main struct that will hold all mapping:
00165     MappingType Mappings;
00166
00167     double Progress;
00168 };
00169 //-----
00170 inline std::ostream& operator<<(std::ostream &os, const Scanner &s)
00171 {
00172     s.Print( os );
00173     return os;
00174 }
00175
00176 #if defined(SWIGPYTHON) || defined(SWIGCSharp) || defined(SWIGJAVA) || defined(SWIGPHP)
00177 /*
00178  * HACK: I need this temp class to be able to manipulate a std::map from python,
00179  * swig does not support wrapping of simple class like std::map...
00180  */
00181 class SWIGTagToValue
00182 {
00183 public:
00184     SWIGTagToValue(Scanner::TagToValue const &t2v):Internal(t2v),it(t2v.begin()) {}
00185     const Scanner::TagToValueValueType& GetCurrent() const { return *it; }
00186     const Tag& GetCurrentTag() const { return it->first; }
00187     const char *GetCurrentValue() const { return it->second; }
00188     void Start() { it = Internal.begin(); }
00189     bool IsAtEnd() const { return it == Internal.end(); }
00190     void Next() { ++it; }
00191 private:
00192     const Scanner::TagToValue& Internal;
00193     Scanner::TagToValue::const_iterator it;
00194 };
00195 #endif /* SWIG */
00196
00197 } // end namespace gdcm
00198
00199 #endif //GDCMSCANNER_H

```

## 13.399 gdcmScanner2.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmSubject.h"
#include "gdcmTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmSmartPointer.h"
#include <map>
#include <set>
#include <string>

```





```

00018 #include "gdcmSubject.h"
00019 #include "gdcmTag.h"
00020 #include "gdcmPrivateTag.h"
00021 #include "gdcmSmartPointer.h"
00022
00023 #include <map>
00024 #include <set>
00025 #include <string>
00026
00027 #include <string.h> // strcmp
00028
00029 namespace gdcm
00030 {
00031   class StringFilter;
00032
00033   class GDCM_EXPORT Scanner2 : public Subject
00034   {
00035   public:
00036     Scanner2() : Values(), Filenames(), PublicMappings(), PrivateMappings(), Progress(0.0) {}
00037     ~Scanner2() override;
00038
00039     typedef std::map<Tag, const char*> PublicTagToValue;
00040     typedef PublicTagToValue::value_type PublicTagToValueValueType;
00041
00042     typedef std::map<PrivateTag, const char*> PrivateTagToValue;
00043     typedef PrivateTagToValue::value_type PrivateTagToValueValueType;
00044
00045     bool AddPublicTag( Tag const & t );
00046     void ClearPublicTags();
00047
00048     // Work in progress do not use:
00049     bool AddPrivateTag( PrivateTag const & pt );
00050     void ClearPrivateTags();
00051
00052     bool AddSkipTag( Tag const & t );
00053     void ClearSkipTags();
00054
00055     bool Scan( Directory::FileNamesType const & filenames );
00056
00057     Directory::FileNamesType const &GetFilenames() const { return Filenames; }
00058
00059     void Print( std::ostream & os ) const override;
00060
00061     void PrintTable( std::ostream & os, bool header = false ) const;
00062
00063     bool IsKey( const char * filename ) const;
00064
00065     Directory::FileNamesType GetKeys() const;
00066
00067     // struct to store all the values found:
00068     typedef std::set< std::string > ValueType;
00069
00070     ValueType const & GetValues() const { return Values; }
00071
00072     ValueType GetPublicValues(Tag const &t) const;
00073
00074     ValueType GetPrivateValues(PrivateTag const &pt) const;
00075
00076     Directory::FileNamesType GetPublicOrderedValues(Tag const &t) const;
00077
00078     Directory::FileNamesType GetPrivateOrderedValues(PrivateTag const &pt) const;
00079
00080     /* ltstr is CRITICAL, otherwise pointers value are used to do the key comparison */
00081     struct ltstr
00082     {
00083       bool operator()(const char* s1, const char* s2) const
00084       {
00085         assert( s1 && s2 );
00086         return strcmp(s1, s2) < 0;
00087       }
00088     };
00089
00090     typedef std::map<const char *,PublicTagToValue, ltstr> PublicMappingType;
00091     typedef PublicMappingType::const_iterator PublicConstIterator;
00092     PublicConstIterator Begin() const { return PublicMappings.begin(); }
00093     PublicConstIterator End() const { return PublicMappings.end(); }
00094
00095     typedef std::map<const char *,PrivateTagToValue, ltstr> PrivateMappingType;
00096     typedef PrivateMappingType::const_iterator PrivateConstIterator;
00097     PrivateConstIterator PrivateBegin() const { return PrivateMappings.begin(); }
00098     PrivateConstIterator PrivateEnd() const { return PrivateMappings.end(); }

```

```

00144
00146 PublicMappingType const & GetPublicMappings() const { return PublicMappings; }
00147 PrivateMappingType const & GetPrivateMappings() const { return PrivateMappings; }
00148
00150 PublicTagToValue const & GetPublicMapping(const char *filename) const;
00151 PrivateTagToValue const & GetPrivateMapping(const char *filename) const;
00152
00155 const char *GetFilenameFromPublicTagToValue(Tag const &t, const char *valueref) const;
00156 const char *GetFilenameFromPrivateTagToValue(PrivateTag const &pt, const char *valueref) const;
00157
00160 Directory::FileNamesType GetAllFileNamesFromPublicTagToValue(Tag const &t, const char *valueref) const;
00161 Directory::FileNamesType GetAllFileNamesFromPrivateTagToValue(PrivateTag const &pt, const char
*valueref) const;
00162
00164 // by a call to GetMapping()
00165 PublicTagToValue const & GetMappingFromPublicTagToValue(Tag const &t, const char *value) const;
00166 PrivateTagToValue const & GetMappingFromPrivateTagToValue(PrivateTag const &pt, const char *value)
const;
00167
00173 const char* GetPublicValue(const char *filename, Tag const &t) const;
00174 const char* GetPrivateValue(const char *filename, PrivateTag const &t) const;
00175
00177 static SmartPointer<Scanner2> New() { return new Scanner2; }
00178
00179 protected:
00180 void ProcessPublicTag(StringFilter &sf, const char *filename);
00181 void ProcessPrivateTag(StringFilter &sf, const char *filename);
00182 private:
00183 // struct to store all uniq tags in ascending order:
00184 typedef std::set< Tag > PublicTagsType;
00185 typedef std::set< PrivateTag > PrivateTagsType;
00186 std::set< Tag > PublicTags; // Public and Private Creator
00187 std::set< PrivateTag > PrivateTags; // Only Private (no Private Creator)
00188 std::set< Tag > SkipTags;
00189 ValuesType Values;
00190 Directory::FileNamesType FileNames;
00191
00192 // Main struct that will hold all public mapping:
00193 PublicMappingType PublicMappings;
00194 // Main struct that will hold all private mapping:
00195 PrivateMappingType PrivateMappings;
00196
00197 double Progress;
00198 };
00199 //-----
00200 inline std::ostream& operator<<(std::ostream &os, const Scanner2 &s)
00201 {
00202     s.Print( os );
00203     return os;
00204 }
00205
00206 } // end namespace gdcm
00207
00208 #endif //GDCMSCANNER2_H

```

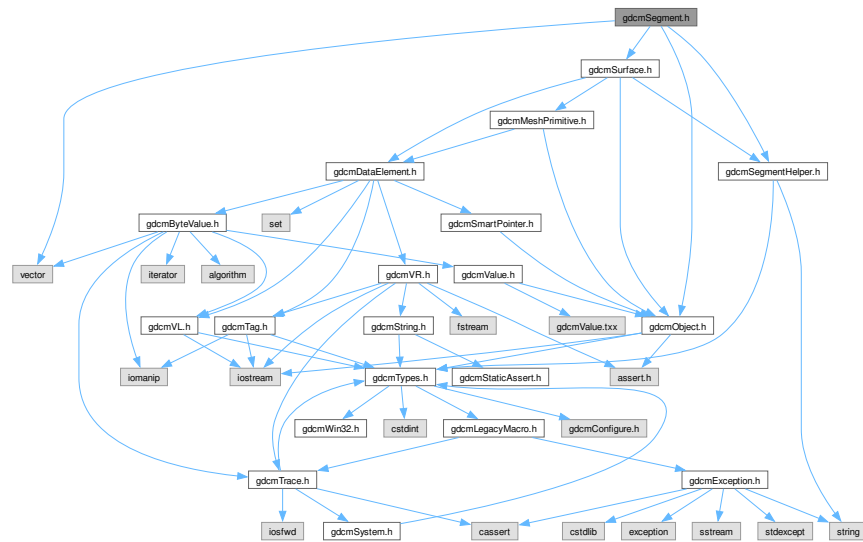
## 13.401 gdcmSegment.h File Reference

```

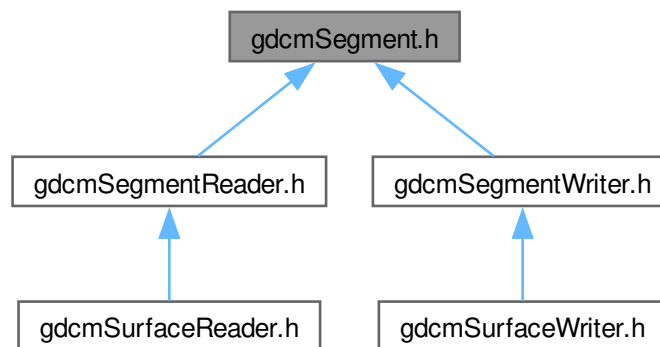
#include <vector>
#include <gdcmObject.h>
#include <gdcmSurface.h>
#include "gdcmSegmentHelper.h"

```

Include dependency graph for `gdcmSegment.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Segment`  
*This class defines a segment.*

## Namespaces

- namespace `gdcm`

## 13.402 gdcmSegment.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSEGMENT_H
00015 #define GDCMSEGMENT_H
00016
00017 #include <vector>
00018
00019 #include <gdcmObject.h>
00020 #include <gdcmSurface.h>
00021 #include "gdcmSegmentHelper.h"
00022
00023 namespace gdcm
00024 {
00025
00026     class GDCM_EXPORT Segment : public Object
00027     {
00028     public:
00029         typedef std::vector<SmartPointer< Surface > > SurfaceVector;
00030         typedef std::vector< SegmentHelper::BasicCodedEntry > BasicCodedEntryVector;
00031
00032         typedef enum {
00033             AUTOMATIC = 0,
00034             SEMIAUTOMATIC,
00035             MANUAL,
00036             ALGOType_END
00037         } ALGOType;
00038
00039         static const char * GetALGOTypeString(ALGOType type);
00040         static ALGOType GetALGOType(const char * type);
00041
00042         Segment();
00043
00044         ~Segment() override;
00045
00046         /**      Segment getters/setters      **/
00047         unsigned short GetSegmentNumber() const;
00048         void SetSegmentNumber(const unsigned short num);
00049
00050         const char * GetSegmentLabel() const;
00051         void SetSegmentLabel(const char * label);
00052
00053         const char * GetSegmentDescription() const;
00054         void SetSegmentDescription(const char * description);
00055
00056         SegmentHelper::BasicCodedEntry const & GetAnatomicRegion() const;
00057         SegmentHelper::BasicCodedEntry & GetAnatomicRegion();
00058         void SetAnatomicRegion(SegmentHelper::BasicCodedEntry const & BSE);
00059
00060         BasicCodedEntryVector const & GetAnatomicRegionModifiers() const;
00061         BasicCodedEntryVector & GetAnatomicRegionModifiers();
00062         void SetAnatomicRegionModifiers(BasicCodedEntryVector const & BSEV);
00063
00064         SegmentHelper::BasicCodedEntry const & GetPropertyCategory() const;
00065         SegmentHelper::BasicCodedEntry & GetPropertyCategory();
00066         void SetPropertyCategory(SegmentHelper::BasicCodedEntry const & BSE);
00067
00068         SegmentHelper::BasicCodedEntry const & GetPropertyType() const;
00069         SegmentHelper::BasicCodedEntry & GetPropertyType();
00070         void SetPropertyType(SegmentHelper::BasicCodedEntry const & BSE);
00071
00072         BasicCodedEntryVector const & GetPropertyTypeModifiers() const;
00073         BasicCodedEntryVector & GetPropertyTypeModifiers();

```

```

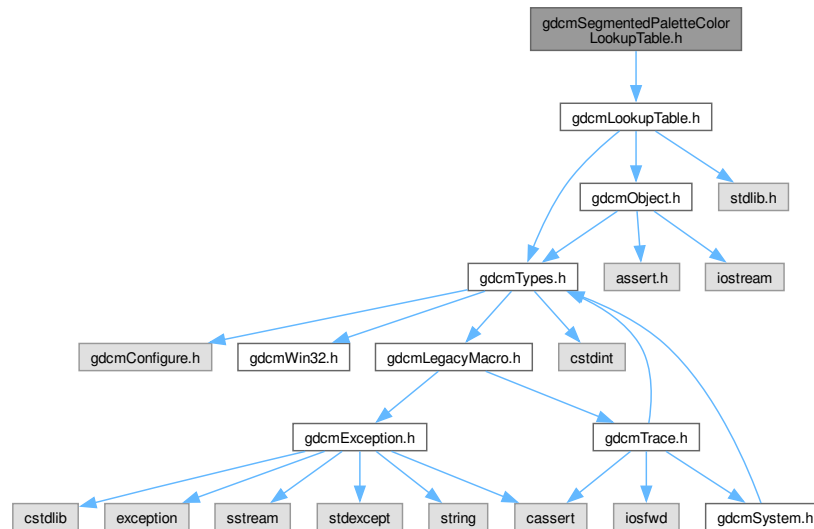
00083 void SetPropertyTypeModifiers(BasicCodedEntryVector const & BSEV);
00084
00085 ALGOType GetSegmentAlgorithmType() const;
00086 void SetSegmentAlgorithmType(ALGOType type);
00087 void SetSegmentAlgorithmType(const char * typeStr);
00088
00089 const char * GetSegmentAlgorithmName() const;
00090 void SetSegmentAlgorithmName(const char * name);
00091
00092 /**      Surface getters/setters      **/
00093 unsigned long GetSurfaceCount();
00094 void SetSurfaceCount(const unsigned long nb);
00095
00096 SurfaceVector const & GetSurfaces() const;
00097 SurfaceVector & GetSurfaces();
00098
00099 SmartPointer< Surface > GetSurface(const unsigned int idx = 0) const;
00100
00101 void AddSurface(SmartPointer< Surface > surface);
00102
00103 protected :
00104 /**      Segment members      **/
00105 //0062 0004 US 1 Segment Number
00106 unsigned short SegmentNumber;
00107 //0062 0005 LO 1 Segment Label
00108 std::string SegmentLabel;
00109 //0062 0006 ST 1 Segment Description
00110 std::string SegmentDescription;
00111
00112 // General Anatomic Region
00113 SegmentHelper::BasicCodedEntry AnatomicRegion;
00114 // General Anatomic Region Modifier
00115 BasicCodedEntryVector AnatomicRegionModifiers;
00116 // Property Category Code
00117 SegmentHelper::BasicCodedEntry PropertyCategory;
00118 // Property Type Code
00119 SegmentHelper::BasicCodedEntry PropertyType;
00120 // Property Type Modifier Code
00121 BasicCodedEntryVector PropertyTypeModifiers;
00122
00123 //0062 0008 CS 1 Segment Algorithm Type
00124 ALGOType SegmentAlgorithmType;
00125 //0062 0009 LO 1 Segment Algorithm Name
00126 std::string SegmentAlgorithmName;
00127
00128 /**      Surface members      **/
00129 //0066 002a UL 1 Surface Count
00130 unsigned long SurfaceCount;
00131
00132 SurfaceVector Surfaces;
00133
00134 private :
00135 void ComputeSurfaceCount();
00136 };
00137
00138 }
00139
00140 #endif // GDCMSEGMENT_H

```

## 13.403 gdcmSegmentedPaletteColorLookupTable.h File Reference

```
#include "gdcmLookupTable.h"
```

Include dependency graph for gdcmSegmentedPaletteColorLookupTable.h:



### Classes

- class [gdcm::SegmentedPaletteColorLookupTable](#)  
*SegmentedPaletteColorLookupTable* class.

### Namespaces

- namespace [gdcm](#)

## 13.404 gdcmSegmentedPaletteColorLookupTable.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003  Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005  Copyright (c) 2006-2011 Mathieu Malaterre
00006  All rights reserved.
00007  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009  This software is distributed WITHOUT ANY WARRANTY; without even
00010  the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011  PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/

```

```

00014
00015 #ifndef GDCMSEGMENTEDPALETTECOLORLOOKUPTABLE_H
00016 #define GDCMSEGMENTEDPALETTECOLORLOOKUPTABLE_H
00017
00018 #include "gdcmLookupTable.h"
00019
00020 namespace gdcm
00021 {
00022
00026 class GDCM_EXPORT SegmentedPaletteColorLookupTable : public LookupTable
00027 {
00028 public:
00029     SegmentedPaletteColorLookupTable();
00030     ~SegmentedPaletteColorLookupTable() override;
00031     void Print(std::ostream &) const override {}
00032
00034     void SetLUT(LookupTableType type, const unsigned char *array,
00035               unsigned int length) override;
00036
00037 };
00038
00039 } // end namespace gdcm
00040
00041 #endif //GDCMSEGMENTEDPALETTECOLORLOOKUPTABLE_H

```

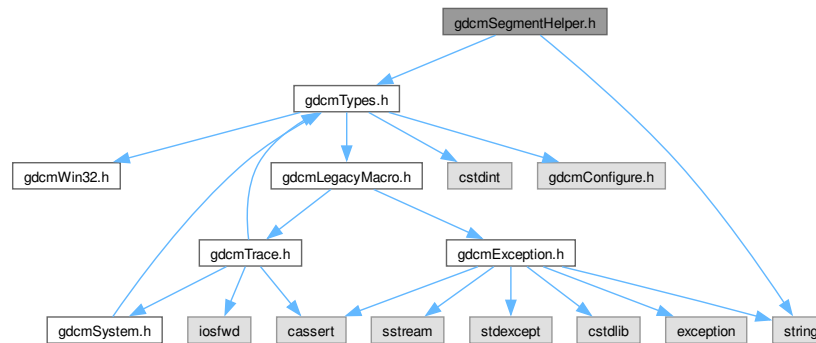
## 13.405 gdcmSegmentHelper.h File Reference

```

#include "gdcmTypes.h"
#include <string>

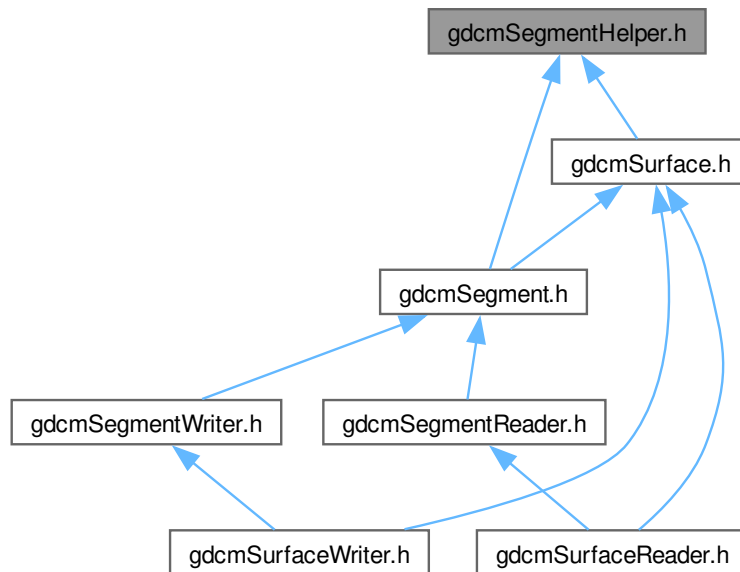
```

Include dependency graph for gdcmSegmentHelper.h:





This graph shows which files directly or indirectly include this file:



## Classes

- struct [gdcm::SegmentHelper::BasicCodedEntry](#)  
*This structure defines a basic coded entry with all of its attributes.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::SegmentHelper](#)

## 13.406 gdcmSegmentHelper.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012

```

```

00013 =====*/
00014 #ifndef GDCMSEGMENTHELPER_H
00015 #define GDCMSEGMENTHELPER_H
00016
00017 #include "gdcmTypes.h"
00018
00019 #include <string>
00020
00021 namespace gdcm
00022 {
00023
00024     namespace SegmentHelper
00025     {
00026
00032         struct GDCM_EXPORT BasicCodedEntry
00033         {
00037             BasicCodedEntry():
00038                 CV(""),
00039                 CSD(""),
00040                 CSV(""),
00041                 CM("")
00042             {}
00043
00047             BasicCodedEntry(const char * a_CV,
00048                             const char * a_CSD,
00049                             const char * a_CM):
00050                 CV(a_CV),
00051                 CSD(a_CSD),
00052                 CSV(""),
00053                 CM(a_CM)
00054             {}
00055
00059             BasicCodedEntry(const char * a_CV,
00060                             const char * a_CSD,
00061                             const char * a_CSV,
00062                             const char * a_CM):
00063                 CV(a_CV),
00064                 CSD(a_CSD),
00065                 CSV(a_CSV),
00066                 CM(a_CM)
00067             {}
00068
00074             bool IsEmpty(const bool checkOptionalAttributes = false) const;
00075
00076
00077             /**      Members      */
00078             // 0008 0100 1   Code Value
00079             std::string CV;
00080             // 0008 0102 1   Coding Scheme Designator
00081             std::string CSD;
00082             // 0008 0103 1C   Coding Scheme Version
00083             std::string CSV;
00084             // 0008 0104 1   Code Meaning
00085             std::string CM;
00086         };
00087
00088     } // end of SegmentHelper namespace
00089
00090 } // end of gdcm namespace
00091
00092 #endif // GDCMSEGMENTHELPER_H

```

## 13.407 gdcmSegmentReader.h File Reference

```

#include <map>
#include <gdcmReader.h>
#include <gdcmSegment.h>

```

```
graph BT; gdcmsurface[gdcmSurfaceReader.h] --> gdcmsegment[gdcmSegmentReader.h];
```

- class `gdcm::SegmentReader`  
*This class defines a segment reader.*

- namespace **gdcm**

## 13.408 gdcmSegmentReader.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSEGMENTREADER_H
00015 #define GDCMSEGMENTREADER_H
00016
00017 #include <map>
00018
00019 #include <gdcmReader.h>
00020 #include <gdcmSegment.h>
00021
00022 namespace gdcm
00023 {
00024
00025     class GDCM_EXPORT SegmentReader : public Reader
00026     {
00027     public:
00028         typedef std::vector<SmartPointer<Segment>> SegmentVector;
00029
00030         SegmentReader();
00031
00032         ~SegmentReader() override;
00033
00034         bool Read() override; // Set to protected ?
00035
00036         /**      Segment getters/setters      **/
00037         SegmentVector GetSegments() const;
00038         SegmentVector GetSegments();
00039
00040         // unsigned int GetNumberOfSegments();
00041
00042     protected:
00043
00044         typedef std::map<unsigned long, SmartPointer<Segment>> SegmentMap;
00045
00046         bool ReadSegments();
00047
00048         bool ReadSegment(const Item & segmentItem, const unsigned int idx);
00049
00050         SegmentMap Segments; // The key value is item number (in segment sequence)
00051                             // or the surface number (for a surface segmentation).
00052     };
00053
00054 #endif // GDCMSEGMENTREADER_H

```

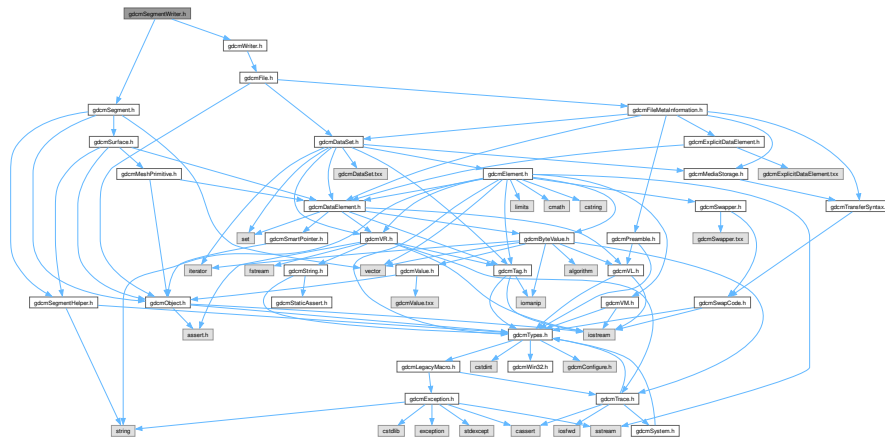
## 13.409 gdcmSegmentWriter.h File Reference

```

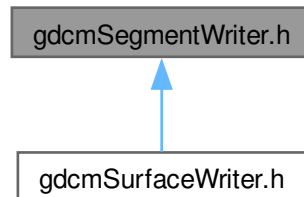
#include <gdcmWriter.h>
#include <gdcmSegment.h>

```

Include dependency graph for `gdcmSegmentWriter.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::SegmentWriter`  
*This class defines a segment writer.*

## Namespaces

- namespace **gdcm**

## 13.410 gdcmSegmentWriter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSEGMENTWRITER_H
00015 #define GDCMSEGMENTWRITER_H
00016
00017 #include <gdcmWriter.h>
00018 #include <gdcmSegment.h>
00019
00020 namespace gdcm
00021 {
00022
00023   class GDCM_EXPORT SegmentWriter : public Writer
00024   {
00025   public:
00026     typedef std::vector<SmartPointer<Segment>> SegmentVector;
00027
00028     SegmentWriter();
00029     ~SegmentWriter() override;
00030
00031     bool Write() override; // Set to protected ?
00032
00033     /** Segment getters/setters */
00034     unsigned int GetNumberOfSegments() const;
00035     void SetNumberOfSegments(const unsigned int size);
00036
00037     const SegmentVector & GetSegments() const;
00038     SegmentVector & GetSegments();
00039     SmartPointer<Segment> GetSegment(const unsigned int idx = 0) const;
00040
00041     void AddSegment(SmartPointer<Segment> segment);
00042
00043     void SetSegments(SegmentVector & segments);
00044
00045   protected:
00046     bool PrepareWrite();
00047
00048     SegmentVector Segments;
00049   };
00050
00051 #endif // GDCMSEGMENTWRITER_H

```

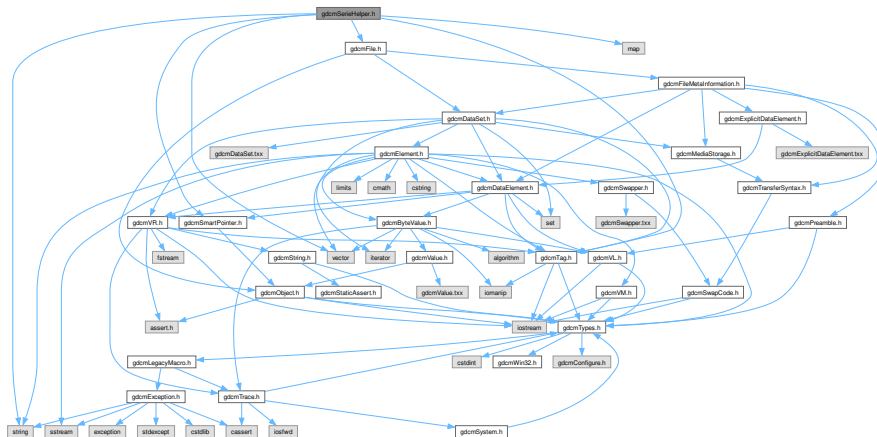
## 13.411 gdcmSerieHelper.h File Reference

```

#include "gdcmTag.h"
#include "gdcmSmartPointer.h"
#include "gdcmFile.h"
#include <vector>
#include <string>

```

Include dependency graph for `gdcmSerieHelper.h`:



- class `gdcm::FileWithName`

- class `gdc::SerieHelper`

*SeriesHelper DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.*

- namespace **gdcm**

- typedef bool(\* [gdcm::BOOL\\_FUNCTION\\_PFILE\\_PFILE\\_POINTER](#)) (File \*, File \*)
- typedef std::vector< [SmartPointer< FileWithName >](#) > [gdcm::FileList](#)

- enum `gdcmm::CompOperators` {  
    `gdcmm::GDCM_EQUAL` = 0 ,  
    `gdcmm::GDCM_DIFFERENT` ,  
    `gdcmm::GDCM_GREATER` ,  
    `gdcmm::GDCM_GREATEROREQUAL` ,  
    `gdcmm::GDCM_LESS` ,  
    `gdcmm::GDCM_LESSEOREQUAL` }  
enum `gdcmm::LodModeType` {  
    `gdcmm::LD_ALL` = 0x00000000 ,  
    `gdcmm::LD_NOSEQ` = 0x00000001 ,  
    `gdcmm::LD_NOSHADOW` = 0x00000002 ,  
    `gdcmm::LD_NOSHADOWSEQ` = 0x00000004 }

## 13.412 gdcmSerieHelper.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSERIEHELPER_H
00015 #define GDCMSERIEHELPER_H
00016
00017 #include "gdcmTag.h"
00018 #include "gdcmSmartPointer.h"
00019 #include "gdcmFile.h"
00020 #include <vector>
00021 #include <string>
00022 #include <map>
00023
00024 namespace gdcm
00025 {
00026
00027     enum CompOperators {
00028         GDCM_EQUAL = 0,
00029         GDCM_DIFFERENT,
00030         GDCM_GREATER,
00031         GDCM_GREATEROREQUAL,
00032         GDCM_LESS,
00033         GDCM_LESSOREQUAL
00034     };
00035     enum LodModeType
00036     {
00037         LD_ALL          = 0x00000000,
00038         LD_NOSEQ        = 0x00000001,
00039         LD_NOSHADOW     = 0x00000002,
00040         LD_NOSHADOWSEQ = 0x00000004
00041     };
00042
00043
00044
00045
00046
00047
00048
00049
00050     class GDCM_EXPORT FileWithName : public File
00051     {
00052     public:
00053         FileWithName(File &f):File(f),filename({})
00054         {
00055             std::string filename;
00056         };
00057
00058         typedef std::vector< SmartPointer<FileWithName> > FileList;
00059         typedef bool (*BOOL_FUNCTION_PFILE_PFILE_POINTER) (File *, File *);
00060         class Scanner;
00061
00062         class GDCM_EXPORT SerieHelper
00063         {
00064         public:
00065             SerieHelper();
00066             ~SerieHelper();
00067
00068             void Clear();
00069             void SetLoadMode (int ) {}
00070             void SetDirectory(std::string const &dir, bool recursive=false);
00071
00072             void AddRestriction(const std::string & tag);
00073             void SetUseSeriesDetails( bool useSeriesDetails );
00074             void CreateDefaultUniqueSeriesIdentifier();
00075             FileList *GetFirstSingleSerieUIDFileSet();
00076             FileList *GetNextSingleSerieUIDFileSet();
00077             std::string CreateUniqueSeriesIdentifier( File * inFile );
00078             void OrderFileList(FileList *fileSet);
00079             void AddRestriction(uint16_t group, uint16_t elem, std::string const &value, int op);
00080
00081         protected:
00082             bool UserOrdering(FileList *fileSet);

```

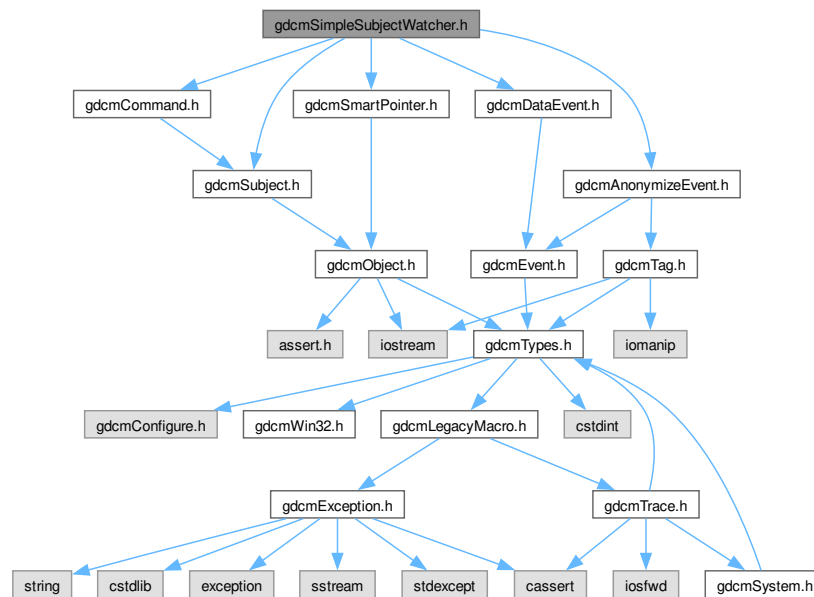


```
00089 void AddFileName(std::string const &filename);
00090 bool AddFile(FileWithName &header);
00091 void AddRestriction(const Tag& tag);
00092 bool ImagePositionPatientOrdering(FileList *fileSet);
00093 bool ImageNumberOrdering( FileList *fileList );
00094 bool FileNameOrdering( FileList *fileList );
00095
00096 using Rule = struct RuleStructure{
00097     uint16_t group;
00098     uint16_t elem;
00099     std::string value;
00100     int op;
00101 };
00102 typedef std::vector<Rule> SerieRestrictions;
00103
00104 typedef std::map<std::string, FileList *> SingleSerieUIDFileSetmap;
00105 SingleSerieUIDFileSetmap SingleSerieUIDFileSetHT;
00106 SingleSerieUIDFileSetmap::iterator ItFileSetHt;
00107
00108 private:
00109     SerieRestrictions Restrictions;
00110     SerieRestrictions Refine;
00111
00112     bool UseSeriesDetails;
00113     bool DirectOrder;
00114
00115     BOOL_FUNCTION_PFILE_PFILE_POINTER UserLessThanFunction;
00116 };
00117
00118 // backward compat
00119 } // end namespace gdcms
00120
00121
00122 #endif //GDCMSERIEHELPER_H
```

## 13.413 gdcmsimpleSubjectWatcher.h File Reference

```
#include "gdcmsubject.h"
#include "gdcmscommand.h"
#include "gdcmsmartpointer.h"
#include "gdcmanonymizeevent.h"
#include "gdcmsdataevent.h"
```

Include dependency graph for `gdcmSimpleSubjectWatcher.h`:



## Classes

- class `gdcm::SimpleSubjectWatcher`  
*SimpleSubjectWatcher.*

## Namespaces

- namespace `gdcm`

## 13.414 gdcmSimpleSubjectWatcher.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMSIMPLESUBJECTWATCHER_H
00015  #define GDCMSIMPLESUBJECTWATCHER_H
00016

```

```

00017 #include "gdcmSubject.h"
00018 #include "gdcmCommand.h"
00019 #include "gdcmSmartPointer.h"
00020 #include "gdcmAnonymizeEvent.h"
00021 #include "gdcmDataEvent.h"
00022
00023 namespace gdcm
00024 {
00025     //-----
00026     class Event;
00027     class GDCM_EXPORT SimpleSubjectWatcher
00028     {
00029     public:
00030         SimpleSubjectWatcher(Subject * s, const char *comment = "");
00031         virtual ~SimpleSubjectWatcher();
00032         SimpleSubjectWatcher(const SimpleSubjectWatcher&) = delete;
00033         void operator=(const SimpleSubjectWatcher&) = delete;
00034
00035     protected:
00036         virtual void StartFilter();
00037         virtual void EndFilter();
00038         virtual void ShowProgress(Subject *caller, const Event &evt);
00039         virtual void ShowFileName(Subject *caller, const Event &evt);
00040         virtual void ShowIteration();
00041         virtual void ShowAnonymization(Subject *caller, const Event &evt);
00042         virtual void ShowDataSet(Subject *caller, const Event &evt);
00043         virtual void ShowData(Subject *caller, const Event &evt);
00044         virtual void ShowAbort();
00045
00046     protected:
00047         // Custom API used for internal Testing do not use !
00048         void TestAbortOn();
00049         void TestAbortOff();
00050
00051     private:
00052         SmartPointer<Subject> m_Subject;
00053         std::string m_Comment;
00054
00055         typedef SimpleMemberCommand<SimpleSubjectWatcher> SimpleCommandType;
00056         typedef MemberCommand<SimpleSubjectWatcher> CommandType;
00057
00058         SmartPointer<SimpleCommandType> m_StartFilterCommand;
00059         SmartPointer<SimpleCommandType> m_EndFilterCommand;
00060         SmartPointer<CommandType> m_ProgressFilterCommand;
00061         SmartPointer<CommandType> m_FileNameFilterCommand;
00062         SmartPointer<SimpleCommandType> m_IterationFilterCommand;
00063         SmartPointer<SimpleCommandType> m_AbortFilterCommand;
00064         SmartPointer<CommandType> m_AnonymizeFilterCommand;
00065         SmartPointer<CommandType> m_DataFilterCommand;
00066         SmartPointer<CommandType> m_DataSetFilterCommand;
00067
00068         unsigned long m_StartTag;
00069         unsigned long m_EndTag;
00070         unsigned long m_ProgressTag;
00071         unsigned long m_FileNameTag;
00072         unsigned long m_IterationTag;
00073         unsigned long m_AbortTag;
00074         unsigned long m_AnonymizeTag;
00075         unsigned long m_DataTag;
00076         unsigned long m_DataSetTag;
00077
00078         bool m_TestAbort;
00079     };
00080 } // end namespace gdcm
00081 //-----
00082 #endif //GDCMSIMPLESUBJECTWATCHER_H

```

## 13.415 gdcmSorter.h File Reference

```

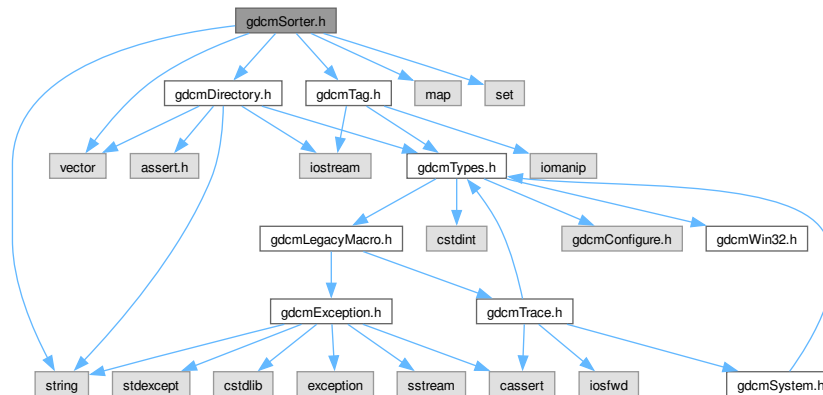
#include "gdcmDirectory.h"
#include "gdcmTag.h"
#include <vector>
#include <string>

```

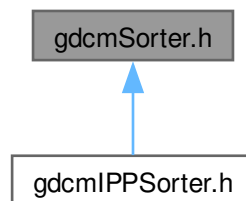
```
#include <map>
```

```
#include <set>
```

Include dependency graph for `gdcmSorter.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::Sorter`  
*Sorter.*

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Sorter &s)`

## 13.416 gdcmSorter.h

[Go to the documentation of this file.](#)

```

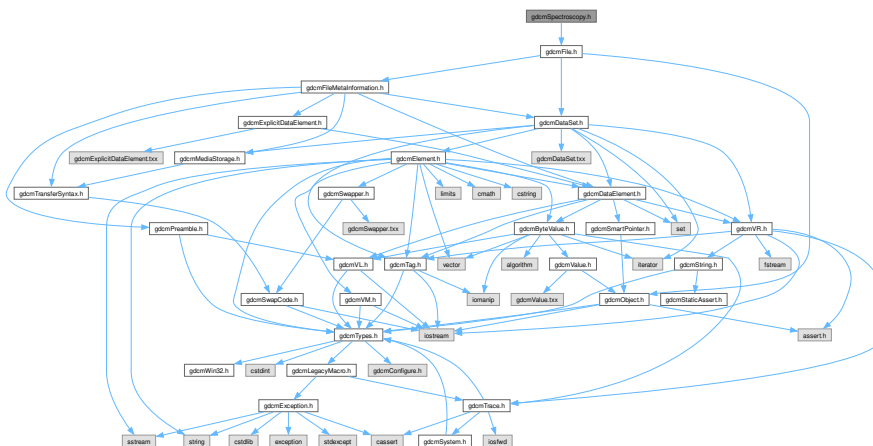
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSORTER_H
00015 #define GDCMSORTER_H
00016
00017 #include "gdcmDirectory.h"
00018 #include "gdcmTag.h"
00019
00020 #include <vector>
00021 #include <string>
00022 #include <map>
00023 #include <set>
00024
00025 namespace gdcm
00026 {
00027   class DataSet;
00028
00039   class GDCM_EXPORT Sorter
00040   {
00041   friend std::ostream& operator<<(std::ostream &_os, const Sorter &s);
00042   public:
00043     Sorter();
00044     virtual ~Sorter();
00045
00047     virtual bool Sort(std::vector<std::string> const & filenames);
00048
00051     const std::vector<std::string> &GetFilenames() const { return Filenames; }
00052
00054     void Print(std::ostream &os) const;
00055
00057     bool AddSelect( Tag const &tag, const char *value );
00058
00062     void SetTagsToRead( std::set<Tag> const & tags );
00063
00065     typedef bool (*SortFunction)(DataSet const &, DataSet const &);
00066     void SetSortFunction( SortFunction f );
00067
00068     virtual bool StableSort(std::vector<std::string> const & filenames);
00069
00070   protected:
00071     std::vector<std::string> Filenames;
00072     typedef std::map<Tag, std::string> SelectionMap;
00073     std::map<Tag, std::string> Selection;
00074     SortFunction SortFunc;
00075     std::set<Tag> TagsToRead;
00076   };
00077   //-----
00078   inline std::ostream& operator<<(std::ostream &os, const Sorter &s)
00079   {
00080     s.Print( os );
00081     return os;
00082   }
00083
00084
00085 } // end namespace gdcm
00086
00087 #endif //GDCMSORTER_H

```



### 13.419 gdcmspectroscopy.h File Reference

Include dependency graph for `qdcmspectroscopy.h`:



## Classes

- class [gdcm::Spectroscopy](#)  
*Spectroscopy* class.

## Namespaces

- namespace [gdcm](#)

## 13.420 gdcmSpectroscopy.h

[Go to the documentation of this file.](#)

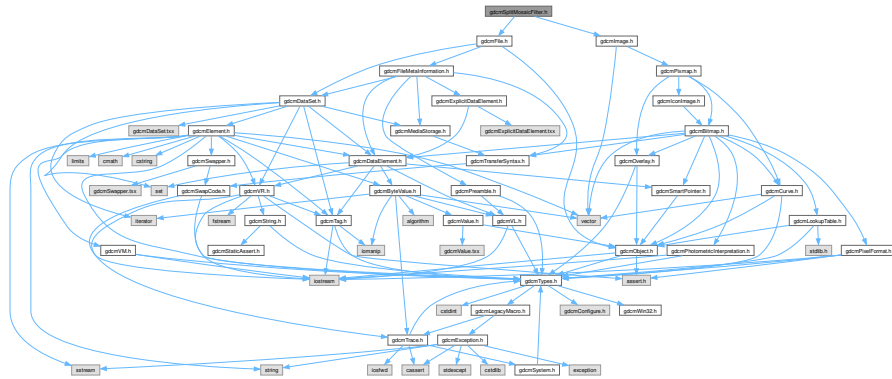
```
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMSPECTROSCOPY_H
00015 #define GDCMSPECTROSCOPY_H
00016
00017 #include "gdcmFile.h"
00018
00019 namespace gdcm
00020 {
00021
00022   class GDCM_EXPORT Spectroscopy
00023   {
00024   public:
00025     Spectroscopy() = default;
00026
00027   private:
00028
00029   };
00030
00031 } // end namespace gdcm
00032
00033 #endif //GDCMSPECTROSCOPY_H
```

## 13.421 gdcmSplitMosaicFilter.h File Reference

```
#include "gdcmFile.h"
#include "gdcmImage.h"
```



Include dependency graph for gdcmSplitMosaicFilter.h:



## Classes

- class [gdcm::SplitMosaicFilter](#)  
*SplitMosaicFilter* class.

## Namespaces

- namespace [gdcm](#)

## 13.422 gdcmSplitMosaicFilter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
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00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMSPLITMOSAICFILTER_H
00015 #define GDCMSPLITMOSAICFILTER_H
00016
00017 #include "gdcmFile.h"
00018 #include "gdcmImage.h"
00019
00020 namespace gdcm
00021 {
00022
00023     /*
00024     * Everything done in this code is for the sole purpose of writing interoperable
00025     * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
00026     * If you believe anything in this code violates any law or any of your rights,
00027     * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
00028     * find a solution.
00029     */

```

```
00043 class GDCM_EXPORT SplitMosaicFilter
00044 {
00045 public:
00046     SplitMosaicFilter();
00047     ~SplitMosaicFilter();
00048
00050     bool Split();
00051
00054     bool ComputeMOSAICDimensions(unsigned int dims[3]);
00055
00057     bool ComputeMOSAICSliceNormal( double dims[3], bool & inverted );
00058
00061     bool ComputeMOSAICSlicePosition( double pos[3], bool inverted );
00062
00064     bool ComputeMOSAICImagePositionPatient( double pos[3],
00065         const double ipp[6],
00066         const double dircos[6],
00067         const double pixelspacing[3],
00068         const unsigned int image_dims[3] ,
00069         const unsigned int mosaic_dims[3], bool inverted );
00070
00071     void SetImage(const Image& image);
00072     const Image &GetImage() const { return *I; }
00073     Image &GetImage() { return *I; }
00074
00075     void SetFile(const File& f) { F = f; }
00076     File &GetFile() { return *F; }
00077     const File &GetFile() const { return *F; }
00078
00080     static bool GetAcquisitionSize(unsigned int size[2], DataSet const & ds);
00081
00083     static unsigned int GetNumberOfImagesInMosaic( File const & file );
00084
00085 protected:
00086
00087 private:
00088     SmartPointer<File> F;
00089     SmartPointer<Image> I;
00090 };
00091
00092 } // end namespace gdcms
00093
00094 #endif //GDCMSPLITMOSAICFILTER_H
```



```

00017  *=====*/
00018  #ifndef GDCMSTREAMIMAGEREADER_H
00019  #define GDCMSTREAMIMAGEREADER_H
00020
00021  #include "gdcmReader.h"
00022
00023  namespace gdcm
00024  {
00025
00026  class MediaStorage;
00038  class GDCM_EXPORT StreamImageReader
00039  {
00040
00041  public:
00042      StreamImageReader();
00043      virtual ~StreamImageReader();
00044
00048      void SetFileName(const char* inFileName);
00049      void SetStream(std::istream& inStream);
00050
00051      std::vector<unsigned int> GetDimensionsValueForResolution( unsigned int );
00052
00060      void DefinePixelExtent(uint16_t inXMin, uint16_t inXMax,
00061          uint16_t inYMin, uint16_t inYMax, uint16_t inZMin = 0, uint16_t inZMax = 1);
00062
00067      uint32_t DefineProperBufferLength() const;
00068
00076      bool Read(char* inReadBuffer, const std::size_t& inBufferLength);
00077
00083      bool CanReadImage() const;
00084
00088      virtual bool ReadImageInformation();
00089
00093      File const & GetFile() const;
00094
00095  protected:
00096  private:
00097      //contains a reader for being able to ReadUpToTag
00098      //however, we don't want the user to be able to call Read
00099      //either directly or via a parent class call, so we hide the reader in here.
00100      Reader mReader;
00101
00102      std::streamoff mFileOffset; //the file offset for getting header information
00103      #if 0
00104      std::streamoff mFileOffset1;
00105      #endif
00106      DataSet mHeaderInformation; //all the non-pixel information
00107
00108      //for thread safety, these should not be stored here, but should be used
00109      //for every read subregion operation.
00110      uint16_t mXMin, mYMin, mXMax, mYMax, mZMin, mZMax;
00111
00116      bool ReadImageSubregionRAW(char* inReadBuffer, const std::size_t& inBufferLength);
00117
00120      bool ReadImageSubregionJpegLS(char* inReadBuffer, const std::size_t& inBufferLength);
00121  };
00122
00123  } // end namespace gdcm
00124
00125  #endif //GDCMSTREAMIMAGEREADER_H
00126

```

## 13.425 gdcmStreamImageWriter.h File Reference

```

#include "gdcmWriter.h"
#include <iostream>
#include "gdcmDataSet.h"

```

- class `gdcm::StreamImageWriter`  
*StreamImageReader*.

- namespace **gdcm**

[Go to the documentation of this file.](#)

Generated by Doxygen

```

00024 #include "gdcmDataSet.h"
00025
00026 namespace gdcm
00027 {
00028
00029 class MediaStorage;
00030 class RAWCodec;
00042 class GDCM_EXPORT StreamImageWriter
00043 {
00044
00045 public:
00046     StreamImageWriter();
00047     virtual ~StreamImageWriter();
00048
00049
00053     void SetFileName(const char* inFileName);
00054     void SetStream(std::ostream& inStream);
00055
00064     void DefinePixelExtent(uint16_t inXMin, uint16_t inXMax,
00065         uint16_t inYMin, uint16_t inYMax, uint16_t inZMin = 0, uint16_t inZMax = 1);
00066
00067
00073     uint32_t DefineProperBufferLength();
00074
00082     bool Write(void* inWriteBuffer, const std::size_t& inBufferLength);
00083
00087     virtual bool WriteImageInformation();
00088
00092     bool CanWriteFile() const;
00093
00094
00097     void SetFile(const File& inFile);
00098
00099 protected:
00100
00101     //contains the PrepareWrite function, which will get the given dataset ready
00102     //for writing to disk by manufacturing the header information.
00103     //note that if there is a pixel element in the given dataset, that will be removed
00104     //during the copy, so that the imagewriter can write everything else out
00105     Writer mWriter;
00106
00107     //is the offset necessary if we always append?
00108     //std::streamoff mFileOffset; //the fileoffset for getting header information
00109     SmartPointer<File> mspFile; //all the non-pixel information
00110
00111     //for thread safety, these should not be stored here, but should be used
00112     //for every read subregion operation.
00113     uint16_t mXMin, mYMin, mXMax, mYMax, mZMin, mZMax;
00114
00119     //virtual bool ReadImageSubregionRAW(std::ostream& os);
00120     virtual bool WriteImageSubregionRAW(char* inWriteBuffer, const std::size_t& inBufferLength);
00121
00131     int WriteRawHeader(RAWCodec* inCodec, std::ostream* inStream);
00132
00137     int mElementOffsets;
00138     int mElementOffsets1;
00139
00140 };
00141
00142
00143 } // end namespace gdcm
00144
00145 #endif //GDCMSTREAMIMAGEWRITER_H

```

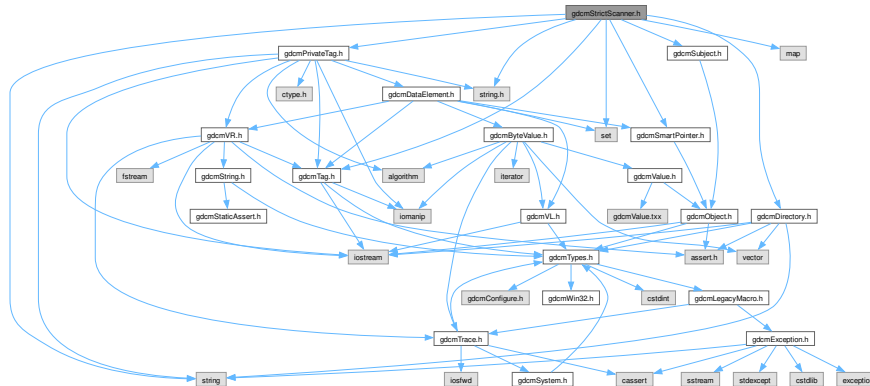
## 13.427 gdcmStrictScanner.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmSubject.h"
#include "gdcmTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmSmartPointer.h"
#include <map>

```

Include dependency graph for `gdcmStrictScanner.h`:



## Classes

- struct `gdcm::StrictScanner::Itstr`
- class `gdcm::StrictScanner`  
*StrictScanner.*

## Namespaces

- namespace **gdcm**

## Functions

- `std::ostream & gdcmm::operator<< (std::ostream &os, const StrictScanner &s)`

### 13.428 gdcmStrictScanner.h

[Go to the documentation of this file.](#)

```
00001 /*=====*/
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSTRICTSCANNER_H
```

```

00015 #define GDCMSTRICTSCANNER_H
00016
00017 #include "gdcmDirectory.h"
00018 #include "gdcmSubject.h"
00019 #include "gdcmTag.h"
00020 #include "gdcmPrivateTag.h"
00021 #include "gdcmSmartPointer.h"
00022
00023 #include <map>
00024 #include <set>
00025 #include <string>
00026
00027 #include <string.h> // strcmp
00028
00029 namespace gdcm
00030 {
00031 class StringFilter;
00032
00033 class GDCM_EXPORT StrictScanner : public Subject
00034 {
00035     friend std::ostream& operator<<(std::ostream &_os, const StrictScanner &s);
00036 public:
00037     StrictScanner():Values(),FileNames(),Mappings() {}
00038     ~StrictScanner() override;
00039
00040     typedef std::map<Tag, const char*> TagToValue;
00041     //typedef std::map<Tag, ConstCharWrapper> TagToValue; //StringMap;
00042     //typedef TagToStringMap TagToValue;
00043     typedef TagToValue::value_type TagToValueValueType;
00044
00045     void AddTag( Tag const & t );
00046     void ClearTags();
00047
00048     // Work in progress do not use:
00049     void AddPrivateTag( PrivateTag const & t );
00050
00051     void AddSkipTag( Tag const & t );
00052     void ClearSkipTags();
00053
00054     bool Scan( Directory::FileNamesType const & filenames );
00055
00056     Directory::FileNamesType const &GetFileNames() const { return FileNames; }
00057
00058     void Print( std::ostream & os ) const override;
00059
00060     void PrintTable( std::ostream & os ) const;
00061
00062     bool IsKey( const char * filename ) const;
00063
00064     Directory::FileNamesType GetKeys() const;
00065
00066     // struct to store all the values found:
00067     typedef std::set< std::string > ValueType;
00068
00069     ValueType const & GetValues() const { return Values; }
00070
00071     ValueType GetValues(Tag const &t) const;
00072
00073     Directory::FileNamesType GetOrderedValues(Tag const &t) const;
00074
00075     /* ltstr is CRITICAL, otherwise pointers value are used to do the key comparison */
00076     struct ltstr
00077     {
00078         bool operator()(const char* s1, const char* s2) const
00079         {
00080             assert( s1 && s2 );
00081             return strcmp(s1, s2) < 0;
00082         }
00083     };
00084
00085     typedef std::map<const char *,TagToValue, ltstr> MappingType;
00086     typedef MappingType::const_iterator ConstIterator;
00087     ConstIterator Begin() const { return Mappings.begin(); }
00088     ConstIterator End() const { return Mappings.end(); }
00089
00090     MappingType const & GetMappings() const { return Mappings; }
00091
00092     TagToValue const & GetMapping(const char *filename) const;
00093
00094     const char *GetFilenameFromTagToValue(Tag const &t, const char *valueref) const;
00095
00096     Directory::FileNamesType GetAllFileNamesFromTagToValue(Tag const &t, const char *valueref) const;

```



```

00144
00146 // by a call to GetMapping()
00147 TagToValue const & GetMappingFromTagToValue(Tag const &t, const char *value) const;
00148
00154 const char* GetValue(const char *filename, Tag const &t) const;
00155
00157 static SmartPointer<StrictScanner> New() { return new StrictScanner; }
00158
00159 protected:
00160 void ProcessPublicTag(StringFilter &sf, const char *filename);
00161 private:
00162 // struct to store all uniq tags in ascending order:
00163 typedef std::set< Tag > TagsType;
00164 typedef std::set< PrivateTag > PrivateTagsType;
00165 std::set< Tag > Tags;
00166 std::set< PrivateTag > PrivateTags;
00167 std::set< Tag > SkipTags;
00168 ValuesType Values;
00169 Directory::FileNamesType Filenames;
00170
00171 // Main struct that will hold all mapping:
00172 MappingType Mappings;
00173
00174 double Progress;
00175 };
00176 //-----
00177 inline std::ostream& operator<<(std::ostream &os, const StrictScanner &s)
00178 {
00179 s.Print( os );
00180 return os;
00181 }
00182
00183 } // end namespace gdcm
00184
00185 #endif //GDCMSTRICTSCANNER_H

```

## 13.429 gdcmStrictScanner2.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmPrivateTag.h"
#include "gdcmSmartPointer.h"
#include "gdcmSubject.h"
#include "gdcmTag.h"
#include <map>
#include <set>
#include <string>
#include <string.h>

```



```

00017 #include "gdcmDirectory.h"
00018 #include "gdcmPrivateTag.h"
00019 #include "gdcmSmartPointer.h"
00020 #include "gdcmSubject.h"
00021 #include "gdcmTag.h"
00022
00023 #include <map>
00024 #include <set>
00025 #include <string>
00026
00027 #include <string.h> // strcmp
00028
00029 namespace gdcm {
00030 class StringFilter;
00031
00032 class GDCM_EXPORT StrictScanner2 : public Subject {
00033     friend std::ostream &operator<<(std::ostream &_os, const StrictScanner2 &s);
00034
00035 public:
00036     StrictScanner2() : Values(), Filenames(), PublicMappings(), PrivateMappings(), Progress(0.0) {}
00037     ~StrictScanner2() override;
00038
00039     typedef std::map<Tag, const char *> PublicTagToValue;
00040     typedef PublicTagToValue::value_type PublicTagToValueValueType;
00041
00042     typedef std::map<PrivateTag, const char *> PrivateTagToValue;
00043     typedef PrivateTagToValue::value_type PrivateTagToValueValueType;
00044
00045     bool AddPublicTag(Tag const &t);
00046     void ClearPublicTags();
00047
00048     // Work in progress do not use:
00049     bool AddPrivateTag(PrivateTag const &pt);
00050     void ClearPrivateTags();
00051
00052     bool AddSkipTag(Tag const &t);
00053     void ClearSkipTags();
00054
00055     bool Scan(Directory::FileNamesType const &filenames);
00056
00057     Directory::FileNamesType const &GetFilenames() const { return Filenames; }
00058
00059     void Print(std::ostream &os) const override;
00060
00061     void PrintTable(std::ostream &os, bool header = false) const;
00062
00063     bool IsKey(const char *filename) const;
00064
00065     Directory::FileNamesType GetKeys() const;
00066
00067     // struct to store all the values found:
00068     typedef std::set<std::string> ValuesType;
00069
00070     ValuesType const &GetValues() const { return Values; }
00071
00072     ValuesType GetPublicValues(Tag const &t) const;
00073
00074     ValuesType GetPrivateValues(PrivateTag const &pt) const;
00075
00076     Directory::FileNamesType GetPublicOrderedValues(Tag const &t) const;
00077
00078     Directory::FileNamesType GetPrivateOrderedValues(PrivateTag const &pt) const;
00079
00080     /* ltstr is CRITICAL, otherwise pointers value are used to do the key
     * comparison */
00081     struct ltstr {
00082         bool operator()(const char *s1, const char *s2) const {
00083             assert(s1 && s2);
00084             return strcmp(s1, s2) < 0;
00085         }
00086     };
00087
00088     typedef std::map<const char *, PublicTagToValue, ltstr> PublicMappingType;
00089     typedef PublicMappingType::const_iterator PublicConstIterator;
00090     PublicConstIterator Begin() const { return PublicMappings.begin(); }
00091     PublicConstIterator End() const { return PublicMappings.end(); }
00092
00093     typedef std::map<const char *, PrivateTagToValue, ltstr> PrivateMappingType;
00094     typedef PrivateMappingType::const_iterator PrivateConstIterator;
00095     PrivateConstIterator PrivateBegin() const { return PrivateMappings.begin(); }
00096     PrivateConstIterator PrivateEnd() const { return PrivateMappings.end(); }
00097
00098
00099
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00140
00141

```

```

00144     PublicMappingType const &GetPublicMappings() const { return PublicMappings; }
00145     PrivateMappingType const &GetPrivateMappings() const {
00146         return PrivateMappings;
00147     }
00148
00150     PublicTagToValue const &GetPublicMapping(const char *filename) const;
00151     PrivateTagToValue const &GetPrivateMapping(const char *filename) const;
00152
00155     const char *GetFilenameFromPublicTagToValue(Tag const &t,
00156                                                const char *valueref) const;
00157     const char *GetFilenameFromPrivateTagToValue(PrivateTag const &pt,
00158                                                const char *valueref) const;
00159
00162     Directory::FileNamesType GetAllFileNamesFromPublicTagToValue(
00163         Tag const &t, const char *valueref) const;
00164     Directory::FileNamesType GetAllFileNamesFromPrivateTagToValue(
00165         PrivateTag const &pt, const char *valueref) const;
00166
00169     // by a call to GetMapping()
00170     PublicTagToValue const &GetMappingFromPublicTagToValue(
00171         Tag const &t, const char *value) const;
00172     PrivateTagToValue const &GetMappingFromPrivateTagToValue(
00173         PrivateTag const &pt, const char *value) const;
00174
00180     const char *GetPublicValue(const char *filename, Tag const &t) const;
00181     const char *GetPrivateValue(const char *filename, PrivateTag const &t) const;
00182
00184     static SmartPointer<StrictScanner2> New() { return new StrictScanner2; }
00185
00186 protected:
00187     void ProcessPublicTag(StringFilter &sf, const char *filename);
00188     void ProcessPrivateTag(StringFilter &sf, const char *filename);
00189
00190 private:
00191     // struct to store all uniq tags in ascending order:
00192     typedef std::set<Tag> PublicTagsType;
00193     typedef std::set<PrivateTag> PrivateTagsType;
00194     std::set<Tag> PublicTags; // Public and Private Creator
00195     std::set<PrivateTag> PrivateTags; // Only Private (no Private Creator)
00196     std::set<Tag> SkipTags;
00197     ValuesType Values;
00198     Directory::FileNamesType FileNames;
00199
00200     // Main struct that will hold all public mapping:
00201     PublicMappingType PublicMappings;
00202     // Main struct that will hold all private mapping:
00203     PrivateMappingType PrivateMappings;
00204
00205     double Progress;
00206 };
00207 //-----
00208 inline std::ostream &operator<<(std::ostream &os, const StrictScanner2 &s) {
00209     s.Print(os);
00210     return os;
00211 }
00212
00213 } // end namespace gdcm
00214
00215 #endif // GDCMSTRICTSCANNER2_H

```

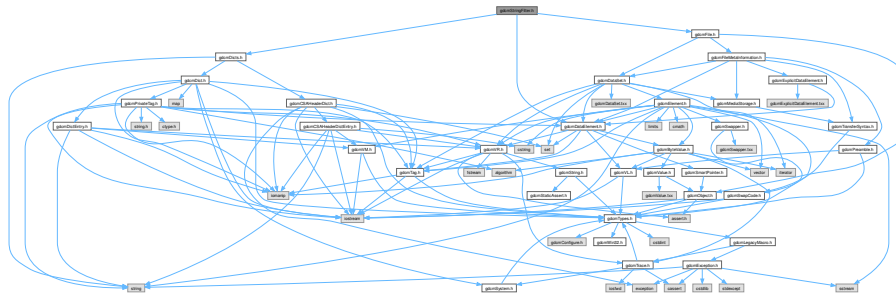
## 13.431 gdcmStringFilter.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmDicts.h"
#include "gdcmFile.h"

```

Include dependency graph for gdcmStringFilter.h:



## Classes

- class `gdcm::StringFilter`  
*StringFilter.*

## Namespaces

- namespace `gdcm`

## 13.432 gdcmStringFilter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMSTRINGFILTER_H
00015 #define GDCMSTRINGFILTER_H
00016
00017 #include "gdcmDataElement.h"
00018 #include "gdcmDicts.h"
00019 #include "gdcmFile.h"
00020
00021 namespace gdcm
00022 {
00023
00024     class GDCM_EXPORT StringFilter
00025     {
00026     public:
00027         StringFilter();
00028         ~StringFilter();
00029
00030         void UseDictAlways(bool) {}
00031
00032         void SetDicts(const Dicts &dicts);
00033
00034         std::string ToString(const DataElement& de) const;
00035     };
00036
00037 }
00038
00039 #endif

```

```

00045
00047     std::string ToString(const Tag& t) const;
00048
00049     std::string ToString(const PrivateTag& t) const;
00050
00055     std::pair<std::string, std::string> ToStringPair(const DataElement& de) const;
00057     std::pair<std::string, std::string> ToStringPair(const Tag& t) const;
00058
00060     std::string FromString(const Tag&t, const char * value, size_t len);
00061
00063     void SetFile(const File& f) { F = f; }
00064     File &GetFile() { return *F; }
00065     const File &GetFile() const { return *F; }
00066
00070     bool ExecuteQuery(std::string const &query, std::string & value) const;
00071
00072 protected:
00073     std::pair<std::string, std::string> ToStringPair(const Tag& t, DataSet const &ds) const;
00074     bool ExecuteQuery(std::string const &query, DataSet const &ds, std::string & value) const;
00075
00076 private:
00077     std::pair<std::string, std::string> ToStringPairInternal(const DataElement& de, DataSet const &ds)
00078         const;
00078     SmartPointer<File> F;
00079 };
00080
00081 } // end namespace gdcm
00082
00083 #endif //GDCMSTRINGFILTER_H

```

## 13.433 gdcmSurface.h File Reference

```

#include <gdcmObject.h>
#include <gdcmDataElement.h>
#include <gdcmMeshPrimitive.h>
#include "gdcmSegmentHelper.h"

```

Include dependency graph for gdcmSurface.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::Surface](#)  
*This class defines a SURFACE IE.*

## Namespaces

- namespace [gdcm](#)

## 13.434 gdcmSurface.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSURFACE_H
00015 #define GDCMSURFACE_H
00016
00017 #include <gdcmObject.h>
00018 #include <gdcmDataElement.h>
00019 #include <gdcmMeshPrimitive.h>
00020 #include "gdcmSegmentHelper.h" // for BasicCodedEntry
00021

```

```

00022 namespace gdcmm
00023 {
00024
00031 class GDCM_EXPORT Surface : public Object
00032 {
00033 public:
00034
00035     typedef enum {
00036         NO = 0,
00037         YES,
00038         UNKNOWN,
00039         STATES_END
00040     } STATES;
00041
00042     static const char * GetSTATESString(STATES state);
00043     static STATES GetSTATES(const char * state);
00044
00050     typedef enum {
00051         SURFACE = 0,
00052         WIREFRAME,
00053         POINTS,
00054         VIEWType_END
00055     } VIEWType;
00056
00057     static const char * GetVIEWTypeString(VIEWType type);
00058     static VIEWType GetVIEWType(const char * type);
00059
00060     Surface();
00061
00062     ~Surface() override;
00063
00064     /** Common getters/setters */
00065     unsigned long GetSurfaceNumber() const;
00066     void SetSurfaceNumber(const unsigned long nb);
00067
00068     const char * GetSurfaceComments() const;
00069     void SetSurfaceComments(const char * comment);
00070
00071     bool GetSurfaceProcessing() const;
00072     void SetSurfaceProcessing(bool b);
00073
00074     float GetSurfaceProcessingRatio() const;
00075     void SetSurfaceProcessingRatio(const float ratio);
00076
00077     const char * GetSurfaceProcessingDescription() const;
00078     void SetSurfaceProcessingDescription(const char * description);
00079
00080     SegmentHelper::BasicCodedEntry const & GetProcessingAlgorithm() const;
00081     SegmentHelper::BasicCodedEntry & GetProcessingAlgorithm();
00082     void SetProcessingAlgorithm(SegmentHelper::BasicCodedEntry const & BSE);
00083
00084     unsigned short GetRecommendedDisplayGrayscaleValue() const;
00085     void SetRecommendedDisplayGrayscaleValue(const unsigned short vl);
00086
00087     const unsigned short * GetRecommendedDisplayCIELabValue() const;
00088     unsigned short GetRecommendedDisplayCIELabValue(const unsigned int idx) const;
00089     void SetRecommendedDisplayCIELabValue(const unsigned short vl[3]);
00090     void SetRecommendedDisplayCIELabValue(const unsigned short vl, const unsigned int idx = 0);
00091     void SetRecommendedDisplayCIELabValue(const std::vector< unsigned short > & vl);
00092
00093     float GetRecommendedPresentationOpacity() const;
00094     void SetRecommendedPresentationOpacity(const float opacity);
00095
00096     VIEWType GetRecommendedPresentationType() const;
00097     void SetRecommendedPresentationType(VIEWType type);
00098
00099     STATES GetFiniteVolume() const;
00100     void SetFiniteVolume(STATES state);
00101
00102     STATES GetManifold() const;
00103     void SetManifold(STATES state);
00104
00105     SegmentHelper::BasicCodedEntry const & GetAlgorithmFamily() const;
00106     SegmentHelper::BasicCodedEntry & GetAlgorithmFamily();
00107     void SetAlgorithmFamily(SegmentHelper::BasicCodedEntry const & BSE);
00108
00109     const char * GetAlgorithmVersion() const;
00110     void SetAlgorithmVersion(const char * str);
00111
00112     const char * GetAlgorithmName() const;
00113     void SetAlgorithmName(const char * str);

```



```

00114
00115 /** Points getters/setters */
00116 unsigned long GetNumberOfSurfacePoints() const;
00117 void SetNumberOfSurfacePoints(const unsigned long nb);
00118
00119 const DataElement & GetPointCoordinatesData() const;
00120 DataElement & GetPointCoordinatesData();
00121
00122 void SetPointCoordinatesData(DataElement const & de);
00123
00127 const float * GetPointPositionAccuracy() const;
00128 void SetPointPositionAccuracy(const float * accuracies);
00129
00130 float GetMeanPointDistance() const;
00131 void SetMeanPointDistance(float average);
00132
00133 float GetMaximumPointDistance() const;
00134 void SetMaximumPointDistance(float maximum);
00135
00139 const float * GetPointsBoundingBoxCoordinates() const;
00140 void SetPointsBoundingBoxCoordinates(const float * coordinates);
00141
00145 const float * GetAxisOfRotation() const;
00146 void SetAxisOfRotation(const float * axis);
00147
00151 const float * GetCenterOfRotation() const;
00152 void SetCenterOfRotation(const float * center);
00153
00154 /** Vectors getters/setters */
00155 unsigned long GetNumberOfVectors() const;
00156 void SetNumberOfVectors(const unsigned long nb);
00157
00158 unsigned short GetVectorDimensionality() const;
00159 void SetVectorDimensionality(const unsigned short dim);
00160
00161 const float * GetVectorAccuracy() const;
00162 void SetVectorAccuracy(const float * accuracy);
00163
00164 const DataElement & GetVectorCoordinateData() const;
00165 DataElement & GetVectorCoordinateData();
00166
00167 void SetVectorCoordinateData(DataElement const & de);
00168
00169 /** Primitive getters/setters */
00170 MeshPrimitive const & GetMeshPrimitive() const;
00171 MeshPrimitive & GetMeshPrimitive();
00172
00173 void SetMeshPrimitive(MeshPrimitive & mp);
00174
00175 private:
00176
00177 /** Common members */
00178
00179 //0066 0003 UL 1 Surface Number
00180 unsigned long SurfaceNumber;
00181 //0066 0004 LT 1 Surface Comments
00182 std::string SurfaceComments;
00183
00184 //0066 0009 CS 1 Surface Processing
00185 bool SurfaceProcessing;
00186 //0066 000a FL 1 Surface Processing Ratio
00187 float SurfaceProcessingRatio;
00188 //0066 000b LO 1 Surface Processing Description
00189 std::string SurfaceProcessingDescription;
00190 // Processing Algorithm Code
00191 SegmentHelper::BasicCodedEntry ProcessingAlgorithm;
00192
00193 //0062 000c US 1 Recommended Display Grayscale Value
00194 unsigned short RecommendedDisplayGrayscaleValue;
00195 //0062 000d US 3 Recommended Display CIELab Value
00196 unsigned short RecommendedDisplayCIELabValue[3];
00197
00198 // 0066 000c FL 1 Recommended Presentation Opacity
00199 float RecommendedPresentationOpacity;
00200 // 0066 000d CS 1 Recommended Presentation Type
00201 VIEWType RecommendedPresentationType;
00202
00203 //0066 000e CS 1 Finite Volume
00204 STATES FiniteVolume;
00205 //0066 0010 CS 1 Manifold
00206 STATES Manifold;

```

```

00207
00208 // Algorithm Family Code
00209 SegmentHelper::BasicCodedEntry AlgorithmFamily;
00210
00211 //0066 0031 LO 1 Algorithm Version
00212 std::string AlgorithmVersion;
00213 //0066 0032 LT 1 Algorithm Parameters
00214 //0066 0036 LO 1 Algorithm Name
00215 std::string AlgorithmName;
00216
00217
00218 /**          Point members          **/
00219
00220 //0066 0015 UL 1 Number of Surface Points
00221 unsigned long NumberOfSurfacePoints;
00222 //0066 0016 OF 1 Point Coordinates Data
00223 DataElement PointCoordinatesData;
00224 //0066 0017 FL 3 Point Position Accuracy
00225 float *      PointPositionAccuracy;
00226 //0066 0018 FL 1 Mean Point Distance
00227 float      MeanPointDistance;
00228 //0066 0019 FL 1 Maximum Point Distance
00229 float      MaximumPointDistance;
00230 //0066 001a FL 6 Points Bounding Box Coordinates
00231 float *      PointsBoundingBoxCoordinates;
00232 //0066 001b FL 3 Axis of Rotation
00233 float *      AxisOfRotation;
00234 //0066 001c FL 3 Center of Rotation
00235 float *      CenterOfRotation;
00236
00237
00238 /**          Normal members          **/
00239
00240 //0066 001e UL 1 Number of Vectors
00241 unsigned long NumberOfVectors;
00242 //0066 001f US 1 Vector Dimensionality
00243 unsigned short VectorDimensionality;
00244 //0066 0020 FL 1-n Vector Accuracy
00245 float *      VectorAccuracy;
00246 //0066 0021 OF 1 Vector Coordinate Data
00247 DataElement VectorCoordinateData;
00248
00249
00250 /**          Primitive members          **/
00251 SmartPointer< MeshPrimitive > Primitive;
00252 };
00253
00254 }
00255
00256 #endif // GDCMSURFACE_H

```

## 13.435 gdcmSurfaceHelper.h File Reference

```

#include "gdcmTypes.h"
#include <vector>
#include <iostream>

```

Include dependency graph for gdcmSurfaceHelper.h:



## Classes

- class `gdcm::SurfaceHelper`  
*SurfaceHelper*.

## Namespaces

- namespace `gdcm`

## 13.436 gdcmSurfaceHelper.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2017 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSURFACEHELPER_H
00015 #define GDCMSURFACEHELPER_H
00016
00017 #include "gdcmTypes.h" // for GDCM_EXPORT
00018
00019 #include <vector>
00020 #include <iostream>
00021
00022 namespace gdcm
00023 {
00024
00029   class GDCM_EXPORT SurfaceHelper
00030   {
00031   public:

```

```

00032
00033     typedef std::vector< unsigned short > ColorArray;
00034
00046     template <typename T, typename U>
00047     static unsigned short RGBToRecommendedDisplayGrayscale(const std::vector<T> & RGB,
00048                                                             const U rangeMax = 255);
00060     template <typename T, typename U>
00061     static ColorArray RGBToRecommendedDisplayCIELab(const std::vector<T> & RGB,
00062                                                      const U rangeMax = 255);
00074     template <typename T, typename U>
00075     static std::vector<T> RecommendedDisplayCIELabToRGB(const ColorArray & CIELab,
00076                                                         const U rangeMax = 255);
00087     template <typename U>
00088     static std::vector<float> RecommendedDisplayCIELabToRGB(const ColorArray & CIELab,
00089                                                             const U rangeMax = 255);
00090
00091 private:
00092
00093     static std::vector< float > RGBToXYZ(const std::vector<float> & RGB);
00094
00095     static std::vector< float > XYZToRGB(const std::vector<float> & XYZ);
00096
00097     static std::vector< float > XYZToCIELab(const std::vector<float> & XYZ);
00098
00099     static std::vector< float > CIELabToXYZ(const std::vector<float> & CIELab);
00100 };
00101
00102 template <typename T, typename U>
00103 unsigned short SurfaceHelper::RGBToRecommendedDisplayGrayscale(const std::vector<T> & RGB,
00104                                                                 const U rangeMax/* = 255*/)
00105 {
00106     assert(RGB.size() > 2);
00107
00108     unsigned short Grayscale = 0;
00109
00110     const float inverseRangeMax = 1.0f / (float) rangeMax;
00111
00112     // 0xFFFF "=" 255 "=" white
00113     Grayscale = (unsigned short) ((0.2989 * RGB[0] + 0.5870 * RGB[1] + 0.1140 * RGB[2])
00114                                  * inverseRangeMax // Convert to range 0-1
00115                                  * 0xFFFF);        // Convert to range 0x0000-0xFFFF
00116
00117     return Grayscale;
00118 }
00119
00120 template <typename T, typename U>
00121 SurfaceHelper::ColorArray SurfaceHelper::RGBToRecommendedDisplayCIELab(const std::vector<T> & RGB,
00122                                                                           const U rangeMax/* = 255*/)
00123 {
00124     assert(RGB.size() > 2);
00125
00126     ColorArray CIELab(3);
00127     std::vector<float> tmp(3);
00128
00129     // Convert to range 0-1
00130     const float inverseRangeMax = 1.0f / (float) rangeMax;
00131     tmp[0] = (float) (RGB[0] * inverseRangeMax);
00132     tmp[1] = (float) (RGB[1] * inverseRangeMax);
00133     tmp[2] = (float) (RGB[2] * inverseRangeMax);
00134
00135     tmp = SurfaceHelper::XYZToCIELab( SurfaceHelper::RGBToXYZ( tmp ) );
00136
00137     // Convert to range 0x0000-0xFFFF
00138     // 0xFFFF "=" 127, 0x8080 "=" 0, 0x0000 "=" -128
00139     CIELab[0] = (unsigned short) ( 0xFFFF * (tmp[0]*0.01f));
00140     if(tmp[1] >= -128 && tmp[1] <= 0)
00141     {
00142         CIELab[1] = (unsigned short) (((float) (0x8080)/128.0f)*tmp[1] + ((float)0x8080));
00143     }
00144     else if(tmp[1] <= 127 && tmp[1] > 0)
00145     {
00146         CIELab[1] = (unsigned short) (((float) (0xFFFF - 0x8080)/127.0f)*tmp[1] + (float) (0x8080));
00147     }
00148     if(tmp[2] >= -128 && tmp[2] <= 0)
00149     {
00150         CIELab[2] = (unsigned short) (((float) 0x8080/128.0f)*tmp[2] + ((float)0x8080));
00151     }
00152     else if(tmp[2] <= 127 && tmp[2] > 0)
00153     {
00154         CIELab[2] = (unsigned short) (((float) (0xFFFF - 0x8080)/127.0f)*tmp[2] + (float) (0x8080));
00155     }

```

```

00156
00157     return CIELab;
00158 }
00159
00160 template <typename T, typename U>
00161 std::vector<T> SurfaceHelper::RecommendedDisplayCIELabToRGB(const ColorArray & CIELab,
00162                                                            const U rangeMax/* = 255*/)
00163 {
00164     assert(CIELab.size() > 2);
00165
00166     std::vector<T> RGB(3);
00167     std::vector<float> tmp(3);
00168
00169     // Convert to range 0-1
00170
00171     tmp[0] = 100.0f*CIELab[0] / (float) (0xFFFF);
00172     if(CIELab[1] <= 0x8080)
00173     {
00174         tmp[1] = (float) (((CIELab[1] - 0x8080) * 128.0f) / (float) 0x8080);
00175     }
00176     else
00177     {
00178         tmp[1] = (float) ((CIELab[1]-0x8080)*127.0f / (float) (0xFFFF - 0x8080));
00179     }
00180     if(CIELab[2] <= 0x8080)
00181     {
00182         tmp[2] = (float) (((CIELab[2] - 0x8080) * 128.0f) / (float) 0x8080);
00183     }
00184     else
00185     {
00186         tmp[2] = (float) ((CIELab[2]-0x8080)*127.0f / (float) (0xFFFF - 0x8080));
00187     }
00188
00189     tmp = SurfaceHelper::XYZToRGB( SurfaceHelper::CIELabToXYZ( tmp ) );
00190
00191     // Convert to range 0-rangeMax
00192     RGB[0] = (T) (tmp[0] * rangeMax);
00193     RGB[1] = (T) (tmp[1] * rangeMax);
00194     RGB[2] = (T) (tmp[2] * rangeMax);
00195
00196     return RGB;
00197 }
00198
00199 template <typename U>
00200 std::vector<float> SurfaceHelper::RecommendedDisplayCIELabToRGB(const ColorArray & CIELab,
00201                                                                const U rangeMax/* = 255*/)
00202 {
00203     return RecommendedDisplayCIELabToRGB<float>(CIELab, rangeMax);
00204 }
00205
00206 } // end namespace gdcm
00207
00208 #endif // GDCMSURFACEHELPER_H

```

## 13.437 gdcmSurfaceReader.h File Reference

```

#include <gdcmSegmentReader.h>
#include <gdcmSurface.h>

```



### 13.439 gdcmsurfaceWriter.h File Reference

- class `gdcm::SurfaceWriter`  
*This class defines a SURFACE IE writer.*

- namespace **gdcm**

## 13.440 gdcmSurfaceWriter.h

[Go to the documentation of this file.](#)

```

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00012
00013 =====*/
00014 #ifndef GDCMSURFACEWRITER_H
00015 #define GDCMSURFACEWRITER_H
00016
00017 #include <gdcmSegmentWriter.h>
00018 #include <gdcmSurface.h>
00019
00020 namespace gdcm
00021 {
00022
00023   class GDCM_EXPORT SurfaceWriter : public SegmentWriter
00024   {
00025   public:
00026     SurfaceWriter();
00027
00028     ~SurfaceWriter() override;
00029
00030     // const Surface & GetSurface() const { return *SurfaceData; }
00031     // Surface & GetSurface() { return *SurfaceData; }
00032     // void SetSurface(Surface const & segment);
00033
00034     bool Write() override; // Execute()
00035
00036     unsigned long GetNumberOfSurfaces();
00037     void SetNumberOfSurfaces(const unsigned long nb);
00038
00039 protected:
00040
00041     bool PrepareWrite();
00042
00043     void ComputeNumberOfSurfaces();
00044
00045     bool PrepareWritePointMacro(SmartPointer< Surface > surface,
00046                                DataSet & surfaceDS,
00047                                const TransferSyntax & ts);
00048
00049     //0066 0001 UL 1 Number of Surfaces
00050     unsigned long NumberOfSurfaces;
00051 };
00052
00053 #endif // GDCMSURFACEWRITER_H

```

## 13.441 gdcmTagPath.h File Reference

```

#include "gdcmTag.h"
#include <vector>

```



Include dependency graph for gdcmTagPath.h:



## Classes

- class `gdcm::TagPath`  
*class to handle a path of tag.*

## Namespaces

- namespace `gdcm`

## 13.442 gdcmTagPath.h

[Go to the documentation of this file.](#)

```

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00012
00013   =====*/
00014 #ifndef GDCMTAGPATH_H
00015 #define GDCMTAGPATH_H
00016
00017 #include "gdcmTag.h"
00018
00019 #include <vector>
00020
00021 namespace gdcm
00022 {
00023

```

```

00030 class GDCM_EXPORT TagPath
00031 {
00032 public:
00033     TagPath();
00034     ~TagPath();
00035     void Print(std::ostream &) const;
00036
00041     bool ConstructFromString(const char *path);
00042
00044     static bool IsValid(const char *path);
00045
00047     bool ConstructFromTagList(Tag const *l, unsigned int n);
00048
00049     bool Push(Tag const & t);
00050     bool Push(unsigned int itemnum);
00051
00052 private:
00053     std::vector<Tag> Path;
00054 };
00055
00056 } // end namespace gdcmm
00057
00058 #endif //GDCMTAGPATH_H

```

## 13.443 gdcmmUIDGenerator.h File Reference

```
#include "gdcmmTypes.h"
```

Include dependency graph for gdcmmUIDGenerator.h:



### Classes

- class [gdcmm::UIDGenerator](#)  
Class for generating unique UID.

### Namespaces

- namespace [gdcmm](#)

## 13.444 gdcmUIDGenerator.h

[Go to the documentation of this file.](#)

```

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00012
00013 =====*/
00014 #ifndef GDCMUIDGENERATOR_H
00015 #define GDCMUIDGENERATOR_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021
00022   class GDCM_EXPORT UIDGenerator
00023   {
00024   public:
00025     UIDGenerator():Unique() {}
00026
00027     // Function to override the GDCM root with a user one:
00028     // WARNING: This need to be a valid root, otherwise call will fail
00029     // Implementation note. According to DICOM standard PS 3.5, Section 9 :
00030     // Unique Identifiers (UIDs), we have:
00031     /*
00032     ...
00033     The <org root> portion of the UID uniquely identifies an organization, (i.e., manufacturer, research
00034     organization, NEMA, etc.), and is composed of a number of numeric components as defined by ISO 8824.
00035     The <suffix> portion of the UID is also composed of a number of numeric components, and shall be
00036     unique within the scope of the <org root>. This implies that the organization identified in the <org
00037     root> is
00038     responsible for guaranteeing <suffix> uniqueness by providing registration policies. These policies
00039     shall
00040     guarantee <suffix> uniqueness for all UID's created by that organization. Unlike the <org root>, which
00041     may
00042     be common for UID's in an organization, the <suffix> shall take different unique values between
00043     different
00044     UID's that identify different objects.
00045     ...
00046     */
00047     static void SetRoot(const char * root);
00048     static const char *GetRoot();
00049
00050     const char* Generate();
00051
00052     static bool IsValid(const char *uid);
00053
00054     static const char *GetGDCMUID(); // who would want that in the public API ??
00055
00056   protected:
00057     static bool GenerateUUID(unsigned char *uuid_data);
00058
00059   private:
00060     static const char GDCM_UID[];
00061     static std::string Root;
00062     static std::string EncodedHardwareAddress;
00063     static std::string Unique; // Buffer
00064 };
00065
00066 } // end namespace gdcm
00067
00068 #endif //GDCMUIDGENERATOR_H

```

## 13.445 gdcmUUIDGenerator.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmUUIDGenerator.h:



### Classes

- class [gdcm::UUIDGenerator](#)  
Class for generating unique UUID.

### Namespaces

- namespace [gdcm](#)

## 13.446 gdcmUUIDGenerator.h

[Go to the documentation of this file.](#)

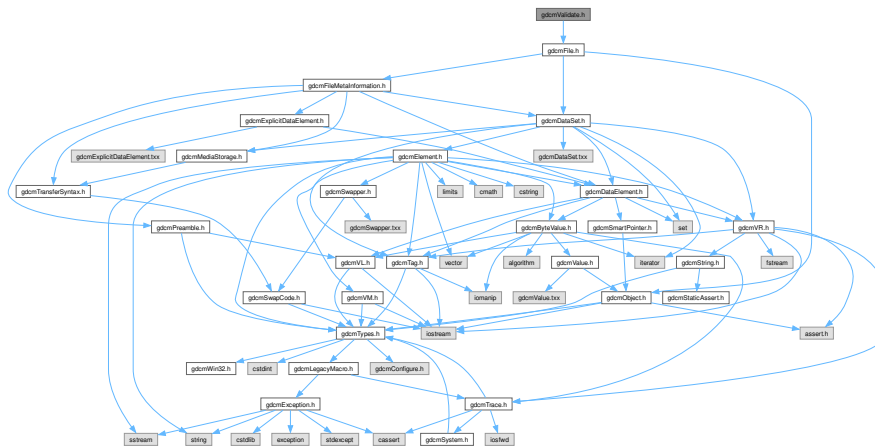
```

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00012
00013  =====*/
00014  #ifndef GDCMUUIDGENERATOR_H
00015  #define GDCMUUIDGENERATOR_H
00016
00017  #include "gdcmTypes.h"
00018
00019  namespace gdcm
00020  {
00021

```

### 13.447 gdcmValidate.h File Reference

Include dependency graph for gdcmValidate.h:



- class `gdcm::Validate`  
*Validate* class.

- namespace **gdcm**

### 13.448 gdcmlValidate.h

[Go to the documentation of this file.](#)

```

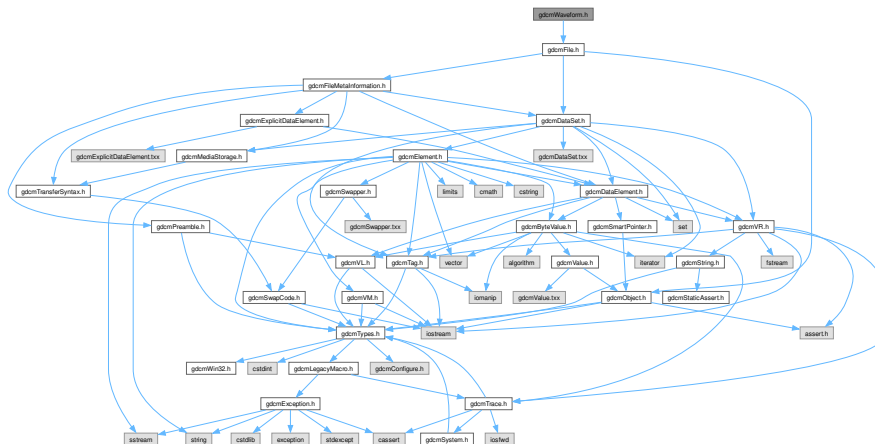
00001  /*=====
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00012
00013     =====*/
00014 #ifndef GDCMVALIDATE_H
00015 #define GDCMVALIDATE_H
00016
00017 #include "gdcmFile.h"
00018
00019 namespace gdcm
00020 {
00021
00022     class GDCM_EXPORT Validate
00023     {
00024     public:
00025         Validate();
00026         ~Validate();
00027
00028         void SetFile(File const &f) { F = &f; }
00029         const File& GetValidatedFile() { return V; }
00030
00031         void Validation();
00032
00033     protected:
00034         const File *F;
00035         File V; // Validated file
00036     };
00037
00038 } // end namespace gdcm
00039
00040 #endif //GDCMVALIDATE_H

```

### 13.449 gdcmWaveform.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for `gdcmWaveform.h`:



**Classes**

- class [gdcm::Waveform](#)  
*Waveform class.*

**Namespaces**

- namespace [gdcm](#)

**13.450 gdcmWaveform.h**

[Go to the documentation of this file.](#)

```

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00012
00013   =====*/
00014 #ifndef GDCMWAVEFORM_H
00015 #define GDCMWAVEFORM_H
00016
00017 #include "gdcmFile.h"
00018
00019 namespace gdcm
00020 {
00024   class GDCM_EXPORT Waveform
00025   {
00026   public:
00027     Waveform() = default;
00028
00029   private:
00030   };
00031
00032 } // end namespace gdcm
00033
00034 #endif //GDCMWAVEFORM_H

```

**13.451 gdcmXMLPrinter.h File Reference**

```

#include "gdcmFile.h"
#include "gdcmDataElement.h"

```





```

00029 DicomDataSet = DicomAttribute*
00030 DicomAttribute = element DicomAttribute {
00031   Tag, VR, Keyword?, PrivateCreator?,
00032   ( BulkData | Value+ | Item+ | PersonName+ )?
00033 }
00034
00035 BulkData = element BulkData{ UUID }
00036 Value = element Value { Number, xsd:string }
00037 Item = element Item { Number, DicomDataSet }
00038 PersonName = element PersonName {
00039   Number,
00040   element SingleByte { NameComponents }?,
00041   element Ideographic { NameComponents }?,
00042   element Phonetic
00043   { NameComponents }?
00044 }
00045
00046 NameComponents =
00047   element FamilyName {xsd:string}?,
00048   element GivenName {xsd:string}?,
00049   element MiddleName {xsd:string}?,
00050   element NamePrefix {xsd:string}?,
00051   element NameSuffix {xsd:string}?
00052
00053 # keyword is the attribute tag from PS3.6
00054 # (derived from the DICOM Attribute's name)
00055 Keyword = attribute keyword { xsd:token }
00056 # canonical XML definition of Hex, with lowercase letters disallowed
00057 Tag = attribute tag { xsd:string{ minLength="8" maxLength="8" pattern="[0-9A-F]{8}" } }
00058 VR = attribute vr { "AE" | "AS" | "AT" | "CS" | "DA" | "DS" | "DT" | "FL" | "FD"
00059 | "IS" | "LO" | "LT" | "OB" | "OF" | "OW" | "PN" | "SH" | "SL"
00060 | "SQ" | "SS" | "ST" | "TM" | "UI" | "UL" | "UN" | "US" | "UT" }
00061 PrivateCreator = attribute privateCreator{ xsd:string }
00062 UUID = attribute uuid { xsd:string }
00063 Number = attribute number { xsd:positiveInteger }
00064
00065
00066 */
00067
00068 #include "gdcmFile.h"
00069 #include "gdcmDataElement.h"
00070
00071 namespace gdcm
00072 {
00073
00074   class DataSet;
00075   class DictEntry;
00076   class Dicts;
00077
00078   class GDCM_EXPORT XMLPrinter
00079   {
00080   public:
00081     XMLPrinter();
00082     virtual ~XMLPrinter();
00083
00084     // Set file
00085     void SetFile(File const &f) { F = &f; }
00086
00087
00088     typedef enum {
00089         OnlyUUID = 0 ,
00090         LOADBULKDATA = 1
00091     } PrintStyles;
00092
00093     // Set PrintStyle value
00094     void SetStyle(PrintStyles ps)
00095     {
00096         PrintStyle = ps;
00097     }
00098
00099     // Get PrintStyle value
00100     PrintStyles GetPrintStyle() const
00101     {
00102         return PrintStyle;
00103     }
00104
00105     // Print
00106     void Print(std::ostream& os);

```

```

00110
00111 // Print an individual dataset
00112 void PrintDataSet(const DataSet &ds, const TransferSyntax &ts, std::ostream& os);
00113
00114 //void PrintUID(std::ostream &os);
00115
00119 virtual void HandleBulkData(const char *uuid, const TransferSyntax &ts,
00120     const char *bulkdata, size_t bulklen);
00121
00122 protected:
00123
00124 VR PrintDataElement(std::ostream &os, const Dicts &dicts, const DataSet &ds, const DataElement &de,
    const TransferSyntax &ts);
00125
00126 void PrintSQ(const SequenceOfItems *sqi, const TransferSyntax &ts, std::ostream &os);
00127
00128 PrintStyles PrintStyle;
00129
00130 const File *F;
00131
00132 };
00133
00134 } // end namespace gdcm
00135
00136 #endif //GDCMXMLPRINTER_H

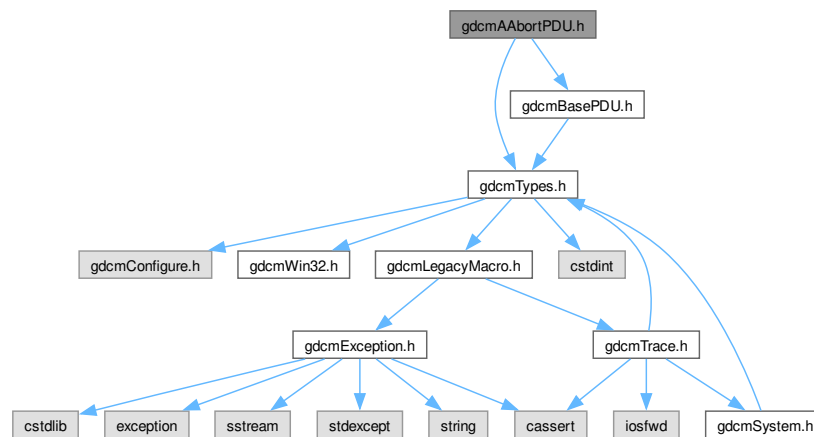
```

## 13.453 gdcmAAbortPDU.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAAbortPDU.h:



## Classes

- class `gdcm::network::AAbortPDU`  
*AAbortPDU*.

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.454 gdcmAAbortPDU.h

[Go to the documentation of this file.](#)

```

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00012
00013   =====*/
00014 #ifndef GDCMAABORTPDU_H
00015 #define GDCMAABORTPDU_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmBasePDU.h"
00019
00020 namespace gdcm
00021 {
00022
00023   namespace network
00024   {
00025
00026     class GDCM_EXPORT AAbortPDU : public BasePDU
00027     {
00028     public:
00029       AAbortPDU();
00030       std::istream &Read(std::istream &is) override;
00031       const std::ostream &Write(std::ostream &os) const override;
00032
00033       size_t Size() const override;
00034       void Print(std::ostream &os) const override;
00035
00036       bool IsLastFragment() const override { return true; }
00037
00038       void SetSource(const uint8_t s);
00039       void SetReason(const uint8_t r);
00040
00041     private:
00042       static const uint8_t ItemType; // PDUType ?
00043       static const uint8_t Reserved2;
00044       uint32_t ItemLength; // PDU Length
00045       static const uint8_t Reserved7;
00046       static const uint8_t Reserved8;
00047       uint8_t Source;
00048       uint8_t Reason; // diag
00049     };
00050
00051   } // end namespace network
00052
00053 } // end namespace gdcm
00054
00055 #endif //GDCMAABORTPDU_H

```

## 13.455 gdcmAAssociateACPDU.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmApplicationContext.h"

```

```
#include "gdcmPresentationContextAC.h"
#include "gdcmUserInformation.h"
#include "gdcmBasePDU.h"
#include <vector>
```

Include dependency graph for `gdcmAAssociateACPDU.h`:



## Classes

- class `gdcm::network::AAssociateACPDU`  
*AAssociateACPDU.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.456 gdcmAAssociateACPDU.h

[Go to the documentation of this file.](#)

```
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00011 PURPOSE. See the above copyright notice for more information.
00012 =====*/
00013 #ifndef GDCMAASSOCIATEACPDU_H
00014 #define GDCMAASSOCIATEACPDU_H
00015
00016 #include "gdcmTypes.h"
00017 #include "gdcmApplicationContext.h"
00018 #include "gdcmPresentationContextAC.h"
```

```

00020 #include "gdcmUserInformation.h"
00021 #include "gdcmBasePDU.h"
00022
00023 #include <vector>
00024
00025 namespace gdcm
00026 {
00027
00028 namespace network
00029 {
00030 class AAssociateRQPDU;
00031
00037 class AAssociateACPDU : public BasePDU
00038 {
00039 public:
00040     AAssociateACPDU();
00041     std::istream &Read(std::istream &is) override;
00042     const std::ostream &Write(std::ostream &os) const override;
00043
00044     void AddPresentationContextAC( PresentationContextAC const &pcac );
00045
00046     typedef std::vector<PresentationContextAC>::size_type SizeType;
00047     const PresentationContextAC &GetPresentationContextAC( SizeType i ) {
00048         assert( !PresContextAC.empty() && i < PresContextAC.size() );
00049         return PresContextAC[i];
00050     }
00051     SizeType GetNumberOfPresentationContextAC() const {
00052         return PresContextAC.size();
00053     }
00054     const UserInformation &GetUserInformation() const { return UserInfo; }
00055
00056     SizeType Size() const override;
00057
00058     void Print(std::ostream &os) const override;
00059     bool IsLastFragment() const override { return true; }
00060
00061     void InitFromRQ( AAssociateRQPDU const &rqpdu );
00062 protected:
00063     friend class AAssociateRQPDU;
00064     void SetCalledAETitle(const char calledaetitle[16]);
00065     void SetCallingAETitle(const char callingaetitle[16]);
00066
00067 private:
00068     void InitSimple( AAssociateRQPDU const &rqpdu );
00069
00070 private:
00071     static const uint8_t ItemType; // PDUType ?
00072     static const uint8_t Reserved2;
00073     uint32_t PDULength; // len of
00074     static const uint16_t ProtocolVersion;
00075     static const uint16_t Reserved9_10;
00076
00077     // This reserved field shall be sent with a value identical to the value
00078     // received in the same field of the A-ASSOCIATE-RQ PDU, but its value
00079     // shall not be tested when received.
00080     char Reserved11_26[16];
00081     // This reserved field shall be sent with a value identical to the value
00082     // received in the same field of the A-ASSOCIATE-RQ PDU, but its value
00083     // shall not be tested when received.
00084     char Reserved27_42[16];
00085     // This reserved field shall be sent with a value identical to the value
00086     // received in the same field of the A-ASSOCIATE-RQ PDU, but its value
00087     // shall not be tested when received.
00088     char Reserved43_74[32];
00089     /*
00090     75-xxx Variable items This variable field shall contain the following items: one Application
00091     Context Item, one or more Presentation Context Item(s) and one User
00092     Information Item. For a complete description of these items see Sections
00093     7.1.1.2, 7.1.1.14, and 7.1.1.6.
00094     */
00095     ApplicationContext AppContext;
00096     std::vector<PresentationContextAC> PresContextAC;
00097     UserInformation UserInfo;
00098 };
00099
00100 } // end namespace network
00101
00102 } // end namespace gdcm
00103
00104 #endif //GDCMAASSOCIATEACPDU_H

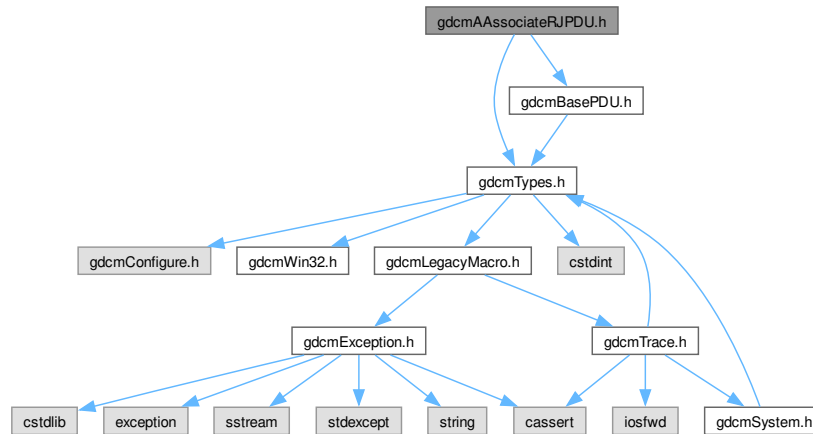
```

## 13.457 gdcmAAssociateRJPDU.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAAssociateRJPDU.h:



### Classes

- class [gdcm::network::AAssociateRJPDU](#)  
*AAssociateRJPDU*.

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.458 gdcmAAssociateRJPDU.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMAASSOCIATERJPDU_H

```

```

00015 #define GDCMAASSOCIATERJPDU_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmBasePDU.h"
00019
00020 namespace gdcm
00021 {
00022
00023 namespace network
00024 {
00025
00031 class AAssociateRJPDU : public BasePDU
00032 {
00033 public:
00034     AAssociateRJPDU();
00035     std::istream &Read(std::istream &is) override;
00036     const std::ostream &Write(std::ostream &os) const override;
00037     void Print(std::ostream &os) const override;
00038     size_t Size() const override;
00039     bool IsLastFragment() const override { return true; }
00040 private:
00041     static const uint8_t ItemType; // PDUType ?
00042     static const uint8_t Reserved2;
00043     uint32_t ItemLength; // PDU Length ?
00044     static const uint8_t Reserved8;
00045     uint8_t Result;
00046     uint8_t Source;
00047     uint8_t Reason; // diag ?
00048 };
00049
00050 } // end namespace network
00051
00052 } // end namespace gdcm
00053
00054 #endif //GDCMAASSOCIATERJPDU_H

```

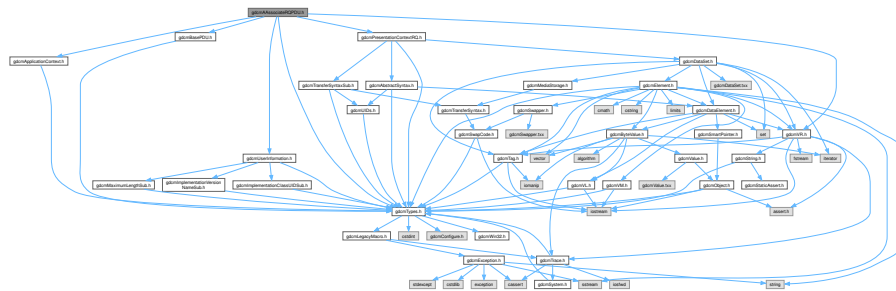
## 13.459 gdcmAAssociateRQPDU.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmVR.h"
#include "gdcmApplicationContext.h"
#include "gdcmPresentationContextRQ.h"
#include "gdcmUserInformation.h"
#include "gdcmBasePDU.h"

```

Include dependency graph for gdcmAAssociateRQPDU.h:



### Classes

- class [gdcm::network::AAssociateRQPDU](#)  
*AAssociateRQPDU.*

## Namespaces

- namespace [gdc](#)m
- namespace [gdc](#)m::network

## 13.460 gdcmAAssociateRQPDU.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdc.m.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMAASSOCIATERQPDU_H
00015 #define GDCMAASSOCIATERQPDU_H
00016
00017 #include "gdcTypes.h"
00018 #include "gdcVR.h" // AEComp
00019 #include "gdcApplicationContext.h"
00020 #include "gdcPresentationContextRQ.h"
00021 #include "gdcUserInformation.h"
00022 #include "gdcBasePDU.h"
00023
00024 namespace gdc
00025 {
00026
00027     namespace network
00028     {
00029
00030         class AAssociateACPDU;
00031         class AAssociateRQPDU : public BasePDU
00032         {
00033         public:
00034             AAssociateRQPDU();
00035             std::istream &Read(std::istream &is) override;
00036             const std::ostream &Write(std::ostream &os) const override;
00037             size_t Size() const override;
00038             void AddPresentationContext( PresentationContextRQ const &pc );
00039
00040             void SetCalledAETitle(const char calledaetitle[16]);
00041             std::string GetCalledAETitle() const { return std::string(CalledAETitle,16); }
00042
00043             void SetCallingAETitle(const char callingaetitle[16]);
00044             std::string GetCallingAETitle() const { return std::string(CallingAETitle,16); }
00045
00046             static bool IsAETitleValid(const char title[16]);
00047
00048             //void InitFromRQ( AAssociateACPDU & acpdu );
00049
00050             void Print(std::ostream &os) const override;
00051
00052             AAssociateRQPDU(const AAssociateRQPDU &pdu):BasePDU(pdu)
00053             {
00054                 assert( 0 );
00055             }
00056             //this function fails to compile on windows.
00057             // AAssociateRQPDU &operator=(const AAssociateRQPDU &_val)
00058             // {
00059             //     assert( 0 );
00060             // }
00061
00062             typedef std::vector<PresentationContextRQ>::size_type SizeType;
00063             SizeType GetNumberOfPresentationContext() const {
00064                 return PresContext.size();
00065             }
00066         }
00067     }
00068 }

```



```

00075 PresentationContextRQ const &GetPresentationContext(SizeType i) const {
00076     assert( !PresContext.empty() && i < PresContext.size() );
00077     return PresContext[i];
00078 }
00079 typedef std::vector<PresentationContextRQ> PresentationContextArrayType;
00080 PresentationContextArrayType const &GetPresentationContexts() { return PresContext; }
00081
00082 const PresentationContextRQ *GetPresentationContextByID(uint8_t i) const;
00083 const PresentationContextRQ *GetPresentationContextByAbstractSyntax(AbstractSyntax const & absyn )
00084 const;
00084 bool IsLastFragment() const override { return true; }
00085
00086 const UserInformation & GetUserInformation() const { return UserInfo; }
00087 void SetUserInformation( UserInformation const & ui );
00088
00089 protected:
00090     friend class AAssociateACPDU;
00091     std::string GetReserved43_74() const;
00092
00093 private:
00094     // 1 PDU-type 01H
00095     static const uint8_t ItemType; // PDUType ?
00096     // 2 Reserved This reserved field shall be sent with a value 00H but not tested to this value when
00097     received.
00097     static const uint8_t Reserved2;
00098     /* 3-6 PDU-length This PDU-length shall be the number of bytes from the first byte of the
00099     following field to the last byte of the variable field. It shall be encoded as
00100     an unsigned binary number
00101     */
00102     uint32_t ItemLength; // PDU Length
00103     /*
00104     7-8 Protocol-version This two byte field shall use one bit to identify each version of the
00105     DICOM UL protocol supported by the calling end-system. This is
00106     Version 1 and shall be identified with bit 0 set. A receiver of this PDU
00107     implementing only this version of the DICOM UL protocol shall only test
00108     that bit 0 is set.
00109     */
00110     static const uint16_t ProtocolVersion;
00111     /*
00112     9-10 Reserved This reserved field shall be sent with a value 0000H but not tested to
00113     this value when received.
00114     */
00115     static const uint16_t Reserved9_10;
00116     /*
00117     11-26 Called-AE-title Destination DICOM Application Name. It shall be encoded as 16
00118     characters as defined by the ISO 646:1990-Basic G0 Set with leading
00119     and trailing spaces (20H) being non-significant. The value made of 16
00120     spaces (20H) meaning "no Application Name specified" shall not be
00121     used. For a complete description of the use of this field, see Section
00122     7.1.1.4.
00123     */
00124     char CalledAETitle[16];
00125     /*
00126     27-42 Calling-AE-title Source DICOM Application Name. It shall be encoded as 16
00127     characters as defined by the ISO 646:1990-Basic G0 Set with leading
00128     and trailing spaces (20H) being non-significant. The value made of 16
00129     spaces (20H) meaning "no Application Name specified" shall not be
00130     used. For a complete description of the use of this field, see Section
00131     7.1.1.3.
00132     */
00133     char CallingAETitle[16];
00134     /*
00135     43-74 Reserved This reserved field shall be sent with a value 00H for all bytes but not
00136     tested to this value when received
00137     */
00138     char Reserved43_74[32]; // { 0 }
00139     /*
00140     75-xxx Variable items This variable field shall contain the following items: one Application
00141     Context Item, one or more Presentation Context Items and one User
00142     Information Item. For a complete description of the use of these items
00143     see Sections 7.1.1.2, 7.1.1.13, and 7.1.1.6.
00144     */
00145     ApplicationContext AppContext;
00146     std::vector<PresentationContextRQ> PresContext;
00147     UserInformation UserInfo;
00148 };
00149
00150 } // end namespace network
00151 } // end namespace gdcM
00152
00153 #endif //GDCMAASSOCIATERQPDU_H

```



## 13.462 gdcmAbstractSyntax.h

[Go to the documentation of this file.](#)

```

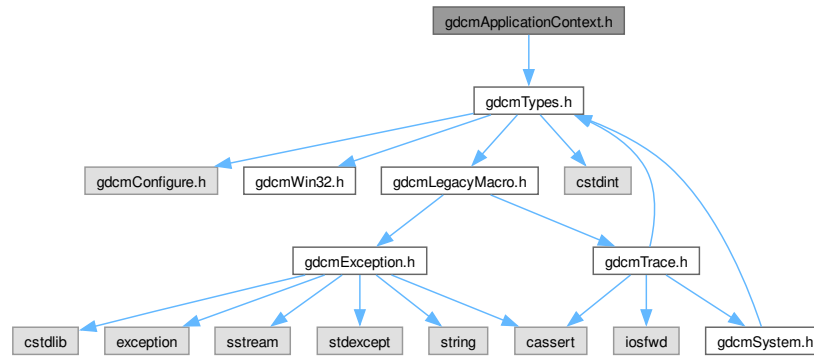
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMABSTRACTSYNTAX_H
00015 #define GDCMABSTRACTSYNTAX_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmUIDs.h"
00019 #include "gdcmDataElement.h"
00020
00021 namespace gdcm
00022 {
00023
00024   namespace network
00025   {
00026
00032     class AbstractSyntax
00033     {
00034     public:
00035       AbstractSyntax();
00036       std::istream &Read(std::istream &is);
00037       const std::ostream &Write(std::ostream &os) const;
00038
00039       void SetName( const char *name ) { UpdateName( name ); }
00040       const char *GetName() const { return Name.c_str(); }
00041
00042       // accept a UID::TSType also...
00043       void SetNameFromUID( UID::TSType tname );
00044       //now that the PresentationContext messes around with UIDs and returns a string
00045       //use that string as well.
00046       //void SetNameFromUIDString( const std::string& inUIDName );
00047
00048       size_t Size() const;
00049
00050       void Print(std::ostream &os) const;
00051
00052       bool operator==(const AbstractSyntax & as) const
00053       {
00054         return Name == as.Name;
00055       }
00056
00057       DataElement GetAsDataElement() const;
00058
00059     private:
00060       void UpdateName( const char *name );
00061       static const uint8_t ItemType;
00062       static const uint8_t Reserved2;
00063       uint16_t ItemLength; // len of
00064       std::string /*AbstractSyntax*/ Name; // UID
00065     };
00066
00067   } // end namespace network
00068 } // end namespace gdcm
00069
00070 #endif //GDCMABSTRACTSYNTAX_H

```

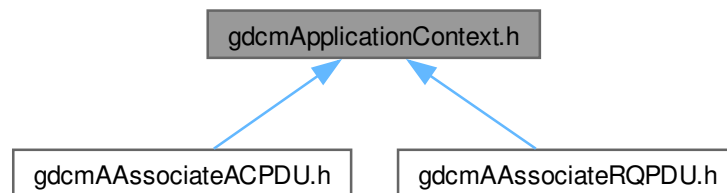
## 13.463 gdcmApplicationContext.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmApplicationContext.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcm::network::ApplicationContext](#)  
*ApplicationContext.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.464 gdcmApplicationContext.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMAPPLICATIONCONTEXT_H
00015 #define GDCMAPPLICATIONCONTEXT_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021
00022     namespace network
00023     {
00024
00032         class ApplicationContext
00033         {
00034         public:
00035             ApplicationContext();
00036             std::istream &Read(std::istream &is);
00037             const std::ostream &Write(std::ostream &os) const;
00038
00039             void SetName( const char *name ) { UpdateName( name ); }
00040             const char *GetName() const { return Name.c_str(); }
00041             size_t Size() const;
00042
00043             //static const uint8_t GetItemType() { return ItemType; }
00044             void Print(std::ostream &os) const;
00045
00046         private:
00047             void UpdateName( const char *name );
00048             static const uint8_t ItemType;
00049             static const uint8_t Reserved2;
00050             uint16_t ItemLength; // len of application context name
00051             std::string /*ApplicationContext*/ Name; // UID
00052         };
00053
00054     } // end namespace network
00055
00056 } // end namespace gdcm
00057
00058 #endif //GDCMAPPLICATIONCONTEXT_H

```

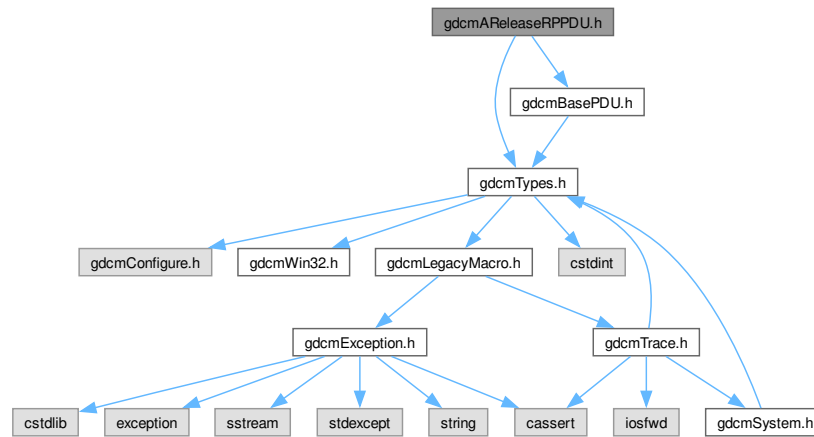
## 13.465 gdcmAReleaseRPPDU.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmBasePDU.h"

```

Include dependency graph for `gdcmAReleaseRPPDU.h`:



## Classes

- class `gdcm::network::AReleaseRPPDU`  
*AReleaseRPPDU.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.466 gdcmAReleaseRPPDU.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012  =====*/
00013  #ifndef GDCMARELEASERPPDU_H
00014  #define GDCMARELEASERPPDU_H
00015
00016  #include "gdcmTypes.h"
00017  #include "gdcmBasePDU.h"
00018
00019  namespace gdcm
00020  {
00021  {
00022

```

```

00023 namespace network
00024 {
00025
00031 class AReleaseRPPDU : public BasePDU
00032 {
00033 public:
00034     AReleaseRPPDU();
00035     std::istream &Read(std::istream &is) override;
00036     const std::ostream &Write(std::ostream &os) const override;
00037     size_t Size() const override;
00038     void Print(std::ostream &os) const override;
00039     bool IsLastFragment() const override { return true; }
00040 private:
00041     static const uint8_t ItemType; // PDUType ?
00042     static const uint8_t Reserved2;
00043     uint32_t ItemLength; // PDU Length
00044     static const uint32_t Reserved7_10;
00045 };
00046
00047 } // end namespace network
00048
00049 } // end namespace gdcm
00050
00051 #endif //GDCMARELEASERPPDU_H

```

## 13.467 gdcmAReleaseRQPDU.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAReleaseRQPDU.h:



### Classes

- class `gdcm::network::AReleaseRQPDU`  
*AReleaseRQPDU*.

### Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.468 gdcmAReleaseRQPDU.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMARELEASERQPDU_H
00015 #define GDCMARELEASERQPDU_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmBasePDU.h"
00019
00020 namespace gdcm
00021 {
00022
00023   namespace network
00024   {
00025
00031     class AReleaseRQPDU : public BasePDU
00032     {
00033     public:
00034       AReleaseRQPDU();
00035       std::istream &Read(std::istream &is) override;
00036       const std::ostream &Write(std::ostream &os) const override;
00037       size_t Size() const override;
00038       void Print(std::ostream &os) const override;
00039       bool IsLastFragment() const override { return true; }
00040     private:
00041       static const uint8_t ItemType; // PDUType ?
00042       static const uint8_t Reserved2;
00043       uint32_t ItemLength; // PDU Length
00044       static const uint32_t Reserved7_10;
00045     };
00046
00047   } // end namespace network
00048
00049 } // end namespace gdcm
00050
00051 #endif //GDCMARELEASERQPDU_H

```

## 13.469 gdcmARTIMTimer.h File Reference

This graph shows which files directly or indirectly include this file:





**Classes**

- class `gdcm::network::ARTIMTimer`  
*ARTIMTimer.*

**Namespaces**

- namespace `gdcm`
- namespace `gdcm::network`

**13.470 gdcmARTIMTimer.h**

[Go to the documentation of this file.](#)

```

00001 /*=====
00002  *
00003  * Copyright NumFOCUS
00004  *
00005  * Licensed under the Apache License, Version 2.0 (the "License");
00006  * you may not use this file except in compliance with the License.
00007  * You may obtain a copy of the License at
00008  *
00009  * http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
00011  * Unless required by applicable law or agreed to in writing, software
00012  * distributed under the License is distributed on an "AS IS" BASIS,
00013  * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  * See the License for the specific language governing permissions and
00015  * limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMARTIMTIMER_H
00019 #define GDCMARTIMTIMER_H
00020
00021 namespace gdcm {
00022     namespace network{
00023     class ARTIMTimer
00024     {
00025     private:
00026         double mStartTime; //ms timing should be good enough, but there are also
00027         //high-resolution timing options. Those return doubles. For now,
00028         //go with integer timing solutions based on milliseconds (DWORD on windows),
00029         //but leave as doubles to ease transitions to other timing methods.
00030
00031         double mTimeout;
00032         //once GetCurrentTime() -mStartTime > mTimeout, GetHasExpired returns true.
00033
00034         double GetCurrentTime() const;//a platform-specific implementation of getting the
00035         //current time.
00036
00037     public:
00038         ARTIMTimer(); //initiates the start and timeout at -1;
00039         void Start(); //start the timer by getting the current wall time
00040         void Stop();//stop the timer by resetting the 'start' to -1;
00041         void SetTimeout(double inTimeout);
00042         double GetTimeout() const;
00043
00044         double GetElapsedTime() const;
00045
00046         bool GetHasExpired() const;
00047
00048     };
00049     }
00050 }
00051 #endif //GDCMARTIMTIMER_H

```

## 13.471 gdcmAsynchronousOperationsWindowSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmAsynchronousOperationsWindowSub.h:



### Classes

- class [gdcm::network::AsynchronousOperationsWindowSub](#)  
*AsynchronousOperationsWindowSub.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.472 gdcmAsynchronousOperationsWindowSub.h

[Go to the documentation of this file.](#)

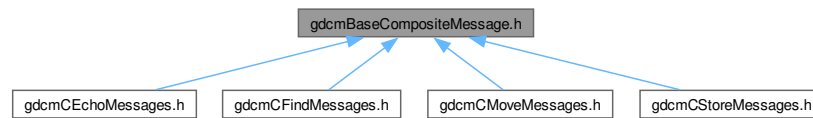
```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012  =====*/
00013
00014  #ifndef GDCMASYNCHRONOUSOPERATIONSWINDOWSUB_H
00015  #define GDCMASYNCHRONOUSOPERATIONSWINDOWSUB_H
00016
00017  #include "gdcmTypes.h"
00018
00019  namespace gdcm

```

## 13.473 gdcmbaseCompositeMessage.h File Reference

This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcM::network::BaseCompositeMessage](#)  
*BaseCompositeMessage.*

## Namespaces

- namespace [gdcM](#)
- namespace [gdcM::network](#)

## 13.474 gdcBaseCompositeMessage.h

[Go to the documentation of this file.](#)

```

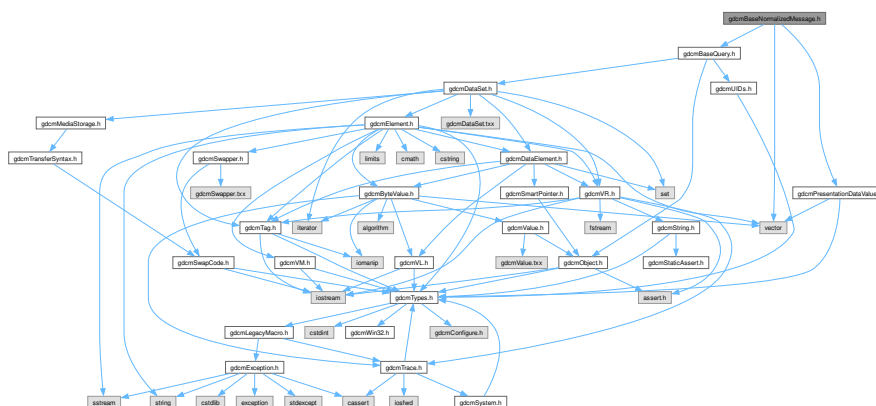
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00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMBASECOMPOSITEMESSAGE_H
00019 #define GDCMBASECOMPOSITEMESSAGE_H
00020
00021 #include "gdcmPresentationDataValue.h"
00022 #include "gdcmBaseRootQuery.h"
00023
00024 #include <vector>
00025
00026 namespace gdcM
00027 {
00028     namespace network
00029     {
00030         class ULConnection;
00052         class BaseCompositeMessage
00053         {
00054             public:
00055                 virtual ~BaseCompositeMessage() = default;
00056                 //construct the appropriate pdv and dataset for this message
00057                 //for instance, setting tag 0x0,0x100 to the appropriate value
00058                 //the pdv, as described in Annex E of 3.8-2009, is the first byte

```

```
00059         //of the message (the MessageHeader), and then the subsequent dataset
00060         //that describes the operation.
00061         virtual std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
00062             const BaseRootQuery * inRootQuery) = 0;
00063     };
00064 }
00065 }
00066 #endif //BASECOMPOSITEMESSAGE_H
```

## 13.475 gdcmbaseNormalizedMessage.h File Reference

```
#include "gdcmPresentationDataValue.h"
#include "gdcmBaseQuery.h"
#include <vector>
Include dependency graph for gdcmBaseNormalizedMessage.h:
```



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcmm::network::BaseNormalizedMessage`  
*BaseNormalizedMessage.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.476 gdcmBaseNormalizedMessage.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00008
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00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMBASENORMALIZEDMESSAGE_H
00015  #define GDCMBASENORMALIZEDMESSAGE_H
00016
00017  #include "gdcmPresentationDataValue.h"
00018  #include "gdcmBaseQuery.h"
00019
00020  #include <vector>
00021
00022  namespace gdcm
00023  {
00024      namespace network
00025      {
00026          class ULConnection;
00049          class BaseNormalizedMessage
00050          {
00051          public:
00052              virtual ~BaseNormalizedMessage() = default;
00053              //construct the appropriate pdv and dataset for this message
00054              //for instance, setting tag 0x0,0x100 to the appropriate value
00055              //the pdv, as described in Annex E of 3.8-2009, is the first byte
00056              //of the message (the MessageHeader), and then the subsequent dataset
00057              //that describes the operation.
00058              virtual std::vector<PresentationDataValue> ConstructPDV( const ULConnection &inConnection,
00059                                                                      const BaseQuery * inQuery) = 0;
00060          };
00061      }
00062  }
00063  #endif //GDCMBASENORMALIZEDMESSAGE_H

```

## 13.477 gdcmBasePDU.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmBasePDU.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::network::BasePDU`  
*BasePDU.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.478 gdcmBasePDU.h

[Go to the documentation of this file.](#)

```

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00009  *       http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
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00012  *   distributed under the License is distributed on an "AS IS" BASIS,
00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
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00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMBASEPDU_H
00019 #define GDCMBASEPDU_H
00020
00021 #include "gdcmTypes.h"
00022
00023 namespace gdcm
00024 {
00025     namespace network
00026     {
00027
00050         class BasePDU
00051         {
00052         public:
00053             virtual ~BasePDU() = default;
00054
00055             virtual std::istream &Read(std::istream &is) = 0;
00056             virtual const std::ostream &Write(std::ostream &os) const = 0;
00057
00058             virtual size_t Size() const = 0;
00059             virtual void Print(std::ostream &os) const = 0;
00060

```





## Enumerations

- enum `gdcm::ENQueryType` {  
`gdcm::eCreateMMPS = 0` ,  
`gdcm::eSetMMPS` }

## 13.480 gdcmBaseQuery.h

[Go to the documentation of this file.](#)

```

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00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMBASEQUERY_H
00019 #define GDCMBASEQUERY_H
00020
00021 #include "gdcmDataSet.h"
00022 #include "gdcmUIDs.h"
00023 #include "gdcmObject.h"
00024
00025 namespace gdcm
00026 {
00027     class QueryFactory;
00028     class DictEntry;
00029
00030     enum ENQueryType
00031     {
00032         eCreateMMPS = 0,
00033         eSetMMPS
00034     };
00041 class GDCM_EXPORT BaseQuery : public Object
00042 {
00043     //these four classes contain the required, unique, and optional tags from the standard.
00044     //used both to list the tags as well as to validate a dataset, if ever we were to do so.
00045 protected:
00046
00047     DataSet mDataSet;
00048     friend class QueryFactory;
00049     BaseQuery();
00050
00051     std::string mSopInstanceUID;
00052
00053     void SetSearchParameter(const Tag& inTag, const DictEntry& inDictEntry, const std::string& inValue);
00054
00055     bool ValidDataSet( const DataSet & dataSetToValid, const DataSet & dataSetReference ) const ;
00056 public:
00057     ~BaseQuery() override;
00058
00059     void SetSearchParameter(const Tag& inTag, const std::string& inValue);
00060     void SetSearchParameter(const std::string& inKeyword, const std::string& inValue);
00061
00062     const std::ostream &WriteHelpFile(std::ostream &os);
00063
00064     //this function allows writing of the query to disk for storing for future use
00065     //virtual in case it needs to be overridden
00066     //returns false if the operation failed
00067     bool WriteQuery(const std::string& inFileName);
00068
00070     DataSet const & GetQueryDataSet() const;

```

## 13.481 gdcmbaseRootQuery.h File Reference

Include dependency graph for gdcmBaseRootQuery.h:



**Classes**

- class [gdcm::BaseRootQuery](#)  
*BaseRootQuery.*

**Namespaces**

- namespace [gdcm](#)

**Enumerations**

- enum [gdcm::EQueryLevel](#) {  
  [gdcm::ePatient](#) = 0 ,  
  [gdcm::eStudy](#) = 1 ,  
  [gdcm::eSeries](#) = 2 ,  
  [gdcm::eImage](#) = 3 }
- enum [gdcm::EQueryType](#) {  
  [gdcm::eFind](#) = 0 ,  
  [gdcm::eMove](#) ,  
  [gdcm::eWLMFind](#) }

**13.482 gdcmBaseRootQuery.h**

[Go to the documentation of this file.](#)

```

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00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMBASEROOTQUERY_H
00019 #define GDCMBASEROOTQUERY_H
00020
00021 #include "gdcmDataSet.h"
00022 #include "gdcmUIDs.h"
00023 #include "gdcmBaseQuery.h"
00024 #include "gdcmQueryPatient.h"
00025 #include "gdcmQueryStudy.h"
00026 #include "gdcmQuerySeries.h"
00027 #include "gdcmQueryImage.h"
00028
00029 namespace gdcm
00030 {
00031     class QueryFactory;
00032     class DictEntry;
00033
00034     enum EQueryLevel
00035     {
00036         // -1 is reserved do not use
00037         ePatient = 0,

```

```
00038     eStudy    = 1,
00039     eSeries   = 2,
00040     eImage    = 3
00041 };
00042 enum EQueryType
00043 {
00044     eFind= 0,
00045     eMove,
00046     eWLMFind
00047 };
00048
00066 class GDCM_EXPORT BaseRootQuery : public BaseQuery
00067 {
00068     //these four classes contain the required, unique, and optional tags from the standard.
00069     //used both to list the tags as well as to validate a dataset, if ever we were to do so.
00070 protected:
00071     QueryPatient mPatient;
00072     QueryStudy mStudy;
00073     QuerySeries mSeries;
00074     QueryImage mImage;
00075
00076     friend class QueryFactory;
00077     BaseRootQuery();
00078
00079     ERootType mRootType; //set in construction, and it's something else in the study root type
00080     std::string mHelpDescription; //used when generating the help output
00081
00082 public:
00083     ~BaseRootQuery() override = default;
00084
00088     virtual std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) = 0;
00089
00093     virtual void InitializeDataSet(const EQueryLevel& inQueryLevel) = 0;
00094
00108     bool ValidateQuery( bool inStrict = true ) const override = 0;
00109
00110     static const char *GetQueryLevelString( EQueryLevel ql );
00111     static int GetQueryLevelFromString( const char * str );
00112
00113     static QueryBase * Construct(ERootType inRootType, EQueryLevel qllevel);
00114     EQueryLevel GetQueryLevelFromQueryRoot( ERootType roottype );
00115 };
00116
00117 } // end namespace gdcms
00118
00119 #endif //GDCMBASEROOTQUERY_H
```





## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.486 gdcmCFindMessages.h

[Go to the documentation of this file.](#)

```

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00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMCFINDMESSAGES_H
00019 #define GDCMCFINDMESSAGES_H
00020
00021 #include "gdcmBaseCompositeMessage.h"
00022 #include "gdcmBaseRootQuery.h"
00023
00024 namespace gdcm
00025 {
00026     namespace network
00027     {
00028
00029         class CFindRQ : public BaseCompositeMessage
00030         {
00031         public:
00032             std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
00033                 const BaseRootQuery* inRootQuery) override;
00034         };
00035
00036         class CFindRSP : public BaseCompositeMessage {
00037         public:
00038             std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
00039         };
00040
00041         class CFindCancelRQ : public BaseCompositeMessage {
00042         public:
00043             std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
00044         };
00045     }
00046 }
00047 #endif

```

## 13.487 gdcmCMoveMessages.h File Reference

```

#include "gdcmBaseCompositeMessage.h"
#include "gdcmBaseRootQuery.h"

```





## 13.489 gdcMCommandDataSet.h File Reference

[illegible]

- class `gdcm::CommandDataSet`  
*Class to represent a `Command DataSet`.*

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const CommandDataSet &val)`

## 13.490 gdcmCommandDataSet.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMCOMMANDDATASET_H
00015 #define GDCMCOMMANDDATASET_H
00016
00017 #include "gdcmDataSet.h"
00018 #include "gdcmDataElement.h"
00019
00020 namespace gdcm
00021 {
00022     class GDCM_EXPORT CommandDataSet : public DataSet
00023     {
00024     public:
00025         CommandDataSet() = default;
00026         ~CommandDataSet() = default;
00027
00028         friend std::ostream &operator<<(std::ostream &os, const CommandDataSet &val);
00029
00030         // FIXME: no virtual function means: duplicate code...
00031         void Insert(const DataElement& de) {
00032             if( de.GetTag().GetGroup() == 0x0000 )
00033             {
00034                 InsertDataElement( de );
00035             }
00036             else
00037             {
00038                 gdcmErrorMacro( "Cannot add element with group != 0x0000 in the command dataset : " << de );
00039             }
00040         }
00041         void Replace(const DataElement& de) {
00042             Remove(de.GetTag());
00043             Insert(de);
00044         }
00045
00046         std::istream &Read(std::istream &is);
00047
00048         std::ostream &Write(std::ostream &os) const;
00049
00050     protected:
00051     };
00052
00053 //-----
00054 inline std::ostream& operator<<(std::ostream &os, const CommandDataSet &val)
00055 {
00056     val.Print( os );
00057     return os;
00058 }
00059
00060 } // end namespace gdcm
00061
00062 #endif //GDCMFILEMETAINFORMATION_H

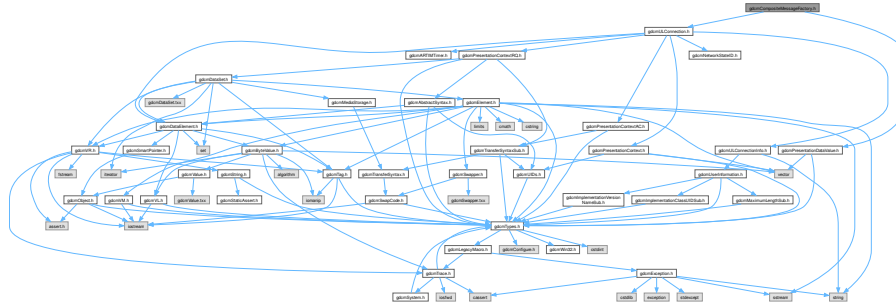
```

## 13.491 gdcmCompositeMessageFactory.h File Reference

```
#include "gdcmPresentationDataValue.h"
```

```
#include "gdcmULConnection.h"
```

Include dependency graph for gdcmCompositeMessageFactory.h:



### Classes

- class `gdcm::network::CompositeMessageFactory`  
*CompositeMessageFactory.*

### Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.492 gdcmCompositeMessageFactory.h

[Go to the documentation of this file.](#)

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00009  * http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
00011  * Unless required by applicable law or agreed to in writing, software
00012  * distributed under the License is distributed on an "AS IS" BASIS,
00013  * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  * See the License for the specific language governing permissions and
00015  * limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMCOMPOSITEMESSAGEFACTORY_H
00019 #define GDCMCOMPOSITEMESSAGEFACTORY_H
00020
00021 #include "gdcmPresentationDataValue.h"
00022 #include "gdcmULConnection.h"
00023
00024 namespace gdcm {
```

## 13.493 gdcmCompositeNetworkFunctions.h File Reference

[illegible]

- class `gdcm::CompositeNetworkFunctions`  
*Composite Network Functions.*

## Namespaces

- namespace `gdcm`

## 13.494 gdcmCompositeNetworkFunctions.h

[Go to the documentation of this file.](#)

```

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00009  *       http://www.apache.org/licenses/LICENSE-2.0.txt
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00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMCOMPOSITENETWORKFUNCTIONS_H
00019 #define GDCMCOMPOSITENETWORKFUNCTIONS_H
00020
00021 #include "gdcmDirectory.h"
00022 #include "gdcmBaseRootQuery.h" // EQueryLevel / EQueryType
00023
00024 #include <vector>
00025 #include <string>
00026
00027 namespace gdcm
00028 {
00048 class GDCM_EXPORT CompositeNetworkFunctions
00049 {
00050 public:
00057     static bool CEcho( const char *remote, uint16_t portno, const char *aetitle = nullptr,
00058                       const char *call = nullptr );
00059
00060     typedef std::pair<Tag, std::string> KeyValuePairType;
00061     typedef std::vector< KeyValuePairType > KeyValuePairArrayType;
00062
00069     static BaseRootQuery* ConstructQuery(ERootType inRootType, EQueryLevel inQueryLevel,
00070                                           const DataSet& queryds, EQueryType queryType = eFind );
00071
00073     static BaseRootQuery* ConstructQuery(ERootType inRootType, EQueryLevel inQueryLevel,
00074                                           const KeyValuePairArrayType& keys, EQueryType queryType = eFind );
00075
00091     static bool CMove( const char *remote, uint16_t portno, const BaseRootQuery* query,
00092                       uint16_t portscp, const char *aetitle = nullptr,
00093                       const char *call = nullptr, const char *outputdir = nullptr);
00094
00104     static bool CFind( const char *remote, uint16_t portno,
00105                       const BaseRootQuery* query,
00106                       std::vector<DataSet> &retDataSets,
00107                       const char *aetitle = nullptr,
00108                       const char *call = nullptr );
00109
00117     static bool CStore( const char *remote, uint16_t portno,
00118                       const Directory::FileNamesType & filenames,
00119                       const char *aetitle = nullptr, const char *call = nullptr);
00120 };
00121
00122 } // end namespace gdcm
00123
00124 #endif // GDCMCOMPOSITENETWORKFUNCTIONS_H

```



```

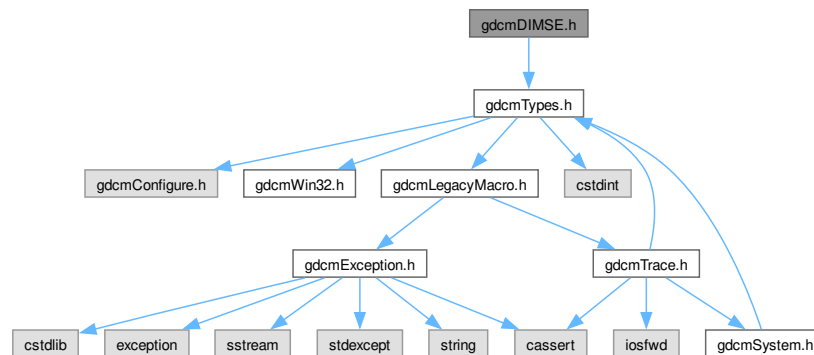
00015  * limitations under the License.
00016  *
00017  *=====*/
00018  #ifndef GDCMCSTOREMESSAGES_H
00019  #define GDCMCSTOREMESSAGES_H
00020
00021  #include "gdcMBaseCompositeMessage.h"
00022
00023  namespace gdcM{
00024  class File;
00025  namespace network{
00026  class BasePDU;
00031  class CStoreRQ : public BaseCompositeMessage {
00032  std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection, const
BaseRootQuery* inRootQuery) override;//to fulfill the virtual contract
00033  public:
00034  std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
00035  const File& file, bool writeDataSet = true );
00036  };
00037
00042  class CStoreRSP : public BaseCompositeMessage {
00043  std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection, const
BaseRootQuery* inRootQuery) override;//to fulfill the virtual contract
00044  public:
00045  std::vector<PresentationDataValue> ConstructPDV(const DataSet* inDataSet, const BasePDU* inPC);
00046  };
00047  }
00048  }
00049  #endif // GDCMCSTOREMESSAGES_H

```

## 13.497 gdcM DIMSE.h File Reference

```
#include "gdcMTypes.h"
```

Include dependency graph for gdcM DIMSE.h:



### Classes

- class [gdcM::network::CEchoRQ](#)  
[CEchoRQ](#).
- class [gdcM::network::CEchoRSP](#)  
[CEchoRSP](#) this file defines the messages for the cecho action.
- class [gdcM::network::CFind](#)
- class [gdcM::network::DIMSE](#)  
[DIMSE](#).

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.498 gdcmDIMSE.h

[Go to the documentation of this file.](#)

```

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00011      PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMDIMSE_H
00015  #define GDCMDIMSE_H
00016
00017  #include "gdcmTypes.h"
00018
00019  namespace gdcm
00020  {
00021
00022      namespace network
00023      {
00024
00025          class DIMSE {
00026          public:
00027              typedef enum {
00028                  C_STORE_RQ      = 0x0001,
00029                  C_STORE_RSP     = 0x8001,
00030                  C_GET_RQ        = 0x0010,
00031                  C_GET_RSP       = 0x8010,
00032                  C_FIND_RQ       = 0x0020,
00033                  C_FIND_RSP      = 0x8020,
00034                  C_MOVE_RQ       = 0x0021,
00035                  C_MOVE_RSP      = 0x8021,
00036                  C_ECHO_RQ       = 0x0030,
00037                  C_ECHO_RSP      = 0x8030,
00038                  N_EVENT_REPORT_RQ = 0x0100,
00039                  N_EVENT_REPORT_RSP = 0x8100,
00040                  N_GET_RQ        = 0x0110,
00041                  N_GET_RSP       = 0x8110,
00042                  N_SET_RQ        = 0x0120,
00043                  N_SET_RSP       = 0x8120,
00044                  N_ACTION_RQ     = 0x0130,
00045                  N_ACTION_RSP    = 0x8130,
00046                  N_CREATE_RQ     = 0x0140,
00047                  N_CREATE_RSP    = 0x8140,
00048                  N_DELETE_RQ     = 0x0150,
00049                  N_DELETE_RSP    = 0x8150,
00050                  C_CANCEL_RQ     = 0x0FFF
00051              } CommandTypes;
00052          };
00053
00054          /*
00055          9.1.5.1 C-ECHO parameters
00056          Table 9.1-5
00057          C-ECHO PARAMETERS
00058          */
00059          class CEchoRQ
00060          {
00061          public:
00062              uint16_t      MessageID;          /* M */
00063              UIComp        AffectedSOPClassUID; /* M */
00064          };
00065
00066  
```



## 13.499 gdcMFindPatientRootQuery.h File Reference

Include dependency graph for gdcFindPatientRootQuery.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::FindPatientRootQuery](#)  
*PatientRootQuery.*

## Namespaces

- namespace [gdcm](#)

## 13.500 gdcmFindPatientRootQuery.h

[Go to the documentation of this file.](#)

```

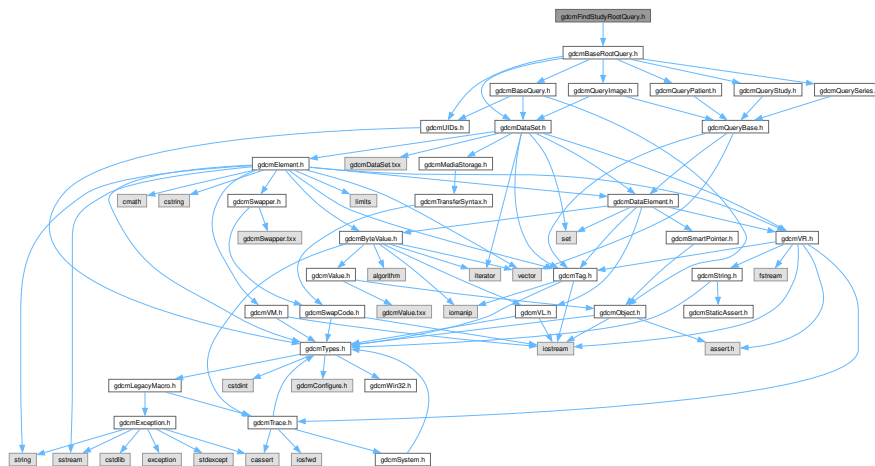
00001 /*=====
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00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012 =====*/
00013 #ifndef GDCMFINDPATIENTROOTQUERY_H
00014 #define GDCMFINDPATIENTROOTQUERY_H
00015 #include "gdcmBaseRootQuery.h"
00016
00017 namespace gdcm
00018 {
00019     class GDCM_EXPORT FindPatientRootQuery : public BaseRootQuery
00020     {
00021     public:
00022         FindPatientRootQuery();
00023
00024         void InitializeDataSet(const EQueryLevel& inQueryLevel) override;
00025
00026         std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) override;
00027         bool ValidateQuery(bool inStrict = true) const override;
00028     };
00029 }
  
```

```
00035
00036     UUIDs::TSName GetAbstractSyntaxUID() const override;
00037 };
00038
00039 } // end namespace gdcmm
00040
00041 #endif // GDCMFINDPATIENTROOTQUERY_H
```

### 13.501 gdcMFindStudyRootQuery.h File Reference

```
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for `gdcmFindStudyRootQuery.h`:



## Classes

- class `gdcm::FindStudyRootQuery`  
*FindStudyRootQuery.*

## Namespaces

- namespace **gdcm**

## 13.502 gdcmFindStudyRootQuery.h

[Go to the documentation of this file.](#)

```
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```

```

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00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMFINDSTUDYROOTQUERY_H
00015 #define GDCMFINDSTUDYROOTQUERY_H
00016
00017 #include "gdcmBaseRootQuery.h"
00018
00019 namespace gdcm
00020 {
00021     class GDCM_EXPORT FindStudyRootQuery : public BaseRootQuery
00022     {
00023     public:
00024         FindStudyRootQuery();
00025
00026         void InitializeDataSet(const EQueryLevel& inQueryLevel) override;
00027
00028         std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) override;
00029
00030         bool ValidateQuery(bool inStrict = true) const override;
00031
00032         UIDs::TSName GetAbstractSyntaxUID() const override;
00033     };
00034 } // end namespace gdcm
00035 #endif // GDCMFINDSTUDYROOTQUERY_H

```

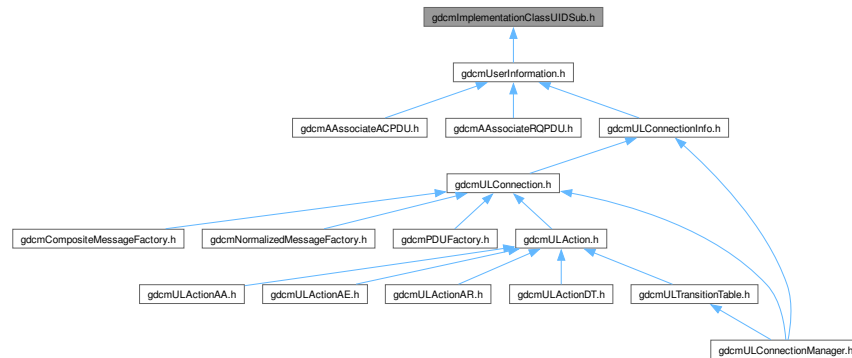
### 13.503 gdcmImplementationClassUIDSub.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmImplementationClassUIDSub.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcml::network::ImplementationClassUIDSub`  
*ImplementationClassUIDSub.*

## Namespaces

- namespace `gdcml`
- namespace `gdcml::network`

## 13.504 gdcmlImplementationClassUIDSub.h

[Go to the documentation of this file.](#)

```

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00012
00013 =====*/
00014 #ifndef GDCMIMPLEMENTATIONCLASSUIDSUB_H
00015 #define GDCMIMPLEMENTATIONCLASSUIDSUB_H
00016
00017 #include "gdcmlTypes.h"
00018
00019 namespace gdcml
00020 {
00021
00022   namespace network
00023   {
00024
00025
00026
00027
00028
00029
00030
00031     class ImplementationClassUIDSub
00032     {
00033     public:
  
```

```

00034 ImplementationClassUIDSub();
00035 std::istream &Read(std::istream &is);
00036 const std::ostream &Write(std::ostream &os) const;
00037
00038 size_t Size() const;
00039
00040 void Print(std::ostream &os) const;
00041
00042 private:
00043 static const uint8_t ItemType;
00044 static const uint8_t Reserved2;
00045 uint16_t ItemLength;
00046 std::string ImplementationClassUID;
00047 };
00048
00049 } // end namespace network
00050
00051 } // end namespace gdcm
00052
00053 #endif //GDCMMAXIMUMLENGTHSUB_H

```

## 13.505 gdcmImplementationUIDSub.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmImplementationUIDSub.h:



### Classes

- class `gdcm::network::ImplementationUIDSub`  
*ImplementationUIDSub.*

### Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.506 gdcmImplementationUIDSub.h

[Go to the documentation of this file.](#)

```

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00012
00013   =====*/
00014 #ifndef GDCMIMPLEMENTATIONUIDSUB_H
00015 #define GDCMIMPLEMENTATIONUIDSUB_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021
00022   namespace network
00023   {
00024
00030     class GDCM_EXPORT ImplementationUIDSub
00031     {
00032     public:
00033       ImplementationUIDSub();
00034       const std::ostream &Write(std::ostream &os) const;
00035     private:
00036       static const uint8_t ItemType;
00037       static const uint8_t Reserved2;
00038       uint16_t ItemLength;
00039       std::string ImplementationClassUID;
00040     };
00041
00042   } // end namespace network
00043
00044 } // end namespace gdcm
00045
00046 #endif //GDCMMAXIMUMLENGTHSUB_H

```

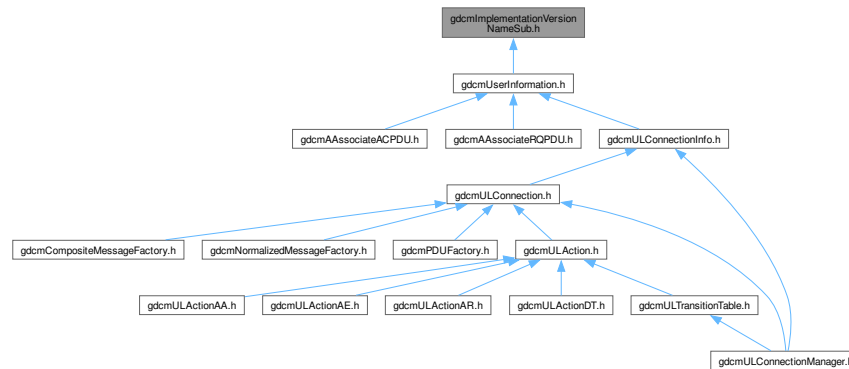
## 13.507 gdcmImplementationVersionNameSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmImplementationVersionNameSub.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::network::ImplementationVersionNameSub](#)  
*ImplementationVersionNameSub.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.508 gdcmImplementationVersionNameSub.h

[Go to the documentation of this file.](#)

```

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00012
00013     =====*/
00014 #ifndef GDCMIMPLEMENTATIONVERSIONNAMESUB_H
00015 #define GDCMIMPLEMENTATIONVERSIONNAMESUB_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021
00022     namespace network
00023     {
00024
00025         class ImplementationVersionNameSub
00026         {
00027
00028         
```



```

00032 public:
00033     ImplementationVersionNameSub();
00034     std::istream &Read(std::istream &is);
00035     const std::ostream &Write(std::ostream &os) const;
00036
00037     size_t Size() const;
00038     void Print(std::ostream &os) const;
00039
00040 private:
00041     static const uint8_t ItemType;
00042     static const uint8_t Reserved2;
00043     uint16_t ItemLength;
00044     std::string ImplementationVersionName;
00045 };
00046
00047 } // end namespace network
00048
00049 } // end namespace gdc
00050
00051 #endif //GDCMAXIMUMLENGTHSUB_H

```

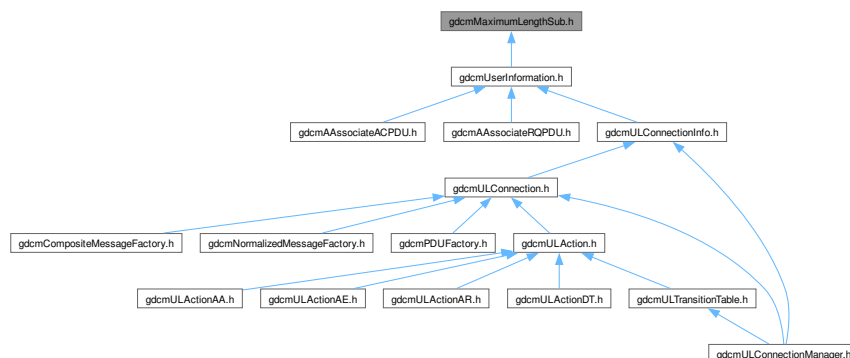
## 13.509 gdcMaximumLengthSub.h File Reference

```
#include "gdcTypes.h"
```

Include dependency graph for gdcMaximumLengthSub.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::network::MaximumLengthSub`  
*MaximumLengthSub.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.510 gdcmMaximumLengthSub.h

[Go to the documentation of this file.](#)

```

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00012
00013   =====*/
00014 #ifndef GDCMMAXIMUMLENGTHSUB_H
00015 #define GDCMMAXIMUMLENGTHSUB_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021
00022   namespace network
00023   {
00024
00025     class MaximumLengthSub
00026     {
00027     public:
00028       MaximumLengthSub();
00029       std::istream &Read(std::istream &is);
00030       const std::ostream &Write(std::ostream &os) const;
00031
00032       size_t Size() const;
00033
00034       uint32_t GetMaximumLength() const { return MaximumLength; }
00035       void SetMaximumLength(uint32_t maximumlength);
00036
00037       void Print(std::ostream &os) const;
00038
00039     private:
00040       static const uint8_t ItemType;
00041       static const uint8_t Reserved2;
00042       uint16_t ItemLength;
00043       uint32_t MaximumLength;
00044     };
00045
00046   } // end namespace network
00047
00048 } // end namespace gdcm
00049
00050 #endif //GDCMMAXIMUMLENGTHSUB_H

```





## 13.514 gdcModalityPerformedProcedureStepSetQuery.h

[Go to the documentation of this file.](#)

```

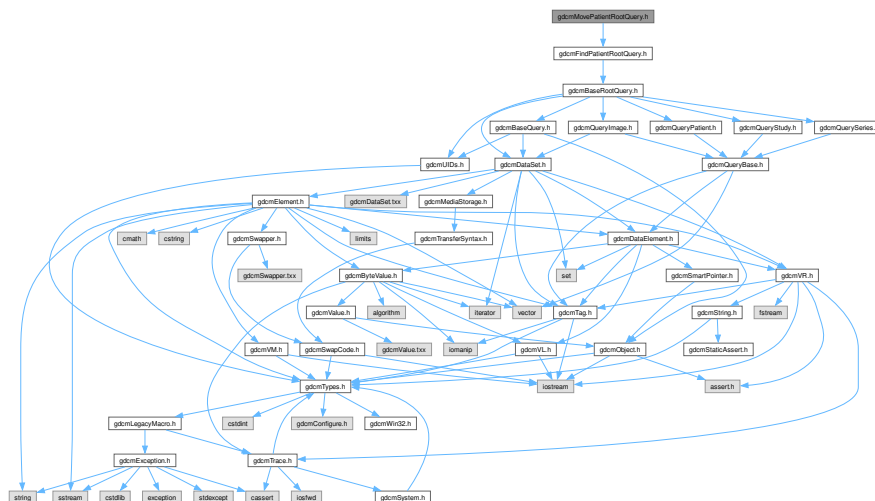
00001  /*
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00010      the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011      PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMMODALITYPERFORMEDPROCEDURESTEPSETQUERY_H
00015  #define GDCMMODALITYPERFORMEDPROCEDURESTEPSETQUERY_H
00016
00017  #include "gdcmBaseQuery.h"
00018
00019  namespace gdcm
00020  {
00021
00022  class GDCM_EXPORT ModalityPerformedProcedureStepSetQuery : public BaseQuery{
00023      friend class QueryFactory;
00024  public:
00025      ModalityPerformedProcedureStepSetQuery( const std::string & iSopInstanceUID );
00026
00027      gdcm::DataSet GetRequiredDataSet() const;
00028      bool ValidateQuery( bool inStrict = true) const override;
00029      UIDs::TSName GetAbstractSyntaxUID() const override;
00030  };
00031
00032  } // end namespace gdcm
00033
00034  #endif // GDCMMODALITYPERFORMEDPROCEDURESTEPSETQUERY_H

```

### 13.515 gdcMovePatientRootQuery.h File Reference

```
#include "gdcmFindPatientRootQuery.h"
```

Include dependency graph for gdcmmovepatientrootquery.h:



## Classes

- class [gdcm::MovePatientRootQuery](#)  
*MovePatientRootQuery.*

## Namespaces

- namespace [gdcm](#)

## 13.516 gdcmMovePatientRootQuery.h

[Go to the documentation of this file.](#)

```

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00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMMOVEPATIENTROOTQUERY_H
00015 #define GDCMMOVEPATIENTROOTQUERY_H
00016
00017 #include "gdcmFindPatientRootQuery.h"
00018
00019 namespace gdcm
00020 {
00021     class GDCM_EXPORT MovePatientRootQuery : public BaseRootQuery
00022     {
00023     public:
00024         friend class QueryFactory;
00025         MovePatientRootQuery();
00026
00027         void InitializeDataSet(const EQueryLevel& inQueryLevel) override;
00028
00029         std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) override;
00030
00031         bool ValidateQuery(bool inStrict = true) const override;
00032
00033         UIDs::TSName GetAbstractSyntaxUID() const override;
00034     };
00035 }
00036
00037 // end namespace gdcm
00038
00039 #endif // GDCMMOVEPATIENTROOTQUERY_H

```









## Classes

- class [gdcm::network::NCreateRQ](#)  
*NCreateRQ.*
- class [gdcm::network::NCreateRSP](#)  
*NCreateRSP this file defines the messages for the ncreate action.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.522 gdcmNCreateMessages.h

[Go to the documentation of this file.](#)

```

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00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMCNCREATEMESSAGES_H
00015 #define GDCMCNCREATEMESSAGES_H
00016
00017 #include "gdcmBaseNormalizedMessage.h"
00018
00019 namespace gdcm{
00020     namespace network{
00021
00022     class ULConnection;
00023
00028     class NCreateRQ : public BaseNormalizedMessage {
00029     public:
00030         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
00031             const BaseQuery* inQuery) override;
00032     };
00033
00038     class NCreateRSP : public BaseNormalizedMessage {
00039     public:
00040         std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
00041     };
00042     }
00043 }
00044 #endif // GDCMCNCREATEMESSAGES_H

```



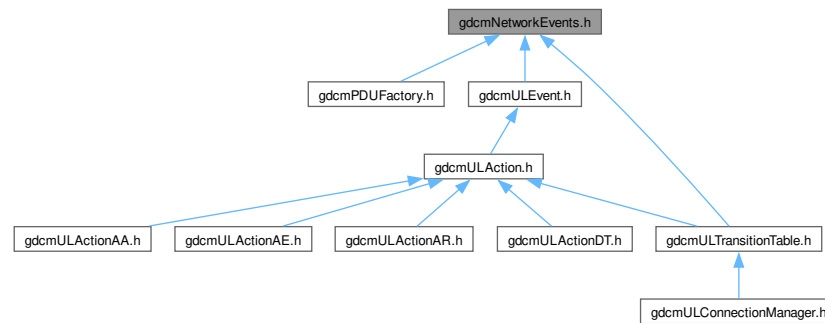
```

00016
00017 #include "gdcmBaseNormalizedMessage.h"
00018
00019 namespace gdcm{
00020     namespace network{
00021
00022     class ULConnection;
00023
00028     class NDeleteRQ : public BaseNormalizedMessage {
00029     public:
00030         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
00031             const BaseQuery* inQuery) override;
00032     };
00033
00038     class NDeleteRSP : public BaseNormalizedMessage {
00039     public:
00040         std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
00041     };
00042 }
00043 }
00044 #endif // GDCMCNDELETEMESSAGES_H

```

## 13.525 gdcmNetworkEvents.h File Reference

This graph shows which files directly or indirectly include this file:



### Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

### Enumerations

- enum `gdcm::network::EEventID` {  
`gdcm::network::eAASSOCIATERequestLocalUser = 0` ,  
`gdcm::network::eTransportConnConfirmLocal` ,  
`gdcm::network::eASSOCIATE_ACPDUreceived` ,  
`gdcm::network::eASSOCIATE_RJPDUreceived` ,  
`gdcm::network::eTransportConnIndicLocal` ,  
`gdcm::network::eAASSOCIATE_RQPDUreceived` ,

```

gdcm::network::eAASSOCIATEresponseAccept ,
gdcm::network::eAASSOCIATEresponseReject ,
gdcm::network::ePDATArequest ,
gdcm::network::ePDATATFPDU ,
gdcm::network::eARELEASERequest ,
gdcm::network::eARELEASE_RQPDUReceivedOpen ,
gdcm::network::eARELEASE_RPPDUReceived ,
gdcm::network::eARELEASEResponse ,
gdcm::network::eAABORTRequest ,
gdcm::network::eAABORTPDUReceivedOpen ,
gdcm::network::eTransportConnectionClosed ,
gdcm::network::eARTIMTimerExpired ,
gdcm::network::eUnrecognizedPDUReceived ,
gdcm::network::eEventDoesNotExist }

```

## Variables

- const int gdcm::network::cMaxEventID = eEventDoesNotExist

## 13.526 gdcmNetworkEvents.h

[Go to the documentation of this file.](#)

```

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00012  * distributed under the License is distributed on an "AS IS" BASIS,
00013  * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  * See the License for the specific language governing permissions and
00015  * limitations under the License.
00016  *
00017  *=====*/
00018 /*
00019 The NetworkEvents enumeration defines the inputs into the state of the network connection.
00020
00021 These inputs can come either from user input or input from other things on the socket,
00022 ie, responses from the peer or ARTIM timeouts.
00023
00024 Note that this enumeration is not 'power of two', like the states, because you can't have
00025 multiple simultaneous events. Multiple state outputs in transition tables, however, is possible.
00026
00027 */
00028 #ifndef GDCMNETWORKEVENTS_H
00029 #define GDCMNETWORKEVENTS_H
00030
00031 namespace gdcm {
00032 namespace network {
00033 typedef enum {
00034 eAASSOCIATERequestLocalUser = 0,
00035 eTransportConnConfirmLocal,
00036 eASSOCIATE_ACPDUreceived,
00037 eASSOCIATE_RJPDUreceived,
00038 eTransportConnIndicLocal,
00039 eAASSOCIATE_RQPDUreceived,
00040 eAASSOCIATEresponseAccept,
00041 eAASSOCIATEresponseReject,
00042 ePDATArequest,

```

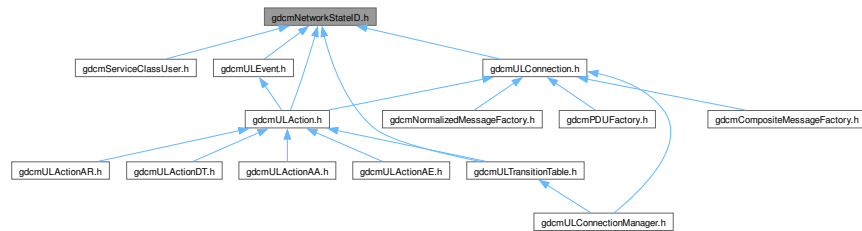
```

00043     ePDATATFPDU,
00044     eARELEASERequest,
00045     eARELEASE_RQPDUReceivedOpen,
00046     eARELEASE_RPPDUReceived,
00047     eARELEASEResponse,
00048     eAABORTRequest,
00049     eAABORTPDUReceivedOpen,
00050     eTransportConnectionClosed,
00051     eARTIMTimerExpired,
00052     eUnrecognizedPDUReceived,
00053     eEventDoesNotExist
00054 } EEventID;
00055
00056 const int cMaxEventID = eEventDoesNotExist;
00057 }
00058 }
00059
00060 #endif //NETWORKEVENTS_H

```

## 13.527 gdcmlNetworkStateID.h File Reference

This graph shows which files directly or indirectly include this file:



### Namespaces

- namespace [gdcml](#)
- namespace [gdcml::network](#)

### Enumerations

- enum [gdcml::network::EStateID](#) {  
[gdcml::network::eStaDoesNotExist](#) = 0 ,  
[gdcml::network::eSta1Idle](#) = 1 ,  
[gdcml::network::eSta2Open](#) = 2 ,  
[gdcml::network::eSta3WaitLocalAssoc](#) = 4 ,  
[gdcml::network::eSta4LocalAssocDone](#) = 8 ,  
[gdcml::network::eSta5WaitRemoteAssoc](#) = 16 ,  
[gdcml::network::eSta6TransferReady](#) = 32 ,  
[gdcml::network::eSta7WaitRelease](#) = 64 ,  
[gdcml::network::eSta8WaitLocalRelease](#) = 128 ,  
[gdcml::network::eSta9ReleaseCollisionRqLocal](#) = 256 ,  
[gdcml::network::eSta10ReleaseCollisionAc](#) = 512 ,  
[gdcml::network::eSta11ReleaseCollisionRq](#) = 1024 ,  
[gdcml::network::eSta12ReleaseCollisionAcLocal](#) = 2048 ,  
[gdcml::network::eSta13AwaitingClose](#) = 4096 }

## Functions

- `int gdcm::network::GetStateIndex (EStateID inState)`

## Variables

- `const int gdcm::network::cMaxStateID = 13`

## 13.528 gdcmNetworkStateID.h

[Go to the documentation of this file.](#)

```

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00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMNETWORKSTATEID_H
00019 #define GDCMNETWORKSTATEID_H
00020
00021 namespace gdcm {
00022     namespace network {
00023
00024         enum EStateID {
00025             eStaDoesNotExist = 0,
00026             eStaIdle = 1,
00027             eSta2Open = 2,
00028             eSta3WaitLocalAssoc = 4,
00029             eSta4LocalAssocDone = 8,
00030             eSta5WaitRemoteAssoc = 16,
00031             eSta6TransferReady = 32,
00032             eSta7WaitRelease = 64,
00033             eSta8WaitLocalRelease = 128,
00034             eSta9ReleaseCollisionRqLocal = 256,
00035             eSta10ReleaseCollisionAc = 512,
00036             eSta11ReleaseCollisionRq = 1024,
00037             eSta12ReleaseCollisionAcLocal = 2048,
00038             eSta13AwaitingClose = 4096
00039         };
00040
00041         const int cMaxStateID = 13;
00042
00043         //the transition table is built on state indices
00044         //this function will produce the index from the power-of-two EStateID
00045         inline int GetStateIndex(EStateID inState){
00046             switch (inState){
00047                 case eStaDoesNotExist:
00048                     default:
00049                         return -1;
00050                 case eStaIdle:
00051                     return 0;
00052                 case eSta2Open:
00053                     return 1;
00054                 case eSta3WaitLocalAssoc:
00055                     return 2;
00056                 case eSta4LocalAssocDone:
00057                     return 3;
00058                 case eSta5WaitRemoteAssoc:
00059                     return 4;
00060             }
00061         }
00062     }
00063 }

```

### 13.529 gdcnNEventReportMessages.h File Reference

The graph illustrates the complex interdependencies between various header files in the glibc library. The nodes represent header files, and the directed edges represent dependencies. The graph is highly interconnected, with many files having multiple dependencies. Key nodes include `glibc/stdio.h`, `glibc/stdlib.h`, `glibc/string.h`, `glibc/unistd.h`, `glibc/sys/types.h`, `glibc/time.h`, `glibc/errno.h`, `glibc/signal.h`, `glibc/setjmp.h`, `glibc/limits.h`, `glibc/math.h`, `glibc/ctype.h`, `glibc/locale.h`, `glibc/iconv.h`, `glibc/regex.h`, `glibc/uuid.h`, `glibc/uuidgen.h`, `glibc/uuidm.h`, `glibc/uuidctl.h`, `glibc/uuidutil.h`, `glibc/uuidtest.h`, `glibc/uuidtest2.h`, `glibc/uuidtest3.h`, `glibc/uuidtest4.h`, `glibc/uuidtest5.h`, `glibc/uuidtest6.h`, `glibc/uuidtest7.h`, `glibc/uuidtest8.h`, `glibc/uuidtest9.h`, `glibc/uuidtest10.h`, `glibc/uuidtest11.h`, `glibc/uuidtest12.h`, `glibc/uuidtest13.h`, `glibc/uuidtest14.h`, `glibc/uuidtest15.h`, `glibc/uuidtest16.h`, `glibc/uuidtest17.h`, `glibc/uuidtest18.h`, `glibc/uuidtest19.h`, `glibc/uuidtest20.h`, `glibc/uuidtest21.h`, `glibc/uuidtest22.h`, `glibc/uuidtest23.h`, `glibc/uuidtest24.h`, `glibc/uuidtest25.h`, `glibc/uuidtest26.h`, `glibc/uuidtest27.h`, `glibc/uuidtest28.h`, `glibc/uuidtest29.h`, `glibc/uuidtest30.h`, `glibc/uuidtest31.h`, `glibc/uuidtest32.h`, `glibc/uuidtest33.h`, `glibc/uuidtest34.h`, `glibc/uuidtest35.h`, `glibc/uuidtest36.h`, `glibc/uuidtest37.h`, `glibc/uuidtest38.h`, `glibc/uuidtest39.h`, `glibc/uuidtest40.h`, `glibc/uuidtest41.h`, `glibc/uuidtest42.h`, `glibc/uuidtest43.h`, `glibc/uuidtest44.h`, `glibc/uuidtest45.h`, `glibc/uuidtest46.h`, `glibc/uuidtest47.h`, `glibc/uuidtest48.h`, `glibc/uuidtest49.h`, `glibc/uuidtest50.h`, `glibc/uuidtest51.h`, `glibc/uuidtest52.h`, `glibc/uuidtest53.h`, `glibc/uuidtest54.h`, `glibc/uuidtest55.h`, `glibc/uuidtest56.h`, `glibc/uuidtest57.h`, `glibc/uuidtest58.h`, `glibc/uuidtest59.h`, `glibc/uuidtest60.h`, `glibc/uuidtest61.h`, `glibc/uuidtest62.h`, `glibc/uuidtest63.h`, `glibc/uuidtest64.h`, `glibc/uuidtest65.h`, `glibc/uuidtest66.h`, `glibc/uuidtest67.h`, `glibc/uuidtest68.h`, `glibc/uuidtest69.h`, `glibc/uuidtest70.h`, `glibc/uuidtest71.h`, `glibc/uuidtest72.h`, `glibc/uuidtest73.h`, `glibc/uuidtest74.h`, `glibc/uuidtest75.h`, `glibc/uuidtest76.h`, `glibc/uuidtest77.h`, `glibc/uuidtest78.h`, `glibc/uuidtest79.h`, `glibc/uuidtest80.h`, `glibc/uuidtest81.h`, `glibc/uuidtest82.h`, `glibc/uuidtest83.h`, `glibc/uuidtest84.h`, `glibc/uuidtest85.h`, `glibc/uuidtest86.h`, `glibc/uuidtest87.h`, `glibc/uuidtest88.h`, `glibc/uuidtest89.h`, `glibc/uuidtest90.h`, `glibc/uuidtest91.h`, `glibc/uuidtest92.h`, `glibc/uuidtest93.h`, `glibc/uuidtest94.h`, `glibc/uuidtest95.h`, `glibc/uuidtest96.h`, `glibc/uuidtest97.h`, `glibc/uuidtest98.h`, `glibc/uuidtest99.h`, `glibc/uuidtest100.h`, `glibc/uuidtest101.h`, `glibc/uuidtest102.h`, `glibc/uuidtest103.h`, `glibc/uuidtest104.h`, `glibc/uuidtest105.h`, `glibc/uuidtest106.h`, `glibc/uuidtest107.h`, `glibc/uuidtest108.h`, `glibc/uuidtest109.h`, `glibc/uuidtest110.h`, `glibc/uuidtest111.h`, `glibc/uuidtest112.h`, `glibc/uuidtest113.h`, `glibc/uuidtest114.h`, `glibc/uuidtest115.h`, `glibc/uuidtest116.h`, `glibc/uuidtest117.h`, `glibc/uuidtest118.h`, `glibc/uuidtest119.h`, `glibc/uuidtest120.h`, `glibc/uuidtest121.h`, `glibc/uuidtest122.h`, `glibc/uuidtest123.h`, `glibc/uuidtest124.h`, `glibc/uuidtest125.h`, `glibc/uuidtest126.h`, `glibc/uuidtest127.h`, `glibc/uuidtest128.h`, `glibc/uuidtest129.h`, `glibc/uuidtest130.h`, `glibc/uuidtest131.h`, `glibc/uuidtest132.h`, `glibc/uuidtest133.h`, `glibc/uuidtest134.h`, `glibc/uuidtest135.h`, `glibc/uuidtest136.h`, `glibc/uuidtest137.h`, `glibc/uuidtest138.h`, `glibc/uuidtest139.h`, `glibc/uuidtest140.h`, `glibc/uuidtest141.h`, `glibc/uuidtest142.h`, `glibc/uuidtest143.h`, `glibc/uuidtest144.h`, `glibc/uuidtest145.h`, `glibc/uuidtest146.h`, `glibc/uuidtest147.h`, `glibc/uuidtest148.h`, `glibc/uuidtest149.h`, `glibc/uuidtest150.h`, `glibc/uuidtest151.h`, `glibc/uuidtest152.h`, `glibc/uuidtest153.h`, `glibc/uuidtest154.h`, `glibc/uuidtest155.h`, `glibc/uuidtest156.h`, `glibc/uuidtest157.h`, `glibc/uuidtest158.h`, `glibc/uuidtest159.h`, `glibc/uuidtest160.h`, `glibc/uuidtest161.h`, `glibc/uuidtest162.h`, `glibc/uuidtest163.h`, `glibc/uuidtest164.h`, `glibc/uuidtest165.h`, `glibc/uuidtest166.h`, `glibc/uuidtest167.h`, `glibc/uuidtest168.h`, `glibc/uuidtest169.h`, `glibc/uuidtest170.h`, `glibc/uuidtest171.h`, `glibc/uuidtest172.h`, `glibc/uuidtest173.h`, `glibc/uuidtest174.h`, `glibc/uuidtest175.h`, `glibc/uuidtest176.h`, `glibc/uuidtest177.h`, `glibc/uuidtest178.h`, `glibc/uuidtest179.h`, `glibc/uuidtest180.h`, `glibc/uuidtest181.h`, `glibc/uuidtest182.h`, `glibc/uuidtest183.h`, `glibc/uuidtest184.h`, `glibc/uuidtest185.h`, `glibc/uuidtest186.h`, `glibc/uuidtest187.h`, `glibc/uuidtest188.h`, `glibc/uuidtest189.h`, `glibc/uuidtest190.h`, `glibc/uuidtest191.h`, `glibc/uuidtest192.h`, `glibc/uuidtest193.h`, `glibc/uuidtest194.h`, `glibc/uuidtest195.h`, `glibc/uuidtest196.h`, `glibc/uuidtest197.h`, `glibc/uuidtest198.h`, `glibc/uuidtest199.h`, `glibc/uuidtest200.h`, `glibc/uuidtest201.h`, `glibc/uuidtest202.h`, `glibc/uuidtest203.h`, `glibc/uuidtest204.h`, `glibc/uuidtest205.h`, `glibc/uuidtest206.h`, `glibc/uuidtest207.h`, `glibc/uuidtest208.h`, `glibc/uuidtest209.h`, `glibc/uuidtest210.h`, `glibc/uuidtest211.h`, `glibc/uuidtest212.h`, `glibc/uuidtest213.h`, `glibc/uuidtest214.h`, `glibc/uuidtest215.h`, `glibc/uuidtest216.h`, `glibc/uuidtest217.h`, `glibc/uuidtest218.h`, `glibc/uuidtest219.h`, `glibc/uuidtest220.h`, `glibc/uuidtest221.h`, `glibc/uuidtest222.h`, `glibc/uuidtest223.h`, `glibc/uuidtest224.h`, `glibc/uuidtest225.h`, `glibc/uuidtest226.h`, `glibc/uuidtest227.h`, `glibc/uuidtest228.h`, `glibc/uuidtest229.h`, `glibc/uuidtest230.h`, `glibc/uuidtest231.h`, `glibc/uuidtest232.h`, `glibc/uuidtest233.h`, `glibc/uuidtest234.h`, `glibc/uuidtest235.h`, `glibc/uuidtest236.h`, `glibc/uuidtest237.h`, `glibc/uuidtest238.h`, `glibc/uuidtest239.h`, `glibc/uuidtest240.h`, `glibc/uuidtest241.h`, `glibc/uuidtest242.h`, `glibc/uuidtest243.h`, `glibc/uuidtest244.h`, `glibc/uuidtest245.h`, `glibc/uuidtest246.h`, `glibc/uuidtest247.h`, `glibc/uuidtest248.h`, `glibc/uuidtest249.h`, `glibc/uuidtest250.h`, `glibc/uuidtest251.h`, `glibc/uuidtest252.h`, `glibc/uuidtest253.h`, `glibc/uuidtest254.h`, `glibc/uuidtest255.h`, `glibc/uuidtest256.h`, `glibc/uuidtest257.h`, `glibc/uuidtest258.h`, `glibc/uuidtest259.h`, `g`

- class `gdcm::network::NEventReportRQ`  
`NEventReportRQ`.
- class `gdcm::network::NEventReportRSP`  
`NEventReportRSP` this file defines the messages for the neventreport action.

- namespace `gdcm`
- namespace `gdcm::network`





## Classes

- class [gdcm::network::NGetRQ](#)  
*NGetRQ.*
- class [gdcm::network::NGetRSP](#)  
*NGetRSP this file defines the messages for the nget action.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.532 gdcmNGetMessages.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2014 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMCNGETMESSAGES_H
00015 #define GDCMCNGETMESSAGES_H
00016
00017 #include "gdcmBaseNormalizedMessage.h"
00018
00019 namespace gdcm{
00020     namespace network{
00021
00022     class ULConnection;
00023
00024     class NGetRQ : public BaseNormalizedMessage {
00025     public:
00026         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
00027             const BaseQuery* inQuery) override;
00028     };
00029
00030     class NGetRSP : public BaseNormalizedMessage {
00031     public:
00032         std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
00033     };
00034     }
00035 }
00036 #endif // GDCMCNGETMESSAGES_H

```

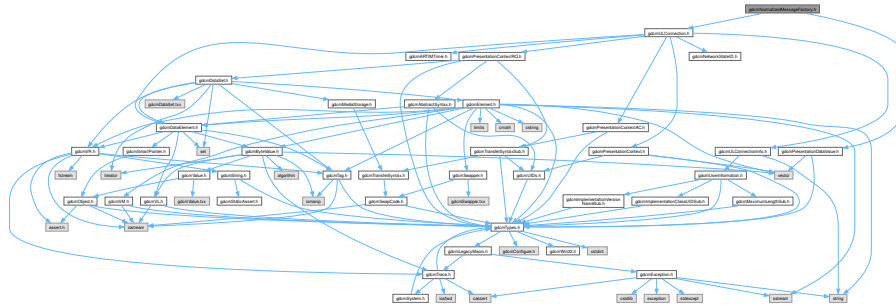
## 13.533 gdcmNormalizedMessageFactory.h File Reference

```

#include "gdcmPresentationDataValue.h"
#include "gdcmULConnection.h"

```

Include dependency graph for gdcmNormalizedMessageFactory.h:



## Classes

- class [gdcm::network::NormalizedMessageFactory](#)

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.534 gdcmNormalizedMessageFactory.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  #ifndef GDCMNORMALIZEDMESSAGEFACTORY_H
00015  #define GDCMNORMALIZEDMESSAGEFACTORY_H
00016
00017  #include "gdcmPresentationDataValue.h"
00018  #include "gdcmULConnection.h"
00019
00020  namespace gdcm {
00021      class BaseQuery;
00022      class File;
00023      namespace network {
00024          class BasePDU;
00025
00026          class NormalizedMessageFactory
00027          {
00028          public:
00029              static std::vector<PresentationDataValue> ConstructNEventReport (const ULConnection& inConnection,
00030              const BaseQuery* inQuery);
00031              static std::vector<PresentationDataValue> ConstructNGet (const ULConnection& inConnection,
00032              const BaseQuery* inQuery);
00033              static std::vector<PresentationDataValue> ConstructNSet (const ULConnection& inConnection,
00034              const BaseQuery* inQuery);

```



## 13.536 gdcmNormalizedNetworkFunctions.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMNORMALIZEDNETWORKFUNCTIONS_H
00015 #define GDCMNORMALIZEDNETWORKFUNCTIONS_H
00016
00017 #include "gdcmDirectory.h"
00018 #include "gdcmBaseQuery.h" // EQueryLevel / EQueryType
00019
00020 #include <vector>
00021 #include <string>
00022
00023 namespace gdcm
00024 {
00046 class GDCM_EXPORT NormalizedNetworkFunctions
00047 {
00048 public:
00049   static BaseQuery* ConstructQuery( const std::string & sopInstanceUID,
00050                                     const DataSet& queryds, ENQueryType queryType = eCreateMMPS );
00051   static bool NEventReport( const char *remote, uint16_t portno,
00052                             const BaseQuery* query, std::vector<DataSet> &retDataSets,
00053                             const char *aetitle, const char *call );
00054   static bool NGet( const char *remote, uint16_t portno,
00055                     const BaseQuery* query, std::vector<DataSet> &retDataSets,
00056                     const char *aetitle, const char *call );
00057   static bool NSet( const char *remote, uint16_t portno,
00058                     const BaseQuery* query, std::vector<DataSet> &retDataSets,
00059                     const char *aetitle, const char *call );
00060   static bool NAction( const char *remote, uint16_t portno,
00061                        const BaseQuery* query, std::vector<DataSet> &retDataSets,
00062                        const char *aetitle, const char *call );
00063   static bool NCreate( const char *remote, uint16_t portno,
00064                        BaseQuery* query, std::vector<DataSet> &retDataSets,
00065                        const char *aetitle, const char *call );
00066   static bool NDelete( const char *remote, uint16_t portno,
00067                        const BaseQuery* query, std::vector<DataSet> &retDataSets,
00068                        const char *aetitle, const char *call );
00069 };
00070
00071 } // end namespace gdcm
00072
00073 #endif // GDCMCOMPOSITENETWORKFUNCTIONS_H

```



```

00016
00017 #include "gdcmBaseNormalizedMessage.h"
00018
00019 namespace gdcm{
00020     namespace network{
00021
00022     class ULConnection;
00023
00024     class NSetRQ : public BaseNormalizedMessage {
00025     public:
00026         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
00027             const BaseQuery* inQuery) override;
00028     };
00029
00030     class NSetRSP : public BaseNormalizedMessage {
00031     public:
00032         std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
00033     };
00034 }
00035 #endif // GDCMCNSETMESSAGES_H

```

## 13.539 gdcmPDataTFPDU.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmPresentationDataValue.h"
#include "gdcmBasePDU.h"
#include <limits>

```

Include dependency graph for gdcmPDataTFPDU.h:



### Classes

- class `gdcm::network::PDataTFPDU`  
*PDataTFPDU*.

### Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.540 gdcmPDataTFPDU.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPDATATFPDU_H
00015 #define GDCMPDATATFPDU_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmPresentationDataValue.h"
00019 #include "gdcmBasePDU.h"
00020 #include <limits>
00021
00022 namespace gdcm
00023 {
00024
00025 namespace network
00026 {
00027
00033 class GDCM_EXPORT PDataTFPDU : public BasePDU
00034 {
00035 public:
00036   PDataTFPDU();
00037   std::istream &Read(std::istream &is) override;
00038   const std::ostream &Write(std::ostream &os) const override;
00039
00041   size_t Size() const override;
00042
00043   void AddPresentationDataValue( PresentationDataValue const &pdv ) {
00044     V.push_back( pdv );
00045     assert(Size() < std::numeric_limits<uint32_t>::max());
00046     ItemLength = (uint32_t)Size() - 6;
00047   }
00048
00049   typedef std::vector<PresentationDataValue>::size_type SizeType;
00050   PresentationDataValue const &GetPresentationDataValue(SizeType i) const {
00051     assert( !V.empty() && i < V.size() );
00052     return V[i];
00053   }
00054   SizeType GetNumberOfPresentationDataValues() const {
00055     return V.size();
00056   }
00057
00058   void Print(std::ostream &os) const override;
00059   bool IsLastFragment() const override;
00060
00061 protected:
00062   std::istream &ReadInto(std::istream &is, std::ostream &os);
00063 private:
00064   static const uint8_t ItemType; // PDUType ?
00065   static const uint8_t Reserved2;
00066   uint32_t ItemLength; // PDU Length ?
00067   std::vector<PresentationDataValue> V;
00068 };
00069
00070 } // end namespace network
00071
00072 } // end namespace gdcm
00073
00074 #endif //GDCMPDATATFPDU_H

```



## 13.541 gdcmPDUFactory.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmNetworkEvents.h"
#include "gdcmULConnection.h"
#include "gdcmPresentationDataValue.h"
```

Include dependency graph for gdcmPDUFactory.h:



### Classes

- class `gdcm::network::PDUFactory`  
*PDUFactory* basically, given an initial byte, construct the.

### Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.542 gdcmPDUFactory.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002  *
00003  *   Copyright NumFOCUS
00004  *
00005  *   Licensed under the Apache License, Version 2.0 (the "License");
00006  *   you may not use this file except in compliance with the License.
00007  *   You may obtain a copy of the License at
00008  *
00009  *       http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
00011  *   Unless required by applicable law or agreed to in writing, software
00012  *   distributed under the License is distributed on an "AS IS" BASIS,
00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMPDUFACTORY_H
00019 #define GDCMPDUFACTORY_H
00020
00021 #include "gdcmTypes.h"
00022 #include "gdcmNetworkEvents.h"
```

```

00023 #include "gdcmULConnection.h"
00024 #include "gdcmPresentationDataValue.h"
00025
00026 namespace gdcm{
00027     class BaseRootQuery;
00028     class BaseQuery;
00029     class File;
00030     namespace network{
00031         class BasePDU;
00032
00033         class PDUFactory {
00034         public:
00035             static BasePDU* ConstructPDU(uint8_t itemtype); //eventually needs to be smartpointer'd
00036             static EEventID DetermineEventByPDU(const BasePDU* inPDU);
00037             static BasePDU* ConstructReleasePDU();
00038             static BasePDU* ConstructAbortPDU();
00039
00040             //these are the composite PDU construction methods for the PDataPDUs.
00041             //basically, builds a pdatapdu, and then puts the appropriate information in
00042             //for the appropriate composite service (c-echo, c-find, c-store, c-get, c-move)
00043             //the connection is necessary to construct the stream of PDVs that will
00044             //be then placed into the vector of PDUs
00045             static std::vector<BasePDU*> CreateCEchoPDU(const ULConnection& inConnection);
00046             static std::vector<BasePDU*> CreateCStoreRQPDU(const ULConnection& inConnection, const File &file,
00047 bool writeDataSet = true );
00048             static std::vector<BasePDU*> CreateCStoreRSPDU(const DataSet *inDataSet, const BasePDU* inPC);
00049             static std::vector<BasePDU*> CreateCFindPDU(const ULConnection& inConnection, const BaseRootQuery*
inRootQuery);
00050             static std::vector<BasePDU*> CreateCMovePDU(const ULConnection& inConnection, const BaseRootQuery*
inRootQuery);
00051             static std::vector<BasePDU*> CreateNEventReportPDU (const ULConnection& inConnection, const BaseQuery
*inQuery);
00052             static std::vector<BasePDU*> CreateNGetPDU (const ULConnection& inConnection, const BaseQuery
*inQuery);
00053             static std::vector<BasePDU*> CreateNSetPDU (const ULConnection& inConnection, const BaseQuery
*inQuery);
00054             static std::vector<BasePDU*> CreateNActionPDU (const ULConnection& inConnection, const BaseQuery
*inQuery);
00055             static std::vector<BasePDU*> CreateNCreatePDU (const ULConnection& inConnection, const BaseQuery
*inQuery);
00056             static std::vector<BasePDU*> CreateNDeletePDU (const ULConnection& inConnection, const BaseQuery
*inQuery);
00057
00058             //given data pdus, produce the presentation data values stored within.
00059             //all operations have these as the payload of the data sending operation
00060             //however, echo does not have a dataset in the pdv.
00061             static std::vector<PresentationDataValue> GetPDVs(const std::vector<BasePDU*> & inDataPDUs);
00062         };
00063     }
00064 }
00065 #endif //GDCMPDUFACTORY_H

```

## 13.543 gdcmPresentationContext.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmUIDs.h"
#include <vector>

```

Include dependency graph for gdcmPresentationContext.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::PresentationContext`  
*PresentationContext*.

## Namespaces

- namespace `gdcm`

## 13.544 gdcmPresentationContext.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPRESENTATIONCONTEXT_H
00015 #define GDCMPRESENTATIONCONTEXT_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmUIDs.h"
00019
00020 #include <vector>
00021
00022 namespace gdcm
00023 {
00024
00025 class GDCM_EXPORT PresentationContext
00026 {
00027 public:
00028   PresentationContext();
00029
00030   PresentationContext( UIDs::TSName asname,
00031     UIDs::TSName tsname = UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM );
00032
00033   void SetAbstractSyntax( const char *absyn ) { AbstractSyntax = absyn; }
00034   const char *GetAbstractSyntax() const { return AbstractSyntax.c_str(); }
00035
00036   void AddTransferSyntax( const char *tsstr );
00037   typedef std::vector<std::string> TransferSyntaxArrayType;
00038   typedef TransferSyntaxArrayType::size_type SizeType;
00039   const char *GetTransferSyntax(SizeType i) const { return TransferSyntaxes[i].c_str(); }
00040   SizeType GetNumberOfTransferSyntaxes() const { return TransferSyntaxes.size(); }
00041
00042   void SetPresentationContextID( uint8_t id );
00043   uint8_t GetPresentationContextID() const;
00044
00045   void Print(std::ostream &os) const;
00046
00047   bool operator==(const PresentationContext & pc) const
00048   {
00049     assert( TransferSyntaxes.size() == 1 ); // TODO
00050     assert( pc.TransferSyntaxes.size() == 1 );
00051     return AbstractSyntax == pc.AbstractSyntax && TransferSyntaxes == pc.TransferSyntaxes;
00052   }
00053
00054 protected :
00055   std::string AbstractSyntax;
00056   std::vector<std::string> TransferSyntaxes;
00057   uint8_t /*PresentationContext*/ID;
00058 };
00059
00060 } // end namespace gdcm
00061
00062 #endif //GDCMPRESENTATIONCONTEXT_H

```

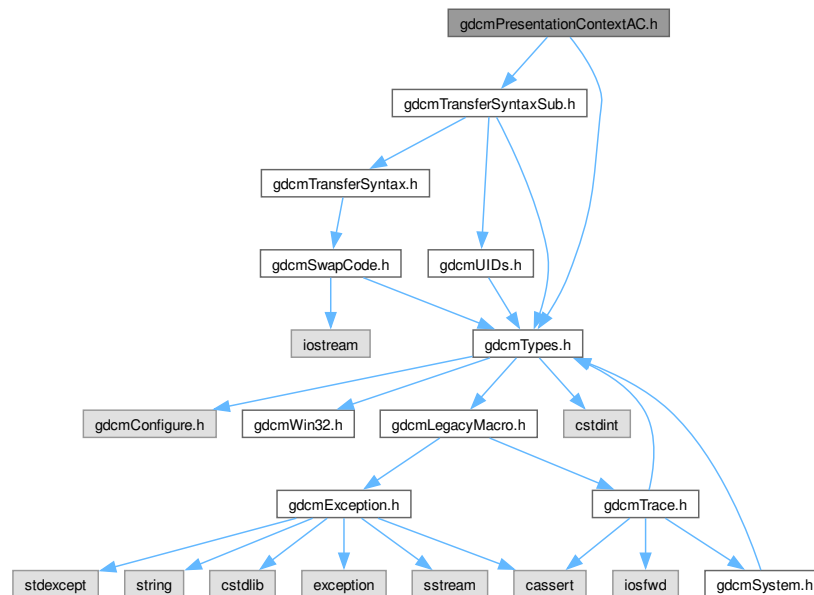
## 13.545 gdcmPresentationContextAC.h File Reference

```

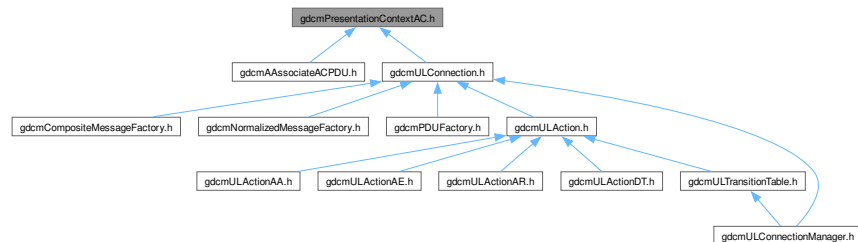
#include "gdcmTypes.h"
#include "gdcmTransferSyntaxSub.h"

```

Include dependency graph for gdcmPresentationContextAC.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::network::PresentationContextAC](#)  
*PresentationContextAC.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.546 gdcmPresentationContextAC.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMPRESENTATIONCONTEXTAC_H
00015 #define GDCMPRESENTATIONCONTEXTAC_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmTransferSyntaxSub.h"
00019
00020 namespace gdcm
00021 {
00022
00023     namespace network
00024     {
00025
00032         class PresentationContextAC
00033         {
00034         public:
00035             PresentationContextAC();
00036             std::istream &Read(std::istream &is);
00037             const std::ostream &Write(std::ostream &os) const;
00038
00039             size_t Size() const;
00040
00041             void SetTransferSyntax( TransferSyntaxSub const &ts );
00042             void SetPresentationContextID( uint8_t id );
00043
00044             void Print(std::ostream &os) const;
00045
00046             uint8_t GetPresentationContextID() const
00047             {
00048                 return ID;
00049             }
00050             TransferSyntaxSub const & GetTransferSyntax() const { return SubItems; }
00051
00052             void SetReason( uint8_t r ) { Result = r; }
00053             uint8_t GetReason() const { return Result; }
00054
00055         private:
00056             static const uint8_t ItemType;
00057             static const uint8_t Reserved2;
00058             uint16_t ItemLength; // len of last transfer syntax
00059             uint8_t /*PresentationContext*/ID;
00060             static const uint8_t Reserved6;
00061             uint8_t /*Reason*/Result;
00062             static const uint8_t Reserved8;
00063             TransferSyntaxSub SubItems;
00064         };
00065
00066     } // end namespace network
00067
00068 } // end namespace gdcm
00069
00070 #endif //GDCMPRESENTATIONCONTEXTAC_H

```

## 13.547 gdcmPresentationContextGenerator.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmPresentationContext.h"

```

Include dependency graph for gdcmPresentationContextGenerator.h:



## Classes

- class [gdcm::PresentationContextGenerator](#)  
*PresentationContextGenerator.*

## Namespaces

- namespace [gdcm](#)

## 13.548 gdcmPresentationContextGenerator.h

[Go to the documentation of this file.](#)

```

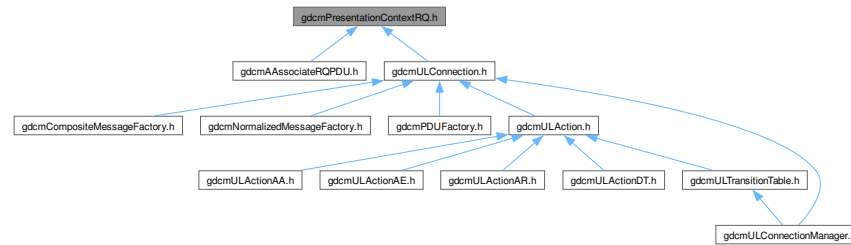
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014 #ifndef GDCMPRESENTATIONCONTEXTGENERATOR_H
00015 #define GDCMPRESENTATIONCONTEXTGENERATOR_H
00016
00017 #include "gdcmDirectory.h"
00018 #include "gdcmPresentationContext.h"
00019
00020 namespace gdcm
00021 {

```





This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::network::PresentationContextRQ`  
*PresentationContextRQ.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.550 gdcmPresentationContextRQ.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 #ifndef GDCMPRESENTATIONCONTEXTTRQ_H
00015 #define GDCMPRESENTATIONCONTEXTTRQ_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmAbstractSyntax.h"
00019 #include "gdcmTransferSyntaxSub.h"
00020 #include "gdcmDataSet.h"
00021
00022 namespace gdcm
00023 {
00024     class PresentationContext;
00025     namespace network
00026     {
00027
00034     class GDCM_EXPORT PresentationContextRQ
00035     {
00036     public:
00037         PresentationContextRQ();
00038     }
  
```

```

00042 PresentationContextRQ( UIDs::TSName asname, UIDs::TSName tname =
00043     UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM );
00044
00045 std::istream &Read(std::istream &is);
00046 const std::ostream &Write(std::ostream &os) const;
00047 size_t Size() const;
00048
00049 void SetAbstractSyntax( AbstractSyntax const & absyn );
00050 AbstractSyntax const &GetAbstractSyntax() const { return SubItems; }
00051 AbstractSyntax &GetAbstractSyntax() { return SubItems; }
00052
00053 void AddTransferSyntax( TransferSyntaxSub const &ts );
00054 typedef std::vector<TransferSyntaxSub>::size_type SizeType;
00055 TransferSyntaxSub const &GetTransferSyntax(SizeType i) const { return TransferSyntaxes[i]; }
00056 TransferSyntaxSub &GetTransferSyntax(SizeType i) { return TransferSyntaxes[i]; }
00057 std::vector<TransferSyntaxSub> const &GetTransferSyntaxes() const {return TransferSyntaxes; }
00058 SizeType GetNumberOfTransferSyntaxes() const { return TransferSyntaxes.size(); }
00059
00060 void SetPresentationContextID( uint8_t id );
00061 uint8_t GetPresentationContextID() const;
00062
00063 void Print(std::ostream &os) const;
00064
00065 bool operator==(const PresentationContextRQ & pc) const
00066 {
00067     assert( TransferSyntaxes.size() == 1 ); // TODO
00068     assert( pc.TransferSyntaxes.size() == 1 );
00069     return SubItems == pc.SubItems && TransferSyntaxes == pc.TransferSyntaxes;
00070 }
00071
00072 PresentationContextRQ(const PresentationContext & pc);
00073
00074 private:
00075     static const uint8_t ItemType;
00076     static const uint8_t Reserved2;
00077     uint16_t ItemLength; // len of last transfer syntax
00078     uint8_t /*PresentationContext*/ID;
00079     static const uint8_t Reserved6;
00080     static const uint8_t Reserved7;
00081     static const uint8_t Reserved8;
00082     /*
00083     This variable field shall contain the following sub-items: one Abstract
00084     Syntax and one or more Transfer Syntax(es). For a complete
00085     description of the use and encoding of these sub-items see Sections
00086     9.3.2.2.1 and 9.3.2.2.2.
00087     */
00088     AbstractSyntax SubItems;
00089     std::vector<TransferSyntaxSub> TransferSyntaxes;
00090 };
00091
00092 } // end namespace network
00093
00094 } // end namespace gdcmm
00095
00096 #endif //GDCMPRESENTATIONCONTEXTRO_H

```

## 13.551 gdcmmPresentationDataValue.h File Reference

```

#include "gdcmmTypes.h"
#include <vector>

```



```

00014 #ifndef GDCMPRESENTATIONDATAVALUE_H
00015 #define GDCMPRESENTATIONDATAVALUE_H
00016
00017 #include "gdcmTypes.h"
00018
00019 #include <vector>
00020
00021 namespace gdcm
00022 {
00023 class DataSet;
00024 namespace network
00025 {
00026
00032 class GDCM_EXPORT PresentationDataValue
00033 {
00034 public:
00035     PresentationDataValue();
00036     std::istream &Read(std::istream &is);
00037     std::istream &ReadInto(std::istream &is, std::ostream &os);
00038
00039     const std::ostream &Write(std::ostream &os) const;
00040
00042     size_t Size() const;
00043
00046     void SetDataSet(const DataSet & ds);
00047     void SetBlob(const std::string & partialblob);
00048     const std::string &GetBlob() const;
00049
00050     uint8_t GetPresentationContextID() const { return PresentationContextID; }
00051     void SetPresentationContextID(uint8_t id) {
00052         assert( id );
00053         PresentationContextID = id;
00054     }
00055     uint8_t GetMessageHeader() const {
00056         assert( MessageHeader <= 0x3 );
00057         return MessageHeader;
00058     }
00059     // E.2 MESSAGE CONTROL HEADER ENCODING
00060     // Only the first two bits are considered
00061     void SetMessageHeader(uint8_t messageheader) {
00062         MessageHeader = messageheader;
00063         assert( MessageHeader <= 0x3 );
00064     }
00065     //flip the least significant bit of the message header to 1
00066     //if this is a command, else set it to 0.
00067     void SetCommand(bool inCommand);
00068     void SetLastFragment(bool inLast); //set to true if this is the last PDV of a set
00069
00070     bool GetIsCommand() const;
00071     bool GetIsLastFragment() const;
00072
00073     void Print(std::ostream &os) const;
00074
00075     //NOTE that the PDVs have to be given in the order in which they were received!
00076     //also note that a dataset may be across multiple PDVs
00077     static DataSet ConcatenatePDVBlobs(const std::vector<PresentationDataValue>& inPDVs);
00078
00079     static DataSet ConcatenatePDVBlobsAsExplicit(const std::vector<PresentationDataValue>& inPDVs);
00080
00082 private:
00083     uint32_t ItemLength;
00084     uint8_t PresentationContextID;
00085     uint8_t MessageHeader;
00086     std::string Blob;
00087 };
00088 } // end namespace network
00089
00090 } // end namespace gdcm
00091
00092 #endif //GDCMPRESENTATIONDATAVALUE_H

```

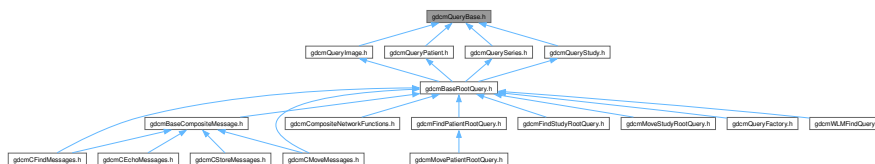
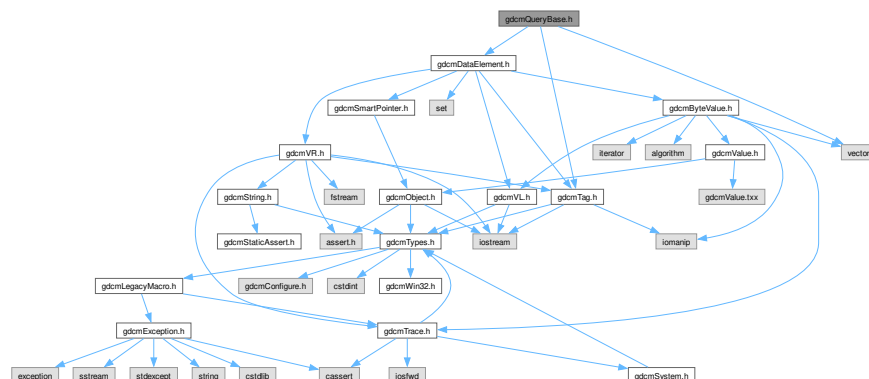
## 13.553 gdcmQueryBase.h File Reference

```

#include "gdcmTag.h"
#include "gdcmDataElement.h"

```

Include dependency graph for `gdcmQueryBase.h`:



- class `gdcm::QueryBase`  
*QueryBase*.

- namespace **gdcm**

- enum `gdcm::ERootType` {  
`gdcm::ePatientRootType` ,  
`gdcm::eStudyRootType` }

## 13.554 gdcmQueryBase.h

[Go to the documentation of this file.](#)

```

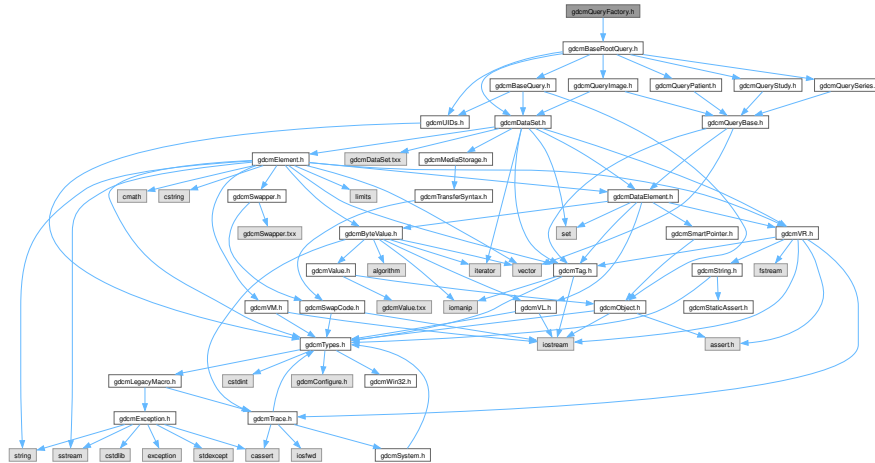
00001 /*=====
00002  *
00003  *   Copyright NumFOCUS
00004  *
00005  *   Licensed under the Apache License, Version 2.0 (the "License");
00006  *   you may not use this file except in compliance with the License.
00007  *   You may obtain a copy of the License at
00008  *
00009  *       http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
00011  *   Unless required by applicable law or agreed to in writing, software
00012  *   distributed under the License is distributed on an "AS IS" BASIS,
00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMQUERYBASE_H
00019 #define GDCMQUERYBASE_H
00020
00021 #include "gdcmTag.h"
00022 #include "gdcmDataElement.h"
00023
00024 #include <vector>
00025
00026 namespace gdcm
00027 {
00028     enum ERootType
00029     {
00030         ePatientRootType,
00031         eStudyRootType
00032     };
00033
00060 class GDCM_EXPORT QueryBase
00061 {
00062 public:
00063     virtual ~QueryBase() = default;
00064
00065     virtual std::vector<Tag> GetRequiredTags(const ERootType& inRootType) const = 0;
00066     virtual std::vector<Tag> GetUniqueTags(const ERootType& inRootType) const = 0;
00067     virtual std::vector<Tag> GetOptionalTags(const ERootType& inRootType) const = 0;
00068     // C.4.1.2.1 Baseline Behavior of SCU
00069     // All C-FIND SCUs shall be capable of generating query requests which
00070     // meet the requirements of the Hierarchical Search.
00071     // The Identifier contained in a C-FIND request shall contain a single
00072     // value in the Unique Key Attribute for each level above the
00073     // Query/Retrieve level. No Required or Optional Keys shall be
00074     // specified which are associated with levels above the Query/Retrieve
00075     // level.
00077     virtual std::vector<Tag> GetHierachicalSearchTags(const ERootType& inRootType) const = 0;
00078
00081     std::vector<Tag> GetAllTags(const ERootType& inRootType) const;
00082
00085     std::vector<Tag> GetAllRequiredTags(const ERootType& inRootType) const;
00086
00087     virtual const char * GetName() const = 0;
00088     virtual DataElement GetQueryLevel() const = 0;
00089 };
00090 }
00091
00092 #endif //GDCMQUERYBASE_H

```

## 13.555 gdcmQueryFactory.h File Reference

```
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmQueryFactory.h:



### Classes

- class [gdcm::QueryFactory](#)  
*QueryFactory.h*

### Namespaces

- namespace [gdcm](#)

### Enumerations

- enum [gdcm::ECharSet](#) {  
[gdcm::eLatin1](#) = 0 ,  
[gdcm::eLatin2](#) ,  
[gdcm::eLatin3](#) ,  
[gdcm::eLatin4](#) ,  
[gdcm::eCyrillic](#) ,  
[gdcm::eArabic](#) ,  
[gdcm::eGreek](#) ,  
[gdcm::eHebrew](#) ,  
[gdcm::eLatin5](#) ,  
[gdcm::eJapanese](#) ,  
[gdcm::eThai](#) ,  
[gdcm::eJapaneseKanjiMultibyte](#) ,  
[gdcm::eJapaneseSupplementaryKanjiMultibyte](#) ,  
[gdcm::eKoreanHangulHanjaMultibyte](#) ,  
[gdcm::eUTF8](#) ,  
[gdcm::eGB18030](#) }

## 13.556 gdcmQueryFactory.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002  *
00003  *   Copyright NumFOCUS
00004  *
00005  *   Licensed under the Apache License, Version 2.0 (the "License");
00006  *   you may not use this file except in compliance with the License.
00007  *   You may obtain a copy of the License at
00008  *
00009  *       http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
00011  *   Unless required by applicable law or agreed to in writing, software
00012  *   distributed under the License is distributed on an "AS IS" BASIS,
00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMQUERYFACTORY_H
00019 #define GDCMQUERYFACTORY_H
00020
00021 #include "gdcmBaseRootQuery.h"
00022
00023 namespace gdcm{
00024     enum ECharSet {
00025         eLatin1 = 0,
00026         eLatin2,
00027         eLatin3,
00028         eLatin4,
00029         eCyrillic,
00030         eArabic,
00031         eGreek,
00032         eHebrew,
00033         eLatin5, // Latin Alphabet No. 5 (Turkish) Extended
00034         eJapanese, // JIS X 0201 (Shift JIS) Extended
00035         eThai, // TIS 620-2533 (Thai) Extended
00036         eJapaneseKanjiMultibyte, // JIS X 0208 (Kanji) Extended
00037         eJapaneseSupplementaryKanjiMultibyte, // JIS X 0212 (Kanji) Extended
00038         eKoreanHangulHanjaMultibyte, // KS X 1001 (Hangul and Hanja) Extended
00039         eUTF8,
00040         eGB18030 // Chinese (Simplified) Extended
00041     };
00042
00043     class GDCM_EXPORT QueryFactory
00044     {
00045     public:
00046
00047         static BaseQuery* ProduceQuery( const std::string & sopInstanceUID, ENQueryType inQueryType );
00048         static BaseRootQuery* ProduceQuery(ERootType inRootType, EQueryType inQueryType,
00049             EQueryLevel inQueryLevel);
00050
00051         static DataElement ProduceCharacterSetDataElement(
00052             const std::vector<ECharSet>& inCharSetType);
00053
00054         static ECharSet GetCharacterFromCurrentLocale();
00055
00056         static void ListCharSets(std::ostream& os);
00057     };
00058 } // end namespace gdcm
00059
00060 #endif // GDCMQUERYFACTORY_H

```

## 13.557 gdcmQueryImage.h File Reference

```

#include "gdcmQueryBase.h"
#include "gdcmDataSet.h"

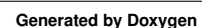
```





### 13.559 gdcMQueryPatient.h File Reference

Include dependency graph for gdcQueryPatient.h:



**Classes**

- class `gdcm::QueryPatient`  
*QueryPatient.*

**Namespaces**

- namespace `gdcm`

**13.560 gdcmQueryPatient.h**

[Go to the documentation of this file.](#)

```

00001 /*=====
00002  *
00003  * Copyright NumFOCUS
00004  *
00005  * Licensed under the Apache License, Version 2.0 (the "License");
00006  * you may not use this file except in compliance with the License.
00007  * You may obtain a copy of the License at
00008  *
00009  * http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
00011  * Unless required by applicable law or agreed to in writing, software
00012  * distributed under the License is distributed on an "AS IS" BASIS,
00013  * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  * See the License for the specific language governing permissions and
00015  * limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMQUERYPATIENT_H
00019 #define GDCMQUERYPATIENT_H
00020
00021 #include "gdcmQueryBase.h"
00022
00023 namespace gdcm
00024 {
00025     class GDCM_EXPORT QueryPatient : public QueryBase
00026     {
00027     public:
00028         std::vector<Tag> GetRequiredTags(const ERootType& inRootType) const override;
00029         std::vector<Tag> GetUniqueTags(const ERootType& inRootType) const override;
00030         std::vector<Tag> GetOptionalTags(const ERootType& inRootType) const override;
00031         std::vector<Tag> GetHierarchicalSearchTags(const ERootType& inRootType) const override;
00032
00033         const char * GetName() const override;
00034         DataElement GetQueryLevel() const override;
00035     };
00036
00037 } // end namespace gdcm
00038
00039 #endif //GDCMQUERYPATIENT_H

```



```

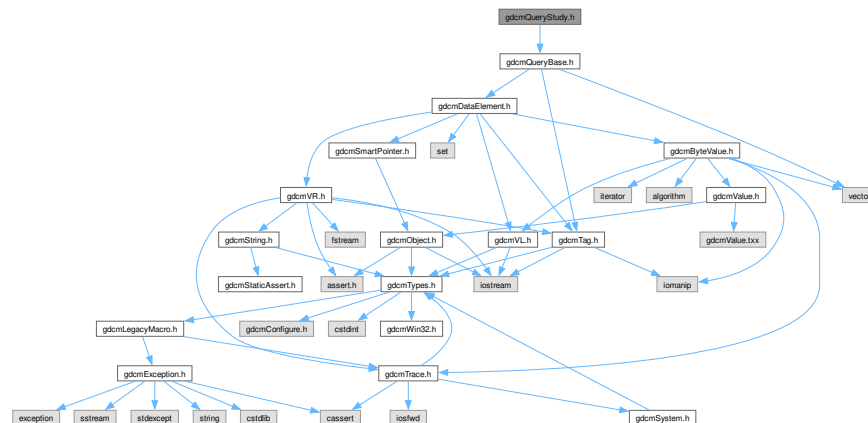
00006  * you may not use this file except in compliance with the License.
00007  * You may obtain a copy of the License at
00008  *
00009  *      http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
00011  * Unless required by applicable law or agreed to in writing, software
00012  * distributed under the License is distributed on an "AS IS" BASIS,
00013  * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  * See the License for the specific language governing permissions and
00015  * limitations under the License.
00016  *
00017  *===== */
00018 #ifndef GDCMQUERYSERIES_H
00019 #define GDCMQUERYSERIES_H
00020
00021 #include "gdcmQueryBase.h"
00022
00023 namespace gdcm
00024 {
00029 class GDCM_EXPORT QuerySeries : public QueryBase
00030 {
00031 public:
00032     std::vector<Tag> GetRequiredTags(const ERootType& inRootType) const override;
00033     std::vector<Tag> GetUniqueTags(const ERootType& inRootType) const override;
00034     std::vector<Tag> GetOptionalTags(const ERootType& inRootType) const override;
00035     std::vector<Tag> GetHierarchicalSearchTags(const ERootType& inRootType) const override;
00036
00037     const char * GetName() const override;
00038     DataElement GetQueryLevel() const override;
00039 };
00040
00041 } // end namespace gdcm
00042
00043 #endif //GDCMQUERYSERIES_H

```

## 13.563 gdcmQueryStudy.h File Reference

```
#include "gdcmQueryBase.h"
```

Include dependency graph for gdcmQueryStudy.h:





## 13.565 gdcmRoleSelectionSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmRoleSelectionSub.h:



### Classes

- class [gdcm::network::RoleSelectionSub](#)  
*RoleSelectionSub.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.566 gdcmRoleSelectionSub.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMROLESELECTIONSUB_H
00015 #define GDCMROLESELECTIONSUB_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {

```

```

00021
00022 namespace network
00023 {
00024
00031 class RoleSelectionSub
00032 {
00033 public:
00034     RoleSelectionSub();
00035     std::istream &Read(std::istream &is);
00036     const std::ostream &Write(std::ostream &os) const;
00037
00038     size_t Size() const;
00039     void Print(std::ostream &os) const;
00040
00041     void SetTuple(const char *uid, uint8_t scurole, uint8_t scprole);
00042
00043 private:
00044     static const uint8_t ItemType;
00045     static const uint8_t Reserved2;
00046     uint16_t ItemLength;
00047     uint16_t UIDLength;
00048     std::string /*SOP-class-uid*/ Name; // UID
00049     uint8_t SCURole;
00050     uint8_t SCPRole;
00051 };
00052
00053 } // end namespace network
00054
00055 } // end namespace gdcm
00056
00057 #endif // GDCMROLESELECTIONSUB_H

```

## 13.567 gdcmServiceClassApplicationInformation.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmServiceClassApplicationInformation.h:





This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::network::ServiceClassApplicationInformation](#)

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.568 gdcmServiceClassApplicationInformation.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMSERVICECLASSAPPLICATIONINFORMATION_H
00015 #define GDCMSERVICECLASSAPPLICATIONINFORMATION_H
00016
00017 #include "gdcmTypes.h"
00018
00019 namespace gdcm
00020 {
00021
00022   namespace network
00023   {
00024
00030     class ServiceClassApplicationInformation
00031     {
00032     public:
  
```



## 13.570 gdcmServiceClassUser.h

[Go to the documentation of this file.](#)

```

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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSERVICECLASSUSER_H
00015 #define GDCMSERVICECLASSUSER_H
00016
00017 #include "gdcmSubject.h"
00018
00019 #include "gdcmPresentationContext.h"
00020 #include "gdcmFile.h"
00021
00022 #include "gdcmNetworkStateID.h" // EStateID
00023
00024 namespace gdcm
00025 {
00026   class ServiceClassUserInternals;
00027   class BaseRootQuery;
00028   namespace network{
00029     class ULEvent;
00030     class ULConnection;
00031     class ULConnectionCallback;
00032   }
00033   class GDCM_EXPORT ServiceClassUser : public Subject
00034   {
00035   public:
00036     ServiceClassUser();
00037     ~ServiceClassUser() override;
00038     ServiceClassUser(const ServiceClassUser&) = delete;
00039     void operator=(const ServiceClassUser &) = delete;
00040
00041     void SetHostname( const char *hostname );
00042
00043     void SetPort( uint16_t port );
00044
00045     void SetPortSCP( uint16_t portscp );
00046
00047     void SetAETitle(const char *aetitle);
00048     const char *GetAETitle() const;
00049
00050     void SetCalledAETitle(const char *aetitle);
00051     const char *GetCalledAETitle() const;
00052
00053     void SetTimeout(double t);
00054     double GetTimeout() const;
00055
00056     bool InitializeConnection();
00057
00058     void SetPresentationContexts(std::vector<PresentationContext> const & pcs);
00059
00060     bool IsPresentationContextAccepted(const PresentationContext& pc) const;
00061
00062     bool StartAssociation();
00063
00064     bool StopAssociation();
00065
00066     bool SendEcho();
00067
00068     bool SendStore(const char *filename);
00069     bool SendStore(File const &file);
00070     bool SendStore(DataSet const &ds);
00071
00072     bool SendFind(const BaseRootQuery* query, std::vector<DataSet> &retDatasets);
00073
00074     bool SendMove(const BaseRootQuery* query, const char *outputdir);
00075     bool SendMove(const BaseRootQuery* query, std::vector<DataSet> &retDatasets);

```

```

00104     bool SendMove(const BaseRootQuery* query, std::vector<File> &retFile);
00105
00107     static SmartPointer<ServiceClassUser> New() { return new ServiceClassUser; }
00108
00109 private:
00110     network::EStateID RunEventLoop(network::ULEvent& inEvent,
00111         network::ULConnection* inWhichConnection,
00112         network::ULConnectionCallback* inCallback, const bool& startWaiting);
00113     network::EStateID RunMoveEventLoop(network::ULEvent& inEvent,
00114         network::ULConnectionCallback* inCallback);
00115
00116 private:
00117     ServiceClassUserInternals *Internals;
00118 };
00119
00120 } // end namespace gdcm
00121
00122 #endif // GDCMSERVICECLASSUSER_H

```

## 13.571 gdcmSOPClassExtendedNegotiationSub.h File Reference

#include "gdcmServiceClassApplicationInformation.h"

Include dependency graph for gdcmSOPClassExtendedNegotiationSub.h:



### Classes

- class `gdcm::network::SOPClassExtendedNegotiationSub`  
*SOPClassExtendedNegotiationSub.*

### Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.572 gdcmSOPClassExtendedNegociationSub.h

[Go to the documentation of this file.](#)

```

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00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMSOPCLASSEXTENDEDNEGOCIATIONSUB_H
00015 #define GDCMSOPCLASSEXTENDEDNEGOCIATIONSUB_H
00016
00017 #include "gdcmServiceClassApplicationInformation.h"
00018
00019 namespace gdcm
00020 {
00021     namespace network
00022     {
00023
00031         class SOPClassExtendedNegociationSub
00032         {
00033         public:
00034             SOPClassExtendedNegociationSub();
00035             std::istream &Read(std::istream &is);
00036             const std::ostream &Write(std::ostream &os) const;
00037
00038             size_t Size() const;
00039             void Print(std::ostream &os) const;
00040
00041             void SetTuple(const char *uid, uint8_t levelofsupport = 3,
00042                 uint8_t levelofdigitalsig = 0,
00043                 uint8_t elementcoercion = 2);
00044
00045         private:
00046             static const uint8_t ItemType;
00047             static const uint8_t Reserved2;
00048             uint16_t ItemLength;
00049             uint16_t UIDLength;
00050             std::string /*SOP-class-uid*/ Name; // UID
00051             ServiceClassApplicationInformation SCAI;
00052         };
00053
00054     } // end namespace network
00055
00056 } // end namespace gdcm
00057
00058 #endif // GDCMSOPCLASSEXTENDEDNEGOCIATIONSUB_H

```

## 13.573 gdcmTransferSyntaxSub.h File Reference

```

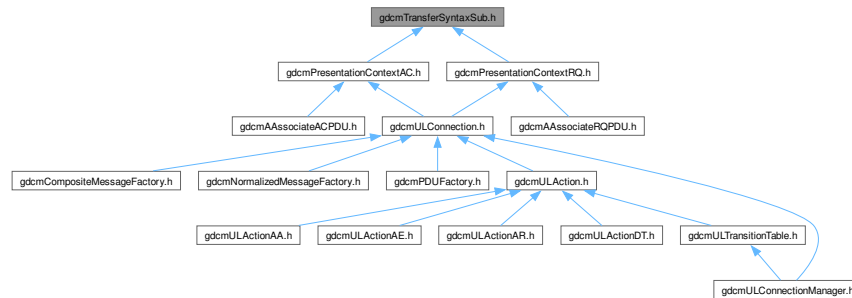
#include "gdcmTypes.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDs.h"

```

Include dependency graph for `gdcmTransferSyntaxSub.h`:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::network::TransferSyntaxSub`  
*TransferSyntaxSub.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.574 gdcmTransferSyntaxSub.h

[Go to the documentation of this file.](#)

```

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00012
00013 =====*/
00014 #ifndef GDCMTRANSFERSYNTAXSUB_H
00015 #define GDCMTRANSFERSYNTAXSUB_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmTransferSyntax.h"
00019 #include "gdcmUIDs.h"
00020
00021 namespace gdcm
00022 {
00023
00024   namespace network
00025   {
00026
00027     class TransferSyntaxSub
00028     {
00029     public:
00030       TransferSyntaxSub();
00031       void SetName( const char *name );
00032       const char *GetName() const { return Name.C_str(); }
00033
00034       // accept a UIDs::TSType also...
00035       void SetNameFromUID( UIDs::TSName tsname );
00036
00037       std::istream &Read(std::istream &is);
00038       const std::ostream &Write(std::ostream &os) const;
00039       size_t Size() const;
00040       void Print(std::ostream &os) const;
00041
00042       bool operator==(const TransferSyntaxSub & ts) const
00043       {
00044         return Name == ts.Name;
00045       }
00046
00047     private:
00048       void UpdateName( const char *name );
00049       static const uint8_t ItemType;
00050       static const uint8_t Reserved2;
00051       uint16_t ItemLength; // len of
00052       std::string /*TransferSyntaxSub*/ Name; // UID
00053     };
00054
00055   } // end namespace network
00056
00057 } // end namespace gdcm
00058
00059 #endif //GDCMTRANSFERSYNTAXSUB_H

```

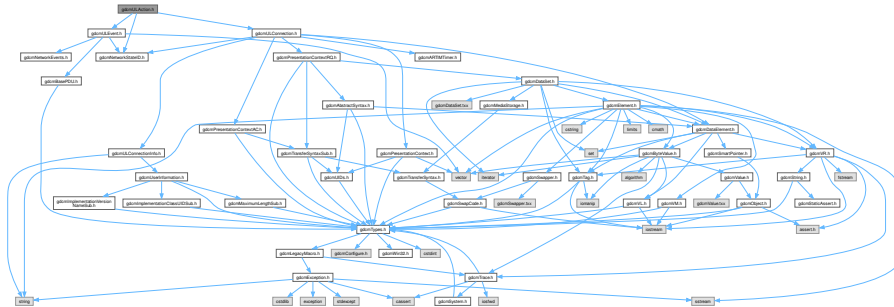
## 13.575 gdcmULAction.h File Reference

```

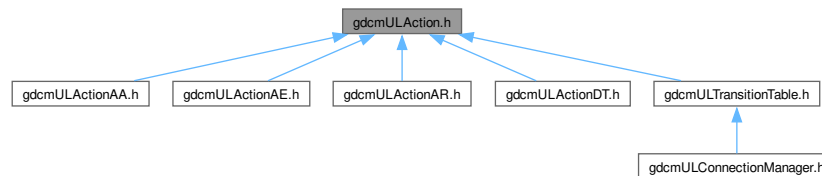
#include "gdcmNetworkStateID.h"
#include "gdcmULEvent.h"

```

```
#include "gdcmULConnection.h"
Include dependency graph for gdcmULAction.h:
```



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::network::ULAction`  
*ULAction.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.576 gdcmULAction.h

[Go to the documentation of this file.](#)

```
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00009  * http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
```



```

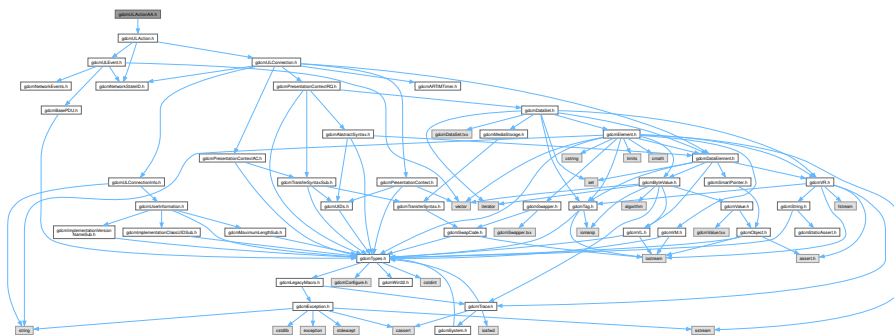
00011  * Unless required by applicable law or agreed to in writing, software
00012  * distributed under the License is distributed on an "AS IS" BASIS,
00013  * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  * See the License for the specific language governing permissions and
00015  * limitations under the License.
00016  *
00017  *=====*/
00018  #ifndef GDCMULACTION_H
00019  #define GDCMULACTION_H
00020
00021  #include "gdcmNetworkStateID.h"
00022  #include "gdcmULEvent.h"
00023  #include "gdcmULConnection.h"
00024
00025  namespace gdcm {
00026  class Subject;
00027      namespace network {
00028
00062  class ULAction {
00063
00064      protected:
00065
00066
00067      public:
00068          ULAction() = default;
00069          //make sure destructors are virtual to avoid memory leaks
00070          virtual ~ULAction() = default;
00071          //cannot copy a ULAction
00072          ULAction(const ULAction& inAction) = delete;
00073          void operator=(const ULAction&) = delete;
00074
00075          virtual EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00076              bool& outWaitingForEvent, EEventID& outRaisedEvent) = 0;
00077      };
00078  }
00079  }
00080
00081  #endif // GDCMULACTION_H

```

## 13.577 gdcmULActionAA.h File Reference

```
#include "gdcmULAction.h"
```

Include dependency graph for gdcmULActionAA.h:



### Classes

- class [gdcm::network::ULActionAA1](#)
- class [gdcm::network::ULActionAA2](#)
- class [gdcm::network::ULActionAA3](#)

- class [gdcmm::network::ULActionAA4](#)
- class [gdcmm::network::ULActionAA5](#)
- class [gdcmm::network::ULActionAA6](#)
- class [gdcmm::network::ULActionAA7](#)
- class [gdcmm::network::ULActionAA8](#)

## Namespaces

- namespace [gdcmm](#)
- namespace [gdcmm::network](#)

## 13.578 gdcmmULActionAA.h

[Go to the documentation of this file.](#)

```

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00009  *     http://www.apache.org/licenses/LICENSE-2.0.txt
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00013  * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  * See the License for the specific language governing permissions and
00015  * limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMULACTIONAA_H
00019 #define GDCMULACTIONAA_H
00020
00021 #include "gdcmmULAction.h"
00022
00023 namespace gdcmm {
00024     namespace network {
00025
00026         //Send A-ABORT PDU (service-user source) and start (or restart if already started) ARTIM timer
00027         //Next State: eStal3AwaitingClose
00028         class ULActionAA1 : public ULAction {
00029         public:
00030             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00031                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00032         };
00033
00034         //Stop ARTIM timer if running. Close transport connection.
00035         //Next State: eStalIdle
00036         class ULActionAA2 : public ULAction {
00037         public:
00038             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00039                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00040         };
00041
00042         //If (service-user initiated abort)
00043         //- issue A-ABORT indication and close transport connection
00044         //otherwise (service-provider initiated abort):
00045         //- issue A-P-ABORT indication and close transport connection
00046         //Next State: eStalIdle
00047         class ULActionAA3 : public ULAction {
00048         public:
00049             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00050                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00051         };
00052
00053         //Issue A-P-ABORT indication primitive

```

```

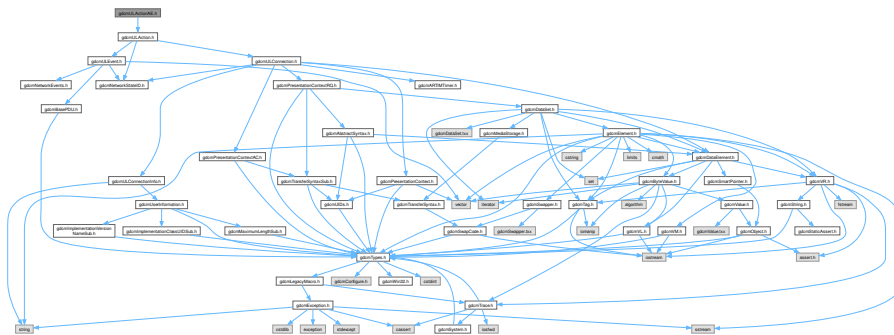
00062     //Next State: eStalIdle
00063     class ULActionAA4 : public ULAction {
00064     public:
00065         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00066             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00067     };
00068
00069     //Stop ARTIM timer
00070     //Next State: eStalIdle
00071     class ULActionAA5 : public ULAction {
00072     public:
00073         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00074             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00075     };
00076
00077     //Ignore PDU
00078     //Next State: eStal3AwaitingClose
00079     class ULActionAA6 : public ULAction {
00080     public:
00081         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00082             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00083     };
00084
00085     //Send A-ABORT PDU
00086     //Next State: eStal3AwaitingClose
00087     class ULActionAA7 : public ULAction {
00088     public:
00089         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00090             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00091     };
00092
00093     //Send A-ABORT PDU (service-provider source), issue an A-P-ABORT indication, and start ARTIM timer
00094     //Next State: eStal3AwaitingClose
00095     class ULActionAA8 : public ULAction {
00096     public:
00097         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00098             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00099     };
00100 }
00101 }
00102
00103 #endif // GDCMULActionAA_H

```

## 13.579 gdcMULActionAE.h File Reference

#include "gdcMULAction.h"

Include dependency graph for gdcMULActionAE.h:



### Classes

- class [gdcM::network::ULActionAE1](#)

- class [gdcm::network::ULActionAE2](#)
- class [gdcm::network::ULActionAE3](#)
- class [gdcm::network::ULActionAE4](#)
- class [gdcm::network::ULActionAE5](#)
- class [gdcm::network::ULActionAE6](#)
- class [gdcm::network::ULActionAE7](#)
- class [gdcm::network::ULActionAE8](#)

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.580 gdcmULActionAE.h

[Go to the documentation of this file.](#)

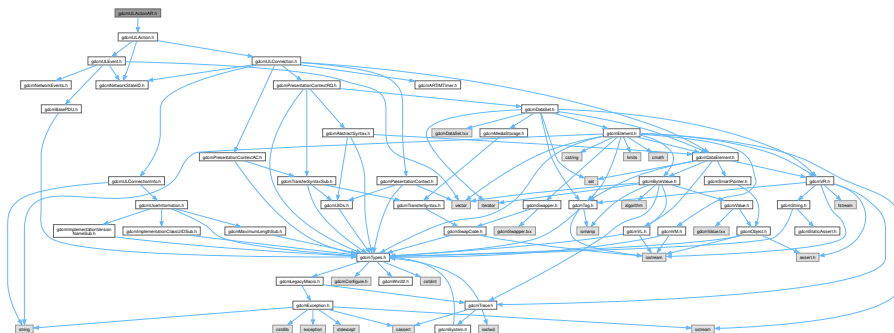
```

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00009  *       http://www.apache.org/licenses/LICENSE-2.0.txt
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00011  *   Unless required by applicable law or agreed to in writing, software
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00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMULACTIONAE_H
00019 #define GDCMULACTIONAE_H
00020
00021 #include "gdcmULAction.h"
00022
00031
00032 namespace gdcm {
00033     namespace network {
00034
00035         //Issue TRANSPORT CONNECT request primitive to local transport service.
00036         class ULActionAE1 : public ULAction {
00037         public:
00038             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00039                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00040         };
00041
00042         //Send A-ASSOCIATE-RQ-PDU
00043         //Next State: eSta5WaitRemoteAssoc
00044         class ULActionAE2 : public ULAction {
00045         public:
00046             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00047                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00048         };
00049
00050         //Issue A-ASSOCIATE confirmation (accept) primitive
00051         //Next State: eSta6TransferReady
00052         class ULActionAE3 : public ULAction {
00053         public:
00054             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00055                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00056         };
00057
00058         //Issue A-ASSOCIATE confirmation (reject) primitive and close transport connection

```

## 13.581 gdcmlActionAR.h File Reference

Include dependency graph for `gdcmlActionAR.h`:



## Classes

- class [gdcm::network::ULActionAR1](#)
- class [gdcm::network::ULActionAR10](#)
- class [gdcm::network::ULActionAR2](#)
- class [gdcm::network::ULActionAR3](#)
- class [gdcm::network::ULActionAR4](#)
- class [gdcm::network::ULActionAR5](#)
- class [gdcm::network::ULActionAR6](#)
- class [gdcm::network::ULActionAR7](#)
- class [gdcm::network::ULActionAR8](#)
- class [gdcm::network::ULActionAR9](#)

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.582 gdcmULActionAR.h

[Go to the documentation of this file.](#)

```

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00009  *       http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
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00012  *   distributed under the License is distributed on an "AS IS" BASIS,
00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMULACTIONAR_H
00019 #define GDCMULACTIONAR_H
00020
00021 #include "gdcmULAction.h"
00022
00023
00024 namespace gdcm {
00025     namespace network {
00026
00027         //Send A-RELEASE-RQ-PDU
00028         //Next State: eSta7WaitRelease
00029         class ULActionAR1 : public ULAction {
00030         public:
00031             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00032                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00033         };
00034
00035         //Issue A-RELEASE indication primitive
00036         //Next State: eSta8WaitLocalRelease
00037         class ULActionAR2 : public ULAction {
00038         public:
00039             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00040                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00041         };
00042
00043         //Issue A-RELEASE confirmation primitive, and close transport connection

```

```

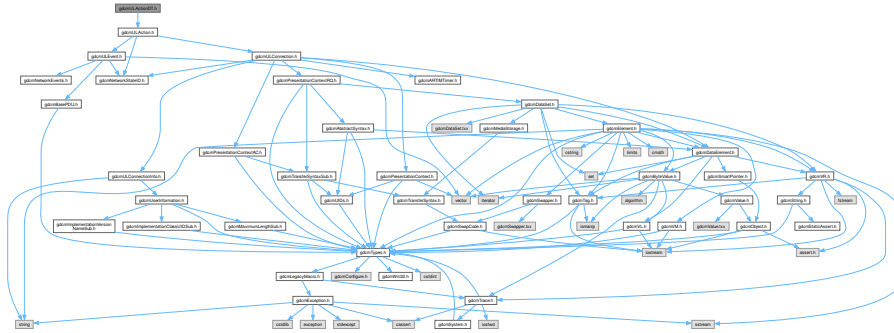
00051     //Next State: eStalIdle
00052     class ULAActionAR3 : public ULAAction {
00053     public:
00054         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00055             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00056     };
00057
00058     //Issue A-RELEASE-RP PDU and start ARTIM timer
00059     //Next State: eStal3AwaitingClose
00060     class ULAActionAR4 : public ULAAction {
00061     public:
00062         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00063             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00064     };
00065
00066     //Stop ARTIM timer
00067     //Next State: eStalIdle
00068     class ULAActionAR5 : public ULAAction {
00069     public:
00070         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00071             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00072     };
00073
00074     //Issue P-Data indication
00075     //Next State: eSta7WaitRelease
00076     class ULAActionAR6 : public ULAAction {
00077     public:
00078         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00079             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00080     };
00081
00082     //Issue P-DATA-TF PDU
00083     //Next State: eSta8WaitLocalRelease
00084     class ULAActionAR7 : public ULAAction {
00085     public:
00086         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00087             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00088     };
00089
00090     //Issue A-RELEASE indication (release collision):
00091     //- If association-requestor, next state is eSta9ReleaseCollisionRqLocal
00092     //- if not, next state is eStal0ReleaseCollisionAc
00093     class ULAActionAR8 : public ULAAction {
00094     public:
00095         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00096             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00097     };
00098
00099     //Send A-RELEASE-RP PDU
00100     //Next State: eStal1ReleaseCollisionRq
00101     class ULAActionAR9 : public ULAAction {
00102     public:
00103         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00104             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00105     };
00106
00107     //Issue A-RELEASE confirmation primitive
00108     //Next State: eStal2ReleaseCollisionAcLocal
00109     class ULAActionAR10 : public ULAAction {
00110     public:
00111         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00112             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00113     };
00114 }
00115 }
00116 #endif // GDCMULACTIONAR_H

```

## 13.583 gdcmULActionDT.h File Reference

```
#include "gdcmULAction.h"
```

Include dependency graph for gdcmULActionDT.h:



### Classes

- class `gdcm::network::ULActionDT1`
- class `gdcm::network::ULActionDT2`

### Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.584 gdcmULActionDT.h

[Go to the documentation of this file.](#)

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00016  *
00017  *=====*/
00018 #ifndef GDCMULACTIONDT_H
00019 #define GDCMULACTIONDT_H
00020
00021 #include "gdcmULAction.h"
00022
00030 namespace gdcm {
00031     namespace network {
```



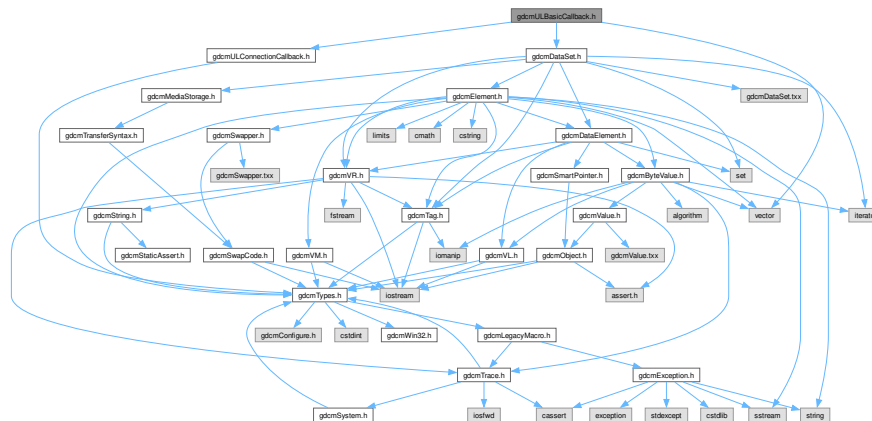
```

00033
00034 //Send P-DATA-TF PDU
00035 //Next state: eSta6TransferReady
00036 class ULActionDT1 : public ULAction {
00037 public:
00038     EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00039         bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00040 };
00041
00042 //Send P-DATA indication primitive
00043 //Next state: eSta6TransferReady
00044 class ULActionDT2 : public ULAction {
00045 public:
00046     EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
00047         bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
00048 };
00049 }
00050 }
00051 #endif // GDCMULACTIONDT_H

```

## 13.585 gdcmlBasicCallback.h File Reference

```
#include "gdcmULConnectionCallback.h"
#include "gdcmDataSet.h"
#include <vector>
Include dependency graph for gdcmULBasicCallback.h:
```



## Classes

- class `gdcm::network::ULBasicCallback`  
*ULBasicCallback.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.586 gdcmULBasicCallback.h

[Go to the documentation of this file.](#)

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00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMULCONNECTIONBASICCALLBACK_H
00019 #define GDCMULCONNECTIONBASICCALLBACK_H
00020
00021 #include "gdcmULConnectionCallback.h"
00022 #include "gdcmDataSet.h"
00023 #include <vector>
00024
00025 namespace gdcm
00026 {
00027     namespace network
00028     {
00029         class GDCM_EXPORT ULBasicCallback : public ULConnectionCallback
00030         {
00031         {
00032             std::vector<DataSet> mDataSets;
00033             std::vector<DataSet> mResponses;
00034         public:
00035             ULBasicCallback() = default;
00036             ~ULBasicCallback() override = default; //empty, for later inheritance
00037
00038             void HandleDataSet(const DataSet& inDataSet) override;
00039             void HandleResponse(const DataSet& inDataSet) override;
00040
00041             std::vector<DataSet> const & GetDataSets() const;
00042             std::vector<DataSet> const & GetResponses() const;
00043         };
00044     } // end namespace network
00045 } // end namespace gdcm
00046
00047 #endif // GDCMULCONNECTIONBASICCALLBACK_H

```

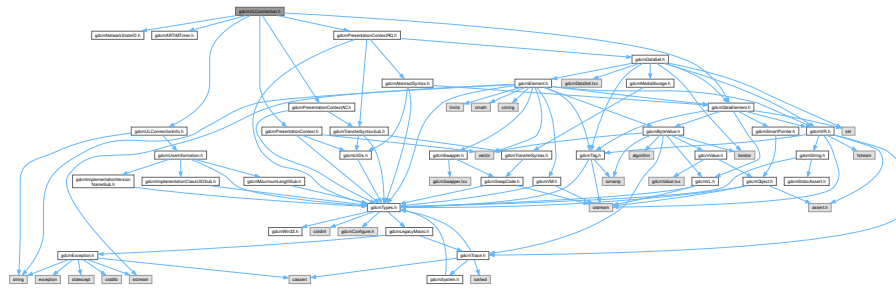
## 13.587 gdcmULConnection.h File Reference

```

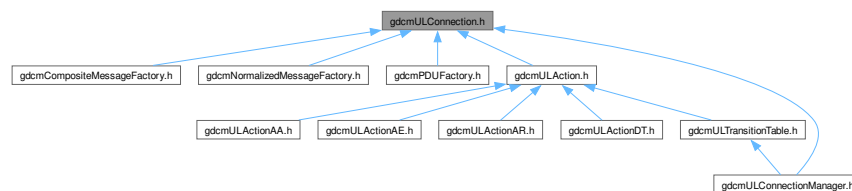
#include "gdcmNetworkStateID.h"
#include "gdcmARTIMTimer.h"
#include "gdcmULConnectionInfo.h"
#include "gdcmPresentationContextRQ.h"
#include "gdcmDataElement.h"
#include "gdcmPresentationContextAC.h"
#include "gdcmPresentationContext.h"

```

Include dependency graph for gdcmULConnection.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcm::network::ULConnection`  
*ULConnection.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 13.588 gdcmULConnection.h

[Go to the documentation of this file.](#)

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```

```

00014  * See the License for the specific language governing permissions and
00015  * limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMULCONNECTION_H
00019 #define GDCMULCONNECTION_H
00020
00021 #include "gdcmNetworkStateID.h"
00022 #include "gdcmARTIMTimer.h"
00023 #include "gdcmULConnectionInfo.h"
00024 #include "gdcmPresentationContextRQ.h"
00025 #include "gdcmDataElement.h"
00026 #include "gdcmPresentationContextAC.h"
00027 #include "gdcmPresentationContext.h"
00028
00029 class iosocket;
00030 class echo;
00031 namespace gdcm{
00032     namespace network{
00033
00057 class GDCM_EXPORT ULConnection
00058 {
00059     ULConnectionInfo mInfo;
00060     //this is a dirty dirty hack
00061     //but to establish an outgoing connection (scu), we need the echo service
00062     //to establish incoming, we just need a port and localhost, so an iosocket works while an
00063     //echo would fail (probably because one already exists)
00064     echo* mEcho;
00065     iosocket* mSocket; //of the three protocols offered by socket++-- echo, smtp, and ftp--
00066     //echo most closely matches what the DICOM standard describes as a network connection
00067     ARTIMTimer mTimer;
00068
00069     EStateID mCurrentState;
00070
00071     std::vector<PresentationContextRQ> mPresentationContexts;
00072     //this is our list of presentation contexts of what we can send
00073     uint32_t mMaxPDUSize;
00074
00075     std::vector<PresentationContextAC> mAcceptedPresentationContexts; //these come back from the server
00076     //and tell us what can be sent over this connection
00077
00078     TransferSyntaxSub cstorets;
00079
00080     friend class ULActionAE6;
00081     void SetCStoreTransferSyntax( TransferSyntaxSub const & ts );
00082     friend class ULConnectionManager;
00083     TransferSyntaxSub const & GetCStoreTransferSyntax( ) const;
00084 public:
00085
00086     ULConnection(const ULConnectionInfo& inUserInformation);
00087     //destructors are virtual to prevent memory leaks by inherited classes
00088     virtual ~ULConnection();
00089
00090     EStateID GetState() const;
00091     void SetState(const EStateID& inState); //must be able to update state...
00092
00093     //echo* GetProtocol();
00094     std::iostream* GetProtocol();
00095     void StopProtocol();
00096
00097     ARTIMTimer& GetTimer();
00098
00099     const ULConnectionInfo &GetConnectionInfo() const;
00100
00101     //when the connection is first associated, the connection is told
00102     //the max packet/PDU size and the way in which to present data
00103     //(presentation contexts, etc). Store that here.
00104     void SetMaxPDUSize(uint32_t inSize);
00105     uint32_t GetMaxPDUSize() const;
00106
00107     const PresentationContextAC *GetPresentationContextACByID(uint8_t id) const;
00108     const PresentationContextRQ *GetPresentationContextRQByID(uint8_t id) const;
00109
00110     uint8_t GetPresentationContextIDFromPresentationContext(PresentationContextRQ const & pc) const;
00111
00112     std::vector<PresentationContextRQ> const & GetPresentationContexts() const;
00113     void SetPresentationContexts(const std::vector<PresentationContextRQ>& inContexts);
00114
00115     void SetPresentationContexts(const std::vector<PresentationContext>& inContexts);
00116
00117     //given a particular data element, presumably the SOP class,
00118

```

```

00119      //find the presentation context for that SOP
00120      //NOT YET IMPLEMENTED
00121      PresentationContextRQ FindContext(const DataElement& de) const;
00122
00123      std::vector<PresentationContextAC> const & GetAcceptedPresentationContexts() const;
00124      std::vector<PresentationContextAC> & GetAcceptedPresentationContexts();
00125      void AddAcceptedPresentationContext(const PresentationContextAC& inPC);
00126
00127      bool InitializeConnection();
00128
00129      bool InitializeIncomingConnection();
00130
00131      ULConnection(const ULConnection&) = delete;
00132      void operator=(const ULConnection&) = delete;
00133  };
00134  }
00135  #endif // ULCONNECTION_H

```

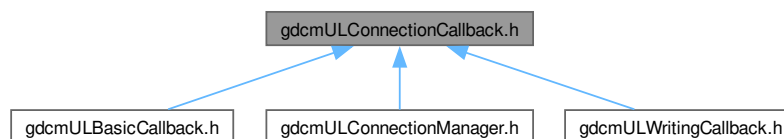
## 13.589 gdcmlConnectionCallback.h File Reference

```
#include "gdcmlTypes.h"
```

Include dependency graph for gdcmlConnectionCallback.h:



This graph shows which files directly or indirectly include this file:



### Classes

- class [gdcml::network::ULConnectionCallback](#)

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.590 gdcmULConnectionCallback.h

[Go to the documentation of this file.](#)

```

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00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMULCONNECTIONCALLBACK_H
00019 #define GDCMULCONNECTIONCALLBACK_H
00020
00021 #include "gdcmTypes.h" //to be able to export the class
00022
00023 namespace gdcm
00024 {
00025     class DataSet;
00026     namespace network
00027     {
00039         class GDCM_EXPORT ULConnectionCallback {
00040             bool mHandledDataSet;
00041         protected:
00042             bool mImplicit;
00043             //inherited callbacks MUST call this function for the cmove loop to work properly
00044             void DataSetHandled() { mHandledDataSet = true; }
00045         public:
00046             ULConnectionCallback():mHandledDataSet(false),mImplicit(true){}
00047             virtual ~ULConnectionCallback() = default; //placeholder for inherited objects
00048             virtual void HandleDataSet(const DataSet& inDataSet) = 0;
00049             virtual void HandleResponse(const DataSet& inDataSet) = 0;
00050
00051             bool DataSetHandles() const { return mHandledDataSet; }
00052             void ResetHandledDataSet() { mHandledDataSet = false; }
00053
00054             void SetImplicitFlag( const bool imp ) { mImplicit = imp; }
00055         };
00056     }
00057 }
00058 #endif //GDCMULCONNECTIONCALLBACK_H

```

## 13.591 gdcmULConnectionInfo.h File Reference

```

#include "gdcmUserInformation.h"
#include <string>

```

Include dependency graph for gdcmULConnectionInfo.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::network::ULConnectionInfo](#)  
*ULConnectionInfo*.

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.592 gdcmULConnectionInfo.h

[Go to the documentation of this file.](#)

```

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00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMULCONNECTIONINFO_H
00019 #define GDCMULCONNECTIONINFO_H
00020
00021 #include "gdcmUserInformation.h"
00022 #include <string>
00023
00024 namespace gdcm{
00025     namespace network {
00038     class ULConnectionInfo {
00039     public:
00040         UserInformation mUserInformation;
00041
00042         std::string mCalledAETitle;
00043         std::string mCallingAETitle;
00044
00045         unsigned long mCalledIPAddress;
00046         int mCalledIPPort;
00047         std::string mCalledComputerName; //either the IP or the name has to be filled in
00048
00049         unsigned long mMaxPDULength;
00050     public:
00051         ULConnectionInfo();
00052
00053         //it is possible to misinitialize this object, so
00054         //have it return false if something breaks (ie, given AEs are bigger than 16 characters,
00055         //no name or IP address).
00056         bool Initialize(UserInformation const &inUserInformation,
00057             const char *inCalledAETitle, const char *inCallingAETitle,
00058             unsigned long inCalledIPAddress, int inCalledIPPort,
00059             std::string inCalledComputerName);
00060
00061         //UserInformation GetUserInformation() const;
00062         const char* GetCalledAETitle() const;
00063         const char* GetCallingAETitle() const;
00064
00065         unsigned long GetCalledIPAddress() const;
00066         int GetCalledIPPort() const;
00067         std::string GetCalledComputerName() const;
00068
00069         //CStore needs to know the max pdu length, so the value gets initialized
00070         //when a cstore connection is established (but not for the others).
00071         void SetMaxPDULength(unsigned long inMaxPDULength);
00072         unsigned long GetMaxPDULength() const;
00073     };
00074 }
00075
00076 #endif //GDCMULCONNECTIONINFO_H

```

## 13.593 gdcmULConnectionManager.h File Reference

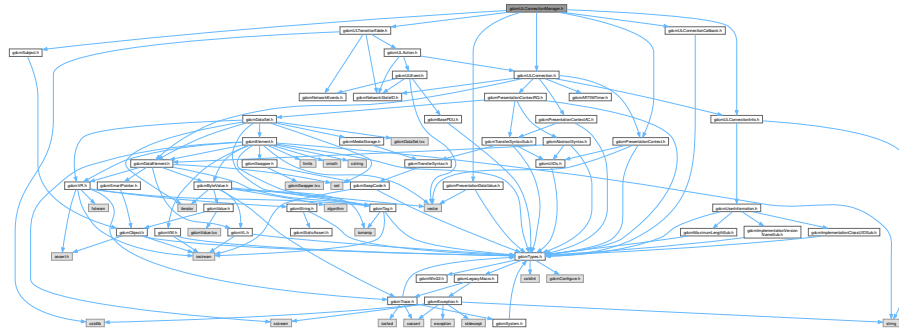
```

#include "gdcmULTransitionTable.h"
#include "gdcmULConnection.h"

```



```
#include "gdcmULConnectionInfo.h"
#include "gdcmPresentationDataValue.h"
#include "gdcmULConnectionCallback.h"
#include "gdcmSubject.h"
#include "gdcmPresentationContext.h"
Include dependency graph for gdcmULConnectionManager.h:
```



## Classes

- class [gdcm::network::ULConnectionManager](#)  
*ULConnectionManager.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.594 gdcmULConnectionManager.h

[Go to the documentation of this file.](#)

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00013  * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
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00015  * limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMULCONNECTIONMANAGER_H
00019 #define GDCMULCONNECTIONMANAGER_H
00020
00021 #include "gdcmULTransitionTable.h"
00022 #include "gdcmULConnection.h"
00023 #include "gdcmULConnectionInfo.h"
```

```

00024 #include "gdcmPresentationDataValue.h"
00025 #include "gdcmULConnectionCallback.h"
00026 #include "gdcmSubject.h"
00027 #include "gdcmPresentationContext.h"
00028
00029 namespace gdcm {
00030     class File;
00031     class BaseRootQuery;
00032     class BaseQuery;
00033
00034     namespace network {
00035
00045     class GDCM_EXPORT ULConnectionManager : public Subject
00046     {
00047     protected:
00048         ULConnection* mConnection;
00049         ULConnection* mSecondaryConnection;
00050         ULTransitionTable mTransitions;
00051
00052         //no copying
00053         ULConnectionManager(const ULConnectionManager& inCM);
00054
00055         //event handler loop.
00056         //will just keep running until the current event is nonexistent.
00057         //at which point, it will return the current state of the connection
00058         //this starts by initiating an action, but can be put into a passive mode
00059         //for a cmove/cstore combination by setting startWaiting to true
00060         EStateID RunEventLoop(ULEvent& inEvent, ULConnection* inWhichConnection,
00061             ULConnectionCallback* inCallback, const bool& startWaiting);
00062
00063         //like the above, but will manage the event loop for a move event (which
00064         //is basically two simultaneous connections interwoven, one inbound and
00065         //the other outbound. Note, for instance, that cmoversp's can be sent back
00066         //during the other connection's operation.
00067         EStateID RunMoveEventLoop(ULEvent& inEvent, ULConnectionCallback* inCallback);
00068
00069     public:
00070         ULConnectionManager();
00071         ~ULConnectionManager() override;
00072
00073         // NOTE: (MM) The following two functions are difficult to use, therefore marking
00074         // them as internal for now.
00075
00076         // \internal
00084         bool EstablishConnection(const std::string& inAETitle,
00085             const std::string& inConnectAETitle,
00086             const std::string& inComputerName, long inIPAddress,
00087             uint16_t inConnectPort, double inTimeout,
00088             std::vector<PresentationContext> const & pcVector );
00089
00092         bool EstablishConnectionMove(const std::string& inAETitle,
00093             const std::string& inConnectAETitle,
00094             const std::string& inComputerName, long inIPAddress,
00095             uint16_t inConnectPort, double inTimeout,
00096             uint16_t inReturnPort,
00097             std::vector<PresentationContext> const & pcVector);
00098         // \endinternal
00099
00100
00101         //bool ReestablishConnection(const EConnectionType& inConnectionType,
00102         // const DataSet& inDS);
00103
00104         //allows for a connection to be broken, but waits for an acknowledgement
00105         //of the breaking for a certain amount of time. Returns true of the
00106         //other side acknowledges the break
00107         bool BreakConnection(const double& inTimeout);
00108
00109         //severs the connection, if it's open, without waiting for any kind of response.
00110         //typically done if the program is going down.
00111         void BreakConnectionNow();
00112
00113         //This function will send a given piece of data
00114         //across the network connection. It will return true if the
00115         //sending worked, false otherwise.
00116         //note that sending is asynchronous; as such, there's
00117         //also a 'receive' option, but that requires a callback function.
00118         //bool SendData();
00119
00120         //send the Data PDU associated with Echo (ie, a default DataPDU)
00121         //this lets the user confirm that the connection is alive.
00122         //the user should look to cout to see the response of the echo command

```

```

00123     //returns the PresentationDataValue that was returned by the remote
00124     //host. Note that the PDV can be uninitialized, which would indicate failure.
00125     //Echo does not use a callback for results.
00126     std::vector<PresentationDataValue> SendEcho();
00127
00128     // \internal
00129     // API will change...
00130     std::vector<DataSet> SendStore(const File &file, std::istream * pStream = nullptr, std::streampos
dataSetOffset = 0 );
00131     std::vector<DataSet> SendFind(const BaseRootQuery* inRootQuery);
00132     std::vector<DataSet> SendMove(const BaseRootQuery* inRootQuery);
00133
00134     std::vector<DataSet> SendNEventReport (const BaseQuery* inQuery);
00135     std::vector<DataSet> SendNGet      (const BaseQuery* inQuery);
00136     std::vector<DataSet> SendNSet      (const BaseQuery* inQuery);
00137     std::vector<DataSet> SendNAction   (const BaseQuery* inQuery);
00138     std::vector<DataSet> SendNCreate   (const BaseQuery* inQuery);
00139     std::vector<DataSet> SendNDelete   (const BaseQuery* inQuery);
00140     // \endinternal
00141
00142     void SendStore(const File & file, ULConnectionCallback* inCallback, std::istream * pStream = nullptr
, std::streampos dataSetOffset = 0 );
00143     void SendFind(const BaseRootQuery* inRootQuery, ULConnectionCallback* inCallback);
00144     bool SendMove(const BaseRootQuery* inRootQuery, ULConnectionCallback* inCallback);
00145
00146     void SendNEventReport (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
00147     void SendNGet      (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
00148     void SendNSet      (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
00149     void SendNAction   (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
00150     void SendNCreate   (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
00151     void SendNDelete   (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
00152
00153 };
00154
00155 }
00156 }
00157 }
00158
00159 #endif // GDCMULCONNECTIONMANAGER_H

```

## 13.595 gdcmULEvent.h File Reference

```

#include "gdcmNetworkStateID.h"
#include "gdcmNetworkEvents.h"
#include "gdcmBasePDU.h"
#include <vector>

```

Include dependency graph for gdcmULEvent.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class `gdcml::network::UEvent`  
*UEvent.*

## Namespaces

- namespace `gdcml`
- namespace `gdcml::network`

## 13.596 gdcmlEvent.h

[Go to the documentation of this file.](#)

```

00001 /*=====
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00009  *       http://www.apache.org/licenses/LICENSE-2.0.txt
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00012  *   distributed under the License is distributed on an "AS IS" BASIS,
00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMLEVENT_H
00019 #define GDCMLEVENT_H
00020
00021 #include "gdcmlNetworkStateID.h"
00022 #include "gdcmlNetworkEvents.h"
00023 #include "gdcmlBasePDU.h"
00024 #include <vector>
00025
00026 namespace gdcml {
00027     namespace network {
00028
00037     class UEvent {
00038     public:
00039         EEventID mEvent;
00040         std::vector<BasePDU*> mBasePDU;
00041     };
00042     }
00043 }
  
```

```

00040     std::istream * m_pStream ;
00041     std::streampos m_posDataSet ;
00042     void DeletePDUVector(){
00043         std::vector<BasePDU*>::iterator baseItr;
00044         for (baseItr = mBasePDU.begin(); baseItr < mBasePDU.end(); baseItr++){
00045             if (*baseItr != nullptr){
00046                 delete *baseItr;
00047                 *baseItr = nullptr;
00048             }
00049         }
00050     }
00051
00052     public:
00053     ULEvent(const EEventID& inEventID, std::vector<BasePDU*> inBasePDU, std::istream * iStream =
nullptr, std::streampos posDataSet = 0 ){
00054         mEvent = inEventID;
00055         mBasePDU = inBasePDU;
00056         m_pStream = iStream ;
00057         m_posDataSet = posDataSet ;
00058     }
00059     ULEvent(const EEventID& inEventID, BasePDU* inBasePDU, std::istream * iStream = nullptr,
std::streampos posDataSet = 0 ){
00060         mEvent = inEventID;
00061         mBasePDU.push_back(inBasePDU);
00062         m_pStream = iStream ;
00063         m_posDataSet = posDataSet ;
00064     }
00065     ~ULEvent() {
00066         DeletePDUVector();
00067     }
00068
00069     EEventID GetEvent() const { return mEvent; }
00070     std::vector<BasePDU*> const & GetPDUs() const { return mBasePDU; }
00071     std::istream * GetIStream() const { return m_pStream; }
00072     std::streampos GetDataSetPos() const { return m_posDataSet; }
00073
00074     void SetEvent(const EEventID& inEvent) { mEvent = inEvent; }
00075     void SetPDU(std::vector<BasePDU*> const & inPDU) {
00076         DeletePDUVector();
00077         mBasePDU = inPDU;
00078     }
00079 };
00080 }
00081 }
00082
00083 #endif //GDCMULEVENT_H

```

## 13.597 gdcmlTransitionTable.h File Reference

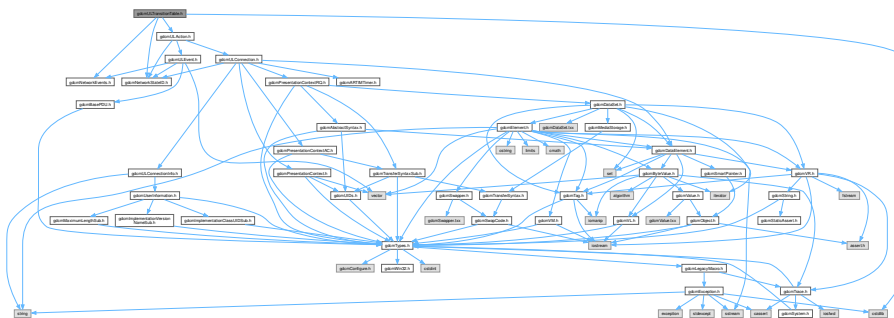
```
#include "gdcmlNetworkStateID.h"
```

```
#include "gdcmlNetworkEvents.h"
```

```
#include "gdcmlULAction.h"
```

```
#include <cstdlib>
```

Include dependency graph for gdcmlTransitionTable.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcml::network::TableRow](#)
- struct [gdcml::network::Transition](#)
- class [gdcml::network::ULTransitionTable](#)

*[ULTransitionTable](#) The transition table of all the ULEvents, new ULActions, and ULStates.*

## Namespaces

- namespace [gdcml](#)
- namespace [gdcml::network](#)

## 13.598 gdcmlTransitionTable.h

[Go to the documentation of this file.](#)

```

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00008  *
00009  *       http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
00011  *   Unless required by applicable law or agreed to in writing, software
00012  *   distributed under the License is distributed on an "AS IS" BASIS,
00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMULTRANSITIONTABLE_H
00019 #define GDCMULTRANSITIONTABLE_H
00020
00021 #include "gdcmlNetworkStateID.h"
00022 #include "gdcmlNetworkEvents.h"
00023 #include "gdcmlULAction.h"
00024
00025 #include <stdlib> // NULL
  
```

```

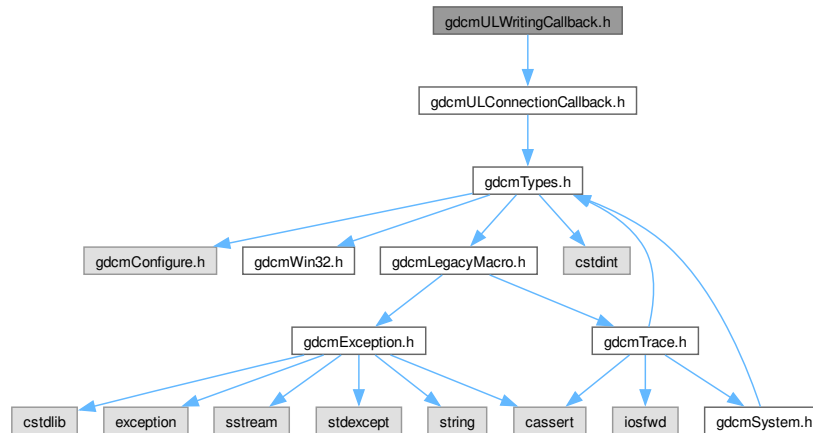
00026
00027 namespace gdcm {
00028 class Subject;
00029     namespace network{
00030 class ULConnection;
00031 class ULAction;
00032 class ULEvent;
00033
00034     //The transition dictates the action that should be taken from the start state to the end state
00035 struct Transition {
00036     int mEnd;
00037     ULAction* mAction;
00038     Transition(){
00039         mEnd = eStaDoesNotExist;
00040         mAction = nullptr;
00041     }
00042     ~Transition(){
00043         if (mAction != nullptr){
00044             delete mAction;
00045             mAction = nullptr;
00046         }
00047     }
00048     Transition(int inEndState, ULAction* inAction){
00049         mEnd = inEndState;
00050         mAction = inAction;
00051     }
00052     static Transition* MakeNew(int inEndState, ULAction* inAction){
00053         return new Transition(inEndState, inAction);
00054     }
00055 };
00056
00057 //used to define a row in table 9-10 of 3.8 2009
00058 //the transition table is events, then state,
00059 //then the transition itself (which has the event
00060 //and start state implied by their starting locations)
00061 //don't need to store the event; that's implicitly defined in the Table itself by location
00062 class TableRow{
00063 public:
00064     TableRow() {
00065         for(int stateIndex = 0; stateIndex < cMaxStateID; ++stateIndex)
00066         {
00067             transitions[stateIndex] = nullptr;
00068         }
00069     }
00070     ~TableRow() {
00071         for(int stateIndex = 0; stateIndex < cMaxStateID; ++stateIndex)
00072         {
00073             Transition *t = transitions[stateIndex];
00074             delete t;
00075         }
00076     }
00077     Transition *transitions[cMaxStateID];
00078
00079     //copy constructor for stl additions into the transition table below.
00080 };
00081
00082 class ULTransitionTable
00083 {
00084 private:
00085     TableRow mTable[cMaxEventID];
00086 public:
00087     ULTransitionTable();
00088
00089     void HandleEvent (Subject*s, ULEvent& inEvent, ULConnection& inConnection,
00090         bool& outWaitingForEvent, EEventID& outRaisedEvent) const;
00091
00092     void PrintTable() const; //so that the table can be printed and verified against the DICOM standard
00093 };
00094 }
00095 #endif // GDCMULTRANSITIONTABLE_H

```

## 13.599 gdcmULWritingCallback.h File Reference

```
#include "gdcmULConnectionCallback.h"
```

Include dependency graph for gdcmULWritingCallback.h:



### Classes

- class [gdcm::network::ULWritingCallback](#)

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.600 gdcmULWritingCallback.h

[Go to the documentation of this file.](#)

```

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00009  *       http://www.apache.org/licenses/LICENSE-2.0.txt
00010  *
00011  *   Unless required by applicable law or agreed to in writing, software
00012  *   distributed under the License is distributed on an "AS IS" BASIS,
00013  *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
00014  *   See the License for the specific language governing permissions and
00015  *   limitations under the License.
00016  *
00017  *=====*/
00018 #ifndef GDCMULCONNECTIONWRITINGCALLBACK_H

```



```

00019 #define GDCMULCONNECTIONWRITINGCALLBACK_H
00020
00021 #include "gdcmULConnectionCallback.h"
00022
00023 namespace gdcm
00024 {
00025 class DataSet;
00026 namespace network
00027 {
00028 /* \brief ULWritingCallback
00029  * \details This is the most basic of callbacks for how the ULConnectionManager handles
00030  * incoming datasets. DataSets are immediately written to disk as soon as they
00031  * are received. NOTE that if the incoming connection is faster than the disk
00032  * writing speed, this callback could cause some pileups!
00033  */
00034 class GDCM_EXPORT ULWritingCallback : public ULConnectionCallback
00035 {
00036     std::string mDirectoryName;
00037 public:
00038     ULWritingCallback() = default;
00039     ~ULWritingCallback() override = default; //empty, for later inheritance
00040
00042     void SetDirectory(const std::string& inDirectoryName) { mDirectoryName = inDirectoryName; }
00043
00044     void HandleDataSet(const DataSet& inDataSet) override;
00045     void HandleResponse(const DataSet& inDataSet) override;
00046 };
00047 } // end namespace network
00048 } // end namespace gdcm
00049
00050 #endif //GDCMULCONNECTIONWRITINGCALLBACK_H

```

## 13.601 gdcmUserInformation.h File Reference

```

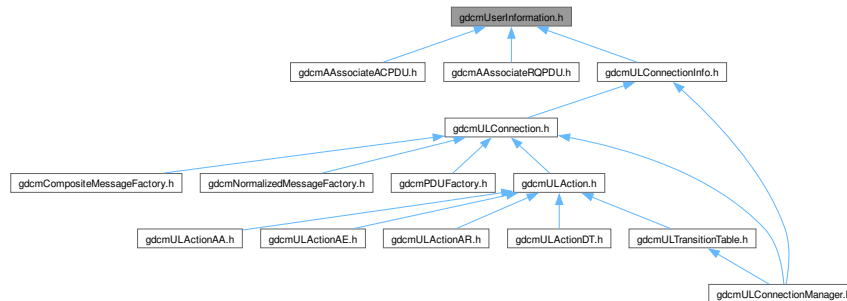
#include "gdcmTypes.h"
#include "gdcmMaximumLengthSub.h"
#include "gdcmImplementationVersionNameSub.h"
#include "gdcmImplementationClassUIDSub.h"

```

Include dependency graph for gdcmUserInformation.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::network::UserInformation](#)  
*UserInformation.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 13.602 gdcmUserInformation.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 #ifndef GDCMUSERINFORMATION_H
00015 #define GDCMUSERINFORMATION_H
00016
00017 #include "gdcmTypes.h"
00018 #include "gdcmMaximumLengthSub.h"
00019 #include "gdcmImplementationVersionNameSub.h"
00020 #include "gdcmImplementationClassUIDSub.h"
00021
00022 namespace gdcm
00023 {
00024
00025     namespace network
00026     {
00027
00028         class AsynchronousOperationsWindowSub;
00029         class RoleSelectionSub;
00030         struct RoleSelectionSubItems;
00031
00032     }
00033
00034 }

```

### 13.603 gdcmlWLMFindQuery.h File Reference

[illegible]

## Classes

- class [gdcm::WLMFindQuery](#)  
*PatientRootQuery.*

## Namespaces

- namespace [gdcm](#)

## 13.604 gdcmWLMFindQuery.h

[Go to the documentation of this file.](#)

```

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00003   Program: GDCM (Grassroots DICOM). A DICOM library
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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 #ifndef GDCMWLMFindQuery_H
00015 #define GDCMWLMFindQuery_H
00016
00017 #include "gdcmBaseRootQuery.h"
00018
00019 namespace gdcm
00020 {
00021     class GDCM_EXPORT WLMFindQuery : public BaseRootQuery
00022     {
00023     public:
00024         friend class QueryFactory;
00025         WLMFindQuery();
00026
00027         // no sense here
00028         void InitializeDataSet(const EQueryLevel& inQueryLevel) override;
00029         std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) override;
00030         // validate query has required tag
00031         bool ValidateQuery(bool inStrict = true) const override;
00032
00033         UIDs::TSName GetAbstractSyntaxUID() const override;
00034     protected:
00035         DataSet GetValidDataSet() const;
00036     };
00037 } // end namespace gdcm
00038 #endif // GDCMWLMFindQuery_H

```

## 13.605 vtkGDCMImageReader.h File Reference

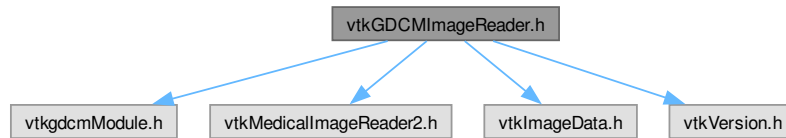
```

#include "vtkgdcmModule.h"
#include "vtkMedicalImageReader2.h"
#include "vtkImageData.h"

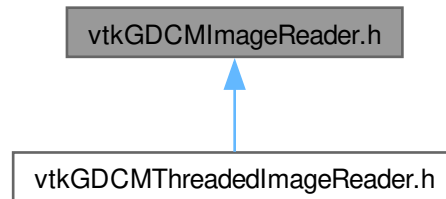
```

```
#include "vtkVersion.h"
```

Include dependency graph for vtkGDCMImageReader.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class [vtkGDCMImageReader](#)

## Namespaces

- namespace [gdcM](#)

## Macros

- #define [VTK\\_CMYK](#) 8
- #define [VTK\\_INVERSE\\_LUMINANCE](#) 5
- #define [VTK\\_LOOKUP\\_TABLE](#) 6
- #define [VTK\\_YBR](#) 7

## 13.605.1 Macro Definition Documentation

### 13.605.1.1 VTK\_CMYK

```
#define VTK_CMYK 8
```

### 13.605.1.2 VTK\_INVERSE\_LUMINANCE

```
#define VTK_INVERSE_LUMINANCE 5
```

### 13.605.1.3 VTK\_LOOKUP\_TABLE

```
#define VTK_LOOKUP_TABLE 6
```

### 13.605.1.4 VTK\_YBR

```
#define VTK_YBR 7
```

## 13.606 vtkGDCMImageReader.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003 Program: GDCM (Grassroots DICOM). A DICOM library
00004
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00007 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009 This software is distributed WITHOUT ANY WARRANTY; without even
00010 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011 PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 // .NAME vtkGDCMImageReader - read DICOM Image files (Pixel Data)
00015 // .SECTION Description
00016 // vtkGDCMImageReader is a source object that reads some DICOM files
00017 // this reader is single threaded.
00018 // .SECTION Implementation note: when FileLowerLeft is set to on the image is not flipped
00019 // upside down as VTK would expect, use this option only if you know what you are doing.
00020 // .SECTION Implementation note: when reading a series of 2D slices, user is
00021 // expected to provide an ordered list of filenames. No sorting will be applied afterward.
00022 // .SECTION Implementation note: Although 99% of the time the Zspacing as read
00023 // from a tag in a 2D DICOM file should be correct, there has been reports that this
00024 // value can be missing, or incorrect, in which case users are advised to override this
00025 // value using the return value from gdcm::IPPSorter::GetZSpacing() and set it via
00026 // vtkImageChangeInformation on the reader itself.
00027 // .SECTION TODO
00028 // This reader does not handle a series of 3D images, only a single 3D (multi frame) or a
00029 // list of 2D files are supported for now.
00030 // .SECTION TODO
00031 // Did not implement SetFilePattern / SetFilePrefix API, move it to protected section for now.
00032 // .SECTION BUG
00033 // Overlay are assumed to have the same extent as image. Right now if overlay origin is not
00034 // 0,0 the overlay will have an offset...
00035 // Only the very first overlay is loaded at the VTK level, for now (even if there are more than one in the
file)
```

```

00036 // .SECTION DataOrigin
00037 // When the reader is instantiated with FileLowerLeftOn the DataOrigin and Image Position (Patient) are
00038 // identical. But when FileLowerLeft is Off, we have to reorder the Y-line of the image, and thus the
    DataOrigin
00039 // is then translated to the other side of the image.
00040 // .SECTION Spacing
00041 // When reading a 3D volume, the spacing along the Z dimension might be negative (so as to respect
    up-side-down)
00042 // as specified in the Image Orientation (Patient) tag. When Z-spacing is 0, this means the multi-frame
    object
00043 // contains image which do not represent uniform volume.
00044 // .SECTION Warning
00045 // When using vtkGDCMPolyDataReader in conjunction with vtkGDCMImageReader
00046 // it is *required* that FileLowerLeft is set to ON as coordinate system
00047 // would be inconsistent in between the two data structures.
00048 // .SECTION Color Space mapping:
00049 // * VTK_LUMINANCE <=> MONOCHROME2
00050 // * VTK_LUMINANCE_ALPHA <=> Not supported
00051 // * VTK_RGB <=> RGB
00052 // * VTK_RGBA <=> ARGB (deprecated, DICOM 2008)
00053 // * VTK_INVERSE_LUMINANCE <=> MONOCHROME1
00054 // * VTK_LOOKUP_TABLE <=> PALETTE COLOR
00055 // * VTK_YBR <=> YBR_FULL
00056 //
00057 // For detailed information on color space transformation and true lossless transformation see:
00058 // http://gdcm.sourceforge.net/wiki/index.php/Color\_Space\_Transformations
00059
00060 // .SECTION See Also
00061 // vtkMedicalImageReader2 vtkMedicalImageProperties vtkGDCMPolyDataReader vtkGDCMImageWriter
00062 // vtkDICOMImageReader
00063
00064 #ifndef VTKGDCMIMAGEREADER_H
00065 #define VTKGDCMIMAGEREADER_H
00066
00067 #include "vtkgdcmModule.h"
00068 #include "vtkMedicalImageReader2.h"
00069 #include "vtkImageData.h"
00070 #include "vtkVersion.h"
00071
00072 #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
00073 #else
00074 class vtkMedicalImageProperties;
00075 #endif
00076 #if (VTK_MAJOR_VERSION > 5) || ( VTK_MAJOR_VERSION == 5 && VTK_MINOR_VERSION > 0 )
00077 #else
00078 class vtkStringArray;
00079 #endif
00080 class vtkPolyData;
00081
00082 // vtkSystemIncludes.h defines:
00083 // #define VTK_LUMINANCE 1
00084 // #define VTK_LUMINANCE_ALPHA 2
00085 // #define VTK_RGB 3
00086 // #define VTK_RGBA 4
00087 #ifndef VTK_INVERSE_LUMINANCE
00088 #define VTK_INVERSE_LUMINANCE 5
00089 #endif
00090 #ifndef VTK_LOOKUP_TABLE
00091 #define VTK_LOOKUP_TABLE 6
00092 #endif
00093 #ifndef VTK_YBR
00094 #define VTK_YBR 7
00095 #endif
00096 #ifndef VTK_CMYK
00097 #define VTK_CMYK 8
00098 #endif
00099
00100 //BTX
00101 namespace gdcm { class ImageReader; }
00102 //ETX
00103 class vtkMatrix4x4;
00104 class VTKGDCM_EXPORT vtkGDCMImageReader : public vtkMedicalImageReader2
00105 {
00106 public:
00107     static vtkGDCMImageReader *New();
00108     vtkTypeMacro(vtkGDCMImageReader,vtkMedicalImageReader2);
00109     virtual void PrintSelf(ostream& os, vtkIndent indent);
00110
00111     // Description: is the given file name a DICOM file containing an image ?
00112     virtual int CanReadFile(const char* fname);
00113

```

```

00114 // Description:
00115 // Valid extensions
00116 virtual const char* GetFileExtensions()
00117 {
00118     // I would like to get rid of ACR/NEMA/IMA so only allow dcm extension for now
00119     return ".dcm .DCM";
00120 }
00121
00122 // Description:
00123 // A descriptive name for this format
00124 virtual const char* GetDescriptiveName()
00125 {
00126     return "DICOM";
00127 }
00128
00129 // Description:
00130 // Get the Image Position (Patient) as stored in the DICOM file
00131 // This is a read-only data member
00132 vtkGetObjectMacro(DirectionCosines, vtkMatrix4x4);
00133
00134 #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
00135 #else
00136     // Description:
00137     // Get the medical image properties object
00138     vtkGetObjectMacro(MedicalImageProperties, vtkMedicalImageProperties);
00139 #endif
00140 virtual void SetMedicalImageProperties(vtkMedicalImageProperties *pd);
00141
00142 #if (VTK_MAJOR_VERSION > 5) || ( VTK_MAJOR_VERSION == 5 && VTK_MINOR_VERSION > 0 )
00143 #else
00144     virtual void SetFileNames(vtkStringArray*);
00145     vtkGetObjectMacro(FileNames, vtkStringArray);
00146 #endif
00147
00148 // Description:
00149 // Specifically request to load the overlay into the gdcm-VTK layer (gdcm always loads them when found).
00150 // If no overlay is found in the image, then the vtkImageData for the overlay will be empty.
00151 vtkGetMacro(LoadOverlays,int);
00152 vtkSetMacro(LoadOverlays,int);
00153 vtkBooleanMacro(LoadOverlays,int);
00154
00155 // Description:
00156 // Set/Get whether or not to load the Icon as vtkImageData (if found in the DICOM file)
00157 vtkGetMacro(LoadIconImage,int);
00158 vtkSetMacro(LoadIconImage,int);
00159 vtkBooleanMacro(LoadIconImage,int);
00160
00161 // Description:
00162 // Set/Get whether or not the image was compressed using a lossy compression algorithm
00163 vtkGetMacro(LossyFlag,int);
00164 vtkSetMacro(LossyFlag,int);
00165 vtkBooleanMacro(LossyFlag,int);
00166
00167 // Description:
00168 // Read only: number of overlays as found in this image (multiple overlays per slice is allowed)
00169 // Only valid when LoadOverlays is true
00170 vtkGetMacro(NumberOfOverlays,int);
00171
00172 // Description:
00173 // Read only: number of icon image (there can only be zero or one icon per file)
00174 // Only valid when LoadIconImage is true
00175 vtkGetMacro(NumberOfIconImages,int);
00176
00177 // Description:
00178 // Get Overlay/IconImage
00179 // Remember to ALWAYS use those methods in your code, as the internal number for the output port
00180 // is not guaranteed to remain the same, as features are added to the reader
00181 #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
00182 //FIXME: Need to get rid of BTX/ETX if only the Python Wrapper of VTK 4.2 would let me
00183 //BTX
00184 vtkAlgorithmOutput* GetOverlayPort(int index);
00185 vtkAlgorithmOutput* GetIconImagePort();
00186 //ETX
00187 #endif
00188 vtkImageData* GetOverlay(int i);
00189 vtkImageData* GetIconImage();
00190
00191 // Description:
00192 // Load image with its associated Lookup Table
00193 vtkGetMacro(ApplyLookupTable,int);
00194 vtkSetMacro(ApplyLookupTable,int);

```



```

00195     vtkBooleanMacro(ApplyLookupTable,int);
00196
00197     // Description:
00198     // Load image as YBR
00199     vtkGetMacro(ApplyYBRToRGB,int)
00200     vtkSetMacro(ApplyYBRToRGB,int)
00201     vtkBooleanMacro(ApplyYBRToRGB,int);
00202
00203     // Description:
00204     // Return VTK_LUMINANCE, VTK_INVERSE_LUMINANCE, VTK_RGB, VTK_RGBA, VTK_LOOKUP_TABLE, VTK_YBR or VTK_CMYK
00205     // or 0 when ImageFormat is not handled.
00206     // Warning: For color image, PlanarConfiguration need to be taken into account.
00207     vtkGetMacro(ImageFormat,int);
00208
00209     // Description:
00210     // Return the Planar Configuration. This simply means that the internal DICOM image was stored
00211     // using a particular planar configuration (most of the time: 0)
00212     // For monochrome image, PlanarConfiguration is always 0
00213     vtkGetMacro(PlanarConfiguration,int);
00214
00215     // Description:
00216     // Return the 'raw' information stored in the DICOM file:
00217     // In case of a series of multiple files, only the first file is considered. The Image Orientation
(Patient)
00218     // is guaranteed to remain the same, and image Image Position (Patient) in other slice can be computed
00219     // using the ZSpacing (3rd dimension)
00220     // (0020,0032) DS [87.774866~-182.908510\168.629671] # 32, 3 ImagePositionPatient
00221     // (0020,0037) DS [0.001479\0.999989~-0.004376~-0.002039~-0.004372~-0.999988] # 58, 6
ImageOrientationPatient
00222     vtkGetVector3Macro(ImagePositionPatient,double);
00223     vtkGetVector6Macro(ImageOrientationPatient,double);
00224
00225     // Description:
00226     // Set/Get the first Curve Data:
00227     vtkGetObjectMacro(Curve,vtkPolyData);
00228     virtual void SetCurve(vtkPolyData *pd);
00229
00230     // Description:
00231     // \DEPRECATED:
00232     // Modality LUT
00233     // Value returned by GetShift/GetScale might be inaccurate since Shift/Scale could be
00234     // varying along the Series read. Therefore user are advices not to use those functions
00235     // anymore
00236     vtkGetMacro(Shift,double);
00237     vtkGetMacro(Scale,double);
00238
00239 protected:
00240     vtkGDCMImageReader();
00241     ~vtkGDCMImageReader();
00242
00243     vtkSetVector6Macro(ImageOrientationPatient,double);
00244
00245 //BTX
00246 void FillMedicalImageInformation(const gdcm::ImageReader &reader);
00247 //ETX
00248 int RequestInformationCompat();
00249 int RequestDataCompat();
00250
00251 #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
00252 int ProcessRequest(vtkInformation* request,
00253                   vtkInformationVector** inputVector,
00254                   vtkInformationVector* outputVector);
00255 int RequestInformation(vtkInformation *request,
00256                       vtkInformationVector **inputVector,
00257                       vtkInformationVector *outputVector);
00258 int RequestData(vtkInformation *request,
00259                vtkInformationVector **inputVector,
00260                vtkInformationVector *outputVector);
00261 #else /*(VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )*/
00262 void ExecuteInformation();
00263 void ExecuteData(vtkDataObject *out);
00264 #endif /*(VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )*/
00265
00266 protected:
00267 #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
00268 #else
00269     // Description:
00270     // Medical Image properties
00271     vtkMedicalImageProperties *MedicalImageProperties;
00272 #endif
00273 #if (VTK_MAJOR_VERSION > 5) || ( VTK_MAJOR_VERSION == 5 && VTK_MINOR_VERSION > 0 )

```

```

00274 #else
00275     vtkStringArray *FileNames;
00276 #endif
00277
00278     vtkMatrix4x4 *DirectionCosines;
00279     int LoadOverlays;
00280     int NumberOfOverlays;
00281     int LoadIconImage;
00282     int NumberOfIconImages;
00283     int IconImageDataExtent[6];
00284     double ImagePositionPatient[3];
00285     double ImageOrientationPatient[6];
00286     vtkPolyData *Curve;
00287
00288     int ImageFormat;
00289     // the following 3, should remain optional
00290     int ApplyInverseVideo;
00291     int ApplyLookupTable;
00292     int ApplyYBRToRGB;
00293     // I think that planar configuration need to always be applied as far as VTK is concerned
00294     int ApplyPlanarConfiguration;
00295     int ApplyShiftScale;
00296
00297     int LoadSingleFile(const char *filename, char *pointer, unsigned long &outlen);
00298
00299     double Shift;
00300     double Scale;
00301     int IconDataScalarType;
00302     int IconNumberOfScalarComponents;
00303     int PlanarConfiguration;
00304     int LossyFlag;
00305     int ForceRescale;
00306
00307 protected:
00308     // TODO / FIXME
00309     void SetFilePrefix(const char *) {}
00310     vtkGetStringMacro(FilePrefix);
00311     void SetFilePattern(const char *) {}
00312     vtkGetStringMacro(FilePattern);
00313
00314 private:
00315     vtkGDCMImageReader(const vtkGDCMImageReader&); // Not implemented.
00316     void operator=(const vtkGDCMImageReader&); // Not implemented.
00317 };
00318 #endif

```

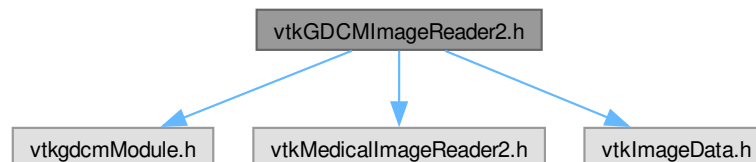
## 13.607 vtkGDCMImageReader2.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkMedicalImageReader2.h"
#include "vtkImageData.h"

```

Include dependency graph for vtkGDCMImageReader2.h:



## Classes

- class [vtkGDCMImageReader2](#)

## Namespaces

- namespace [gdcmm](#)

## Macros

- `#define VTK_CMYK` 8
- `#define VTK_INVERSE_LUMINANCE` 5
- `#define VTK_LOOKUP_TABLE` 6
- `#define VTK_YBR` 7

## 13.607.1 Macro Definition Documentation

### 13.607.1.1 VTK\_CMYK

```
#define VTK_CMYK 8
```

### 13.607.1.2 VTK\_INVERSE\_LUMINANCE

```
#define VTK_INVERSE_LUMINANCE 5
```

### 13.607.1.3 VTK\_LOOKUP\_TABLE

```
#define VTK_LOOKUP_TABLE 6
```

### 13.607.1.4 VTK\_YBR

```
#define VTK_YBR 7
```

## 13.608 vtkGDCMImageReader2.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 // .NAME vtkGDCMImageReader2 - read DICOM Image files (Pixel Data)
00015 // .SECTION Description
00016 // vtkGDCMImageReader2 is a source object that reads some DICOM files
00017 // this reader is single threaded.
00018 // .SECTION Implementation note: when FileLowerLeft is set to on the image is not flipped
00019 // upside down as VTK would expect, use this option only if you know what you are doing.
00020 // .SECTION Implementation note: when reading a series of 2D slices, user is
00021 // expected to provide an ordered list of filenames. No sorting will be applied afterward.
00022 // .SECTION Implementation note: Although 99% of the time the Zspacing as read
00023 // from a tag in a 2D DICOM file should be correct, there has been reports that this
00024 // value can be missing, or incorrect, in which case users are advised to override this
00025 // value using the return value from gdcm::IPPSorter::GetZSpacing() and set it via
00026 // vtkImageChangeInformation on the reader itself.
00027 // .SECTION TODO
00028 // This reader does not handle a series of 3D images, only a single 3D (multi frame) or a
00029 // list of 2D files are supported for now.
00030 // .SECTION TODO
00031 // Did not implement SetFilePattern / SetFilePrefix API, move it to protected section for now.
00032 // .SECTION BUG
00033 // Overlay are assumed to have the same extent as image. Right now if overlay origin is not
00034 // 0,0 the overlay will have an offset...
00035 // Only the very first overlay is loaded at the VTK level, for now (even if there are more than one in the
    file)
00036 // .SECTION DataOrigin
00037 // When the reader is instantiated with FileLowerLeftOn the DataOrigin and Image Position (Patient) are
00038 // identical. But when FileLowerLeft is Off, we have to reorder the Y-line of the image, and thus the
    DataOrigin
00039 // is then translated to the other side of the image.
00040 // .SECTION Spacing
00041 // When reading a 3D volume, the spacing along the Z dimension might be negative (so as to respect
    up-side-down)
00042 // as specified in the Image Orientation (Patient) tag. When Z-spacing is 0, this means the multi-frame
    object
00043 // contains image which do not represent uniform volume.
00044 // .SECTION Warning
00045 // When using vtkGDCMPolyDataReader in conjunction with vtkGDCMImageReader2
00046 // it is *required* that FileLowerLeft is set to ON as coordinate system
00047 // would be inconsistent in between the two data structures.
00048 // .SECTION Color Space mapping:
00049 // * VTK_LUMINANCE      <=> MONOCHROME2
00050 // * VTK_LUMINANCE_ALPHA <=> Not supported
00051 // * VTK_RGB            <=> RGB
00052 // * VTK_RGBA           <=> ARGB (deprecated, DICOM 2008)
00053 // * VTK_INVERSE_LUMINANCE <=> MONOCHROME1
00054 // * VTK_LOOKUP_TABLE   <=> PALETTE COLOR
00055 // * VTK_YBR            <=> YBR_FULL
00056 //
00057 // For detailed information on color space transformation and true lossless transformation see:
00058 // http://gdcm.sourceforge.net/wiki/index.php/Color_Space_Transformations
00059
00060 // .SECTION See Also
00061 // vtkMedicalImageReader2 vtkMedicalImageProperties vtkGDCMPolyDataReader vtkGDCMImageWriter
00062 // vtkDICOMImageReader
00063
00064 #ifndef VTKGDCMIMAGEREADER2_H
00065 #define VTKGDCMIMAGEREADER2_H
00066
00067 #include "vtkgdcmModule.h"
00068 #include "vtkMedicalImageReader2.h"
00069 #include "vtkImageData.h"
00070
00071 class vtkPolyData;
```

```

00072
00073 // vtkSystemIncludes.h defines:
00074 // #define VTK_LUMINANCE 1
00075 // #define VTK_LUMINANCE_ALPHA 2
00076 // #define VTK_RGB 3
00077 // #define VTK_RGBA 4
00078 #ifndef VTK_INVERSE_LUMINANCE
00079 #define VTK_INVERSE_LUMINANCE 5
00080 #endif
00081 #ifndef VTK_LOOKUP_TABLE
00082 #define VTK_LOOKUP_TABLE 6
00083 #endif
00084 #ifndef VTK_YBR
00085 #define VTK_YBR 7
00086 #endif
00087 #ifndef VTK_CMYK
00088 #define VTK_CMYK 8
00089 #endif
00090
00091 //BTX
00092 namespace gdcm { class ImageReader; }
00093 //ETX
00094 class vtkMatrix4x4;
00095 class VTKGDCM_EXPORT vtkGDCMImageReader2 : public vtkMedicalImageReader2
00096 {
00097 public:
00098     static vtkGDCMImageReader2 *New();
00099     vtkTypeMacro(vtkGDCMImageReader2,vtkMedicalImageReader2);
00100     virtual void PrintSelf(ostream& os, vtkIndent indent);
00101
00102     // Description: is the given file name a DICOM file containing an image ?
00103     virtual int CanReadFile(const char* fname);
00104
00105     // Description:
00106     // Valid extensions
00107     virtual const char* GetFileExtensions()
00108     {
00109         // I would like to get rid of ACR/NEMA/IMA so only allow dcm extension for now
00110         return ".dcm .DCM";
00111     }
00112
00113     // Description:
00114     // A descriptive name for this format
00115     virtual const char* GetDescriptiveName()
00116     {
00117         return "DICOM";
00118     }
00119
00120     // Description:
00121     // Get the Image Position (Patient) as stored in the DICOM file
00122     // This is a read-only data member
00123     vtkGetObjectMacro(DirectionCosines, vtkMatrix4x4);
00124
00125     virtual void SetMedicalImageProperties(vtkMedicalImageProperties *pd);
00126
00127     // Description:
00128     // Specifically request to load the overlay into the gdcm-VTK layer (gdcm always loads them when found).
00129     // If no overlay is found in the image, then the vtkImageData for the overlay will be empty.
00130     vtkGetMacro(LoadOverlays,int);
00131     vtkSetMacro(LoadOverlays,int);
00132     vtkBooleanMacro(LoadOverlays,int);
00133
00134     // Description:
00135     // Set/Get whether or not to load the Icon as vtkImageData (if found in the DICOM file)
00136     vtkGetMacro(LoadIconImage,int);
00137     vtkSetMacro(LoadIconImage,int);
00138     vtkBooleanMacro(LoadIconImage,int);
00139
00140     // Description:
00141     // Set/Get whether or not the image was compressed using a lossy compression algorithm
00142     vtkGetMacro(LossyFlag,int);
00143     vtkSetMacro(LossyFlag,int);
00144     vtkBooleanMacro(LossyFlag,int);
00145
00146     // Description:
00147     // Read only: number of overlays as found in this image (multiple overlays per slice is allowed)
00148     // Only valid when LoadOverlays is true
00149     vtkGetMacro(NumberOfOverlays,int);
00150
00151     // Description:
00152     // Read only: number of icon image (there can only be zero or one icon per file)

```

```

00153 // Only valid when LoadIconImage is true
00154 vtkGetMacro(NumberOfIconImages,int);
00155
00156 // Description:
00157 // Get Overlay/IconImage
00158 // Remember to ALWAYS use those methods in your code, as the internal number for the output port
00159 // is not guaranteed to remain the same, as features are added to the reader
00160 vtkAlgorithmOutput* GetOverlayPort(int index);
00161 vtkAlgorithmOutput* GetIconImagePort();
00162 vtkImageData* GetOverlay(int i);
00163 vtkImageData* GetIconImage();
00164
00165 // Description:
00166 // Load image with its associated Lookup Table
00167 vtkGetMacro(ApplyLookupTable,int);
00168 vtkSetMacro(ApplyLookupTable,int);
00169 vtkBooleanMacro(ApplyLookupTable,int);
00170
00171 // Description:
00172 // Load image as YBR
00173 vtkGetMacro(ApplyYBRToRGB,int)
00174 vtkSetMacro(ApplyYBRToRGB,int)
00175 vtkBooleanMacro(ApplyYBRToRGB,int);
00176
00177 // Description:
00178 // Return VTK_LUMINANCE, VTK_INVERSE_LUMINANCE, VTK_RGB, VTK_RGBA, VTK_LOOKUP_TABLE, VTK_YBR or VTK_CMYK
00179 // or 0 when ImageFormat is not handled.
00180 // Warning: For color image, PlanarConfiguration need to be taken into account.
00181 vtkGetMacro(ImageFormat,int);
00182
00183 // Description:
00184 // Return the Planar Configuration. This simply means that the internal DICOM image was stored
00185 // using a particular planar configuration (most of the time: 0)
00186 // For monochrome image, PlanarConfiguration is always 0
00187 vtkGetMacro(PlanarConfiguration,int);
00188
00189 // Description:
00190 // Return the 'raw' information stored in the DICOM file:
00191 // In case of a series of multiple files, only the first file is considered. The Image Orientation
(Patient)
00192 // is guaranteed to remain the same, and image Image Position (Patient) in other slice can be computed
00193 // using the ZSpacing (3rd dimension)
00194 // (0020,0032) DS [87.774866~-182.908510~168.629671] # 32, 3 ImagePositionPatient
00195 // (0020,0037) DS [0.001479~0.999989~-0.004376~-0.002039~-0.004372~-0.999988] # 58, 6
ImageOrientationPatient
00196 vtkGetVector3Macro(ImagePositionPatient,double);
00197 vtkGetVector6Macro(ImageOrientationPatient,double);
00198
00199 // Description:
00200 // Set/Get the first Curve Data:
00201 vtkGetObjectMacro(Curve,vtkPolyData);
00202 virtual void SetCurve(vtkPolyData *pd);
00203
00204 // Description:
00205 // \DEPRECATED:
00206 // Modality LUT
00207 // Value returned by GetShift/GetScale might be inaccurate since Shift/Scale could be
00208 // varying along the Series read. Therefore user are advices not to use those functions
00209 // anymore
00210 vtkGetMacro(Shift,double);
00211 vtkGetMacro(Scale,double);
00212
00213 protected:
00214 vtkGDCMImageReader2();
00215 ~vtkGDCMImageReader2();
00216
00217 vtkSetVector6Macro(ImageOrientationPatient,double);
00218
00219 //BTX
00220 void FillMedicalImageInformation(const gdcm::ImageReader &reader);
00221 //ETX
00222 int RequestInformationCompat();
00223 int RequestDataCompat();
00224
00225 int ProcessRequest(vtkInformation* request,
00226                   vtkInformationVector** inputVector,
00227                   vtkInformationVector* outputVector);
00228 int RequestInformation(vtkInformation *request,
00229                       vtkInformationVector **inputVector,
00230                       vtkInformationVector *outputVector);
00231 int RequestData(vtkInformation *request,

```

```

00232         vtkInformationVector **inputVector,
00233         vtkInformationVector *outputVector);
00234
00235 protected:
00236     vtkMatrix4x4 *DirectionCosines;
00237     int LoadOverlays;
00238     int NumberOfOverlays;
00239     int LoadIconImage;
00240     int NumberOfIconImages;
00241     int IconImageDataExtent[6];
00242     double ImagePositionPatient[3];
00243     double ImageOrientationPatient[6];
00244     vtkPolyData *Curve;
00245
00246     int ImageFormat;
00247     // the following 3, should remain optional
00248     int ApplyInverseVideo;
00249     int ApplyLookupTable;
00250     int ApplyYBRToRGB;
00251     // I think that planar configuration need to always be applied as far as VTK is concerned
00252     int ApplyPlanarConfiguration;
00253     int ApplyShiftScale;
00254
00255     int LoadSingleFile(const char *filename, char *pointer, unsigned long &outlen);
00256
00257     double Shift;
00258     double Scale;
00259     int IconDataScalarType;
00260     int IconNumberOfScalarComponents;
00261     int PlanarConfiguration;
00262     int LossyFlag;
00263     int ForceRescale;
00264
00265 protected:
00266     // TODO / FIXME
00267     void SetFilePrefix(const char *) {}
00268     vtkGetStringMacro(FilePrefix);
00269     void SetFilePattern(const char *) {}
00270     vtkGetStringMacro(FilePattern);
00271
00272 private:
00273     vtkGDCMImageReader2(const vtkGDCMImageReader2&); // Not implemented.
00274     void operator=(const vtkGDCMImageReader2&); // Not implemented.
00275 };
00276 #endif

```

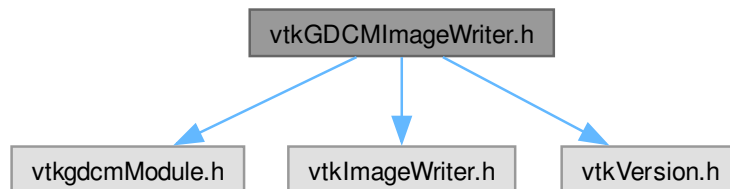
## 13.609 vtkGDCMImageWriter.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkImageWriter.h"
#include "vtkVersion.h"

```

Include dependency graph for vtkGDCMImageWriter.h:



## Classes

- class [vtkGDCMImageWriter](#)

## 13.610 vtkGDCMImageWriter.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcms.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 // .NAME vtkGDCMImageWriter - write DICOM files
00015 // .SECTION Description
00016 // vtkGDCMImageWriter is a sink object that write DICOM files
00017 // this writer is single threaded (see vtkGDCMThreadedImageReader2 for multi-thread)
00018 //
00019 // .SECTION Warning: vtkLookupTable from the vtkImageData object taken into account
00020 // only if ImageFormat is set to VTK_LOOKUP_TABLE
00021 //
00022 // .SECTION NOTE We are not using the usual API SetFilePrefix / SetFilePattern,
00023 // but instead a list of filenames: see SetFileNames and class gdcms::FilenameGenerator
00024 //
00025 // .SECTION Warning
00026 // You need to specify the correct ImageFormat (taken from the reader)
00027 // You need to explicitly specify the DirectionCosines (taken from the reader)
00028 // Since VTK 5.4 vtkMedicalImageProperties has its own DirectionCosine (no 's')
00029 // user need to make sure the vtkMatrix4x4 is compatible with the 6-vector DirectionCosine.
00030 //
00031 // .SECTION NOTE Shift/Scale are global to all DICOM frames (=files) written
00032 // as 2D slice, therefore the shift/scale operation might not be optimized for
00033 // all slices. This is not recommended for image with a large dynamic range.
00034 //
00035 // .SECTION See Also
00036 // vtkImageWriter vtkMedicalImageProperties vtkGDCMImageReader
00037
00038 #ifndef VTKGDCMIMAGEWRITER_H
00039 #define VTKGDCMIMAGEWRITER_H
00040
00041 #include "vtkgdcmModule.h"
00042 #include "vtkImageWriter.h"
00043 #include "vtkVersion.h"
00044
00045 class vtkLookupTable;
00046 class vtkMedicalImageProperties;
00047 class vtkMatrix4x4;
00048 class vtkStringArray;
00049 class VTKGDCM_EXPORT vtkGDCMImageWriter : public vtkImageWriter
00050 {
00051 public:
00052   static vtkGDCMImageWriter *New();
00053   vtkTypeMacro(vtkGDCMImageWriter,vtkImageWriter);
00054   virtual void PrintSelf(ostream& os, vtkIndent indent);
00055
00056   // Description:
00057   // Pass in the vtkmedicalimageproperties object for medical information
00058   // to be mapped to DICOM attributes.
00059   vtkGetObjectMacro(MedicalImageProperties, vtkMedicalImageProperties);
00060   virtual void SetMedicalImageProperties(vtkMedicalImageProperties*);
00061
00062   // Description:
00063   // Pass in the list of filename to be used to write out the DICOM file(s)
00064   virtual void SetFileNames(vtkStringArray*);
00065   vtkGetObjectMacro(FileNames, vtkStringArray);
00066

```



```

00067 // Description:
00068 // Set/Get whether or not the image was compressed using a lossy compression algorithm
00069 vtkGetMacro(LossyFlag,int);
00070 vtkSetMacro(LossyFlag,int);
00071 vtkBooleanMacro(LossyFlag,int);
00072
00073 // I need that...
00074 virtual void Write();
00075
00076 // Description:
00077 // Get the extension for this file format.
00078 virtual const char* GetFileExtensions() {
00079     return ".dcm .DCM"; }
00080
00081 // Description:
00082 // Get the name of this file format.
00083 virtual const char* GetDescriptiveName() {
00084     return "DICOM"; }
00085
00086 // Description:
00087 // You need to manually specify the direction the image is in to write a valid DICOM file
00088 // since vtkImageData do not contains one (eg. MR Image Storage, CT Image Storage...)
00089 virtual void SetDirectionCosines(vtkMatrix4x4 *matrix);
00090 vtkGetObjectMacro(DirectionCosines, vtkMatrix4x4);
00091 virtual void SetDirectionCosinesFromImageOrientationPatient(const double dircos[6]);
00092
00093 // Description:
00094 // Modality LUT
00095 vtkSetMacro(Shift, double);
00096 vtkGetMacro(Shift, double);
00097 vtkSetMacro(Scale, double);
00098 vtkGetMacro(Scale, double);
00099
00100 // Description:
00101 // See vtkGDCMImageReader for list of ImageFormat
00102 vtkGetMacro(ImageFormat,int);
00103 vtkSetMacro(ImageFormat,int);
00104
00105 // Description:
00106 // Set/Get whether the data comes from the file starting in the lower left
00107 // corner or upper left corner.
00108 vtkBooleanMacro(FileLowerLeft, int);
00109 vtkGetMacro(FileLowerLeft, int);
00110 vtkSetMacro(FileLowerLeft, int);
00111
00112 // Description:
00113 // For color image (more than a single comp) you can specify the planar configuration you prefer
00114 vtkSetMacro(PlanarConfiguration,int);
00115 vtkGetMacro(PlanarConfiguration,int);
00116
00117 // Description:
00118 // Set/Get specific StudyUID / SeriesUID
00119 vtkSetStringMacro(StudyUID);
00120 vtkGetStringMacro(StudyUID);
00121 vtkSetStringMacro(SeriesUID);
00122 vtkGetStringMacro(SeriesUID);
00123
00124 //BTX
00125 enum CompressionTypes {
00126     NO_COMPRESSION = 0, // raw (default)
00127     JPEG_COMPRESSION, // JPEG
00128     JPEG2000_COMPRESSION, // J2K
00129     JPEGLS_COMPRESSION, // JPEG-LS
00130     RLE_COMPRESSION // RLE
00131 };
00132 //ETX
00133 // Set/Get the compression type
00134 vtkSetMacro(CompressionType, int);
00135 vtkGetMacro(CompressionType, int);
00136
00137 //void SetCompressionTypeFromString(const char *);
00138 //const char *GetCompressionTypeAsString();
00139
00140 protected:
00141     vtkGDCMImageWriter();
00142     ~vtkGDCMImageWriter();
00143
00144 #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
00145     int FillInputPortInformation(int port, vtkInformation *info);
00146     int RequestInformation(
00147         vtkInformation *request,

```

```

00148     vtkInformationVector **inputVector,
00149     vtkInformationVector *outputVector);
00150 int RequestUpdateExtent(
00151     vtkInformation *request,
00152     vtkInformationVector **inputVector,
00153     vtkInformationVector *outputVector);
00154 int RequestData(
00155     vtkInformation *request,
00156     vtkInformationVector **inputVector,
00157     vtkInformationVector *outputVector);
00158 #else
00159     void WriteSlice(vtkImageData *data);
00160 #endif /*(VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )*/
00161 int WriteGDCMData(vtkImageData *data, int timeStep);
00162
00163 protected:
00164     virtual /*const*/ char *GetFileName();
00165
00166 private:
00167     vtkGDCMImageWriter(const vtkGDCMImageWriter&); // Not implemented.
00168     void operator=(const vtkGDCMImageWriter&); // Not implemented.
00169
00170     // VTK structs:
00171     //vtkLookupTable *LookupTable;
00172     vtkMedicalImageProperties *MedicalImageProperties;
00173     char *StudyUID;
00174     char *SeriesUID;
00175
00176     int DataUpdateExtent[6];
00177     int ImageFormat;
00178
00179     vtkStringArray *FileNames;
00180     vtkMatrix4x4 *DirectionCosines;
00181
00182     double Shift;
00183     double Scale;
00184     int FileLowerLeft;
00185     int PlanarConfiguration;
00186     int LossyFlag;
00187     int CompressionType;
00188 };
00189
00190 #endif

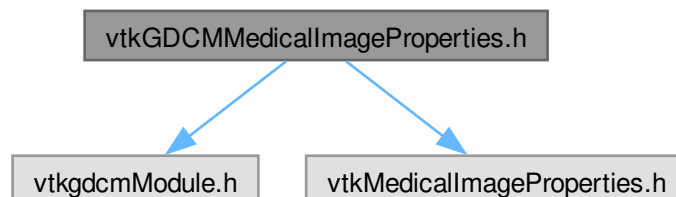
```

## 13.611 vtkGDCMMedicalImageProperties.h File Reference

```
#include "vtkgdcmModule.h"
```

```
#include "vtkMedicalImageProperties.h"
```

Include dependency graph for vtkGDCMMedicalImageProperties.h:



**Classes**

- class [vtkGDCMMedicalImageProperties](#)

**Namespaces**

- namespace [gdcm](#)

**13.612 vtkGDCMMedicalImageProperties.h**

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003     Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005     Copyright (c) 2006-2011 Mathieu Malaterre
00006     All rights reserved.
00007     See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009     This software is distributed WITHOUT ANY WARRANTY; without even
00010     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011     PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 // .NAME vtkGDCMMedicalImageProperties - some medical image properties.
00015 // .SECTION Description
00016 // vtkGDCMMedicalImageProperties is a helper class that can be used by medical
00017 // image readers and applications to encapsulate medical image/acquisition
00018 // properties. Later on, this should probably be extended to add
00019 // any user-defined property.
00020 // .SECTION See Also
00021 // vtkMedicalImageReader2
00022
00023 #ifndef VTKGDCMMEDICALIMAGEPROPERTIES_H
00024 #define VTKGDCMMEDICALIMAGEPROPERTIES_H
00025
00026 #include "vtkgdcmModule.h"
00027 #include "vtkMedicalImageProperties.h"
00028
00029 class vtkGDCMMedicalImagePropertiesInternals;
00030 //BTX
00031 namespace gdcm { class File; }
00032 //ETX
00033
00034 class VTKGDCM_EXPORT vtkGDCMMedicalImageProperties : public vtkMedicalImageProperties
00035 {
00036 public:
00037     static vtkGDCMMedicalImageProperties *New();
00038     vtkTypeMacro(vtkGDCMMedicalImageProperties,vtkMedicalImageProperties);
00039     void PrintSelf(ostream& os, vtkIndent indent);
00040
00041     // Description:
00042     // Convenience method to reset all fields to an empty string/value
00043     virtual void Clear();
00044
00045 /*
00046     // Description:
00047     // Patient name
00048     // For ex: DICOM (0010,0010) = DOE,JOHN
00049     vtkSetStringMacro(PatientName);
00050     vtkGetStringMacro(PatientName);
00051
00052     // Description:
00053     // Patient ID
00054     // For ex: DICOM (0010,0020) = 1933197
00055     vtkSetStringMacro(PatientID);
00056     vtkGetStringMacro(PatientID);
00057
00058     // Description:
00059     // Patient age

```

```
00060 // Format: nnnD, nnW, nnnM or nnnY (eventually nnD, nnW, nnY)
00061 //       with D (day), M (month), W (week), Y (year)
00062 // For ex: DICOM (0010,1010) = 031Y
00063 vtkSetStringMacro(PatientAge);
00064 vtkGetStringMacro(PatientAge);
00065
00066 // Description:
00067 // Take as input a string in VR=AS (DICOM PS3.5) and extract either
00068 // different fields namely: year month week day
00069 // Return 0 on error, 1 on success
00070 // One can test fields if they are different from -1 upon success
00071 static int GetAgeAsFields(const char *age, int &year, int &month, int &week, int &day);
00072
00073 // For Tcl:
00074 // From C++ use GetPatientAge + GetAgeAsField
00075 // Those function parse a DICOM string, and return the value of the number expressed
00076 // this is either expressed in year, month or days. Thus if a string is expressed in years
00077 // GetPatientAgeDay/GetPatientAgeWeek/GetPatientAgeMonth will return 0
00078 int GetPatientAgeYear();
00079 int GetPatientAgeMonth();
00080 int GetPatientAgeWeek();
00081 int GetPatientAgeDay();
00082
00083 // Description:
00084 // Patient sex
00085 // For ex: DICOM (0010,0040) = M
00086 vtkSetStringMacro(PatientSex);
00087 vtkGetStringMacro(PatientSex);
00088
00089 // Description:
00090 // Patient birth date
00091 // Format: yyyyymmdd
00092 // For ex: DICOM (0010,0030) = 19680427
00093 vtkSetStringMacro(PatientBirthDate);
00094 vtkGetStringMacro(PatientBirthDate);
00095
00096 // For Tcl:
00097 // From C++ use GetPatientBirthDate + GetDateAsFields
00098 int GetPatientBirthDateYear();
00099 int GetPatientBirthDateMonth();
00100 int GetPatientBirthDateDay();
00101
00102 // Description:
00103 // Study Date
00104 // Format: yyyyymmdd
00105 // For ex: DICOM (0008,0020) = 20030617
00106 vtkSetStringMacro(StudyDate);
00107 vtkGetStringMacro(StudyDate);
00108
00109 // Description:
00110 // Acquisition Date
00111 // Format: yyyyymmdd
00112 // For ex: DICOM (0008,0022) = 20030617
00113 vtkSetStringMacro(AcquisitionDate);
00114 vtkGetStringMacro(AcquisitionDate);
00115
00116 // For Tcl:
00117 // From C++ use GetAcquisitionDate + GetDateAsFields
00118 int GetAcquisitionDateYear();
00119 int GetAcquisitionDateMonth();
00120 int GetAcquisitionDateDay();
00121
00122 // Description:
00123 // Study Time
00124 // Format: hhmmss.frac (any trailing component(s) can be omitted)
00125 // For ex: DICOM (0008,0030) = 162552.0705 or 230012, or 0012
00126 vtkSetStringMacro(StudyTime);
00127 vtkGetStringMacro(StudyTime);
00128
00129 // Description:
00130 // Acquisition time
00131 // Format: hhmmss.frac (any trailing component(s) can be omitted)
00132 // For ex: DICOM (0008,0032) = 162552.0705 or 230012, or 0012
00133 vtkSetStringMacro(AcquisitionTime);
00134 vtkGetStringMacro(AcquisitionTime);
00135
00136 // Description:
00137 // Image Date aka Content Date
00138 // Format: yyyyymmdd
00139 // For ex: DICOM (0008,0023) = 20030617
00140 vtkSetStringMacro(ImageDate);
```

```
00141     vtkGetStringMacro(ImageDate);
00142
00143     // For Tcl:
00144     // From C++ use GetImageDate + GetDateAsFields
00145     int GetImageDateYear();
00146     int GetImageDateMonth();
00147     int GetImageDateDay();
00148
00149     // Description:
00150     // Take as input a string in ISO 8601 date (YYYY/MM/DD) and extract the
00151     // different fields namely: year month day
00152     // Return 0 on error, 1 on success
00153     static int GetDateAsFields(const char *date, int &year, int &month, int &day);
00154
00155     // Description:
00156     // Take as input a string in ISO 8601 date (YYYY/MM/DD) and construct a
00157     // locale date based on the different fields (see GetDateAsFields to extract
00158     // different fields)
00159     // Return 0 on error, 1 on success
00160     static int GetDateAsLocale(const char *date, char *locale);
00161
00162     // Description:
00163     // Image Time
00164     // Format: hhmmss.frac (any trailing component(s) can be omitted)
00165     // For ex: DICOM (0008,0033) = 162552.0705 or 230012, or 0012
00166     vtkSetStringMacro(ImageTime);
00167     vtkGetStringMacro(ImageTime);
00168
00169     // Description:
00170     // Image number
00171     // For ex: DICOM (0020,0013) = 1
00172     vtkSetStringMacro(ImageNumber);
00173     vtkGetStringMacro(ImageNumber);
00174
00175     // Description:
00176     // Series number
00177     // For ex: DICOM (0020,0011) = 902
00178     vtkSetStringMacro(SeriesNumber);
00179     vtkGetStringMacro(SeriesNumber);
00180
00181     // Description:
00182     // Series Description
00183     // User provided description of the Series
00184     // For ex: DICOM (0008,103e) = SCOUT
00185     vtkSetStringMacro(SeriesDescription);
00186     vtkGetStringMacro(SeriesDescription);
00187
00188     // Description:
00189     // Study ID
00190     // For ex: DICOM (0020,0010) = 37481
00191     vtkSetStringMacro(StudyID);
00192     vtkGetStringMacro(StudyID);
00193
00194     // Description:
00195     // Study description
00196     // For ex: DICOM (0008,1030) = BRAIN/C-SP/FACIAL
00197     vtkSetStringMacro(StudyDescription);
00198     vtkGetStringMacro(StudyDescription);
00199
00200     // Description:
00201     // Modality
00202     // For ex: DICOM (0008,0060)= CT
00203     vtkSetStringMacro(Modality);
00204     vtkGetStringMacro(Modality);
00205
00206     // Description:
00207     // Manufacturer
00208     // For ex: DICOM (0008,0070) = Siemens
00209     vtkSetStringMacro(Manufacturer);
00210     vtkGetStringMacro(Manufacturer);
00211
00212     // Description:
00213     // Manufacturer's Model Name
00214     // For ex: DICOM (0008,1090) = LightSpeed QX/i
00215     vtkSetStringMacro(ManufacturerModelName);
00216     vtkGetStringMacro(ManufacturerModelName);
00217
00218     // Description:
00219     // Station Name
00220     // For ex: DICOM (0008,1010) = LSPD_OC8
00221     vtkSetStringMacro(StationName);
```

```
00222 vtkGetStringMacro(StationName);
00223
00224 // Description:
00225 // Institution Name
00226 // For ex: DICOM (0008,0080) = FooCity Medical Center
00227 vtkSetStringMacro(InstitutionName);
00228 vtkGetStringMacro(InstitutionName);
00229
00230 // Description:
00231 // Convolution Kernel (or algorithm used to reconstruct the data)
00232 // For ex: DICOM (0018,1210) = Bone
00233 vtkSetStringMacro(ConvolutionKernel);
00234 vtkGetStringMacro(ConvolutionKernel);
00235
00236 // Description:
00237 // Slice Thickness (Nominal reconstructed slice thickness, in mm)
00238 // For ex: DICOM (0018,0050) = 0.273438
00239 vtkSetStringMacro(SliceThickness);
00240 vtkGetStringMacro(SliceThickness);
00241 virtual double GetSliceThicknessAsDouble();
00242
00243 // Description:
00244 // Peak kilo voltage output of the (x-ray) generator used
00245 // For ex: DICOM (0018,0060) = 120
00246 vtkSetStringMacro(KVP);
00247 vtkGetStringMacro(KVP);
00248
00249 // Description:
00250 // Gantry/Detector tilt (Nominal angle of tilt in degrees of the scanning
00251 // gantry.)
00252 // For ex: DICOM (0018,1120) = 15
00253 vtkSetStringMacro(GantryTilt);
00254 vtkGetStringMacro(GantryTilt);
00255 virtual double GetGantryTiltAsDouble();
00256
00257 // Description:
00258 // Echo Time
00259 // (Time in ms between the middle of the excitation pulse and the peak of
00260 // the echo produced)
00261 // For ex: DICOM (0018,0081) = 105
00262 vtkSetStringMacro(EchoTime);
00263 vtkGetStringMacro(EchoTime);
00264
00265 // Description:
00266 // Echo Train Length
00267 // (Number of lines in k-space acquired per excitation per image)
00268 // For ex: DICOM (0018,0091) = 35
00269 vtkSetStringMacro(EchoTrainLength);
00270 vtkGetStringMacro(EchoTrainLength);
00271
00272 // Description:
00273 // Repetition Time
00274 // The period of time in msec between the beginning of a pulse sequence and
00275 // the beginning of the succeeding (essentially identical) pulse sequence.
00276 // For ex: DICOM (0018,0080) = 2040
00277 vtkSetStringMacro(RepetitionTime);
00278 vtkGetStringMacro(RepetitionTime);
00279
00280 // Description:
00281 // Exposure time (time of x-ray exposure in msec)
00282 // For ex: DICOM (0018,1150) = 5
00283 vtkSetStringMacro(ExposureTime);
00284 vtkGetStringMacro(ExposureTime);
00285
00286 // Description:
00287 // X-ray tube current (in mA)
00288 // For ex: DICOM (0018,1151) = 400
00289 vtkSetStringMacro(XRayTubeCurrent);
00290 vtkGetStringMacro(XRayTubeCurrent);
00291
00292 // Description:
00293 // Exposure (The exposure expressed in mAs, for example calculated
00294 // from Exposure Time and X-ray Tube Current)
00295 // For ex: DICOM (0018,1152) = 114
00296 vtkSetStringMacro(Exposure);
00297 vtkGetStringMacro(Exposure);
00298
00299 // Interface to allow insertion of user define values, for instance in DICOM one would want to
00300 // store the Protocol Name (0018,1030), in this case one would do:
00301 // AddUserDefinedValue( "Protocol Name", "T1W/SE/1024" );
00302 void AddUserDefinedValue(const char *name, const char *value);
```

```

00303 // Get a particular user value
00304 const char *GetUserDefinedValue(const char *name);
00305 // Get the number of user defined values
00306 unsigned int GetNumberOfUserDefinedValues();
00307 // Get a name/value by index
00308 const char *GetUserDefinedNameByIndex(unsigned int idx);
00309 const char *GetUserDefinedValueByIndex(unsigned int idx);
00310
00311 // Description:
00312 // Copy the contents of p to this instance.
00313 virtual void DeepCopy(vtkGDCMMedicalImageProperties *p);
00314
00315 // Description:
00316 // Add/Remove/Query the window/level presets that may have been associated
00317 // to a medical image. Window is also known as 'width', level is also known
00318 // as 'center'. The same window/level pair can not be added twice.
00319 // As a convenience, a comment (aka Explanation) can be associated to a preset.
00320 // For ex: DICOM Window Center (0028,1050) = 00045\000470
00321 //           DICOM Window Width (0028,1051) = 0106\03412
00322 //           DICOM Window Center Width Explanation (0028,1055) = WINDOW1\WINDOW2
00323 virtual void AddWindowLevelPreset(double w, double l);
00324 virtual void RemoveWindowLevelPreset(double w, double l);
00325 virtual void RemoveAllWindowLevelPresets();
00326 virtual int GetNumberOfWindowLevelPresets();
00327 virtual int HasWindowLevelPreset(double w, double l);
00328 virtual int GetNthWindowLevelPreset(int idx, double *w, double *l);
00329 virtual double* GetNthWindowLevelPreset(int idx);
00330 virtual void SetNthWindowLevelPresetComment(int idx, const char *comment);
00331 virtual const char* GetNthWindowLevelPresetComment(int idx);
00332
00333 // Description:
00334 // Mapping from a sliceidx within a volumeidx into a DICOM Instance UID
00335 // Some DICOM reader can populate this structure so that later on from a slice index
00336 // in a vtkImageData volume we can backtrack and find out which 2d slice it was coming from
00337 const char *GetInstanceUIDFromSliceID(int volumeidx, int sliceid);
00338 void SetInstanceUIDFromSliceID(int volumeidx, int sliceid, const char *uid);
00339
00340 // Description:
00341 // Provides the inverse mapping. Returns -1 if a slice for this uid is
00342 // not found.
00343 int GetSliceIDFromInstanceUID(int &volumeidx, const char *uid);
00344
00345 //BTX
00346 typedef enum {
00347     AXIAL = 0,
00348     CORONAL,
00349     SAGITTAL
00350 } OrientationType;
00351 //ETX
00352 int GetOrientationType(int volumeidx);
00353 void SetOrientationType(int volumeidx, int orientation);
00354 static const char *GetStringFromOrientationType(unsigned int type);
00355 */
00356 protected:
00357     vtkGDCMMedicalImageProperties();
00358     ~vtkGDCMMedicalImageProperties();
00359
00360 //BTX
00361 friend class vtkGDCMImageReader;
00362 friend class vtkGDCMImageReader2;
00363 friend class vtkGDCMImageWriter;
00364 void PushBackFile(gdcm::File const &f);
00365 gdcm::File const & GetFile(unsigned int t);
00366 //ETX
00367
00368 private:
00369     vtkGDCMMedicalImagePropertiesInternals *Internals;
00370
00371     vtkGDCMMedicalImageProperties(const vtkGDCMMedicalImageProperties&); // Not implemented.
00372     void operator=(const vtkGDCMMedicalImageProperties&); // Not implemented.
00373 };
00374
00375 #endif

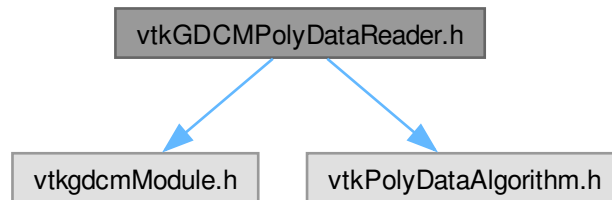
```

## 13.613 vtkGDCMPolyDataReader.h File Reference

```
#include "vtkgdcmModule.h"
```

```
#include "vtkPolyDataAlgorithm.h"
```

Include dependency graph for vtkGDCMPolyDataReader.h:



### Classes

- class [vtkGDCMPolyDataReader](#)

### Namespaces

- namespace [gdcm](#)

## 13.614 vtkGDCMPolyDataReader.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 // .NAME vtkGDCMPolyDataReader - read DICOM PolyData files (Contour Data...)
00015 // .SECTION Description
00016 // For now only support RTSTRUCT (RT Structure Set Storage)
00017 // .SECTION TODO
00018 // Need to do the same job for DVH Sequence/DVH Data...
00019 // .SECTION Warning
00020 // When using vtkGDCMPolyDataReader in conjunction with vtkGDCMImageReader
00021 // it is *required* that FileLowerLeft is set to ON as coordinate system
00022 // would be inconsistent in between the two data structures.
00023 //
00024 // .SECTION See Also

```



```

00025 // vtkGDCMImageReader vtkGDCMPolyDataWriter vtkRTStructSetProperties
00026
00027
00028 #ifndef VTKGDCMPOLYDATAREADER_H
00029 #define VTKGDCMPOLYDATAREADER_H
00030
00031 #include "vtkgdcmModule.h"
00032 #include "vtkPolyDataAlgorithm.h"
00033
00034 class vtkMedicalImageProperties;
00035 class vtkRTStructSetProperties;
00036 //BTX
00037 namespace gdcm { class Reader; }
00038 //ETX
00039 class VTKGDCM_EXPORT vtkGDCMPolyDataReader : public vtkPolyDataAlgorithm
00040 {
00041 public:
00042     static vtkGDCMPolyDataReader *New();
00043     vtkTypeMacro(vtkGDCMPolyDataReader,vtkPolyDataAlgorithm);
00044     virtual void PrintSelf(ostream& os, vtkIndent indent);
00045
00046     // Description:
00047     // Set/Get the filename of the file to be read
00048     vtkSetStringMacro(FileName);
00049     vtkGetStringMacro(FileName);
00050
00051     // Description:
00052     // Get the medical image properties object
00053     vtkGetObjectMacro(MedicalImageProperties, vtkMedicalImageProperties);
00054
00055     vtkGetObjectMacro(RTStructSetProperties, vtkRTStructSetProperties);
00056
00057 protected:
00058     vtkGDCMPolyDataReader();
00059     ~vtkGDCMPolyDataReader();
00060
00061     char *FileName;
00062     vtkMedicalImageProperties *MedicalImageProperties;
00063     vtkRTStructSetProperties *RTStructSetProperties;
00064 //BTX
00065     void FillMedicalImageInformation(const gdcm::Reader &reader);
00066 //ETX
00067
00068     int RequestData(vtkInformation *, vtkInformationVector **, vtkInformationVector *);
00069     int RequestInformation(
00070         vtkInformation *vtkNotUsed(request),
00071         vtkInformationVector **vtkNotUsed(inputVector),
00072         vtkInformationVector *outputVector);
00073 //BTX
00074     int RequestInformation_RTStructureSetStorage(gdcm::Reader const &reader);
00075     int RequestData_RTStructureSetStorage(gdcm::Reader const &reader, vtkInformationVector *outputVector);
00076     int RequestInformation_HemodynamicWaveformStorage(gdcm::Reader const &reader);
00077     int RequestData_HemodynamicWaveformStorage(gdcm::Reader const &reader, vtkInformationVector
00078         *outputVector);
00079 //ETX
00080 private:
00081     vtkGDCMPolyDataReader(const vtkGDCMPolyDataReader&); // Not implemented.
00082     void operator=(const vtkGDCMPolyDataReader&); // Not implemented.
00083 };
00084
00085 #endif

```

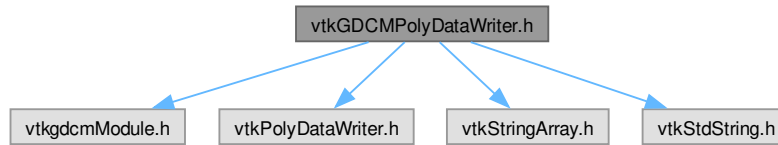
## 13.615 vtkGDCMPolyDataWriter.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkPolyDataWriter.h"
#include "vtkStringArray.h"
#include "vtkStdString.h"

```

Include dependency graph for vtkGDCMPolyDataWriter.h:



## Classes

- class [vtkGDCMPolyDataWriter](#)

## Namespaces

- namespace [gdcM](#)

## 13.616 vtkGDCMPolyDataWriter.h

[Go to the documentation of this file.](#)

```

00001  /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcM.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014  // .NAME vtkGDCMPolyDataWriter - writer DICOM PolyData files (Contour Data...)
00015  // .SECTION Description
00016  // For now only support RTSTRUCT (RT Structure Set Storage)
00017  // .SECTION TODO
00018  // Need to do the same job for DVH Sequence/DVH Data...
00019  // .SECTION Warning
00020  //
00021  // .SECTION See Also
00022  // vtkGDCMImageReader vtkGDCMPolyDataReader vtkRTStructSetProperties
00023
00024
00025  #ifndef VTKGDCMPOLYDATAWRITER_H
00026  #define VTKGDCMPOLYDATAWRITER_H
00027
00028  #include "vtkgdcModule.h"
00029  #include "vtkPolyDataWriter.h"
00030  #include "vtkStringArray.h"
00031  #include "vtkStdString.h"
00032
00033
00034  class vtkMedicalImageProperties;
00035  class vtkRTStructSetProperties;
00036  //BTX
00037  namespace gdcM { class File; }

```

```

00038 //ETX
00039 class VTKGDCM_EXPORT vtkGDCMPolyDataWriter : public vtkPolyDataWriter
00040 {
00041 public:
00042     static vtkGDCMPolyDataWriter *New();
00043     vtkTypeMacro(vtkGDCMPolyDataWriter,vtkPolyDataWriter);
00044     virtual void PrintSelf(ostream& os, vtkIndent indent);
00045
00046     // Description:
00047     // Set/Get the filename of the file to be read
00048     // vtkSetStringMacro(FileName);
00049     // vtkGetStringMacro(FileName);
00050
00051     // Description:
00052     // Get the medical image properties object
00053     // vtkGetObjectMacro(MedicalImageProperties, vtkMedicalImageProperties);
00054     virtual void SetMedicalImageProperties(vtkMedicalImageProperties *pd);
00055
00056     virtual void SetRTStructSetProperties(vtkRTStructSetProperties *pd);
00057
00058
00059     //this function will initialize the contained rtstructset with
00060     //the inputs of the writer and the various extra information
00061     //necessary for writing a complete rtstructset.
00062     //NOTE: inputs must be set BEFORE calling this function!
00063     //NOTE: the number of outputs for the appendpolydata MUST MATCH the ROI vectors!
00064     void InitializeRTStructSet(vtkStdString inDirectory,
00065         vtkStdString inStructLabel, vtkStdString inStructName,
00066         vtkStringArray* inROINames,
00067         vtkStringArray* inROIAlgorithmName,
00068         vtkStringArray* inROIType);
00069
00070     // make parent class public...
00071     void SetNumberOfInputPorts(int n);
00072
00073 protected:
00074     vtkGDCMPolyDataWriter();
00075     ~vtkGDCMPolyDataWriter();
00076
00077     vtkMedicalImageProperties *MedicalImageProperties;
00078     vtkRTStructSetProperties *RTStructSetProperties;
00079
00080     void WriteData();
00081 //BTX
00082     void WriteRTSTRUCTInfo(gdcm::File &file);
00083     void WriteRTSTRUCTData(gdcm::File &file, int num);
00084 //ETX
00085
00086 private:
00087     vtkGDCMPolyDataWriter(const vtkGDCMPolyDataWriter&); // Not implemented.
00088     void operator=(const vtkGDCMPolyDataWriter&); // Not implemented.
00089 };
00090
00091 #endif

```

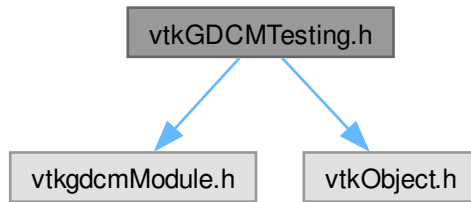
## 13.617 vtkGDCMTesting.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkObject.h"

```

Include dependency graph for vtkGDCMTesting.h:



## Classes

- class [vtkGDCMTesting](#)

## 13.618 vtkGDCMTesting.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014 // .NAME vtkGDCMTesting - GDCM Testing
00015 // .SECTION Description
00016 // GDCM Testing
00017
00018 // .SECTION See Also
00019 // vtkTesting
00020
00021 #ifndef VTKGDCMTESTING_H
00022 #define VTKGDCMTESTING_H
00023
00024 #include "vtkgdcModule.h"
00025 #include "vtkObject.h"
00026
00027 class VTKGDCM_EXPORT vtkGDCMTesting : public vtkObject
00028 {
00029 public:
00030   static vtkGDCMTesting *New();
00031   vtkTypeMacro(vtkGDCMTesting, vtkObject);
00032   void PrintSelf(ostream& os, vtkIndent indent);
00033
00034   static const char *GetVTKDataRoot();
00035   static const char *GetGDCMDataRoot();
00036
00037 //BTX
00038   typedef const char* const (*MD5MetaImagesType)[3];
00039   static const char * const * GetMD5MetaImage(unsigned int file);

```

```

00040 //ETX
00041 static unsigned int GetNumberOfMD5MetaImages();
00042
00043 static const char * GetMHDMD5FromFile(const char *filepath);
00044 static const char * GetRAWMD5FromFile(const char *filepath);
00045
00046 protected:
00047   vtkGDCMTesting();
00048   ~vtkGDCMTesting();
00049
00050 private:
00051   vtkGDCMTesting(const vtkGDCMTesting&); // Not implemented.
00052   void operator=(const vtkGDCMTesting&); // Not implemented.
00053 };
00054
00055 #endif

```

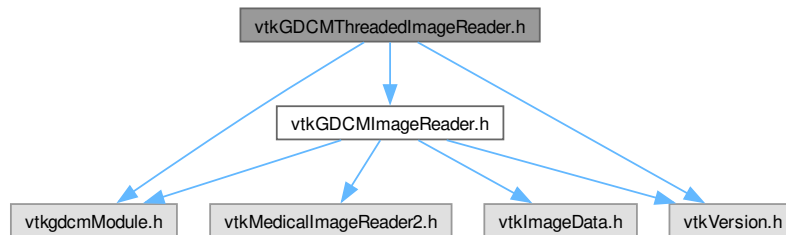
## 13.619 vtkGDCMThreadedImageReader.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkGDCMImageReader.h"
#include "vtkVersion.h"

```

Include dependency graph for vtkGDCMThreadedImageReader.h:



### Classes

- class [vtkGDCMThreadedImageReader](#)

## 13.620 vtkGDCMThreadedImageReader.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.

```

```

00012
00013 =====*/
00014 // .NAME vtkGDCMThreadedImageReader - read DICOM files with multiple threads
00015 // .SECTION Description
00016 // vtkGDCMThreadedImageReader is a source object that reads some DICOM files
00017 // This reader is threaded. Meaning that on a multiple core CPU with N cpu, it will
00018 // read approx N times faster than when reading in a single thread.
00019 //
00020 // .SECTION Warning: Advanced users only. Do not use this class in the general case,
00021 // you have to understand how physically medium works first (sequential reading for
00022 // instance) before playing with this class
00023 //
00024 // .SECTION Implementation note: when FileLowerLeft is set to on the image is not flipped
00025 // upside down as VTK would expect, use this option only if you know what you are doing
00026 //
00027 // .SECTION FIXME: need to implement the other mode where FileLowerLeft is set to OFF
00028 //
00029 // .SECTION FIXME: you need to call SetFileName when reading a volume file (multiple slices DICOM)
00030 // since SetFileNames expect each single file to be single slice (see parent class)
00031 //
00032 // .SECTION BUG: you should really consider using vtkGDCMThreadedImageReader2 instead !
00033 //
00034 // .SECTION See Also
00035 // vtkMedicalImageReader2 vtkMedicalImageProperties vtkGDCMThreadedImageReader2
00036
00037 #ifndef VTKGDCMTHREADEDIMAGEREADER_H
00038 #define VTKGDCMTHREADEDIMAGEREADER_H
00039
00040 #include "vtkgdcmModule.h"
00041 #include "vtkGDCMImageReader.h"
00042 #include "vtkVersion.h"
00043
00044 class VTKGDCM_EXPORT vtkGDCMThreadedImageReader : public vtkGDCMImageReader
00045 {
00046 public:
00047     static vtkGDCMThreadedImageReader *New();
00048     vtkTypeMacro(vtkGDCMThreadedImageReader,vtkGDCMImageReader);
00049     virtual void PrintSelf(ostream& os, vtkIndent indent);
00050
00051     // Description:
00052     // Explicitly set the Rescale Intercept (0028,1052)
00053     vtkSetMacro(Shift,double);
00054
00055     // Description:
00056     // Explicitly get/set the Rescale Slope (0028,1053)
00057     vtkSetMacro(Scale,double);
00058
00059     // Description:
00060     // Determine whether or not reader should use value from Shift/Scale
00061     // Default is 1
00062     vtkSetMacro(UseShiftScale,int);
00063     vtkGetMacro(UseShiftScale,int);
00064     vtkBooleanMacro(UseShiftScale,int);
00065
00066     // Within this class this is allowed to set the Number of Overlays from outside
00067     //vtkSetMacro(NumberOfOverlays,int);
00068
00069 protected:
00070     vtkGDCMThreadedImageReader();
00071     ~vtkGDCMThreadedImageReader();
00072
00073     #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
00074     int RequestInformation(vtkInformation *request,
00075                           vtkInformationVector **inputVector,
00076                           vtkInformationVector *outputVector);
00077     int RequestData(vtkInformation *request,
00078                    vtkInformationVector **inputVector,
00079                    vtkInformationVector *outputVector);
00080     #else /*(VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )*/
00081     void ExecuteInformation();
00082     void ExecuteData(vtkDataObject *out);
00083     #endif /*(VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )*/
00084
00085     void ReadFiles(unsigned int nfiles, const char *filenames[]);
00086     void RequestDataCompat();
00087
00088 private:
00089     vtkGDCMThreadedImageReader(const vtkGDCMThreadedImageReader&); // Not implemented.
00090     void operator=(const vtkGDCMThreadedImageReader&); // Not implemented.
00091
00092     int UseShiftScale;

```

```

00093 };
00094
00095 #endif

```

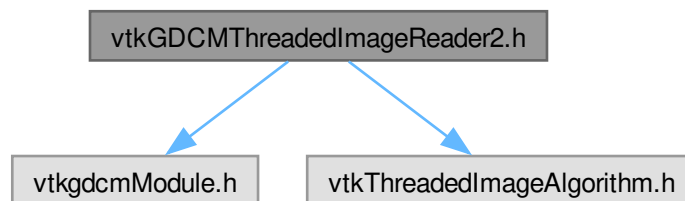
## 13.621 vtkGDCMThreadedImageReader2.h File Reference

```

#include "vtkgdcModule.h"
#include "vtkThreadedImageAlgorithm.h"

```

Include dependency graph for vtkGDCMThreadedImageReader2.h:



### Classes

- class [vtkGDCMThreadedImageReader2](#)

## 13.622 vtkGDCMThreadedImageReader2.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdc.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013   =====*/
00014 // .NAME vtkGDCMThreadedImageReader2 - read DICOM files with multiple threads
00015 // .SECTION Description
00016 // vtkGDCMThreadedImageReader2 is a source object that reads some DICOM files
00017 // This reader is threaded. Meaning that on a multiple core CPU with N cpu, it will
00018 // read approx N times faster than when reading in a single thread assuming the IO is
00019 // not a bottleneck operation.
00020 // If looking for a single threaded class see: vtkGDCMImageReader
00021 //
00022 // .SECTION Warning: Advanced users only. Do not use this class in the general case,
00023 // you have to understand how physically medium works first (sequential reading for
00024 // instance) before playing with this class

```

```

00025 //
00026 // .SECTION Implementation note: when FileLowerLeft is set to on the image is not flipped
00027 // upside down as VTK would expect, use this option only if you know what you are doing
00028 //
00029 // .SECTION FIXME: need to implement the other mode where FileLowerLeft is set to OFF
00030 //
00031 // .SECTION FIXME: need to implement reading of series of 3D files
00032 //
00033 // .SECTION Implementation note: this class is meant to supersede vtkGDCMThreadedImageReader
00034 // because it had support for ProgressEvent support even from python layer. There is a
00035 // subtle trick down in the threading mechanism in VTK were the main thread (talking to the
00036 // python interpreter) is also part of the execution process (and the N-1 other thread
00037 // are just there to execute the remaining of ThreadedRequestData), this separation into
00038 // two types of thread is necessary to achieve a working implementation of UpdateProgress
00039 //
00040 // .SECTION See Also
00041 // vtkMedicalImageReader2 vtkMedicalImageProperties vtkGDCMImageReader
00042 //
00043 #ifndef VTKGDCMTHREADEDIMAGEREADER2_H
00044 #define VTKGDCMTHREADEDIMAGEREADER2_H
00045 //
00046 #include "vtkgdcmModule.h"
00047 #include "vtkThreadedImageAlgorithm.h"
00048 //
00049 class vtkStringArray;
00050 class VTKGDCM_EXPORT vtkGDCMThreadedImageReader2 : public vtkThreadedImageAlgorithm
00051 {
00052 public:
00053     static vtkGDCMThreadedImageReader2 *New();
00054     vtkTypeMacro(vtkGDCMThreadedImageReader2,vtkThreadedImageAlgorithm);
00055     virtual void PrintSelf(ostream& os, vtkIndent indent);
00056 //
00057     vtkGetMacro(FileLowerLeft,int);
00058     vtkSetMacro(FileLowerLeft,int);
00059     vtkBooleanMacro(FileLowerLeft,int);
00060 //
00061     vtkGetMacro(NumberOfOverlays,int);
00062 //
00063     vtkSetMacro(DataScalarType,int);
00064     vtkGetMacro(DataScalarType,int);
00065 //
00066     vtkSetMacro(NumberOfScalarComponents,int);
00067     vtkGetMacro(NumberOfScalarComponents,int);
00068 //
00069     vtkGetMacro(LoadOverlays,int);
00070     vtkSetMacro(LoadOverlays,int);
00071     vtkBooleanMacro(LoadOverlays,int);
00072 //
00073     vtkSetVector6Macro(DataExtent,int);
00074     vtkGetVector6Macro(DataExtent,int);
00075 //
00076     vtkSetVector3Macro(DataOrigin,double);
00077     vtkGetVector3Macro(DataOrigin,double);
00078 //
00079     vtkSetVector3Macro(DataSpacing,double);
00080     vtkGetVector3Macro(DataSpacing,double);
00081 //
00082     //vtkGetStringMacro(FileName);
00083     //vtkSetStringMacro(FileName);
00084     virtual const char *GetFileName(int i = 0);
00085     virtual void SetFileName(const char *filename);
00086 //
00087     virtual void SetFileNames(vtkStringArray*);
00088     vtkGetObjectMacro(FileNames, vtkStringArray);
00089 //
00090     int SplitExtent(int splitExt[6], int startExt[6],
00091                     int num, int total);
00092 //
00093     // Description:
00094     // Explicitly set the Rescale Intercept (0028,1052)
00095     vtkSetMacro(Shift,double);
00096     vtkGetMacro(Shift,double);
00097 //
00098     // Description:
00099     // Explicitly get/set the Rescale Slope (0028,1053)
00100     vtkSetMacro(Scale,double);
00101     vtkGetMacro(Scale,double);
00102 //
00103     // Description:
00104     // Determine whether or not reader should use value from Shift/Scale
00105     // Default is 1

```



```

00106   vtkSetMacro(UseShiftScale,int);
00107   vtkGetMacro(UseShiftScale,int);
00108   vtkBooleanMacro(UseShiftScale,int);
00109
00110 protected:
00111   vtkGDCMThreadedImageReader2();
00112   ~vtkGDCMThreadedImageReader2();
00113
00114   int RequestInformation(vtkInformation *request,
00115                         vtkInformationVector **inputVector,
00116                         vtkInformationVector *outputVector);
00117
00118 protected:
00119   void ThreadedRequestData (
00120     vtkInformation * request,
00121     vtkInformationVector** inputVector,
00122     vtkInformationVector * outputVector,
00123     vtkImageData ***inData,
00124     vtkImageData **outData,
00125     int outExt[6], int id);
00126
00127 private:
00128   int FileLowerLeft;
00129   char *FileName;
00130   vtkStringArray *FileNames;
00131   int LoadIconImage;
00132   int DataExtent[6];
00133   int LoadOverlays;
00134   int NumberOfOverlays;
00135   int DataScalarType;
00136
00137   int NumberOfScalarComponents;
00138   double DataSpacing[3];
00139   double DataOrigin[3];
00140   int IconImageDataExtent[6];
00141
00142   double Shift;
00143   double Scale;
00144   int UseShiftScale;
00145
00146 private:
00147   vtkGDCMThreadedImageReader2(const vtkGDCMThreadedImageReader2&); // Not implemented.
00148   void operator=(const vtkGDCMThreadedImageReader2&); // Not implemented.
00149 };
00150
00151 #endif

```

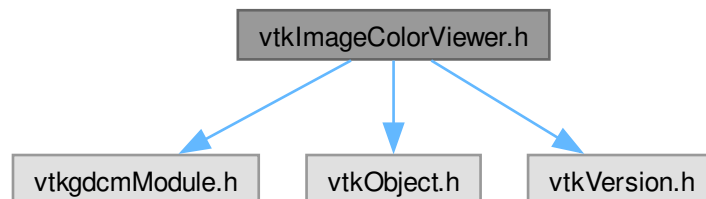
## 13.623 vtkImageColorViewer.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkObject.h"
#include "vtkVersion.h"

```

Include dependency graph for vtkImageColorViewer.h:



## Classes

- class [vtkImageColorViewer](#)

## 13.624 vtkImageColorViewer.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
00006   All rights reserved.
00007   See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 // .NAME vtkImageColorViewer - Display a 2D image.
00015 // .SECTION Description
00016 // vtkImageColorViewer is a convenience class for displaying a 2D image. It
00017 // packages up the functionality found in vtkRenderWindow, vtkRenderer,
00018 // vtkImageActor and vtkImageMapToWindowLevelColors into a single easy to use
00019 // class. This class also creates an image interactor style
00020 // (vtkInteractorStyleImage) that allows zooming and panning of images, and
00021 // supports interactive window/level operations on the image. Note that
00022 // vtkImageColorViewer is simply a wrapper around these classes.
00023 //
00024 // vtkImageColorViewer uses the 3D rendering and texture mapping engine
00025 // to draw an image on a plane. This allows for rapid rendering,
00026 // zooming, and panning. The image is placed in the 3D scene at a
00027 // depth based on the z-coordinate of the particular image slice. Each
00028 // call to SetSlice() changes the image data (slice) displayed AND
00029 // changes the depth of the displayed slice in the 3D scene. This can
00030 // be controlled by the AutoAdjustCameraClippingRange ivar of the
00031 // InteractorStyle member.
00032 //
00033 // It is possible to mix images and geometry, using the methods:
00034 //
00035 // viewer->SetInput( myImage );
00036 // viewer->GetRenderer()->AddActor( myActor );
00037 //
00038 // This can be used to annotate an image with a PolyData of "edges" or
00039 // or highlight sections of an image or display a 3D isosurface
00040 // with a slice from the volume, etc. Any portions of your geometry
00041 // that are in front of the displayed slice will be visible; any
00042 // portions of your geometry that are behind the displayed slice will
00043 // be obscured. A more general framework (with respect to viewing
00044 // direction) for achieving this effect is provided by the
00045 // vtkImagePlaneWidget .
00046 //
00047 // Note that pressing 'r' will reset the window/level and pressing
00048 // shift+'r' or control+'r' will reset the camera.
00049 //
00050 // .SECTION See Also
00051 // vtkRenderWindow vtkRenderer vtkImageActor vtkImageMapToWindowLevelColors
00052
00053 #ifndef VTKIMAGECOLORVIEWER_H
00054 #define VTKIMAGECOLORVIEWER_H
00055
00056 #include "vtkgdcmModule.h"
00057 #include "vtkObject.h"
00058 #include "vtkVersion.h"
00059
00060 class vtkAlgorithm;
00061 class vtkAlgorithmOutput;
00062 class vtkImageActor;
00063 class vtkImageData;
00064 class vtkImageMapToWindowLevelColors2;
00065 class vtkInformation;
00066 class vtkInteractorStyleImage;

```

```

00067 class vtkRenderWindow;
00068 class vtkRenderer;
00069 class vtkRenderWindowInteractor;
00070 class vtkPolyData;
00071
00072 class VTKGDCM_EXPORT vtkImageColorViewer : public vtkObject
00073 {
00074 public:
00075     static vtkImageColorViewer *New();
00076     vtkTypeMacro(vtkImageColorViewer,vtkObject);
00077     void PrintSelf(ostream& os, vtkIndent indent);
00078
00079     // Description:
00080     // Get the name of rendering window.
00081     virtual const char *GetWindowName();
00082
00083     // Description:
00084     // Render the resulting image.
00085     virtual void Render(void);
00086
00087     // Description:
00088     // Set/Get the input image to the viewer.
00089     #if (VTK_MAJOR_VERSION >= 6)
00090     virtual void SetInputData(vtkImageData *in);
00091     #else
00092     virtual void SetInput(vtkImageData *in);
00093     #endif
00094     virtual vtkImageData *GetInput();
00095     virtual void SetInputConnection(vtkAlgorithmOutput* input);
00096     virtual void AddInputConnection(vtkAlgorithmOutput* input);
00097     virtual void AddInput(vtkImageData * input);
00098     //virtual void AddInput(vtkPolyData * input);
00099
00100     double GetOverlayVisibility();
00101     void SetOverlayVisibility(double vis);
00102
00103     // Description:
00104     // Set/get the slice orientation
00105     //BTX
00106     enum
00107     {
00108         SLICE_ORIENTATION_YZ = 0,
00109         SLICE_ORIENTATION_XZ = 1,
00110         SLICE_ORIENTATION_XY = 2
00111     };
00112     //ETX
00113     vtkGetMacro(SliceOrientation, int);
00114     virtual void SetSliceOrientation(int orientation);
00115     virtual void SetSliceOrientationToXY()
00116     { this->SetSliceOrientation(vtkImageColorViewer::SLICE_ORIENTATION_XY); };
00117     virtual void SetSliceOrientationToYZ()
00118     { this->SetSliceOrientation(vtkImageColorViewer::SLICE_ORIENTATION_YZ); };
00119     virtual void SetSliceOrientationToXZ()
00120     { this->SetSliceOrientation(vtkImageColorViewer::SLICE_ORIENTATION_XZ); };
00121
00122     // Description:
00123     // Set/Get the current slice to display (depending on the orientation
00124     // this can be in X, Y or Z).
00125     vtkGetMacro(Slice, int);
00126     virtual void SetSlice(int s);
00127
00128     // Description:
00129     // Update the display extent manually so that the proper slice for the
00130     // given orientation is displayed. It will also try to set a
00131     // reasonable camera clipping range.
00132     // This method is called automatically when the Input is changed, but
00133     // most of the time the input of this class is likely to remain the same,
00134     // i.e. connected to the output of a filter, or an image reader. When the
00135     // input of this filter or reader itself is changed, an error message might
00136     // be displayed since the current display extent is probably outside
00137     // the new whole extent. Calling this method will ensure that the display
00138     // extent is reset properly.
00139     virtual void UpdateDisplayExtent();
00140
00141     // Description:
00142     // Return the minimum and maximum slice values (depending on the orientation
00143     // this can be in X, Y or Z).
00144     virtual int GetSliceMin();
00145     virtual int GetSliceMax();
00146     virtual void GetSliceRange(int range[2])
00147     { this->GetSliceRange(range[0], range[1]); }

```

```

00148     virtual void GetSliceRange(int &min, int &max);
00149     virtual int* GetSliceRange();
00150
00151     // Description:
00152     // Set window and level for mapping pixels to colors.
00153     virtual double GetColorWindow();
00154     virtual double GetColorLevel();
00155     virtual void SetColorWindow(double s);
00156     virtual void SetColorLevel(double s);
00157
00158     // Description:
00159     // These are here when using a Tk window.
00160     virtual void SetDisplayId(void *a);
00161     virtual void SetWindowId(void *a);
00162     virtual void SetParentId(void *a);
00163
00164     // Description:
00165     // Set/Get the position in screen coordinates of the rendering window.
00166     virtual int* GetPosition();
00167     virtual void SetPosition(int a,int b);
00168     virtual void SetPosition(int a[2]) { this->SetPosition(a[0],a[1]); }
00169
00170     // Description:
00171     // Set/Get the size of the window in screen coordinates in pixels.
00172     virtual int* GetSize();
00173     virtual void SetSize(int a, int b);
00174     virtual void SetSize(int a[2]) { this->SetSize(a[0],a[1]); }
00175
00176     // Description:
00177     // Get the internal render window, renderer, image actor, and
00178     // image map instances.
00179     vtkGetObjectMacro(RenderWindow,vtkRenderWindow);
00180     vtkGetObjectMacro(Renderer, vtkRenderer);
00181     vtkGetObjectMacro(ImageActor,vtkImageActor);
00182     vtkGetObjectMacro(WindowLevel,vtkImageMapToWindowLevelColors2);
00183     vtkGetObjectMacro(InteractorStyle,vtkInteractorStyleImage);
00184
00185     // Description:
00186     // Set your own renderwindow and renderer
00187     virtual void SetRenderWindow(vtkRenderWindow *arg);
00188     virtual void SetRenderer(vtkRenderer *arg);
00189
00190     // Description:
00191     // Attach an interactor for the internal render window.
00192     virtual void SetupInteractor(vtkRenderWindowInteractor*);
00193
00194     // Description:
00195     // Create a window in memory instead of on the screen. This may not
00196     // be supported for every type of window and on some windows you may
00197     // need to invoke this prior to the first render.
00198     virtual void SetOffScreenRendering(int);
00199     virtual int GetOffScreenRendering();
00200     vtkBooleanMacro(OffScreenRendering,int);
00201
00202 protected:
00203     vtkImageColorViewer();
00204     ~vtkImageColorViewer();
00205
00206     virtual void InstallPipeline();
00207     virtual void UnInstallPipeline();
00208
00209     vtkImageMapToWindowLevelColors2 *WindowLevel;
00210     vtkRenderWindow *RenderWindow;
00211     vtkRenderer *Renderer;
00212     vtkImageActor *ImageActor;
00213     vtkImageActor *OverlayImageActor;
00214     vtkRenderWindowInteractor *Interactor;
00215     vtkInteractorStyleImage *InteractorStyle;
00216
00217     int SliceOrientation;
00218     int FirstRender;
00219     int Slice;
00220
00221     virtual void UpdateOrientation();
00222
00223 #if (VTK_MAJOR_VERSION >= 6)
00224     vtkAlgorithm* GetInputAlgorithm();
00225     vtkInformation* GetInputInformation();
00226 #endif
00227
00228     friend class vtkImageColorViewerCallback;

```

```

00229
00230 private:
00231     vtkImageColorViewer(const vtkImageColorViewer&); // Not implemented.
00232     void operator=(const vtkImageColorViewer&); // Not implemented.
00233 };
00234
00235 #endif

```

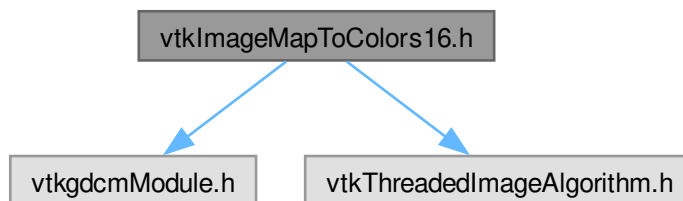
## 13.625 vtkImageMapToColors16.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkThreadedImageAlgorithm.h"

```

Include dependency graph for vtkImageMapToColors16.h:



### Classes

- class [vtkImageMapToColors16](#)

## 13.626 vtkImageMapToColors16.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002
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00011     PURPOSE. See the above copyright notice for more information.
00012
00013     =====*/
00014 /*=====
00015
00016     Portions of this file are subject to the VTK Toolkit Version 3 copyright.
00017
00018     Program:   Visualization Toolkit
00019     Module:    $RCSfile: vtkImageMapToColors16.h,v $
00020

```

```

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00025     This software is distributed WITHOUT ANY WARRANTY; without even
00026     the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00027     PURPOSE. See the above copyright notice for more information.
00028
00029 =====*/
00030 // .NAME vtkImageMapToColors16 - map the input image through a lookup table
00031 // .SECTION Description
00032 // The vtkImageMapToColors16 filter will take an input image of any valid
00033 // scalar type, and map the first component of the image through a
00034 // lookup table. The result is an image of type VTK_UNSIGNED_CHAR.
00035 // If the lookup table is not set, or is set to NULL, then the input
00036 // data will be passed through if it is already of type VTK_UNSIGNED_CHAR.
00037
00038 // .SECTION See Also
00039 // vtkLookupTable vtkScalarsToColors
00040
00041 #ifndef VTKIMAGEMAPTOCOLORS16_H
00042 #define VTKIMAGEMAPTOCOLORS16_H
00043
00044
00045 #include "vtkgdcmModule.h"
00046 #include "vtkThreadedImageAlgorithm.h"
00047
00048 class vtkScalarsToColors;
00049
00050 class VTKGDCM_EXPORT vtkImageMapToColors16 : public vtkThreadedImageAlgorithm
00051 {
00052 public:
00053     static vtkImageMapToColors16 *New();
00054     vtkTypeMacro(vtkImageMapToColors16,vtkThreadedImageAlgorithm);
00055     void PrintSelf(ostream& os, vtkIndent indent);
00056
00057     // Description:
00058     // Set the lookup table.
00059     virtual void SetLookupTable(vtkScalarsToColors*);
00060     vtkGetObjectMacro(LookupTable,vtkScalarsToColors);
00061
00062     // Description:
00063     // Set the output format, the default is RGBA.
00064     vtkSetMacro(OutputFormat,int);
00065     vtkGetMacro(OutputFormat,int);
00066     void SetOutputFormatToRGBA() { this->OutputFormat = VTK_RGBA; };
00067     void SetOutputFormatToRGB() { this->OutputFormat = VTK_RGB; };
00068     void SetOutputFormatToLuminanceAlpha() { this->OutputFormat = VTK_LUMINANCE_ALPHA; };
00069     void SetOutputFormatToLuminance() { this->OutputFormat = VTK_LUMINANCE; };
00070
00071     // Description:
00072     // Set the component to map for multi-component images (default: 0)
00073     vtkSetMacro(ActiveComponent,int);
00074     vtkGetMacro(ActiveComponent,int);
00075
00076     // Description:
00077     // Use the alpha component of the input when computing the alpha component
00078     // of the output (useful when converting monochrome+alpha data to RGBA)
00079     vtkSetMacro(PassAlphaToOutput,int);
00080     vtkBooleanMacro(PassAlphaToOutput,int);
00081     vtkGetMacro(PassAlphaToOutput,int);
00082
00083     // Description:
00084     // We need to check the modified time of the lookup table too.
00085     #ifndef VTK_HAS_MTIME_TYPE
00086     virtual vtkMTimeType GetMTime();
00087     #else
00088     virtual unsigned long GetMTime();
00089     #endif
00090
00091 protected:
00092     vtkImageMapToColors16();
00093     ~vtkImageMapToColors16();
00094
00095     virtual int RequestInformation (vtkInformation *, vtkInformationVector **, vtkInformationVector *);
00096
00097     void ThreadedRequestData(vtkInformation *request,
00098                             vtkInformationVector **inputVector,
00099                             vtkInformationVector *outputVector,
00100                             vtkImageData ***inData, vtkImageData **outData,
00101                             int extent[6], int id);

```

```

00102
00103     virtual int RequestData(vtkInformation *request,
00104                             vtkInformationVector **inputVector,
00105                             vtkInformationVector *outputVector);
00106
00107     vtkScalarsToColors *LookupTable;
00108     int OutputFormat;
00109
00110     int ActiveComponent;
00111     int PassAlphaToOutput;
00112
00113     int DataWasPassed;
00114 private:
00115     vtkImageMapToColors16(const vtkImageMapToColors16&); // Not implemented.
00116     void operator=(const vtkImageMapToColors16&); // Not implemented.
00117 };
00118
00119 #endif

```

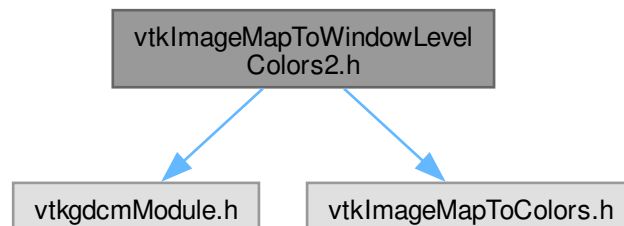
## 13.627 vtkImageMapToWindowLevelColors2.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkImageMapToColors.h"

```

Include dependency graph for vtkImageMapToWindowLevelColors2.h:



### Classes

- class [vtkImageMapToWindowLevelColors2](#)

## 13.628 vtkImageMapToWindowLevelColors2.h

[Go to the documentation of this file.](#)

```

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```

```

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00012
00013      =====*/
00014  /*=====
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00017
00018      Program:   Visualization Toolkit
00019      Module:    $RCSfile: vtkImageMapToWindowLevelColors2.h,v $
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00026      the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
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00028
00029      =====*/
00030  // .NAME vtkImageMapToWindowLevelColors2 - map the input image through a lookup table and window / level
    it
00031  // .SECTION Description
00032  // The vtkImageMapToWindowLevelColors2 filter will take an input image of any
00033  // valid scalar type, and map the first component of the image through a
00034  // lookup table. This resulting color will be modulated with value obtained
00035  // by a window / level operation. The result is an image of type
00036  // VTK_UNSIGNED_CHAR. If the lookup table is not set, or is set to NULL, then
00037  // the input data will be passed through if it is already of type
00038  // UNSIGNED_CHAR.
00039  //
00040  // .SECTION See Also
00041  // vtkLookupTable vtkScalarsToColors
00042
00043  #ifndef VTKIMAGEMAPTOWINDOWLEVELCOLORS2_H
00044  #define VTKIMAGEMAPTOWINDOWLEVELCOLORS2_H
00045
00046  #include "vtkgdcmModule.h"
00047  #include "vtkImageMapToColors.h"
00048
00049  class VTKGDCM_EXPORT vtkImageMapToWindowLevelColors2 : public vtkImageMapToColors
00050  {
00051  public:
00052      static vtkImageMapToWindowLevelColors2 *New();
00053      vtkTypeMacro(vtkImageMapToWindowLevelColors2,vtkImageMapToColors);
00054      void PrintSelf(ostream& os, vtkIndent indent);
00055
00056      // Description:
00057      // Set / Get the Window to use -> modulation will be performed on the
00058      // color based on (S - (L - W/2))/W where S is the scalar value, L is
00059      // the level and W is the window.
00060      vtkSetMacro( Window, double );
00061      vtkGetMacro( Window, double );
00062
00063      // Description:
00064      // Set / Get the Level to use -> modulation will be performed on the
00065      // color based on (S - (L - W/2))/W where S is the scalar value, L is
00066      // the level and W is the window.
00067      vtkSetMacro( Level, double );
00068      vtkGetMacro( Level, double );
00069
00070  protected:
00071      vtkImageMapToWindowLevelColors2();
00072      ~vtkImageMapToWindowLevelColors2();
00073
00074      virtual int RequestInformation (vtkInformation *, vtkInformationVector **, vtkInformationVector *);
00075      void ThreadedRequestData(vtkInformation *request,
00076                              vtkInformationVector **inputVector,
00077                              vtkInformationVector *outputVector,
00078                              vtkImageData **inData, vtkImageData **outData,
00079                              int extent[6], int id);
00080      virtual int RequestData(vtkInformation *request,
00081                              vtkInformationVector **inputVector,
00082                              vtkInformationVector *outputVector);
00083
00084      double Window;
00085      double Level;
00086
00087  private:
00088      vtkImageMapToWindowLevelColors2(const vtkImageMapToWindowLevelColors2&); // Not implemented.

```



```

00089 void operator=(const vtkImageMapToWindowLevelColors2&); // Not implemented.
00090 };
00091
00092 #endif

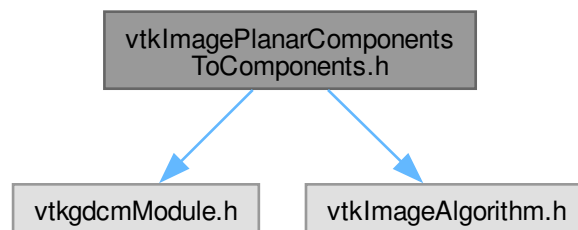
```

## 13.629 vtkImagePlanarComponentsToComponents.h File Reference

```
#include "vtkgdcmModule.h"
```

```
#include "vtkImageAlgorithm.h"
```

Include dependency graph for vtkImagePlanarComponentsToComponents.h:



### Classes

- class [vtkImagePlanarComponentsToComponents](#)

## 13.630 vtkImagePlanarComponentsToComponents.h

[Go to the documentation of this file.](#)

```

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00012
00013 =====*/
00014 /*=====
00015
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00017
00018 Program: Visualization Toolkit
00019 Module: $RCSfile: vtkImagePlanarComponentsToComponents.h,v $
00020
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```

```

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00028
00029 =====*/
00030 // .NAME vtkImagePlanarComponentsToComponents - Converts planar comp to pixel comp
00031 // .SECTION Description
00032
00033 // .SECTION See Also
00034 // TODO: Can I make this filter threaded ?
00035 // TODO: How do I handle the VTK-flipping (FileLowerLeft)?
00036
00037 #ifndef VTKIMAGEPLANARCOMPONENTSTOCOMPONENTS_H
00038 #define VTKIMAGEPLANARCOMPONENTSTOCOMPONENTS_H
00039
00040 #include "vtkgdcmModule.h"
00041 #include "vtkImageAlgorithm.h"
00042
00043 // everything is now handled within the vtkGDCMImageReader as Planar Configuration can not
00044 // be externalized (conflict with file lower left)
00045
00046 #error do not use this class
00047
00048 //class VTKGDCM_EXPORT vtkImagePlanarComponentsToComponents : public vtkThreadedImageAlgorithm
00049 class VTKGDCM_EXPORT vtkImagePlanarComponentsToComponents : public vtkImageAlgorithm
00050 {
00051 public:
00052     static vtkImagePlanarComponentsToComponents *New();
00053     //vtkTypeMacro(vtkImagePlanarComponentsToComponents,vtkThreadedImageAlgorithm);
00054     vtkTypeMacro(vtkImagePlanarComponentsToComponents,vtkImageAlgorithm);
00055
00056     void PrintSelf(ostream& os, vtkIndent indent);
00057
00058 protected:
00059     vtkImagePlanarComponentsToComponents();
00060     ~vtkImagePlanarComponentsToComponents() {};
00061
00062 // void ThreadedExecute (vtkImageData *inData, vtkImageData *outData,
00063 // int ext[6], int id);
00064 // virtual int RequestInformation (vtkInformation *, vtkInformationVector**, vtkInformationVector *);
00065 virtual int RequestData(vtkInformation *, vtkInformationVector **, vtkInformationVector *);
00066
00067 private:
00068     vtkImagePlanarComponentsToComponents(const vtkImagePlanarComponentsToComponents&); // Not implemented.
00069     void operator=(const vtkImagePlanarComponentsToComponents&); // Not implemented.
00070 };
00071
00072 #endif

```

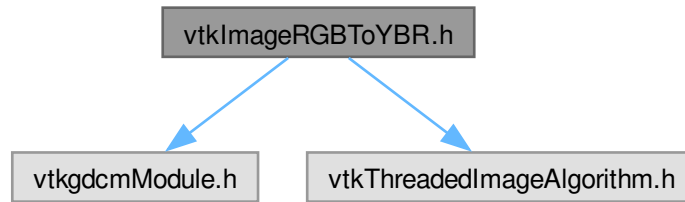
## 13.631 vtkImageRGBToYBR.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkThreadedImageAlgorithm.h"

```

Include dependency graph for vtkImageRGBToYBR.h:



## Classes

- class [vtkImageRGBToYBR](#)

## 13.632 vtkImageRGBToYBR.h

[Go to the documentation of this file.](#)

```

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00012
00013 =====*/
00014 /*=====
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00018   Program:   Visualization Toolkit
00019   Module:    $RCSfile: vtkImageRGBToYBR.h,v $
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00027       PURPOSE.  See the above copyright notice for more information.
00028
00029 =====*/
00030 // .NAME vtkImageRGBToYBR - Converts YBR components to RGB.
00031 // .SECTION Description
00032 // For each pixel with hue, saturation and value components this filter
00033 // outputs the color coded as red, green, blue. Output type must be the same
00034 // as input type.
00035
00036 // .SECTION See Also
00037 // vtkImageRGBToHSV
00038
00039 #ifndef VTKIMAGERGBTOYBR_H

```

```

00040 #define VTKIMAGERGBTOYBR_H
00041
00042 #include "vtkgdcmModule.h"
00043 #include "vtkThreadedImageAlgorithm.h"
00044
00045 class VTKGDCM_EXPORT vtkImageRGBToYBR : public vtkThreadedImageAlgorithm
00046 {
00047 public:
00048     static vtkImageRGBToYBR *New();
00049     vtkTypeMacro(vtkImageRGBToYBR,vtkThreadedImageAlgorithm);
00050
00051     void PrintSelf(ostream& os, vtkIndent indent);
00052
00053 protected:
00054     vtkImageRGBToYBR();
00055     ~vtkImageRGBToYBR() {};
00056
00057     void ThreadedExecute (vtkImageData *inData, vtkImageData *outData,
00058                          int ext[6], int id);
00059 private:
00060     vtkImageRGBToYBR(const vtkImageRGBToYBR&); // Not implemented.
00061     void operator=(const vtkImageRGBToYBR&); // Not implemented.
00062 };
00063
00064 #endif

```

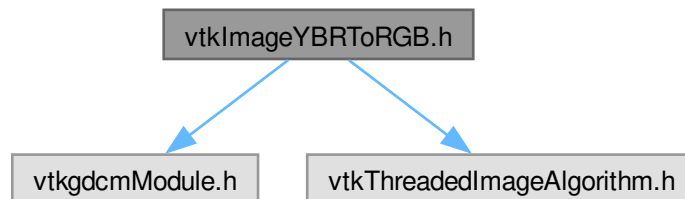
### 13.633 vtkImageYBRToRGB.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkThreadedImageAlgorithm.h"

```

Include dependency graph for vtkImageYBRToRGB.h:



#### Classes

- class [vtkImageYBRToRGB](#)

### 13.634 vtkImageYBRToRGB.h

[Go to the documentation of this file.](#)

```

00001 /*=====
00002

```

```

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00012
00013  =====*/
00014  /*=====
00015
00016      Portions of this file are subject to the VTK Toolkit Version 3 copyright.
00017
00018  Program: Visualization Toolkit
00019  Module:   $RCSfile: vtkImageYBRToRGB.h,v $
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00027      PURPOSE. See the above copyright notice for more information.
00028
00029  =====*/
00030  // .NAME vtkImageYBRToRGB - Converts YBR components to RGB.
00031  // .SECTION Description
00032  // For each pixel with hue, saturation and value components this filter
00033  // outputs the color coded as red, green, blue. Output type must be the same
00034  // as input type.
00035
00036  // .SECTION See Also
00037  // vtkImageRGBToHSV
00038
00039  #ifndef VTKIMAGERYBRTORGB_H
00040  #define VTKIMAGERYBRTORGB_H
00041
00042  #include "vtkgdcmModule.h"
00043  #include "vtkThreadedImageAlgorithm.h"
00044
00045  class VTKGDCM_EXPORT vtkImageYBRToRGB : public vtkThreadedImageAlgorithm
00046  {
00047  public:
00048      static vtkImageYBRToRGB *New();
00049      vtkTypeMacro(vtkImageYBRToRGB,vtkThreadedImageAlgorithm);
00050
00051      void PrintSelf(ostream& os, vtkIndent indent);
00052
00053  protected:
00054      vtkImageYBRToRGB();
00055      ~vtkImageYBRToRGB() {};
00056
00057      void ThreadedExecute (vtkImageData *inData, vtkImageData *outData,
00058                          int ext[6], int id);
00059  private:
00060      vtkImageYBRToRGB(const vtkImageYBRToRGB&); // Not implemented.
00061      void operator=(const vtkImageYBRToRGB&); // Not implemented.
00062  };
00063
00064  #endif

```

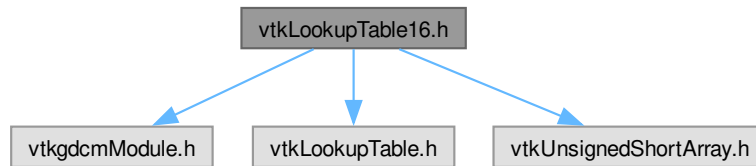
## 13.635 vtkLookupTable16.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkLookupTable.h"
#include "vtkUnsignedShortArray.h"

```

Include dependency graph for vtkLookupTable16.h:



## Classes

- class [vtkLookupTable16](#)

## 13.636 vtkLookupTable16.h

[Go to the documentation of this file.](#)

```

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00012
00013   =====*/
00014 /*=====
00015
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00018   Program: Visualization Toolkit
00019   Module:   $RCSfile: vtkLookupTable16.h,v $
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00028
00029   =====*/
00030 // .NAME vtkLookupTable16 -
00031 // .SECTION Description
00032 //
00033 // .SECTION Caveats
00034 //
00035 // .SECTION See Also
00036 // vtkLookupTable
00037
00038 #ifndef VTKLOOKUPTABLE16_H
00039 #define VTKLOOKUPTABLE16_H
00040
00041 #include "vtkgdcmModule.h"
00042 #include "vtkLookupTable.h"
00043 #include "vtkUnsignedShortArray.h"

```

```

00044
00045 class VTKGDCM_EXPORT vtkLookupTable16 : public vtkLookupTable
00046 {
00047 public:
00048     static vtkLookupTable16 *New();
00049
00050     vtkTypeMacro(vtkLookupTable16,vtkLookupTable);
00051     void PrintSelf(ostream& os, vtkIndent indent);
00052
00053     void Build();
00054
00055     void SetNumberOfTableValues(vtkIdType number);
00056
00057     unsigned char *WritePointer(const vtkIdType id, const int number);
00058
00059     unsigned short *GetPointer(const vtkIdType id) {
00060         return this->Table16->GetPointer(4*id); };
00061
00062 protected:
00063     vtkLookupTable16(int size=256, int ext=256);
00064     ~vtkLookupTable16();
00065
00066     vtkUnsignedShortArray *Table16;
00067
00068     void MapScalarsThroughTable2(void *input,
00069                                 unsigned char *output,
00070                                 int inputDataType,
00071                                 int numberOfValues,
00072                                 int inputIncrement,
00073                                 int outputFormat);
00074
00075 private:
00076     vtkLookupTable16(const vtkLookupTable16&); // Not implemented.
00077     void operator=(const vtkLookupTable16&); // Not implemented.
00078 };
00079
00080 //-----
00081 inline unsigned char *vtkLookupTable16::WritePointer(const vtkIdType id,
00082                                                       const int number)
00083 {
00084     //this->InsertTime.Modified();
00085     return (unsigned char*)this->Table16->WritePointer(4*id,4*number);
00086 }
00087
00088 #endif

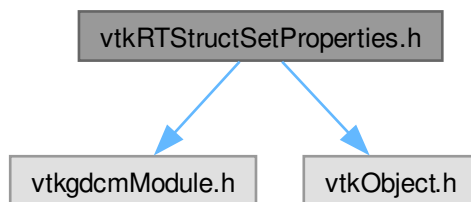
```

## 13.637 vtkRTStrutSetProperties.h File Reference

```
#include "vtkgdcModule.h"
```

```
#include "vtkObject.h"
```

Include dependency graph for vtkRTStrutSetProperties.h:



## Classes

- class [vtkRTStructSetProperties](#)

## 13.638 vtkRTStructSetProperties.h

[Go to the documentation of this file.](#)

```

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00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013 =====*/
00014 // .NAME vtkRTStructSetProperties - some rtstruct properties.
00015 // .SECTION Description
00016 //
00017 // .SECTION See Also
00018 // vtkGDCMPolyDataReader vtkGDCMPolyDataWriter
00019
00020 #ifndef VTKRTSTRUCTSETPROPERTIES_H
00021 #define VTKRTSTRUCTSETPROPERTIES_H
00022
00023 #include "vtkgdcmModule.h"
00024 #include "vtkObject.h"
00025
00026 class vtkRTStructSetPropertiesInternals;
00027
00028 class VTKGDCM_EXPORT vtkRTStructSetProperties : public vtkObject
00029 {
00030 public:
00031   static vtkRTStructSetProperties *New();
00032   vtkTypeMacro(vtkRTStructSetProperties,vtkObject);
00033   void PrintSelf(ostream& os, vtkIndent indent);
00034
00035   // Description:
00036   // Convenience method to reset all fields to an empty string/value
00037   virtual void Clear();
00038
00039   // Description:
00040   //
00041   vtkSetStringMacro(StructureSetLabel);
00042   vtkGetStringMacro(StructureSetLabel);
00043
00044   vtkSetStringMacro(StructureSetName);
00045   vtkGetStringMacro(StructureSetName);
00046
00047   vtkSetStringMacro(StructureSetDate);
00048   vtkGetStringMacro(StructureSetDate);
00049
00050   vtkSetStringMacro(StructureSetTime);
00051   vtkGetStringMacro(StructureSetTime);
00052
00053   vtkSetStringMacro(SOPInstanceUID);
00054   vtkGetStringMacro(SOPInstanceUID);
00055
00056   vtkSetStringMacro(StudyInstanceUID);
00057   vtkGetStringMacro(StudyInstanceUID);
00058
00059   vtkSetStringMacro(SeriesInstanceUID);
00060   vtkGetStringMacro(SeriesInstanceUID);
00061
00062   vtkSetStringMacro(ReferenceSeriesInstanceUID);
00063   vtkGetStringMacro(ReferenceSeriesInstanceUID);
00064
00065   vtkSetStringMacro(ReferenceFrameOfReferenceUID);
00066   vtkGetStringMacro(ReferenceFrameOfReferenceUID);

```



```

00067
00068 // Description:
00069 // Copy the contents of p to this instance.
00070 virtual void DeepCopy(vtkRTStructSetProperties *p);
00071
00072 void AddContourReferencedFrameOfReference( vtkIdType pdnum, const char *classuid , const char *
instanceuid );
00073 const char *GetContourReferencedFrameOfReferenceClassUID( vtkIdType pdnum, vtkIdType id );
00074 const char *GetContourReferencedFrameOfReferenceInstanceUID( vtkIdType pdnum, vtkIdType id );
00075 vtkIdType GetNumberOfContourReferencedFrameOfReferences();
00076 vtkIdType GetNumberOfContourReferencedFrameOfReferences(vtkIdType pdnum);
00077
00078 void AddReferencedFrameOfReference( const char *classuid , const char * instanceuid );
00079 const char *GetReferencedFrameOfReferenceClassUID( vtkIdType id );
00080 const char *GetReferencedFrameOfReferenceInstanceUID( vtkIdType id );
00081 vtkIdType GetNumberOfReferencedFrameOfReferences();
00082
00083 void AddStructureSetROI( int roinumber,
00084     const char* refframerefid,
00085     const char* roiname,
00086     const char* ROIGenerationAlgorithm,
00087     const char* ROIDescription = 0
00088 );
00089 void AddStructureSetROIObservation( int refnumber,
00090     int observationnumber,
00091     const char *rtroiinterpretedtype,
00092     const char *roiinterpreter,
00093     const char *roiobservationlabel = 0
00094 );
00095
00096 vtkIdType GetNumberOfStructureSetROIs();
00097 int GetStructureSetObservationNumber(vtkIdType id);
00098 int GetStructureSetROIInumber(vtkIdType id);
00099 const char *GetStructureSetROIRefFrameRefUID(vtkIdType);
00100 const char *GetStructureSetROIName(vtkIdType);
00101 const char *GetStructureSetROIGenerationAlgorithm(vtkIdType);
00102 const char *GetStructureSetROIDescription(vtkIdType id);
00103 const char *GetStructureSetRTROIInterpretedType(vtkIdType id);
00104 const char *GetStructureSetROIObservationLabel(vtkIdType id);
00105
00106 protected:
00107     vtkRTStructSetProperties();
00108     ~vtkRTStructSetProperties();
00109
00110     char *StructureSetLabel;
00111     char *StructureSetName;
00112     char *StructureSetDate;
00113     char *StructureSetTime;
00114
00115     char *SOPInstanceUID;
00116     char *StudyInstanceUID;
00117     char *SeriesInstanceUID;
00118
00119     char *ReferenceSeriesInstanceUID;
00120     char *ReferenceFrameOfReferenceUID;
00121
00122 // Description:
00123 // PIMPL Encapsulation for STL containers
00124 //BTX
00125 vtkRTStructSetPropertiesInternals *Internals;
00126 //ETX
00127
00128 private:
00129     vtkRTStructSetProperties(const vtkRTStructSetProperties&); // Not implemented.
00130     void operator=(const vtkRTStructSetProperties&); // Not implemented.
00131 };
00132
00133 #endif

```

## 13.639 gdcmPythonFilter.h File Reference

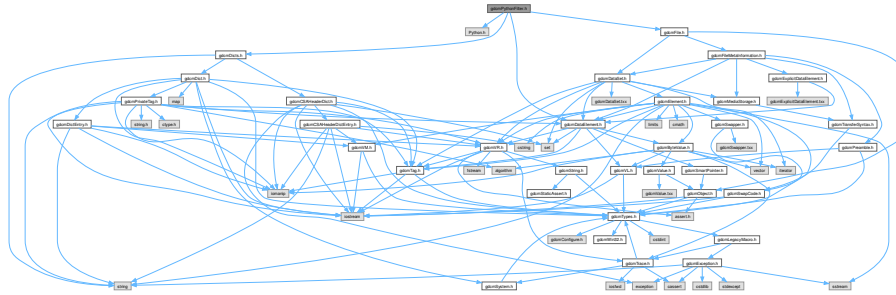
```

#include <Python.h>
#include "gdcmDataElement.h"
#include "gdcmDicts.h"

```

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmPythonFilter.h:



## Classes

- class [gdcm::PythonFilter](#)

*PythonFilter PythonFilter* is the class that make *gdcm2.x* looks more like *gdcm1* and transform the binary blob contained in a *DataElement* into a string, typically this is a nice feature to have for wrapped language.

## Namespaces

- namespace [gdcm](#)

## 13.640 gdcmPythonFilter.h

[Go to the documentation of this file.](#)

```
00001 /*=====
00002
00003   Program: GDCM (Grassroots DICOM). A DICOM library
00004
00005   Copyright (c) 2006-2011 Mathieu Malaterre
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00008
00009   This software is distributed WITHOUT ANY WARRANTY; without even
00010   the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
00011   PURPOSE. See the above copyright notice for more information.
00012
00013  =====*/
00014 #ifndef GDCMPYTHONFILTER_H
00015 #define GDCMPYTHONFILTER_H
00016
00017 #include <Python.h>
00018
00019 #include "gdcmDataElement.h"
00020 #include "gdcmDicts.h"
00021 #include "gdcmFile.h"
00022
00023 namespace gdcm
00024 {
00025
00031 class GDCM_EXPORT PythonFilter
00032 {
00033 public:
00034   PythonFilter();
00035   ~PythonFilter();
00036 }
```

```
00037 void UseDictAlways(bool ) {}
00038
00039 // Allow user to pass in there own dicts
00040 void SetDicts(const Dicts &dicts);
00041
00042 // Convert to string the ByteValue contained in a DataElement
00043 PyObject *ToPyObject(const Tag& t) const;
00044
00045 void SetFile(const File& f);
00046 File &GetFile();
00047 const File &GetFile() const;
00048
00049 private:
00050     SmartPointer<File> F;
00051 };
00052
00053 } // end namespace gdcm
00054
00055 #endif //GDCMPYTHONFILTER_H
```



# Chapter 14

## Examples

### 14.1 TestByteSwap.cxx

This is a C++ example on how to use [gdcm::ByteSwap](#)

```
/*=====
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PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmTypes.h"
#include "gdcmSwapCode.h"
#include "gdcmByteSwap.h"

#include <cstring> // memcpy

int myfunc()
{
    char vl_str[4];
    const char raw[] = "\000\000\000\004";
    memcpy(vl_str, raw, 4);
    uint32_t vl;
    memcpy(&vl, vl_str, 4);
    gdcm::ByteSwap<uint32_t>::SwapRangeFromSwapCodeIntoSystem(&vl, gdcm::SwapCode::BigEndian, 1);
    if( vl != 0x00000004 )
    {
        std::cerr << std::hex << "vl: " << vl << std::endl;
        return 1;
    }

    gdcm::ByteSwap<uint32_t>::SwapFromSwapCodeIntoSystem(vl, gdcm::SwapCode::LittleEndian);
    if( vl != 0x00000004 )
    {
        std::cerr << std::hex << "vl: " << vl << std::endl;
        return 1;
    }

    gdcm::ByteSwap<uint32_t>::SwapFromSwapCodeIntoSystem(vl, gdcm::SwapCode::BigEndian);
    if( vl != 0x40000000 )
    {
        std::cerr << std::hex << "vl: " << vl << std::endl;
        return 1;
    }

    return 0;
}
```

```

}

int TestByteSwap(int , char *[])
{
    gdcm::SwapCode sc = gdcm::SwapCode::Unknown;
    if ( gdcm::ByteSwap<uint16_t>::SystemIsBigEndian() )
    {
        sc = gdcm::SwapCode::BigEndian;
    }
    else if ( gdcm::ByteSwap<uint16_t>::SystemIsLittleEndian() )
    {
        sc = gdcm::SwapCode::LittleEndian;
    }
    if( sc == gdcm::SwapCode::Unknown )
    {
        std::cerr << "unk" << std::endl;
        return 1;
    }

    //std::cout << "sc: " << sc << std::endl;

    uint16_t t = 0x1234;
    gdcm::ByteSwap<uint16_t>::SwapFromSwapCodeIntoSystem(t, sc);
    if( sc == gdcm::SwapCode::BigEndian )
    {
        if( t != 0x3412 )
        {
            std::cerr << std::hex << "t: " << t << std::endl;
            return 1;
        }
        // ok test pass rest value to old one
        t = 0x1234;
    }
    else if ( sc == gdcm::SwapCode::LittleEndian )
    {
        if( t != 0x1234 )
        {
            std::cerr << std::hex << "t: " << t << std::endl;
            return 1;
        }
    }
}

union { char n[2]; uint16_t tn; } ul6;
memcpy(ul6.n, &t, 2 );
gdcm::ByteSwap<uint16_t>::SwapRangeFromSwapCodeIntoSystem(&ul6.tn, sc, 1);
uint16_t tn = ul6.tn;
if( sc == gdcm::SwapCode::BigEndian )
{
    if( tn != 0x3412 )
    {
        std::cerr << std::hex << "tn: " << tn << std::endl;
        return 1;
    }
    // ok test pass rest value to old one
    t = 0x1234;
}
else if ( sc == gdcm::SwapCode::LittleEndian )
{
    if( tn != 0x1234 )
    {
        std::cerr << std::hex << "tn: " << tn << std::endl;
        return 1;
    }
}
gdcm::ByteSwap<uint16_t>::SwapRangeFromSwapCodeIntoSystem(&ul6.tn, gdcm::SwapCode::BigEndian, 1);
tn = ul6.tn;
if( sc == gdcm::SwapCode::LittleEndian )
{
    if( tn != 0x3412 )
    {
        std::cerr << std::hex << "tn: " << tn << std::endl;
        return 1;
    }
}
else if ( sc == gdcm::SwapCode::BigEndian )
{
    if( tn != 0x1234 )
    {
        std::cerr << std::hex << "tn: " << tn << std::endl;
        return 1;
    }
}

```

```

    }

    if( myfunc() )
    {
        return 1;
    }

    uint16_t array[] = { 0x1234 };
    gdcm::ByteSwap<uint16_t>::SwapRangeFromSwapCodeIntoSystem(array,
        gdcm::SwapCode::BigEndian,1);
    if ( array[0] != 0x3412 )
    {
        std::cerr << std::hex << "array: " << array[0] << std::endl;
        return 1;
    }

    return 0;
}

```

## 14.2 PatchFile.cxx

This is a C++ example on how to use `gdcm::Attribute`

```

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=====*/
/*
 * The image was a broken file where the Pixel Data element was 8 times too big
 * Apparently multiplying the BitsAllocated to 4 and multiplying the number of
 * frames by 2 would solve the problem
 *
 * This C++ code can be used to patch the header.
 */

#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmWriter.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        return 1;
    }
    const char *f = argv[1];
    const char *out = argv[2];
    gdcm::Reader r;
    r.SetFileName( f );
    if( !r.Read() )
    {
        return 1;
    }

    gdcm::File &file = r.GetFile();
    gdcm::DataSet& ds = file.GetDataSet();
    // (0028,0100) US 16 # 2, 1 BitsAllocated
    // (0028,0101) US 16 # 2, 1 BitsStored
    // (0028,0102) US 15 # 2, 1 HighBit
    //
    {
        gdcm::Attribute<0x28,0x100> at;
        at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
        if( at.GetValue() != 8 )

```

```

        {
            return 1;
        }
        at.SetValue( 32 );
        ds.Replace( at.GetAsDataElement() );
    }
    {
        gdcmm::Attribute<0x28,0x101> at;
        at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
        if( at.GetValue() != 8 )
        {
            return 1;
        }
        at.SetValue( 32 );
        ds.Replace( at.GetAsDataElement() );
    }
    {
        gdcmm::Attribute<0x28,0x102> at;
        at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
        if( at.GetValue() != 7 )
        {
            return 1;
        }
        at.SetValue( 31 );
        ds.Replace( at.GetAsDataElement() );
    }
    // (0028,0008) IS [56] # 2, 1 NumberOfFrames

    {
        gdcmm::Attribute<0x28,0x8> at;
        at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
        at.SetValue( at.GetValue() * 2 );
        ds.Replace( at.GetAsDataElement() );
    }

    gdcmm::Writer w;
    w.SetFile( file );
    w.SetCheckFileMetaInformation( false );
    w.SetFileName( out );
    if( !w.Write() )
    {
        return 1;
    }

    // Now let's see if we can read it as an image:
    gdcmm::ImageReader ir;
    ir.SetFileName( out );
    if(!ir.Read())
    {
        return 1;
    }
    gdcmm::Image &image = ir.GetImage();
    unsigned long len = image.GetBufferLength();
    const gdcmm::ByteValue *bv = ir.GetFile().GetDataSet().GetDataElement( gdcmm::Tag(0x7fe0,0x0010) )
        .GetByteValue();
    if( !bv || len != bv->GetLength() )
    {
        return 1;
    }
    std::cout << bv->GetLength() << " " << len << std::endl;

    std::cout << "Success to rewrite image !" << std::endl;
    image.Print( std::cout );
    return 0;
}

```

## 14.3 SimplePrint.cs

This is a C# example on how to use gdcmm::SWIGDataSet

```

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```



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PURPOSE. See the above copyright notice for more information.

```

=====*/
/*
    Convertor convertor = new Convertor();
    int a = convertor.Convert<int>( some_int_blob );
    double b = convertor.Convert<double>( some_double_blob );
*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/SimplePrint.exe gdcmData/012345.002.050.dcm
 */
using System;
using gdcm;

public class SimplePrint
{
    public static void RecurseDataSet(File f, DataSet ds, string indent)
    {
        CSharpDataSet cds = new CSharpDataSet(ds);
        while(!cds.IsAtEnd())
        {
            DataElement de = cds.GetCurrent();
            // Compute VR from the toplevel file, and the currently processed dataset:
            VR vr = DataSetHelper.ComputeVR(f, ds, de.GetTag() );

            if( vr.Compatible( new VR(VR.VRType.SQ) ) )
            {
                uint uvl = (uint)de.GetVL(); // Test cast is ok
                System.Console.WriteLine( indent + de.GetTag().ToString() + ":" + uvl ); // why not ?
                //SequenceOfItems sq = de.GetSequenceOfItems();
                // GetValueAsSQ handle more cases than GetSequenceOfItems
                SmartPtrSQ sq = de.GetValueAsSQ();
                uint n = sq.GetNumberOfItems();
                for( uint i = 1; i <= n; i++) // item starts at 1, not 0
                {
                    Item item = sq.GetItem( i );
                    DataSet nested = item.GetNestedDataSet();
                    RecurseDataSet( f, nested, indent + "  " );
                }
            }
            else
            {
                System.Console.WriteLine( indent + de.ToString() );
            }
            cds.Next();
        }
    }

    public static int Main(string[] args)
    {
        string filename = args[0];
        Reader reader = new Reader();
        reader.SetFileName( filename );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }
        File f = reader.GetFile();
        DataSet ds = f.GetDataSet();

        RecurseDataSet( f, ds, "" );

        return 0;
    }
}

```

## 14.4 TestReader.cxx

```

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PURPOSE. See the above copyright notice for more information.
=====*/
#include "gdcmReader.h"
#include "gdcmFileMetaInformation.h"
#include "gdcmFile.h"
#include "gdcmTesting.h"
#include "gdcmMediaStorage.h"

int TestRead(const char* filename, bool verbose = false)
{
    if( verbose )
        std::cout << "TestRead: " << filename << std::endl;

    gdcm::Reader reader;
    reader.SetFileName( filename );
    if ( !reader.Read() )
    {
        std::cerr << "TestReadError: Failed to read: " << filename << std::endl;
        return 1;
    }

    //commenting out the fmi and ds to avoid warnings
    //const gdcm::FileMetaInformation &h = reader.GetFile().GetHeader();
    //std::cout << h << std::endl;

    //const gdcm::DataSet &ds = reader.GetFile().GetDataSet();
    //std::cout << ds << std::endl;

    const char *ref = gdcm::Testing::GetMediaStorageFromFile(filename);
    gdcm::MediaStorage ms;
    ms.SetFromFile( reader.GetFile() );
    if( !ref )
    {
        std::cerr << "TestReadError: Missing MediaStorage: " << filename << std::endl;
        std::cerr << "It should be: " << ms << std::endl;
        return 1;
    }

    if( ms.IsUndefined() && ref && *ref != 0 )
    {
        std::cerr << "TestReadError: MediaStorage: " << filename << std::endl;
        std::cerr << "It should be instead: " << ref << std::endl;
        return 1;
    }

    // Make sure it is the right one:

    if( ref && *ref != 0 && ms != gdcm::MediaStorage::GetMSType(ref) )
    {
        std::cerr << "Error: Found MediaStorage: " << ms << " for " << filename << std::endl;
        std::cerr << "It should be instead: " << ref << std::endl;
        return 1;
    }

    return 0;
}

int TestReader(int argc, char *argv[])
{
    if( argc == 2 )
    {
        const char *filename = argv[1];
        return TestRead(filename, true);
    }

    // else
    gdcm::Trace::DebugOff();
}

```

```

gdcmm::Trace::WarningOff();
int r = 0, i = 0;
const char *filename;
const char * const *filenames = gdcmm::Testing::GetFileNames();
while( (filename = filenames[i]) )
{
    r += TestRead( filename );
    ++i;
}

return r;
}

```

## 14.5 TestReader.py

This is a C++ example on how to use [gdcmm::Reader](#)

```

00001
00014
00015 import os,sys
00016 import gdcmm
00017
00018 def TestRead(filename, verbose = False):
00019     r = gdcmm.Reader()
00020     r.SetFileName( filename )
00021     success = r.Read()
00022     #if verbose: print r.GetFile()
00023     if verbose: print (r.GetFile().GetDataSet())
00024     return success
00025
00026 if __name__ == "__main__":
00027     success = 0
00028     try:
00029         filename = os.sys.argv[1]
00030         success += TestRead( filename, True )
00031     except:
00032         # loop over all files:
00033         gdcmm.Trace.DebugOff()
00034         gdcmm.Trace.WarningOff()
00035         t = gdcmm.Testing()
00036         nfiles = t.GetNumberOfFileNames()
00037         for i in range(0,nfiles):
00038             filename = t.GetFileName(i)
00039             success += TestRead( filename )
00040
00041
00042     # Test succeed ?
00043     sys.exit(success == 0)

```

## 14.6 DecompressJPEGFile.cs

This is a C# example on how to use [gdcmm::SequenceOfFragments](#)

```

/*=====
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PURPOSE. See the above copyright notice for more information.

=====*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcmm/debug-gcc/bin

```

```

* $ mono bin/DecompressJPEGFile.exe somejpegfile.jpg
*/
using System;
using gdcmm;

public class DecompressJPEGFile
{
    public static int Main(string[] args)
    {
        string file1 = args[0];
        System.IO.FileStream infile =
            new System.IO.FileStream(file1, System.IO.FileMode.Open, System.IO.FileAccess.Read);
        uint fsize = gdcmm.PosixEmulation.FileSize(file1);

        byte[] jstream = new byte[fsize];
        infile.Read(jstream, 0, jstream.Length);

        Trace.DebugOn();
        Image image = new Image();
        image.SetNumberOfDimensions( 2 ); // important for now
        DataElement pixeldata = new DataElement( new gdcmm.Tag(0x7fe0,0x0010) );

        // DO NOT set a ByteValue here, JPEG is a particular kind of encapsulated syntax
        // in which can one cannot use a simple byte array for storage. Instead, see
        // gdcmm.SequenceOfFragments
        //pixeldata.SetByteValue( jstream, new gdcmm.VL( (uint)jstream.Length ) );

        // Create a new SequenceOfFragments C++ object, store it as a SmartPointer :
        SmartPtrFrag sq = SequenceOfFragments.New();
        Fragment frag = new Fragment();
        frag.SetByteValue( jstream, new gdcmm.VL( (uint)jstream.Length ) );
        // Single file => single fragment
        sq.AddFragment( frag );
        // Pass by reference:
        pixeldata.SetValue( sq.__ref__() );

        // insert:
        image.SetDataElement( pixeldata );

        // JPEG use YBR to achieve better compression ratio by default (not RGB)
        // FIXME hardcoded:
        PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.YBR_FULLL );
        image.SetPhotometricInterpretation( pi );
        // FIXME hardcoded:
        PixelFormat pixeltype = new PixelFormat(3,8,8,7);
        image.SetPixelFormat( pixeltype );

        // FIXME hardcoded:
        image.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEGLosslessProcess14_1 ) );
        image.SetDimension(0, 692);
        image.SetDimension(1, 721);

        // Decompress !
        byte[] decompressedData = new byte[(int)image.GetBufferLength()];
        image.GetBuffer(decompressedData);

        // Write out the decompressed bytes
        System.Console.WriteLine(image.toString());
        using (System.IO.Stream stream =
            System.IO.File.Open(@"tmp/dd.raw",
                System.IO.FileMode.Create))
        {
            System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
            writer.Write(decompressedData);
        }

        return 0;
    }
}

```

## 14.7 ManipulateFile.cs

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

```

```

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=====*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/ManipulateFile.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;

public class ManipulateFile
{
    public static int Main(string[] args)
    {
        string file1 = args[0];
        string file2 = args[1];
        Reader reader = new Reader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }

        Anonymizer ano = new Anonymizer();
        ano.SetFile( reader.GetFile() );
        ano.RemovePrivateTags();
        ano.RemoveGroupLength();
        Tag t = new Tag(0x10,0x10);
        ano.Replace( t, "GDCM^Csharp^Test^Hello^World" );

        UIDGenerator g = new UIDGenerator();
        ano.Replace( new Tag(0x0008,0x0018), g.Generate() );
        ano.Replace( new Tag(0x0020,0x000d), g.Generate() );
        ano.Replace( new Tag(0x0020,0x000e), g.Generate() );
        ano.Replace( new Tag(0x0020,0x0052), g.Generate() );

        Writer writer = new Writer();
        writer.SetFileName( file2 );
        writer.SetFile( ano.GetFile() );
        ret = writer.Write();
        if( !ret )
        {
            return 1;
        }

        return 0;
    }
}

```

## 14.8 ClinicalTrialIdentificationWorkflow.cs

This is a C# example on how to use Anonymizer

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

```

```

=====*/

/*
 * Typical usage on UNIX:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/ClinicalTrialIdentificationWorkflow.exe input_dir output_dir
 */
using System;
using gdcm;

public class MyWatcher : SimpleSubjectWatcher
{
    public MyWatcher(Subject s):base(s,"Override String"){
    protected override void StartFilter() {
        System.Console.WriteLine( "This is my start" );
    }
    protected override void EndFilter(){
        System.Console.WriteLine( "This is my end" );
    }
    protected override void ShowProgress(Subject caller, Event evt){
        ProgressEvent pe = ProgressEvent.Cast(evt);
        System.Console.WriteLine( "This is my progress: " + pe.GetProgress() );
    }
    protected override void ShowIteration(){
        System.Console.WriteLine( "This is my iteration" );
    }
    protected override void ShowAnonymization(Subject caller, Event evt){
/*
 * A couple of explanation are necessary here to understand how SWIG work
 * http://www.swig.org/Doc1.3/Java.html#adding_downcasts
 *
 * System.Console.WriteLine( "This is my Anonymization. Type: " + evt.GetEventName() );
 * System.Type type = evt.GetType();
 * System.Console.WriteLine( "This is my Anonymization. System.Type: " + type.ToString() );
 * System.Console.WriteLine( "This is my Anonymization. CheckEvent: " + ae.CheckEvent( evt ) );
 * System.Console.WriteLine( "This is my Anonymization. Processing Tag #" + ae.GetTag().toString() );
 */
        AnonymizeEvent ae = AnonymizeEvent.Cast(evt);
        if( ae != null )
        {
            Tag t = ae.GetTag();
            System.Console.WriteLine( "This is my Anonymization. Processing Tag #" + t.toString() );
        }
        else
        {
            System.Console.WriteLine( "This is my Anonymization. Unhandled Event type: " + evt.GetEventName() );
        }
    }
    protected override void ShowAbort(){
        System.Console.WriteLine( "This is my abort" );
    }
}

public class ClinicalTrialIdentificationWorkflow
{
    public static bool ProcessOneFile( gdcm.Anonymizer ano , string filename, string outfilename )
    {
        Reader reader = new Reader();
        reader.SetFileName( filename );
        bool ret = reader.Read();
        if( !ret )
        {
            return false;
        }
        // Pass in the file:
        ano.SetFile( reader.GetFile() );

        // First step, let's protect all Patient information as per
        // PS 3.15 / E.1 / Basic Application Level Confidentiality Profile
        if( !ano.BasicApplicationLevelConfidentialityProfile() )
        {
            return false;
        }

        // Now let's pass in all Clinical Trial fields
        // PS 3.3 - 2008 / C.7.1.3 Clinical Trial Subject Module
        /*
        Clinical Trial Sponsor Name (0012,0010) 1 The name of the clinical trial sponsor. See C.7.1.3.1.1.
        Clinical Trial Protocol ID (0012,0020) 1 Identifier for the noted protocol. See C.7.1.3.1.2.
        Clinical Trial Protocol Name (0012,0021) 2 The name of the clinical trial protocol. See C.7.1.3.1.3.
        Clinical Trial Site ID (0012,0030) 2 The identifier of the site responsible for submitting clinical trial

```

```

    data. See C.7.1.3.1.4.
Clinical Trial Site Name (0012,0031) 2 Name of the site responsible for submitting clinical trial data. See
C.7.1.3.1.5
Clinical Trial Subject ID (0012,0040) 1C The assigned identifier for the clinical trial subject. See
C.7.1.3.1.6. Shall be present if Clinical Trial Subject Reading ID (0012,0042) is absent. May be present
otherwise.
Clinical Trial Subject Reading ID (0012,0042) 1C Identifies the subject for blinded evaluations. Shall be
present if Clinical Trial Subject ID (0012,0040) is absent. May be present otherwise. See C.7.1.3.1.7.
*/
ano.Replace( new gdcm.Tag(0x0012,0x0010), "MySponsorName");
ano.Replace( new gdcm.Tag(0x0012,0x0020), "MyProtocolID");
ano.Replace( new gdcm.Tag(0x0012,0x0021), "MyProtocolName");
ano.Replace( new gdcm.Tag(0x0012,0x0030), "MySiteId");
ano.Replace( new gdcm.Tag(0x0012,0x0031), "MySiteName");
ano.Replace( new gdcm.Tag(0x0012,0x0040), "MySponsorId");
ano.Replace( new gdcm.Tag(0x0012,0x0050), "MyTPId");
ano.Replace( new gdcm.Tag(0x0012,0x0051), "MyTPDescription");

// The following two are not required as they are guaranteed to be filled in by the
// Basic Application Level Confidentiality Profile. Only override if you understand what
// you are doing
//ano.Replace( new gdcm.Tag(0x0012,0x0062), "YES");
//ano.Replace( new gdcm.Tag(0x0012,0x0063), "My Super Duper Anonymization Overload");

// We might be generating a subdirectory. Let's make sure the subdir exist:
gdcm.FileMetaInformation fmi = ano.GetFile().GetHeader();
// The following three lines make sure to regenerate any value:
fmi.Remove( new gdcm.Tag(0x0002,0x0012) );
fmi.Remove( new gdcm.Tag(0x0002,0x0013) );
fmi.Remove( new gdcm.Tag(0x0002,0x0016) );

Writer writer = new Writer();
writer.SetFileName( outfilename );
writer.SetFile( ano.GetFile() );
ret = writer.Write();
if( !ret )
{
    return false;
}

return true;
}

public static int Main(string[] args)
{
    gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "My ClinicalTrial App" );

    // http://www.oid-info.com/get/1.3.6.1.4.17434
    string THERALYS_ORG_ROOT = "1.3.6.1.4.17434";
    gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT );
    System.Console.WriteLine( "Root dir is now: " + gdcm.UIDGenerator.GetRoot() );

    gdcm.Global global = gdcm.Global.GetInstance();
    if( !global.LoadResourcesFiles() )
    {
        System.Console.WriteLine( "Could not LoadResourcesFiles" );
        return 1;
    }

    if( args.Length != 2 )
    {
        System.Console.WriteLine( "Usage: " );
        System.Console.WriteLine( "ClinicalTrialIdentificationWorkflow input_dir output_dir" );
        return 1;
    }
    string dir1 = args[0];
    string dir2 = args[1];

    // Check input is valid:
    if( !gdcm.PosixEmulation.FileIsDirectory(dir1) )
    {
        System.Console.WriteLine( "Input directory: " + dir1 + " does not exist. Sorry" );
        return 1;
    }
}

```

```

if( !gdcm.PosixEmulation.FileIsDirectory(dir2) )
{
    System.Console.WriteLine( "Output directory: " + dir2 + " does not exist. Sorry" );
    return 1;
}

// Recursively search all file within this toplevel directory:
Directory d = new Directory();
uint nfiles = d.Load( dir1, true );
if(nfiles == 0) return 1;

// Let's use the pre-shipped certificate of GDCM.
string certpath = gdcm.Filename.Join(gdcm.Testing.GetSourceDirectory(),
    "/Testing/Source/Data/certificate.pem" );
gdcm.CryptoFactory fact = gdcm.CryptoFactory.GetFactoryInstance();
gdcm.CryptographicMessageSyntax cms = fact.CreateCMSProvider();
if( !cms.ParseCertificateFile( certpath ) )
{
    System.Console.WriteLine( "PEM Certificate : " + certpath + " could not be read. Sorry" );
    return 1;
}

//Anonymizer ano = new Anonymizer();
// A reference to an actual C++ instance is required here:
SmartPtrAno sano = Anonymizer.New();
Anonymizer ano = sano.__ref__();

//SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(ano, "Anonymizer");
MyWatcher watcher = new MyWatcher(ano);

// Explicitly specify the Cryptographic Message Syntax to use:
ano.SetCryptographicMessageSyntax( cms );

// Process all filenames:
FilenamesType filenames = d.GetFilesNames();
for( uint i = 0; i < nfiles; ++i )
{
    string filename = filenames[ (int)i ];
    string outfilename = filename.Replace( dir1, dir2 );
    System.Console.WriteLine( "Filename: " + filename );
    System.Console.WriteLine( "Out Filename: " + outfilename );
    if( !ProcessOneFile( ano , filename, outfilename ) )
    {
        System.Console.WriteLine( "Could not process filename: " + filename );
        return 1;
    }
}

return 0;
}
}

```

## 14.9 GenerateDICOMDIR.cs

This is a C# example on how to use DICOMDIRGenerator

```

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=====*/

/*
 * Simple C# example to show how to use DICOMDIRGenerator
 *
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin

```



```

* $ mono bin/GenerateDICOMDIR.exe path output_filename
*/
using System;
using gdcmm;

public class GenerateDICOMDIR
{
    public static int Main(string[] args)
    {
        string directory = args[0];
        string outfilename = args[1];

        Directory d = new Directory();
        uint nfiles = d.Load( directory, true );
        if(nfiles == 0) return 1;
        //System.Console.WriteLine( "Files:\n" + d.toString() );

        // Implement fast path ?
        // Scanner s = new Scanner();

        string descriptor = "My_Descriptor";
        FilenamesType filenames = d.GetFilesNames();

        gdcmm.DICOMDIRGenerator gen = new DICOMDIRGenerator();
        gen.SetFilenames( filenames );
        gen.SetDescriptor( descriptor );
        if( !gen.Generate() )
        {
            return 1;
        }

        gdcmm.FileMetaInformation.SetSourceApplicationEntityTitle( "GenerateDICOMDIR" );
        gdcmm.Writer writer = new Writer();
        writer.SetFile( gen.GetFile() );
        writer.SetFileName( outfilename );
        if( !writer.Write() )
        {
            return 1;
        }

        return 0;
    }
}

```

## 14.10 GenFakelImage.cxx

```

/*=====
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=====*/
#include "gdcmmImage.h"
#include "gdcmmImageWriter.h"
#include "gdcmmFileDerivation.h"
#include "gdcmmUIDGenerator.h"
// #include "gdcmmImageChangePhotometricInterpretation.h"

/*
* This example shows two things:
* 1. How to create an image ex-nihilo
* 2. How to use the gdcmm.FileDerivation filter. This filter is meant to create "DERIVED" image
* object. FileDerivation has a simple API where you can reference *all* the input image that have been
* used to generate the image. The API also allows user to specify the purpose of reference (see CID 7202,
* PS 3.16 - 2008), and the image derivation type (CID 7203, PS 3.16 - 2008).
*/
int main(int, char *[])
{
    // Step 1: Fake Image

```

```

gdcM::SmartPointer<gdcM::Image> im = new gdcM::Image;

char * buffer = new char[ 256 * 256 * 3];
char * p = buffer;
int b = 128;
//int ybr[3];
int ybr2[3];
//int rgb[3];

for(int r = 0; r < 256; ++r)
    for(int g = 0; g < 256; ++g)
        //for(int b = 0; b < 256; ++b)
        {
            //rgb[0] = r;
            //rgb[1] = g;
            //rgb[1] = 128;
            //rgb[2] = b;
            //ybr[0] = r;
            //ybr[1] = g;
            //ybr[1] = 128;
            //ybr[2] = b;

            ybr2[0] = r;
            ybr2[1] = g;
            ybr2[1] = 128;
            ybr2[2] = b;
            //gdcM::ImageChangePhotometricInterpretation::YBR2RGB(rgb, ybr);
            //gdcM::ImageChangePhotometricInterpretation::RGB2YBR(ybr2, rgb);
            *p++ = (char)ybr2[0];
            *p++ = (char)ybr2[1];
            *p++ = (char)ybr2[2];
        }

im->SetNumberOfDimensions( 2 );
im->SetDimension(0, 256 );
im->SetDimension(1, 256 );

im->GetPixelFormat().SetSamplesPerPixel(3);
//im->SetPhotometricInterpretation( gdcM::PhotometricInterpretation::RGB );
im->SetPhotometricInterpretation( gdcM::PhotometricInterpretation::YBR_FULL );

unsigned long l = im->GetBufferLength();
if( l != 256 * 256 * 3 )
{
    return 1;
}
gdcM::DataElement pixeldata( gdcM::Tag(0x7fe0,0x0010) );
pixeldata.SetByteValue( buffer, (uint32_t)l );
delete[] buffer;
im->SetDataElement( pixeldata );

gdcM::UIDGenerator uid; // helper for uid generation

gdcM::SmartPointer<gdcM::File> file = new gdcM::File; // empty file

// Step 2: DERIVED object
gdcM::FileDerivation fd;
// For the purpose of this exercise we will pretend that this image is referencing
// two source image (we need to generate fake UID for that).
const char ReferencedSOPClassUID[] = "1.2.840.10008.5.1.4.1.1.7"; // Secondary Capture
fd.AddReference( ReferencedSOPClassUID, uid.Generate() );
fd.AddReference( ReferencedSOPClassUID, uid.Generate() );

// Again for the purpose of the exercise we will pretend that the image is a
// multiplanar reformat (MPR):
// CID 7202 Source Image Purposes of Reference
// {"DCM",121322,"Source image for image processing operation"},
fd.SetPurposeOfReferenceCodeSequenceCodeValue( 121322 );
// CID 7203 Image Derivation
// {"DCM",113072,"Multiplanar reformatting"},
fd.SetDerivationCodeSequenceCodeValue( 113072 );
fd.SetFile( *file );
// If all Code Value are ok the filter will execute properly
if( !fd.Derive() )
{
    std::cerr << "Sorry could not derive using input info" << std::endl;
    return 1;
}

// We pass both :
// 1. the fake generated image

```

```

// 2. the 'DERIVED' dataset object
// to the writer.
gdcm::ImageWriter w;
w.SetImage( *im );
w.SetFile( fd.GetFile() );

// Set the filename:
w.SetFileName( "ybr2.dcm" );
if( !w.Write() )
{
    return 1;
}

return 0;
}

```

## 14.11 ReformatFile.cs

This is a C++ example on how to use FileDerivation

```

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PURPOSE. See the above copyright notice for more information.

=====*/

/*
 * Simple C# example
 *
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/ReformatFile.exe input.dcm output.dcm
 */
using System;
using gdcm;

public class ReformatFile
{
    public static int Main(string[] args)
    {
        gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "My Reformat App" );

        // http://www.oid-info.com/get/1.3.6.1.4.17434
        string THERALYS_ORG_ROOT = "1.3.6.1.4.17434";
        gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT );
        System.Console.WriteLine( "Root dir is now: " + gdcm.UIDGenerator.GetRoot() );

        string filename = args[0];
        string outfilename = args[1];

        Reader reader = new Reader();
        reader.SetFileName( filename );
        if( !reader.Read() )
        {
            System.Console.WriteLine( "Could not read: " + filename );
            return 1;
        }

        UIDGenerator uid = new UIDGenerator(); // helper for uid generation
        FileDerivation fd = new FileDerivation();
        // For the purpose of this exercise we will pretend that this image is referencing
        // two source image (we need to generate fake UID for that).
        string ReferencedSOPClassUID = "1.2.840.10008.5.1.4.1.1.7"; // Secondary Capture
        fd.AddReference( ReferencedSOPClassUID, uid.Generate() );
        fd.AddReference( ReferencedSOPClassUID, uid.Generate() );

        // Again for the purpose of the exercise we will pretend that the image is a

```

```

// multiplanar reformat (MPR):
// CID 7202 Source Image Purposes of Reference
// {"DCM",121322,"Source image for image processing operation"},
fd.SetPurposeOfReferenceCodeSequenceCodeValue( 121322 );
// CID 7203 Image Derivation
// {"DCM",113072,"Multiplanar reformatting" },
fd.SetDerivationCodeSequenceCodeValue( 113072 );
fd.SetFile( reader.GetFile() );
// If all Code Value are ok the filter will execute properly
if( !fd.Derive() )
{
    return 1;
}

gdcm.FileMetaInformation fmi = reader.GetFile().GetHeader();
// The following three lines make sure to regenerate any value:
fmi.Remove( new gdcm.Tag(0x0002,0x0012) );
fmi.Remove( new gdcm.Tag(0x0002,0x0013) );
fmi.Remove( new gdcm.Tag(0x0002,0x0016) );

Writer writer = new Writer();
writer.SetFileName( outfilename );
writer.SetFile( fd.GetFile() );
if( !writer.Write() )
{
    System.Console.WriteLine( "Could not write: " + outfilename );
    return 1;
}

return 0;
}
}

```

## 14.12 DecompressImage.cs

This is a C# example on how to use Image

```

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=====*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/DecompressImage.exe gdcmData/012345.002.050.dcm decompress.dcm
 */
using System;
using gdcm;

public class DecompressImage
{
    public static int Main(string[] args)
    {
        {
            string file1 = args[0];
            string file2 = args[1];
            ImageReader reader = new ImageReader();
            reader.SetFileName( file1 );
            bool ret = reader.Read();
            if( !ret )
            {
                return 1;
            }
        }

        // check that one can access a Fragment from C#:
    }
}

```

```

var de = reader.GetFile().GetDataSet().GetDataElement(new Tag(0x7fe0, 0x0010));
var sq = de.GetSequenceOfFragments();
sq.GetFragment(0);

Image image = new Image();
Image ir = reader.GetImage();

image.SetNumberOfDimensions( ir.GetNumberOfDimensions() );

//Just for fun:
//int dircos = ir.GetDirectionCosines();
//t = gdcm.Orientation.GetType(dircos);
//int l = gdcm.Orientation.GetLabel(t);
//System.Console.WriteLine( "Orientation label:" + l );

// Set the dimensions,
// 1. either one at a time
//image.SetDimension(0, ir.GetDimension(0) );
//image.SetDimension(1, ir.GetDimension(1) );

// 2. the array at once
uint[] dims = {0, 0};
// Just for fun let's invert the dimensions:
dims[0] = ir.GetDimension(1);
dims[1] = ir.GetDimension(0);
ir.SetDimensions( dims );

PixelFormat pixeltype = ir.GetPixelFormat();
image.SetPixelFormat( pixeltype );

PhotometricInterpretation pi = ir.GetPhotometricInterpretation();
image.SetPhotometricInterpretation( pi );

DataElement pixeldata = new DataElement( new Tag(0x7fe0,0x0010) );
byte[] str1 = new byte[ ir.GetBufferLength()];
ir.GetBuffer( str1 );
//System.Console.WriteLine( ir.GetBufferLength() );
pixeldata.SetByteValue( str1, new VL( (uint)str1.Length ) );
//image.SetDataElement( pixeldata );
ir.SetDataElement( pixeldata );

ImageWriter writer = new ImageWriter();
writer.SetFileName( file2 );
writer.SetFile( reader.GetFile() );
writer.SetImage( ir );
ret = writer.Write();
if( !ret )
{
    return 1;
}

return 0;
}
}

```

## 14.13 StandardizeFiles.cs

This is a C++ example on how to use ImageChangeTransferSyntax

```

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=====*/
/*

```

```

* Simple C# example to show how one would 'Standardize' a DICOM File-Set
*
* Usage:
* $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
* $ mono bin/StandardizeFiles.exe input_path output_path
*/
using System;
using gdcm;

public class StandardizeFiles
{
    public static bool ProcessOneFile( string filename, string outfilename )
    {
        PixmapReader reader = new PixmapReader();
        reader.SetFileName( filename );
        if( !reader.Read() )
        {
            System.Console.WriteLine( "Could not read: " + filename );
            return false;
        }

        ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
        change.SetForce( false ); // do we really want to recompress when input is already compressed in same alg ?
        change.SetCompressIconImage( false ); // Keep it simple
        change.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEG2000Lossless ) );
        change.SetInput( reader.GetPixmap() );
        if( !change.Change() )
        {
            System.Console.WriteLine( "Could not change: " + filename );
            return false;
        }

        gdcm.FileMetaInformation fmi = reader.GetFile().GetHeader();
        // The following three lines make sure to regenerate any value:
        fmi.Remove( new gdcm.Tag(0x0002,0x0012) );
        fmi.Remove( new gdcm.Tag(0x0002,0x0013) );
        fmi.Remove( new gdcm.Tag(0x0002,0x0016) );

        PixmapWriter writer = new PixmapWriter();
        writer.SetFileName( outfilename );
        writer.SetFile( reader.GetFile() );
        gdcm.Pixmap pixout = ((PixmapToPixmapFilter)change).GetOutput();

        writer.SetPixmap( pixout );
        if( !writer.Write() )
        {
            System.Console.WriteLine( "Could not write: " + outfilename );
            return false;
        }

        return true;
    }

    public static int Main(string[] args)
    {
        gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "My Standardize App" );

        // http://www.oid-info.com/get/1.3.6.1.4.17434
        string THERALYS_ORG_ROOT = "1.3.6.1.4.17434";
        gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT );
        System.Console.WriteLine( "Root dir is now: " + gdcm.UIDGenerator.GetRoot() );

        string dir1 = args[0];
        string dir2 = args[1];

        // Check input is valid:
        if( !gdcm.PosixEmulation.FileIsDirectory(dir1) )
        {
            System.Console.WriteLine( "Input directory: " + dir1 + " does not exist. Sorry" );
            return 1;
        }
        if( !gdcm.PosixEmulation.FileIsDirectory(dir2) )
        {
            System.Console.WriteLine( "Output directory: " + dir2 + " does not exist. Sorry" );
            return 1;
        }

        Directory d = new Directory();
        uint nfiles = d.Load( dir1, true );
    }
}

```

```

        if(nfiles == 0) return 1;

        // Process all filenames:
        FilenamesType filenames = d.GetFilesNames();
        for( uint i = 0; i < nfiles; ++i )
        {
            string filename = filenames[ (int)i ];
            string outfilename = filename.Replace( dir1, dir2 );
            System.Console.WriteLine( "Filename: " + filename );
            System.Console.WriteLine( "Out Filename: " + outfilename );
            if( !ProcessOneFile( filename, outfilename ) )
            {
                System.Console.WriteLine( "Could not process filename: " + filename );
                //return 1;
            }
        }

        return 0;
    }
}

```

## 14.14 ScanDirectory.cs

This is a C# example on how to use Scanner

```

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=====*/

/*
 * Usage:
 * $ bin/ScanDirectory.exe /path/to/gdcmData/
 */
using System;
using gdcm;

// We will print each filename being processed
public class MyWatcher : SimpleSubjectWatcher
{
    public MyWatcher(Subject s):base(s,"Override String"){
    protected override void ShowFileName(Subject caller, Event evt){
        FileNameEvent fne = FileNameEvent.Cast(evt);
        if( fne != null )
        {
            string fn = fne.GetFileName();
            System.Console.WriteLine( "This is my Scanner. Processing FileName: " + fn );
        }
        else
        {
            System.Console.WriteLine( "This is my Anonymization. Unhandled Event type: " + evt.GetEventName() );
        }
    }
}

public class ScanDirectory
{
    public static int Main(string[] args)
    {
        string directory = args[0];
        Tag t = new Tag(0x8,0x80);

        Directory d = new Directory();
        uint nfiles = d.Load( directory );
        if(nfiles == 0) return 1;
    }
}

```

```

//System.Console.WriteLine( "Files:\n" + d.toString() );

// Use a StrictScanner, need to use a reference to pass the C++ pointer to
// MyWatcher implementation
SmartPtrStrictScan sscan = StrictScanner.New();
StrictScanner s = sscan.__ref__();
MyWatcher watcher = new MyWatcher(s);

s.AddTag( t );
bool b = s.Scan( d.GetFilesNames() );
if(!b) return 1;

for(int i = 0; i < (int)nfiles; ++i)
{
    if( !s.IsKey( d.GetFilesNames()[i] ) )
    {
        System.Console.WriteLine( "File is not DICOM or could not be read: " + d.GetFilesNames()[i] );
    }
}

System.Console.WriteLine( "Scan:\n" + s.toString() );

System.Console.WriteLine( "success" );
return 0;
}
}

```

## 14.15 BasicAnonymizer.cs

```

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=====*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/BasicAnonymizer.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;

public class MyWatcher : SimpleSubjectWatcher
{
    public MyWatcher(Subject s):base(s,"Override String"){
    protected override void StartFilter() {
        System.Console.WriteLine( "This is my start" );
    }
    protected override void EndFilter(){
        System.Console.WriteLine( "This is my end" );
    }
    protected override void ShowProgress(Subject caller, Event evt){
        ProgressEvent pe = ProgressEvent.Cast(evt);
        System.Console.WriteLine( "This is my progress: " + pe.GetProgress() );
    }
    protected override void ShowIteration(){
        System.Console.WriteLine( "This is my iteration" );
    }
    protected override void ShowAnonymization(Subject caller, Event evt){
/*
 * A couple of explanation are necessary here to understand how SWIG work
 * http://www.swig.org/Doc1.3/Java.html#adding_downcasts
 *
 * System.Console.WriteLine( "This is my Anonymization. Type: " + evt.GetEventName() );
 * System.Type type = evt.GetType();
 * System.Console.WriteLine( "This is my Anonymization. System.Type: " + type.ToString() );
 * System.Console.WriteLine( "This is my Anonymization. CheckEvent: " + ae.CheckEvent( evt ) );
 */
    }
}

```



```

* System.Console.WriteLine( "This is my Anonymization. Processing Tag #" + ae.GetTag().ToString() );
*/
AnonymizeEvent ae = AnonymizeEvent.Cast(evt);
if( ae != null )
{
    Tag t = ae.GetTag();
    System.Console.WriteLine( "This is my Anonymization. Processing Tag #" + t.ToString() );
}
else
{
    System.Console.WriteLine( "This is my Anonymization. Unhandled Event type: " + evt.GetEventName() );
}
}
protected override void ShowAbort(){
    System.Console.WriteLine( "This is my abort" );
}
}

public class BasicAnonymizer
{
    public static int Main(string[] args)
    {
        gdcn.Global global = gdcn.Global.GetInstance();
        if( !global.LoadResourcesFiles() )
        {
            System.Console.WriteLine( "Could not LoadResourcesFiles" );
            return 1;
        }

        string file1 = args[0];
        string file2 = args[1];
        Reader reader = new Reader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }

        string certpath = gdcn.Filename.Join(gdcn.Testing.GetSourceDirectory(),
            "/Testing/Source/Data/certificate.pem" );
        gdcn.CryptoFactory fact = gdcn.CryptoFactory.GetFactoryInstance();
        gdcn.CryptographicMessageSyntax cms = fact.CreateCMSProvider();
        if( !cms.ParseCertificateFile( certpath ) )
        {
            return 1;
        }

        //Anonymizer ano = new Anonymizer();
        SmartPtrAno sano = Anonymizer.New();
        Anonymizer ano = sano.__ref__();

        //SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(ano, "Anonymizer");
        MyWatcher watcher = new MyWatcher(ano);

        ano.SetFile( reader.GetFile() );
        ano.SetCryptographicMessageSyntax( cms );
        if( !ano.BasicApplicationLevelConfidentialityProfile() )
        {
            return 1;
        }

        Writer writer = new Writer();
        writer.SetFileName( file2 );
        writer.SetFile( ano.GetFile() );
        ret = writer.Write();
        if( !ret )
        {
            return 1;
        }

        return 0;
    }
}

```

## 14.16 BasicImageAnonymizer.cs

```

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=====*/

/*
 */
using System;
using gdcm;

public class BasicImageAnonymizer
{
    public static int Main(string[] args)
    {
        string filename = args[0];

        // instantiate the reader:
        gdcm.ImageReader reader = new gdcm.ImageReader();
        reader.SetFileName( filename );

        if (!reader.Read()) return 1;

        Image ir = reader.GetImage();

        uint[] dims = {0, 0, 0};
        dims[0] = ir.GetDimension(0);
        dims[1] = ir.GetDimension(1);
        dims[2] = ir.GetDimension(2);
        System.Console.WriteLine( "Dim:" + dims[0] );
        System.Console.WriteLine( "Dim:" + dims[1] );
        System.Console.WriteLine( "Dim:" + dims[2] );

        // buffer to get the pixels
        byte[] buffer = new byte[ ir.GetBufferLength()];
        System.Console.WriteLine( "Dim:" + ir.GetBufferLength() );
        ir.GetBuffer( buffer );

        for (uint z = 0; z < dims[2]; z++)
        {
            for (uint y = 0; y < dims[1] / 2; y++) // only half Y
            {
                for (uint x = 0; x < dims[0] / 2; x++) // only half X
                {
                    buffer[ (z * dims[1] + y) * dims[0] + x ] = 0; // works when pixel type == UINT8
                }
            }
        }

        DataElement pixeldata = new DataElement( new Tag(0x7fe0,0x0010) );
        pixeldata.SetByteValue( buffer, new VL( (uint)buffer.Length ) );
        ir.SetDataElement( pixeldata );
        ir.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.ExplicitVRLittleEndian ) );

        ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
        change.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEGLSLossless ) );
        change.SetInput( ir );
        if( !change.Change() )
        {
            System.Console.WriteLine( "Could not change: " + filename );
            return 1;
        }

        ImageWriter writer = new ImageWriter();
        writer.SetFileName( "out.dcm" );
        writer.SetFile( reader.GetFile() );
        writer.SetImage( change.GetOutput() );
        bool ret = writer.Write();
        if( !ret )
        {

```

```

        return 1;
    }

    return 0;
}

```

## 14.17 Cleaner.cs

```

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=====*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/Cleaner.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;

public class MyWatcher : SimpleSubjectWatcher
{
    public MyWatcher(Subject s):base(s,"Override String"){
    protected override void StartFilter() {
        System.Console.WriteLine( "This is my start" );
    }
    protected override void EndFilter(){
        System.Console.WriteLine( "This is my end" );
    }
    protected override void ShowProgress(Subject caller, Event evt){
        ProgressEvent pe = ProgressEvent.Cast(evt);
        System.Console.WriteLine( "This is my progress: " + pe.GetProgress() );
    }
    protected override void ShowIteration(){
        System.Console.WriteLine( "This is my iteration" );
    }
    protected override void ShowAnonymization(Subject caller, Event evt){
/*
 * A couple of explanation are necessary here to understand how SWIG work
 * http://www.swig.org/Doc1.3/Java.html#adding_downcasts
 *
 * System.Console.WriteLine( "This is my Anonymization. Type: " + evt.GetEventName() );
 * System.Type type = evt.GetType();
 * System.Console.WriteLine( "This is my Anonymization. System.Type: " + type.ToString() );
 * System.Console.WriteLine( "This is my Anonymization. CheckEvent: " + ae.CheckEvent( evt ) );
 * System.Console.WriteLine( "This is my Anonymization. Processing Tag #" + ae.GetTag().toString() );
 */
        AnonymizeEvent ae = AnonymizeEvent.Cast(evt);
        if( ae != null )
        {
            Tag t = ae.GetTag();
            System.Console.WriteLine( "This is my Anonymization. Processing Tag #" + t.toString() );
        }
        else
        {
            System.Console.WriteLine( "This is my Anonymization. Unhandled Event type: " + evt.GetEventName() );
        }
    }
    protected override void ShowAbort(){
        System.Console.WriteLine( "This is my abort" );
    }
}

public class Cleaner

```

```

{
    public static int Main(string[] args)
    {
        gdcmm.Global global = gdcmm.Global.GetInstance();
        if( !global.LoadResourcesFiles() )
        {
            System.Console.WriteLine( "Could not LoadResourcesFiles" );
            return 1;
        }

        string file1 = args[0];
        string file2 = args[1];
        Reader reader = new Reader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }

        SmartPtrCleaner scleaner = gdcmm.Cleaner.New();
        gdcmm.Cleaner cleaner = scleaner.__ref__();

        //SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(cleaner, "Anonymizer");
        MyWatcher watcher = new MyWatcher(cleaner);

        cleaner.SetFile( reader.GetFile() );
        cleaner.Empty( new gdcmm.VR(gdcmm.VR.VRType.PN) );
        gdcmm.DPath dpath = new gdcmm.DPath();
        dpath.ConstructFromString( "/0010,0010" );
        cleaner.Preserve( dpath );
        gdcmm.Tag t1 = new gdcmm.Tag(0x10, 0x30);
        cleaner.Empty( t1 );
        gdcmm.PrivateTag pt0 = new gdcmm.PrivateTag( new gdcmm.Tag(0x29,0x60), "SIEMENS MEDCOM HEADER2" );
        cleaner.Remove( pt0 );
        gdcmm.PrivateTag pt1 = new gdcmm.PrivateTag( new gdcmm.Tag(0x29,0x10), "SIEMENS CSA HEADER" );
        gdcmm.PrivateTag pt2 = new gdcmm.PrivateTag( new gdcmm.Tag(0x29,0x20), "SIEMENS CSA HEADER" );
        cleaner.Scrub( pt1 );
        cleaner.Scrub( pt2 );
        if( !cleaner.Clean() )
        {
            return 1;
        }

        Writer writer = new Writer();
        writer.SetFileName( file2 );
        writer.SetFile( cleaner.GetFile() );
        ret = writer.Write();
        if( !ret )
        {
            return 1;
        }

        return 0;
    }
}

```

## 14.18 CompressLossyJPEG.cs

```

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=====*/
/*
* Usage:
* $ export LD_LIBRARY_PATH=$HOME/Perso/gdcmm/debug-gcc/bin
* $ mono bin/CompressLossyJPEG.exe input.dcm output.dcm

```

```

*/

using System;
using gdcm;

public class CompressLossyJPEG
{
    public static int Main(string[] args)
    {
        {
            if( args.Length < 2 )
            {
                System.Console.WriteLine( " input.dcm output.dcm" );
                return 1;
            }
            string filename = args[0];
            string outfilename = args[1];

            ImageReader reader = new ImageReader();
            reader.SetFileName( filename );
            if( !reader.Read() )
            {
                System.Console.WriteLine( "Could not read: " + filename );
                return 1;
            }

            // The output of gdcm::Reader is a gdcm::File
            File file = reader.GetFile();

            // the dataset is the the set of element we are interested in:
            DataSet ds = file.GetDataSet();

            Image image = reader.GetImage();
            //image.Print( cout );

            ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
            TransferSyntax targetts = new TransferSyntax( TransferSyntax.TSType.JPEGBaselineProcess1 );
            change.SetTransferSyntax( targetts );

            // Setup our JPEGCodec, warning it should be compatible with JPEGBaselineProcess1
            JPEGCodec jpegcodec = new JPEGCodec();
            if( !jpegcodec.CanCode( targetts ) )
            {
                System.Console.WriteLine( "Something went really wrong, JPEGCodec cannot handle JPEGBaselineProcess1" );
                return 1;
            }
            jpegcodec.SetLossless( false );
            jpegcodec.SetQuality( 50 ); // poor quality !
            change.SetUserCodec( jpegcodec ); // specify the codec to use to the ImageChangeTransferSyntax

            change.SetInput( image );
            bool b = change.Change();
            if( !b )
            {
                System.Console.WriteLine( "Could not change the Transfer Syntax" );
                return 1;
            }

            ImageWriter writer = new ImageWriter();
            writer.SetImage( (gdcm.Image)change.GetOutput() );
            writer.SetFile( reader.GetFile() );
            writer.SetFileName( outfilename );
            if( !writer.Write() )
            {
                System.Console.WriteLine( "Could not write: " + outfilename );
                return 1;
            }

            return 0;
        }
    }
}

```

## 14.19 DecompressImageMultiframe.cs

```

/*=====

```

```

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=====*/

/*
$ gdcminfo ~/Desktop/angiogram-06.dcm
MediaStorage is 1.2.840.10008.5.1.4.1.1.12.1 [X-Ray Angiographic Image Storage]
TransferSyntax is 1.2.840.10008.1.2.4.50 [JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8
  Bit Image Compression]
NumberOfDimensions: 3
Dimensions: (512,512,355)
Origin: (0,0,0)
Spacing: (1,1,40)
DirectionCosines: (1,0,0,0,1,0)
Rescale Intercept/Slope: (0,1)
SamplesPerPixel :1
BitsAllocated :8
BitsStored :8
HighBit :7
PixelRepresentation:0
ScalarType found :UINT8
PhotometricInterpretation: MONOCHROME2
PlanarConfiguration: 0
TransferSyntax: 1.2.840.10008.1.2.4.50
Orientation Label: AXIAL
*/

/*
* Description:
*
* Assume we have a file angiogram-06.dcm as described above.
* the following program will decompress directly from the extracted jpeg stream.
*
* First step extract the jpeg stream (but not the Basic Offset Table):
*
* $ gdcmrw -i angiogram-06.dcm -o /tmp/output/chris --split-frags --pattern %d.jpg
*
* Check that indeed there are 355 files, while there are 356 fragments in the original DICOM file, since
* gdcmrw always skip the first fragment (Basic Offset Table).
*
* Now from those individual jpeg stream, recreate a fake gdcm.DataElement...
*
* Usage:
*
* $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
* $ mono ./bin/DecompressImageMultiframe.exe /tmp/output
*/
using System;
using gdcm;

public class DecompressImageMultiframe
{
    public static int Main(string[] args)
    {
        string directory = args[0];
        gdcm.Directory dir = new gdcm.Directory();
        uint nfiles = dir.Load(directory);
        //System.Console.WriteLine(dir.toString());
        gdcm.FilenamesType filenames = dir.GetFilesNames();

        Image image = new Image();
        image.SetNumberOfDimensions( 3 ); // important for now
        DataElement pixeldata = new DataElement( new gdcm.Tag(0x7fe0,0x0010) );

        // Create a new SequenceOfFragments C++ object, store it as a SmartPointer :
        SmartPtrFrag sq = SequenceOfFragments.New();

        // Yeah, the files are not guaranteed to be in order, please adapt...
        for(uint i = 0; i < nfiles; ++i)
        {
            System.Console.WriteLine( filenames[(int)i] );
            string file = filenames[(int)i];
            System.IO.FileStream infile =

```

```

        new System.IO.FileStream(file, System.IO.FileMode.Open, System.IO.FileAccess.Read);
        uint fsize = gdcm.PosixEmulation.FileSize(file);

        byte[] jstream = new byte[fsize];
        infile.Read(jstream, 0, jstream.Length);

        Fragment frag = new Fragment();
        frag.SetByteValue( jstream, new gdcm.VL( (uint)jstream.Length) );
        sq.AddFragment( frag );
    }

    // Pass by reference:
    pixeldata.SetValue( sq.__ref__() );

    // insert:
    image.SetDataElement( pixeldata );

    // JPEG use YBR to achieve better compression ratio by default (not RGB)
    // FIXME hardcoded:
    PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.MONOCHROME2
    );
    image.SetPhotometricInterpretation( pi );
    // FIXME hardcoded:
    PixelFormat pixeltype = new PixelFormat(1,8,8,7);
    image.SetPixelFormat( pixeltype );

    // FIXME hardcoded:
    image.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEGLosslessProcess14_1 ) );
    image.SetDimension(0, 512);
    image.SetDimension(1, 512);
    image.SetDimension(2, 355);

    // Decompress !
    byte[] decompressedData = new byte[(int)image.GetBufferLength()];
    image.GetBuffer(decompressedData);

    // Write out the decompressed bytes
    System.Console.WriteLine(image.toString());
    using (System.IO.Stream stream =
        System.IO.File.Open(@"tmp/dd.raw",
            System.IO.FileMode.Create))
    {
        System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
        writer.Write(decompressedData);
    }

    return 0;
}

```

## 14.20 DumpCSA.cs

```

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=====*/

/*
 * Usage:
 * $ bin/DumpCSA.exe input.dcm
 */
using System;
using gdcm;

public class DumpCSA
{

```

```

public static int Main(string[] args)
{
    string filename = args[0];

    gdcm.Reader reader = new gdcm.Reader();
    reader.SetFileName( filename );
    if (!reader.Read()) return 1;

    gdcm.File f = reader.GetFile();
    gdcm.DataSet ds = f.GetDataSet();

    string[] expectedSiemensTags = new string[] { "B_value" , "AcquisitionMatrixText" };
    using (PrivateTag gtag = CSAHeader.GetCSAImageHeaderInfoTag())
    {
        if (ds.FindDataElement(gtag))
        {
            using (DataElement de = ds.GetDataElement(gtag))
            {
                if (de != null && !de.IsEmpty())
                {
                    using (CSAHeader csa = new CSAHeader())
                    {
                        if (csa.LoadFromDataElement(de))
                        {
                            foreach (string str in expectedSiemensTags)
                            {
                                if (csa.FindCSAElementByName(str))
                                {
                                    using (CSAElement elem = csa.GetCSAElementByName(str))
                                    {
                                        if (elem != null)
                                        {
                                            System.Console.WriteLine( elem.toString() );
                                        }
                                    }
                                }
                            }
                        }
                    }
                }
            }
        }
    }

    return 0;
}

```

## 14.21 ExtractEncapsulatedFile.cs

```

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=====*/

/*
 * This example shows how one from C# context can extract a binary blob
 * and write out as a file.
 * This example is meant for pdf encapsulated file, but can be adapted for other type
 * of binary blob.
 *
 * DICOM file is:
 * ...
 * (0042,0010) ST (no value available) # 0, 0 DocumentTitle
 * (0042,0011) OB 25\50\44\46\2d\31\2e\32\20\0d\25\e2\e3\cf\d3\20\0d\31\30\20\30\20... # 40718, 1
 * EncapsulatedDocument

```



```

* (0042,0012) LO [application/pdf]                                # 16, 1 MIMETimeTypeOfEncapsulatedDocument
* ...
*
* Usage:
* $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
* $ mono bin/ExtractEncapsulatedFile.exe some_pdf_encapsulated.dcm
*/
using System;
using gdcm;

public class ExtractEncapsulatedFile
{
    public static int Main(string[] args)
    {
        string file = args[0];
        Reader reader = new Reader();
        reader.SetFileName( file );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }

        File f = reader.GetFile();
        DataSet ds = f.GetDataSet();
        Tag tencapsulated_stream = new Tag(0x0042,0x0011); // Encapsulated Document
        if( !ds.FindDataElement( tencapsulated_stream ) )
        {
            return 1;
        }
        // else
        DataElement de = ds.GetDataElement( tencapsulated_stream );
        ByteValue bv = de.GetByteValue();
        uint len = bv.GetLength();
        byte[] encapsulated_stream = new byte[len];
        bv.GetBuffer( encapsulated_stream, len );

        // Write out the decompressed bytes
        //System.Console.WriteLine(image.toString());
        using (System.IO.Stream stream =
            System.IO.File.Open(@"tmp/dd.pdf",
                System.IO.FileMode.Create))
        {
            System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
            writer.Write( encapsulated_stream );
        }

        return 0;
    }
}

```

## 14.22 ExtractImageRegion.cs

```

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=====*/

/*
* This small code shows how to use the gdcm.ImageRegionReader API
* In this example we are taking each frame by frame and dump them to
* /tmp/frame.raw.
*
* Usage:
* $ bin/ExtractImageRegion.exe input.dcm
*
*/

```

```

* Example:
* $ bin/ExtractImageRegion.exe gdcData/012345.002.050.dcm
* $ md5sum /tmp/frame.raw
* d594a5e2fde12f32b6633ca859b4d4a6 /tmp/frame.raw
* $ gdcminfo --md5sum gdcData/012345.002.050.dcm
* [...]
* md5sum: d594a5e2fde12f32b6633ca859b4d4a6
*/
using System;
using gdc;

public class ExtractImageRegion
{
    public static int Main(string[] args)
    {
        string filename = args[0];

        uint file_size = gdc.PosixEmulation.FileSize(filename);

        // instantiate the reader:
        gdc.ImageRegionReader reader = new gdc.ImageRegionReader();
        reader.SetFileName( filename );

        // pull DICOM info:
        if (!reader.ReadInformation()) return 1;

        // store current offset:
        uint cur_pos = reader.GetStreamCurrentPosition();

        uint remaining = file_size - cur_pos;

        Console.WriteLine("Remaining bytes to read (Pixel Data): " + remaining.ToString() );

        // Get file infos
        gdc.File f = reader.GetFile();

        // get some info about image
        UIntArrayType dims = ImageHelper.GetDimensionsValue(f);
        PixelFormat pf = ImageHelper.GetPixelFormatValue (f);
        int pixelsize = pf.GetPixelSize();
        PhotometricInterpretation pi = ImageHelper.GetPhotometricInterpretationValue(f);
        Console.WriteLine( pi.ToString() );

        // buffer to get the pixels
        byte[] buffer = new byte[ dims[0] * dims[1] * pixelsize ];

        // define a simple box region.
        BoxRegion box = new BoxRegion();
        for (uint z = 0; z < dims[2]; z++)
        {
            // Define that I want the image 0, full size (dimx x dimy pixels)
            // and do that for each z:
            box.SetDomain(0, dims[0] - 1, 0, dims[1] - 1, z, z);
            //System.Console.WriteLine( box.ToString() );
            reader.SetRegion( box );

            // reader will try to load the uncompressed image region into buffer.
            // the call returns an error when buffer.Length is too small. For instance
            // one can call:
            // uint buf_len = reader.ComputeBufferLength(); // take into account pixel size
            // to get the exact size of minimum buffer
            if (reader.ReadIntoBuffer(buffer, (uint)buffer.Length))
            {
                using (System.IO.Stream stream =
                    System.IO.File.Open(@"tmp/frame.raw",
                        System.IO.FileMode.Create))
                {
                    System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
                    writer.Write(buffer);
                }
            }
            else
            {
                throw new Exception("can't read pixels error");
            }
        }

        return 0;
    }
}

```

## 14.23 ExtractImageRegionWithLUT.cs

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====*/

/*
 * This small code shows how to use the gdcm.ImageRegionReader API
 * In this example we are taking each frame by frame and dump them to
 * /tmp/frame.raw.
 * Furthermore we are applying the LUT on this image.
 * Special care should be taken in case the image is not PALETTE COLOR
 *
 * Usage:
 * $ bin/ExtractImageRegionWithLUT.exe input.dcm
 *
 * Example:
 * $ bin/ExtractImageRegionWithLUT.exe gdcmData/rle16loo.dcm
 * $ md5sum /tmp/frame_rgb.raw
 * 73bf61325fdb6e2830244a2b7b0c4ae2 /tmp/frame_rgb.raw
 * $ gdcming --depth 16 --spp 3 --size 600,430 /tmp/frame_rgb.raw rgb.dcm
 * $ gdcmvviewer rgb.dcm
 */
using System;
using gdcm;

public class ExtractImageRegion
{
    public static int Main(string[] args)
    {
        string filename = args[0];

        // instantiate the reader:
        gdcm.ImageRegionReader reader = new gdcm.ImageRegionReader();
        reader.SetFileName( filename );

        // pull DICOM info:
        if (!reader.ReadInformation()) return 1;
        // Get file infos
        gdcm.File f = reader.GetFile();

        gdcm.LookupTable lut = reader.GetImage().GetLUT();

        // get some info about image
        UIntArrayType dims = ImageHelper.GetDimensionsValue(f);
        PixelFormat pf = ImageHelper.GetPixelFormatValue (f);
        int pixelsize = pf.GetPixelSize();

        // buffer to get the pixels
        byte[] buffer = new byte[ dims[0] * dims[1] * pixelsize ];

        // output buffer for the RGB decoded image:
        byte[] buffer2 = new byte[ dims[0] * dims[1] * pixelsize * 3 ];

        // define a simple box region.
        BoxRegion box = new BoxRegion();
        for (uint z = 0; z < dims[2]; z++)
        {
            // Define that I want the image 0, full size (dimx x dimy pixels)
            // and do that for each z:
            box.SetDomain(0, dims[0] - 1, 0, dims[1] - 1, z, z);
            //System.Console.WriteLine( box.toString() );
            reader.SetRegion( box );

            // reader will try to load the uncompressed image region into buffer.
            // the call returns an error when buffer.Length is too small. For instance
            // one can call:
            // uint buf_len = reader.ComputeBufferLength(); // take into account pixel size
            // to get the exact size of minimum buffer
            if (reader.ReadIntoBuffer(buffer, (uint)buffer.Length))

```

```

        {
            if( !lut.Decode( buffer2, (uint)buffer2.Length, buffer, (uint)buffer.Length ) )
            {
                throw new Exception("can't decode");
            }

            using (System.IO.Stream stream =
                System.IO.File.Open(@"tmp/frame_rgb.raw",
                    System.IO.FileMode.Create))
            {
                System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
                writer.Write(buffer2);
            }
        }
        else
        {
            throw new Exception("can't read pixels error");
        }
    }

    return 0;
}
}

```

## 14.24 ExtractOneFrame.cs

```

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Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/

/*
 * This small code shows how to use the gdcm.StreamImageReader API
 * to read a single (whole) frame at a time
 * The API allow extracting a smaller extent of the frame of course.
 * It will write out the extracted frame in /tmp/frame.raw
 *
 * Usage:
 * $ bin/ExtractOneFrame.exe input.dcm
 */
using System;
using gdcm;

public class ExtractOneFrame
{
    public static int Main(string[] args)
    {
        string filename = args[0];

        gdcm.StreamImageReader reader = new gdcm.StreamImageReader();

        reader.SetFileName( filename );

        if (!reader.ReadImageInformation()) return 1;
        // Get file infos
        gdcm.File f = reader.GetFile();

        // get some info about image
        UIntArrayType extent = ImageHelper.GetDimensionsValue(f);
        //System.Console.WriteLine( extent[0] );
        uint dimx = extent[0];
        //System.Console.WriteLine( extent[1] );
        uint dimy = extent[1];
        //System.Console.WriteLine( extent[2] );
        uint dimz = extent[2];
        PixelFormat pf = ImageHelper.GetPixelFormatValue( f);
        int pixelsize = pf.GetPixelSize();
    }
}

```

```

//System.Console.WriteLine( pixelsize );

// buffer to get the pixels
byte[] buffer = new byte[ dimx * dimy * pixelsize ];

for (int i = 0; i < dimz; i++)
{
    // Define that I want the image 0, full size (dimx x dimy pixels)
    reader.DefinePixelExtent(0, (ushort)dimx, 0, (ushort)dimy, (ushort)i, (ushort)(i+1));
    uint buf_len = reader.DefineProperBufferLength(); // take into account pixel size
    //System.Console.WriteLine( buf_len );
    if( buf_len > buffer.Length )
    {
        throw new Exception("buffer is too small for target");
    }

    if (reader.Read(buffer, (uint)buffer.Length))
    {
        using (System.IO.Stream stream =
            System.IO.File.Open(@"tmp/frame.raw",
                System.IO.FileMode.Create))
        {
            System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
            writer.Write(buffer);
        }
    }
    else
    {
        throw new Exception("can't read pixels error");
    }
}

return 0;
}
}

```

## 14.25 FileAnonymize.cs

```

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PURPOSE. See the above copyright notice for more information.

=====*/

/*
 * Simple C# example
 *
 * Usage:
 * $ mono bin/FileAnonymize.exe input.dcm output.dcm
 */
using System;
using gdcm;

public class FileAnonymize
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        string outfilename = args[1];

        gdcm.FileAnonymizer fa = new gdcm.FileAnonymizer();
        fa.SetInputFileName( filename );
        fa.SetOutputFileName( outfilename );

        // Empty Operations
        // It will create elements, since those tags are non-registered public elements (2011):
        fa.Empty( new Tag(0x0008,0x1313) );
        fa.Empty( new Tag(0x0008,0x1317) );
    }
}

```

```

// Remove Operations
// The following Tag are actually carefully chosen, since they refer to SQ:
fa.Remove( new Tag(0x0008,0x2112) );
fa.Remove( new Tag(0x0008,0x9215) );
// Replace Operations
// do not call replace operation on SQ attribute !
fa.Replace( new Tag(0x0018,0x5100), "MYVALUE " );
fa.Replace( new Tag(0x0008,0x1160), "MYOTHERVAL" );

if( !fa.Write() )
{
    System.Console.WriteLine( "Could not write" );
    return 1;
}

return 0;
}

```

## 14.26 FileChangeTS.cs

```

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=====*/

/*
 * Simple C# example
 *
 * Shows multiple steps:
 * Steps 1.
 * Create a fake (dummy) DICOM file, with size 512 x 512 x 2 We use a small
 * image to be able to create the volume in memory Of course you can use any
 * existing DICOM instead
 *
 * Step 2.
 * Hack the DICOM file to pretend the number of frames is 1000 (instead of 2)
 * At this point in time this makes the DICOM file invalid (truncated). But the
 * next step will fix this.
 *
 * Step 3.
 * Use C# to create a binary data which will represent our source object for
 * image.
 *
 * Step 4.
 * We use gdcm.FileStreamer to merge the template DICOM file from Step 2, with
 * the binary data from Step 3. We decide to read a scanline at a time, but
 * this can be read with any number of bytes. AppendToDataElement() will always
 * do the proper computation.
 *
 * Step 5.
 * We compress this gigantic file, into [JPEG Lossless, Non-Hierarchical,
 * First-Order Prediction (Process 14 [Selection Value 1])]
 *
 * Usage:
 * $ mono bin/FileChangeTS.exe small.dcm big.dcm raw.data merge.dcm jpeg.dcm
 */
using System;
using System.IO;
using gdcm;

public class FileChangeTS
{
    public static byte[] StrToByteArray(string str)
    {
        System.Text.ASCIIEncoding encoding=new System.Text.ASCIIEncoding();
        return encoding.GetBytes(str);
    }
}

```

```

    }
    // Create a 256 x 256 Secondary Capture Image Storage
    static private void CreateSmallDICOM(string fileName)
    {
        using( var writer = new gdcm.PixmapWriter() )
        {
            gdcm.Pixmap img = writer.GetImage();
            img.SetNumberOfDimensions( 3 );
            img.SetDimension(0, 512 );
            img.SetDimension(1, 512 );
            img.SetDimension(2, 2 ); // fake a 3d volume
            PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.MONOCHROME2
            );
            img.SetPhotometricInterpretation( pi );
            gdcm.DataElement pixeldata = new gdcm.DataElement( new gdcm.Tag(0x7fe0,0x0010) );
            byte[] buffer = new byte[ 512 * 512 * 2 ];
            pixeldata.SetByteValue( buffer, new gdcm.VL((uint)buffer.Length) );
            img.SetDataElement( pixeldata );

            gdcm.File file = writer.GetFile();
            gdcm.DataSet ds = file.GetDataSet();
            gdcm.DataElement ms = new gdcm.DataElement(new gdcm.Tag(0x0008,0x0016));
            string mediastorage = "1.2.840.10008.5.1.4.1.1.7.2"; // Multi-frame Grayscale Byte Secondary Capture Image
            Storage
            byte[] val = StrToByteArray(mediastorage);
            ms.SetByteValue( val, new gdcm.VL( (uint)val.Length) );
            ds.Insert( ms );

            writer.SetFileName( fileName );
            writer.Write();
        }
    }
    static private void CreateBigDICOM(string fileName, string outfilename)
    {
        using( var ano = new gdcm.FileAnonymizer() )
        {
            // The following is somewhat dangerous, do not try at home:
            string nframes = "1000";
            ano.Replace( new gdcm.Tag(0x0028,0x0008), nframes );
            ano.SetInputFileName(fileName);
            ano.SetOutputFileName(outfilename);
            ano.Write(); // at this point the DICOM is invalid !
        }
    }
    static private void CreateDummyFile(string fileName, long length)
    {
        using (var fileStream = new FileStream(fileName, FileMode.Create, FileAccess.Write, FileShare.None))
        {
            // Looks like C# always init to 0 (fallocate ?)
            // For the purpose of the test we could add some random noise
            fileStream.SetLength(length);
        }
    }
    static private void ReadBytesIntoArray( byte[] array, FileStream source )
    {
        int numBytesToRead = array.Length;
        int numBytesRead = 0;
        while (numBytesToRead > 0)
        {
            // According to spec: Read() may return anything from 0 to numBytesToRead.
            int n = source.Read(array, numBytesRead, numBytesToRead);

            // Break when the end of the file is reached.
            if (n == 0)
                break;

            numBytesRead += n;
            numBytesToRead -= n;
        }
    }
    static private void AssembledDICOMAndRaw(string dicomfn, string rawdata, string outfn)
    {
        using ( var fs = new gdcm.FileStreamer() )
        {
            fs.SetTemplateFileName(dicomfn);
            fs.SetOutputFileName(outfn);
            gdcm.Tag pixeldata = new gdcm.Tag(0x7fe0, 0x0010);
            // FileStreamer support automatic checking of pixel data length
            // based on DICOM attributes, only if we say so:
            fs.CheckDataElement( pixeldata );
            // Declare we are working on Pixel Data attribute:
        }
    }

```

```

fs.StartDataElement( pixeldata );
using (FileStream rawSource = new FileStream(rawdata,
    FileMode.Open, FileAccess.Read))
{
    byte[] bytes = new byte[512];
    // Only read one scanline at a time
    // We could have been reading more at once, if this is more efficient,
    // AppendToDataElement will do the logic in all cases.
    for( int i = 0; i < 512 * 1000; ++i )
    {
        // Read the source file into a byte array.
        ReadBytesIntoArray( bytes, rawSource );
        fs.AppendToDataElement( pixeldata, bytes, (uint)bytes.Length );
    }
}
if( !fs.StopDataElement( pixeldata ) )
{
    // Most likely an issue with Pixel Data Length computation:
    throw new Exception("StopDataElement failed");
}
}
}

static private void CompressIntoJPEG(string rawdicom, string jpegdicom)
{
    using( var sfcts = FileChangeTransferSyntax.New() )
    {
        // Need to retrieve the actual C++ reference, to pass to
        // SimpleSubjectWatcher:
        FileChangeTransferSyntax fcts = sfcts.__ref__();
        SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(fcts, "FileChangeTransferSyntax");
        gdcm.TransferSyntax ts = new TransferSyntax( TransferSyntax.TType.JPEGLosslessProcess14_1 );
        fcts.SetTransferSyntax( ts );
        fcts.SetInputFileName( rawdicom );
        fcts.SetOutputFileName( jpegdicom );
        fcts.Change();
    }
}

public static int Main(string[] args)
{
    string filename = args[0];
    string outfilename = args[1];
    string rawfilename = args[2];
    string mergefn = args[3];
    string jpegfn = args[4];

    CreateSmallDICOM(filename);
    CreateBigDICOM(filename, outfilename);
    CreateDummyFile(rawfilename, 512 * 512 * 1000 );
    AssembleDICOMAndRaw(outfilename, rawfilename, mergefn);
    CompressIntoJPEG(mergefn, jpegfn);

    return 0;
}
}

```

## 14.27 FileChangeTSLossy.cs

```

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=====*/

/*
 * Simple C# example
 *
 * Shows multiple steps:
 * Steps 1.

```



```

* Create a fake (dummy) DICOM file, with size 512 x 512 x 2 We use a small
* image to be able to create the volume in memory Of course you can use any
* existing DICOM instead
*
* Step 2.
* Hack the DICOM file to pretend the number of frames is 1000 (instead of 2)
* At this point in time this makes the DICOM file invalid (truncated). But the
* next step will fix this.
*
* Step 3.
* Use C# to create a binary data which will represent our source object for
* image.
*
* Step 4.
* We use gdcm.FileStreamer to merge the template DICOM file from Step 2, with
* the binary data from Step 3. We decide to read a scanline at a time, but
* this can be read with any number of bytes. AppendToDataElement() will always
* do the proper computation.
*
* Step 5.
* We compress this gigantic file, into [JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit
  Image Compression]
*
* Usage:
* $ bin/FileChangeTSLossy.exe small.dcm big.dcm raw.data merge.dcm jpeg.dcm
*/
using System;
using System.IO;
using gdcm;

public class FileChangeTS
{
    public static byte[] StrToByteArray(string str)
    {
        System.Text.ASCIIEncoding encoding=new System.Text.ASCIIEncoding();
        return encoding.GetBytes(str);
    }
    // Create a 256 x 256 Secondary Capture Image Storage
    static private void CreateSmallDICOM(string fileName)
    {
        using( var writer = new gdcm.PixmapWriter() )
        {
            gdcm.Pixmap img = writer.GetImage();
            img.SetNumberOfDimensions( 3 );
            img.SetDimension(0, 512 );
            img.SetDimension(1, 512 );
            img.SetDimension(2, 2 ); // fake a 3d volume
            PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.MONOCHROME2
            );
            img.SetPhotometricInterpretation( pi );
            gdcm.DataElement pixeldata = new gdcm.DataElement( new gdcm.Tag(0x7fe0,0x0010) );
            byte[] buffer = new byte[ 512 * 512 * 2 ];
            pixeldata.SetByteValue( buffer, new gdcm.VL((uint)buffer.Length) );
            img.SetDataElement( pixeldata );

            gdcm.File file = writer.GetFile();
            gdcm.DataSet ds = file.GetDataSet();
            gdcm.DataElement ms = new gdcm.DataElement(new gdcm.Tag(0x0008,0x0016));
            string mediastorage = "1.2.840.10008.5.1.4.1.1.7.2"; // Multi-frame Grayscale Byte Secondary Capture Image
            Storage
            byte[] val = StrToByteArray(mediastorage);
            ms.SetByteValue( val, new gdcm.VL( (uint)val.Length) );
            ds.Insert( ms );

            writer.SetFileName( fileName );
            writer.Write();
        }
    }
    static private void CreateBigDICOM(string fileName, string outfilename)
    {
        using( var ano = new gdcm.FileAnonymizer() )
        {
            // The following is somewhat dangerous, do not try at home:
            string nframes = "1000";
            ano.Replace( new gdcm.Tag(0x0028,0x0008), nframes );
            ano.SetInputFileName(fileName);
            ano.SetOutputFileName(outfilename);
            ano.Write(); // at this point the DICOM is invalid !
        }
    }
    static private void CreateDummyFile(string fileName, long length)

```

```

{
using (var fileStream = new FileStream(fileName, FileMode.Create, FileAccess.Write, FileShare.None))
{
    // Looks like C# always init to 0 (fallocate ?)
    // For the purpose of the test we could add some random noise
    fileStream.SetLength(length);
}
}
static private void ReadBytesIntoArray( byte[] array, FileStream source )
{
    int numBytesToRead = array.Length;
    int numBytesRead = 0;
    while (numBytesToRead > 0)
    {
        // According to spec: Read() may return anything from 0 to numBytesToRead.
        int n = source.Read(array, numBytesRead, numBytesToRead);

        // Break when the end of the file is reached.
        if (n == 0)
            break;

        numBytesRead += n;
        numBytesToRead -= n;
    }
}
static private void AssembleDICOMAndRaw(string dicomfn, string rawdata, string outfn)
{
using ( var fs = new gdcm.FileStreamer() )
{
    fs.SetTemplateFileName(dicomfn);
    fs.SetOutputFileName(outfn);
    gdcm.Tag pixeldata = new gdcm.Tag(0x7fe0, 0x0010);
    // FileStreamer support automatic checking of pixel data length
    // based on DICOM attributes, only if we say so:
    fs.CheckDataElement( pixeldata );
    // Declare we are working on Pixel Data attribute:
    fs.StartDataElement( pixeldata );
    using (FileStream rawSource = new FileStream(rawdata,
        FileMode.Open, FileAccess.Read))
    {
        byte[] bytes = new byte[512];
        // Only read one scanline at a time
        // We could have been reading more at once, if this is more efficient,
        // AppendToDataElement will do the logic in all cases.
        for( int i = 0; i < 512 * 1000; ++i )
        {
            // Read the source file into a byte array.
            ReadBytesIntoArray( bytes, rawSource );
            fs.AppendToDataElement( pixeldata, bytes, (uint)bytes.Length );
        }
    }
    if( !fs.StopDataElement( pixeldata ) )
    {
        // Most likely an issue with Pixel Data Length computation:
        throw new Exception("StopDataElement failed");
    }
}
}
static private void CompressIntoJPEG(string rawdicom, string jpegdicom)
{
using( var sfcts = FileChangeTransferSyntax.New() )
{
    // Need to retrieve the actual C++ reference, to pass to
    // SimpleSubjectWatcher:
    FileChangeTransferSyntax fcts = sfcts.__ref__();
    SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(fcts, "FileChangeTransferSyntax");
    gdcm.TransferSyntax ts = new TransferSyntax( TransferSyntax.TSType.JPEGBaselineProcess1 );
    fcts.SetTransferSyntax( ts );
    ImageCodec ic = fcts.GetCodec();
    JPEGCodec jpeg = JPEGCodec.Cast( ic );
    jpeg.SetLossless( false );
    jpeg.SetQuality( 50 ); // poor quality !

    fcts.SetInputFileName( rawdicom );
    fcts.SetOutputFileName( jpegdicom );
    fcts.Change();
}
}
public static int Main(string[] args)
{
    string filename = args[0];

```

```

    string outfilename = args[1];
    string rawfilename = args[2];
    string mergefn = args[3];
    string jpegfn = args[4];

    CreateSmallDICOM(filename);
    CreateBigDICOM(filename, outfilename);
    CreateDummyFile(rawfilename, 512 * 512 * 1000 );
    AssembleDICOMAndRaw(outfilename, rawfilename, mergefn);
    CompressIntoJPEG(mergefn, jpegfn);

    return 0;
}
}

```

## 14.28 FileStreaming.cs

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/

/*
 * Simple C# example
 *
 * Usage:
 * $ mono bin/FileStreaming.exe gdcmlData/CT_16b_signed-UsedBits13.dcm output.dcm
 *
 * The class will take care of group handling and will use the first available group:
 * (0009,0012) ?? (LO) [MYTEST] # 6,1 Private Creator
 */
using System;
using gdcml;

public class FileStreaming
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        string outfilename = args[1];

        gdcml.PrivateTag pt = new gdcml.PrivateTag( new gdcml.Tag(0x9,0x10), "MYTEST" );

        gdcml.FileStreamer fs = new gdcml.FileStreamer();
        fs.SetTemplateFileName( filename );
        fs.SetOutputFileName( outfilename );

        byte[] buffer = new byte[ 8192 ];
        uint len = (uint)buffer.Length;

        // In this example, we want that each newly created Private Attribute
        // contains at most 1000 bytes of incoming dataset.
        // We are also calling the function twice to check that appending mode is
        // working from one call to the other. The last element will have a length
        // of (2 * 8192) % 1000 = 384
        if( !fs.StartGroupDataElement( pt, 1000, 1 ) )
        {
            || !fs.AppendToGroupDataElement( pt, buffer, len )
            || !fs.AppendToGroupDataElement( pt, buffer, len )
            || !fs.StopGroupDataElement( pt ) )
        {
            System.Console.WriteLine( "Could not change private group" );
            return 1;
        }

        return 0;
    }
}

```

## 14.29 GetArray.cs

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/GetArray.exe gdcmData/012345.002.050.dcm
 */
using System;
using gdcm;

public class GetArray
{
    public static int Main(string[] args)
    {
        string file1 = args[0];
        ImageReader reader = new ImageReader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }

        Image image = reader.GetImage();

        PixelFormat pixeltype = image.GetPixelFormat();

        if( image.GetNumberOfDimensions() != 2 )
        {
            // For the purpose of the test, exit early on
            return 1;
        }
        uint dimx = image.GetDimension(0);
        uint dimy = image.GetDimension(1);
        uint npixels = dimx * dimy;
        //LookupTable lut = image.GetLUT();
        //uint r1 = lut.GetLUTLength( LookupTable.LookupTableType.RED );
        //byte[] rbuf = new byte[ r1 ];
        //uint r12 = lut.GetLUT( LookupTable.LookupTableType.RED, rbuf );
        //assert r1 == r12;

        //byte[] str1 = new byte[ image.GetBufferLength()];
        //image.GetBuffer( str1 );
        if( pixeltype.GetScalarType() == PixelFormat.ScalarType.UINT8 )
        {
            System.Console.WriteLine( "Processing UINT8 image type" );
            byte[] str1 = new byte[ npixels ];
            image.GetArray( str1 );
        }
        else if( pixeltype.GetScalarType() == PixelFormat.ScalarType.INT16 )
        {
            System.Console.WriteLine( "Processing INT16 image type" );
            short[] str1 = new short[ npixels ];
            image.GetArray( str1 );
        }
        else if( pixeltype.GetScalarType() == PixelFormat.ScalarType.UINT16 )
        {
            System.Console.WriteLine( "Processing UINT16 image type" );
            ushort[] str1 = new ushort[ npixels ];
            image.GetArray( str1 );
        }
        else
        {
            //System.Console.WriteLine( "Default (unhandled pixel format): " + pixeltype.toString() );
            System.Console.WriteLine( "Default (unhandled pixel format): " + pixeltype.GetScalarTypeAsString() );
            // Get bytes

```

```

        byte[] str1 = new byte[ image.GetBufferLength()];
        image.GetBuffer( str1 );
    }

    return 0;
}
}

```

## 14.30 MpegVideoInfo.cs

```

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=====*/
/*
 * This examples takes in a MPEG2 and write out a Video Endoscopic Imagae Storage
 * encoded using MPEG2 @ Main Profile
 * ref: http://chrisa.wordpress.com/2007/11/21/decoding-mpeg2-information/
 * See also:
 * http://dvd.sourceforge.net/dvdinfo/mpeghdrs.html#gop
 * http://cvs.linux.hr/cgi-bin/viewcvs.cgi/mpeg_mod/README.infompeg?view=markup
 * http://www.guru-group.fi/~too/sw/m2vmp2cut/mpeg2info.c
 */

/*
 * Provides information about an MPEG2 file, including the duration, frame rate, aspect
 * ratio, and resolution. Good information about the MPEG2 file structure that helps
 * explain parts of the code can be found here:
 * http://dvd.sourceforge.net/dvdinfo/mpeghdrs.html#gop
 *
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 *
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 *
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 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 */
using System;
using System.IO;
using gdcm;

public class Mpeg2VideoInfo
{
    #region Member Variables
    private TimeSpan m_startTime = TimeSpan.Zero;
    private TimeSpan m_endTime = TimeSpan.Zero;
    private TimeSpan m_duration = TimeSpan.Zero;
    private eAspectRatios m_aspectRatio = eAspectRatios.Invalid;
    private eFrameRates m_frameRate = 0;
    private int m_pictureWidth = 0;
    private int m_pictureHeight = 0;
    #endregion

    #region Constants
    private const byte PADDING_PACKET = 0xBE;
    private const byte VIDEO_PACKET = 0xE0;
    private const byte AUDIO_PACKET = 0xC0;
    private const byte SYSTEM_PACKET = 0xBB;
    private const byte TIMESTAMP_PACKET = 0xB8;
    
```

```

private const byte HEADER_PACKET = 0xB3;

private const int BUFFER_SIZE = 8162; // 8K buffer

private readonly static TimeSpan EMPTY_TIMESPAN = new TimeSpan(0, 0, -1);
#endregion

#region Enumerations
public enum eFrameRates
{
    Invalid,
    PulldownNTSC,           // 24000d/1001d = 23.976 Hz
    Film,                   // 24 Hz
    PAL,                    // 25 Hz
    NTSC,                   // 30000d/1001d = 29.97 Hz
    DropFrameNTSC,         // 30 Hz
    DoubleRatePAL,          // 50 Hz
    DoubleRateNTSC,         // 59.97 Hz
    DoubleRateDropFrameNTSC // 60 Hz
}

public enum eAspectRatios
{
    Invalid,
    VGA,                    // 1/1
    StandardTV,             // 4/3
    LargeTV,                 // 16/9
    Cinema                   // 2.21/1
}
#endregion

#region Constructor
public Mpeg2VideoInfo(string file)
{
    ParseMpeg(file);
}
#endregion

#region Public Properties
public TimeSpan StartTime
{
    get { return m_startTime; }
}

public TimeSpan EndTime
{
    get { return m_endTime; }
}

public TimeSpan Duration
{
    get { return m_duration; }
}

public eAspectRatios AspectRatio
{
    get { return m_aspectRatio; }
}

public eFrameRates FrameRate
{
    get { return m_frameRate; }
}

public int PictureWidth
{
    get { return m_pictureWidth; }
}

public int PictureHeight
{
    get { return m_pictureHeight; }
}
#endregion

#region Private Functions
private void ParseMpeg(string file)
{
    FileStream fs = new FileStream(file, FileMode.Open, FileAccess.Read, FileShare.ReadWrite);

```

```

        BinaryReader br = new BinaryReader(fs);

        m_startTime = GetStartTimeStampInfo(br);
        m_endTime = GetEndTimeStampInfo(br);

        m_duration = m_endTime.Subtract(m_startTime);

        GetHeaderInfo(br);

        br.Close();
        fs.Close();
    }

    private TimeSpan GetStartTimeStampInfo(BinaryReader br)
    {
        TimeSpan startTime = EMPTY_TIMESPAN;
        byte[] buffer = new byte[BUFFER_SIZE];

        br.BaseStream.Seek(0, SeekOrigin.Begin);

        while (startTime == EMPTY_TIMESPAN && br.BaseStream.Position < br.BaseStream.Length)
        {
            int readBytes = br.Read(buffer, 0, BUFFER_SIZE);

            for (int offset = 0; offset < readBytes - 8; offset++)
            {
                if (IsStreamMarker(ref buffer, offset, TIMESTAMP_PACKET))
                {
                    offset += 4; // Move to the data position which follows the stream header
                    uint timeStampEncoded = GetData(ref buffer, offset);
                    startTime = DecodeTimeStamp(timeStampEncoded);

                    if (startTime != EMPTY_TIMESPAN)
                        break;
                }
            }
        }

        return startTime;
    }

    private TimeSpan GetEndTimeStampInfo(BinaryReader br)
    {
        TimeSpan endTime = EMPTY_TIMESPAN;
        byte[] buffer = new byte[BUFFER_SIZE];

        br.BaseStream.Seek(-BUFFER_SIZE, SeekOrigin.End);

        while (endTime == EMPTY_TIMESPAN && br.BaseStream.Position > BUFFER_SIZE)
        {
            int readBytes = br.Read(buffer, 0, BUFFER_SIZE);

            for (int offset = readBytes - 8; offset >= 0; offset--)
            {
                if (IsStreamMarker(ref buffer, offset, TIMESTAMP_PACKET))
                {
                    offset += 4; // Move to the data position which follows the stream header
                    uint timeStampEncoded = GetData(ref buffer, offset);
                    endTime = DecodeTimeStamp(timeStampEncoded);

                    if (endTime != EMPTY_TIMESPAN)
                        break;
                }
            }

            br.BaseStream.Seek(-BUFFER_SIZE * 2, SeekOrigin.Current);
        }

        return endTime;
    }

    private TimeSpan DecodeTimeStamp(uint timeStampEncoded)
    {
        TimeSpan timeStamp = EMPTY_TIMESPAN;

        // Mask out the bits containing the property we are after, then
        // shift the data to the right to get its value
        int hour = (int)(timeStampEncoded & 0x7C000000) >> 26; // Bits 31 -> 27
        int minute = (int)(timeStampEncoded & 0x03F00000) >> 20; // Bits 26 -> 21
        int second = (int)(timeStampEncoded & 0x0007E000) >> 13; // Bits 19 -> 14
        int frame = (int)(timeStampEncoded & 0x00001F80) >> 7; // Bits 13 -> 8 - not used, but included for
    }

```

```

        completeness

        timeStamp = new TimeSpan(hour, minute, second);
        return timeStamp;
    }

    private void GetHeaderInfo(BinaryReader br)
    {
        byte[] buffer = new byte[BUFFER_SIZE];

        br.BaseStream.Seek(0, SeekOrigin.Begin);
        br.Read(buffer, 0, BUFFER_SIZE);

        for (int offset = 0; offset < buffer.Length - 4; offset++)
        {
            if (IsStreamMarker(ref buffer, offset, HEADER_PACKET))
            {
                offset += 4; // Move to the data position which follows the stream header
                uint headerData = GetData(ref buffer, offset);

                // Mask out the bits containing the property we are after, then
                // shift the data to the right to get its value
                m_pictureWidth = (int)(headerData & 0xFFF00000) >> 20;
                m_pictureHeight = (int)(headerData & 0x000FFF00) >> 8;

                uint aspectRatioIndex = (headerData & 0x000000F0) >> 4;
                uint fpsIndex = headerData & 0x0000000F;

                m_aspectRatio = (eAspectRatios)fpsIndex;
                m_frameRate = (eFrameRates)fpsIndex;

                break;
            }
        }
    }

    private uint GetData(ref byte[] buffer, int offset)
    {
        return (uint) ((buffer[offset] << 24) |
                       (buffer[offset + 1] << 16) |
                       (buffer[offset + 2] << 8) |
                       (buffer[offset + 3]));
    }

    private bool IsStreamMarker(ref byte[] buffer, int offset, byte markerType)
    {
        return (buffer[offset] == 0x00 &&
                buffer[offset + 1] == 0x00 &&
                buffer[offset + 2] == 0x01 &&
                buffer[offset + 3] == markerType);
    }
}
#endregion

public static int Main(string[] args)
{
    string file1 = args[0];
    Mpeg2VideoInfo info = new Mpeg2VideoInfo(file1);
    System.Console.WriteLine( info.StartTime );
    System.Console.WriteLine( info.EndTime );
    System.Console.WriteLine( info.Duration );
    System.Console.WriteLine( info.AspectRatio );
    System.Console.WriteLine( info.FrameRate );
    System.Console.WriteLine( info.PictureWidth );
    System.Console.WriteLine( info.PictureHeight );

    ImageReader r = new ImageReader();
    //Image image = new Image();
    Image image = r.GetImage();
    image.SetNumberOfDimensions( 3 );
    DataElement pixeldata = new DataElement( new gdcm.Tag(0x7fe0,0x0010) );

    System.IO.FileStream infile =
        new System.IO.FileStream(file1, System.IO.FileMode.Open, System.IO.FileAccess.Read);
    uint fsize = gdcm.PosixEmulation.FileSize(file1);

    byte[] jstream = new byte[fsize];
    infile.Read(jstream, 0, jstream.Length);

    SmartPtrFrag sq = SequenceOfFragments.New();
    Fragment frag = new Fragment();
    frag.SetByteValue( jstream, new gdcm.VL( (uint)jstream.Length) );
    sq.AddFragment( frag );
}

```



```

        pixeldata.SetValue( sq.__ref__() );

        // insert:
        image.SetDataElement( pixeldata );

        PhotometricInterpretation pi = new PhotometricInterpretation(
            PhotometricInterpretation.PIType.YBR_PARTIAL_420 );
        image.SetPhotometricInterpretation( pi );
        // FIXME hardcoded:
        PixelFormat pixeltype = new PixelFormat(3,8,8,7);
        image.SetPixelFormat( pixeltype );

        // FIXME hardcoded:
        TransferSyntax ts = new TransferSyntax( TransferSyntax.TSType.MPEG2MainProfile);
        image.SetTransferSyntax( ts );

        image.SetDimension(0, (uint)info.PictureWidth);
        image.SetDimension(1, (uint)info.PictureHeight);
        image.SetDimension(2, 721);

        ImageWriter writer = new ImageWriter();
        gdcm.File file = writer.GetFile();
        file.GetHeader().SetDataSetTransferSyntax( ts );
        Anonymizer anon = new Anonymizer();
        anon.SetFile( file );

        MediaStorage ms = new MediaStorage( MediaStorage.MSType.VideoEndoscopicImageStorage);

        UIDGenerator gen = new UIDGenerator();
        anon.Replace( new Tag(0x0008,0x16), ms.GetString() );
        anon.Replace( new Tag(0x0018,0x40), "25" );
        anon.Replace( new Tag(0x0018,0x1063), "40.000000" );
        anon.Replace( new Tag(0x0028,0x34), "4\\3" );
        anon.Replace( new Tag(0x0028,0x2110), "01" );

        writer.SetImage( image );
        writer.SetFileName( "dummy.dcm" );
        if ( !writer.Write() )
        {
            System.Console.WriteLine( "Could not write" );
            return 1;
        }

        return 0;
    }
}

```

## 14.31 NewSequence.cs

```

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=====*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/NewSequence.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
//using gdcm;

public class NewSequence
{
    public static byte[] StrToByteArray(string str)
    {
        System.Text.ASCIIEncoding encoding=new System.Text.ASCIIEncoding();
    }
}

```

```

        return encoding.GetBytes(str);
    }

    public static int Main(string[] argv)
    {
        string file1 = argv[0];
        string file2 = argv[1];

        gdcm.Reader r = new gdcm.Reader();
        r.SetFileName( file1 );
        if ( ! r.Read() )
        {
            return 1;
        }

        gdcm.File f = r.GetFile();
        gdcm.DataSet ds = f.GetDataSet();
        // tsis = gdcm.Tag(0x0008,0x2112) # SourceImageSequence

        // Create a dataelement
        gdcm.DataElement de = new gdcm.DataElement(new gdcm.Tag(0x0010, 0x2180));
        string occ = "Occupation";
        de.SetByteValue( StrToByteArray(occ), new gdcm.VL((uint)occ.Length));
        de.SetVR(new gdcm.VR(gdcm.VR.VRType.SH));

        // Create an item
        gdcm.Item it = new gdcm.Item();
        it.SetVLToUndefined(); // Needed to not popup error message
        //it.InsertDataElement(de)
        gdcm.DataSet nds = it.GetNestedDataSet();
        nds.Insert(de);

        // Create a Sequence
        gdcm.SmartPtrSQ sq = gdcm.SequenceOfItems.New();
        sq.SetLengthToUndefined();
        sq.AddItem(it);

        // Insert sequence into data set
        gdcm.DataElement des = new gdcm.DataElement(new gdcm.Tag(0x0400,0x0550));
        des.SetVR(new gdcm.VR(gdcm.VR.VRType.SQ));
        des.SetValue(sq.__ref__());
        des.SetVLToUndefined();

        ds.Insert(des);

        gdcm.Writer w = new gdcm.Writer();
        w.SetFile( f );
        w.SetFileName( file2 );
        if ( !w.Write() )
            return 1;

        return 0;
    }
}

```

## 14.32 RescaleImage.cs

```

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=====*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/DecompressImage.exe gdcmData/012345.002.050.dcm rescaled.dcm
 */

```

```

using System;
using gdcms;

public class DecompressImage
{
    public static int Main(string[] args)
    {
        string file1 = args[0];
        ImageReader reader = new ImageReader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }

        Image image = reader.GetImage();
        PixelFormat pixeltype = image.GetPixelFormat();

        Rescaler r = new Rescaler();
        r.SetIntercept( 0 );
        r.SetSlope( 1.2 );
        r.SetPixelFormat( pixeltype );
        PixelFormat outputpt = new PixelFormat( r.ComputeInterceptSlopePixelFormat() );

        System.Console.WriteLine( "pixeltype" );
        System.Console.WriteLine( pixeltype.ToString() );
        System.Console.WriteLine( "outputpt" );
        System.Console.WriteLine( outputpt.ToString() );

        uint len = image.GetBufferLength();
        short[] input = new short[ len / 2 ]; // sizeof(short) == 2
        image.GetArray( input );

        double[] output = new double[ len / 2 ];
        r.Rescale( output, input, len );

        // First Pixel is:
        System.Console.WriteLine( "Input:" );
        System.Console.WriteLine( input[0] );

        System.Console.WriteLine( "Output:" );
        System.Console.WriteLine( output[0] );

        return 0;
    }
}

```

## 14.33 SendFileSCU.cs

```

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=====*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Perso/gdcm-gcc/bin
 * $ mono bin/SendFileSCU.exe server port input.dcm
 */
using System;
using gdcms;

public class SendFileSCU
{
    public static int Main(string[] args)
    {

```

```

string server = args[0];
ushort port = ushort.Parse(args[1]);
string filename = args[2];

bool b = CompositeNetworkFunctions.CEcho( server, port );
if( !b ) return 1;

FileNamesType files = new FileNamesType();
files.Add( filename );
b = CompositeNetworkFunctions.CStore( server, port, files );
if( !b ) return 1;

return 0;
}
}

```

## 14.34 SimplePrintPatientName.cs

```

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=====*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Perso/gdcm/debug-gcc/bin
 * $ mono bin/SimplePrintPatientName.exe gdcmData/012345.002.050.dcm
 */
/*
This example was provided by Jonathan Morra /jonmorra gmail com/
on the gdcm mailing list (Fri, 28 May 2010)
*/
using System;
using gdcm;

namespace GDCMTest
{
    class SimplePrintPatientName
    {
        static int Main(string[] args)
        {
            if (args.Length != 1)
            {
                Console.WriteLine("This program prints the patient name of a dicom file with gdcm");
                Console.WriteLine("Usage: [input.dcm]");
                return 1;
            }

            gdcm.Reader reader = new gdcm.Reader();
            reader.SetFileName(args[0]);
            bool ret = reader.Read();
            //TagSetType tst = new TagSetType();
            //tst.Add( new Tag(0x7fe0,0x10) );
            //bool ret = reader.ReadUpToTag( new Tag(0x88,0x200), tst );
            if( !ret )
            {
                return 1;
            }

            gdcm.File file = reader.GetFile();

            gdcm.StringFilter filter = new gdcm.StringFilter();
            filter.SetFile(file);
            string value = filter.ToString(new gdcm.Tag(0x0010, 0x0010));

            Console.WriteLine("Patient Name: " + value);
            return 0;
        }
    }
}

```

```
    }
}
```

## 14.35 SortImage2.cs

```
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=====*/

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/SortImage.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;

public class SortImage2
{
    bool mysort(DataSet ds1, DataSet ds2)
    {
        return false;
    }

    public static int Main(string[] args)
    {
        Sorter sorter = new Sorter();
        sorter.SetSortFunction( mysort );

        return 0;
    }
}
```

## 14.36 CStoreQtProgress.cxx

```
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=====*/

/*
 * This small example show how one can use the virtual function
 * mechanism of the SimpleSubjectWatcher class to redirect progress
 * report to a custom Qt classes
 *
 * http://doc.qt.nokia.com/latest/qprogressdialog.html
 *
 * Usage:
 * CStoreQtProgress dicom.example.com 11112 gdcmData/MR_Spectroscopy_SIEMENS_OF.dcm
 *
 */

#include "gdcmServiceClassUser.h"
#include "gdcmSimpleSubjectWatcher.h"
```

```

#include "gdcmProgressEvent.h"
#include "gdcmDirectory.h"
#include "gdcmPresentationContextGenerator.h"

#include <QApplication>
#include <QProgressDialog>
#include <QVBoxLayout>

namespace gdcm {
/*
 * This class is a little more complicated than what this example demonstrate
 * This watcher is capable of handling nested progress. Since the Progress
 * grows from [0 to 1] on a per file basis and we only have one instance of a
 * watcher per association, we need some calculation to compute the global
 * (total) progress
 * In fact we simply divide the per-file progress by the number of files.
 *
 * This QtWatcher class will then update the progress bar according to the
 * progress.
 */
class MyQtWatcher : public SimpleSubjectWatcher
{
    size_t nfiles;
    double progress;
    size_t index;
    double refprogress;
    QWidget* win;
    QProgressDialog* qtprogress;
public:
    MyQtWatcher(Subject * s, const char *comment = "", QWidget *w = NULL, QProgressDialog* p = NULL, size_t n =
    1):
        SimpleSubjectWatcher(s,comment),nfiles(n),progress(0),index(0),refprogress(0),win(w),qtprogress(p){}
    void ShowIteration()
    {
        index++;
        assert( index <= nfiles );
        // update refprogress (we are moving to the next file)
        refprogress = progress;
    }
    void ShowProgress(Subject *, const Event &evt)
    {
        // Retrieve the ProgressEvent:
        const ProgressEvent &pe = dynamic_cast<const ProgressEvent&>(evt);
        // compute global progress:
        progress = refprogress + (1. / (double)nfiles ) * pe.GetProgress();
        // Print Global and local progress to stdout:
        std::cout << "Global Progress: " << progress << " per file progress " << pe.GetProgress() << std::endl;
        //set progress value in the QtProgress bar
        int i = (int)(progress * 100 + 0.5); // round to next int
        qtprogress->setValue(i);
        win->show();
    }
    virtual void ShowDataSet(Subject *caller, const Event &evt)
    {
        (void)caller;
        (void)evt;
    }
};
} // end namespace gdcm

int main(int argc, char *argv[])
{
    if( argc < 4 )
    {
        std::cerr << argv[0] << " remote_server port filename" << std::endl;
        return 1;
    }
    QApplication a(argc, argv);

    std::ostringstream error_log;
    gdcm::Trace::SetErrorStream( error_log );

    const char *remote = argv[1];
    int portno = atoi(argv[2]);
    const char *filename = argv[3];

    QVBoxLayout* layout = new QVBoxLayout;
    QWidget* win = new QWidget;

    QProgressDialog* progress = new QProgressDialog("Sending data...", "Cancel", 0, 100);

```

```

progress->setWindowModality(Qt::WindowModal);

layout->addWidget (progress,Qt::AlignCenter);
win->setLayout (layout);

gdcm::SmartPointer<gdcm::ServiceClassUser> scup = new gdcm::ServiceClassUser;
gdcm::ServiceClassUser &scu = *scup;
//gdcm::SimpleSubjectWatcher w( &scu, "TestServiceClassUser" );
// let's use a more complicated progress reported in this example
gdcm::MyQtWatcher w( &scu, "QtWatcher", win, progress );

scu.SetHostname( remote );
scu.SetPort( (uint16_t)portno );
scu.SetTimeout( 1000 );
scu.SetCalledAETitle( "GDCM_STORE" );

if( !scu.InitializeConnection() )
{
    std::cerr << "Could not InitializeConnection" << std::endl;
    return 1;
}

gdcm::Directory::FilenameType filenames;
filenames.push_back( filename );

// setup the PC(s) based on the filenames:
gdcm::PresentationContextGenerator generator;
if( !generator.GenerateFromFilenames(filenames) )
{
    std::cerr << "Could not GenerateFromFilenames" << std::endl;
    return 1;
}

// Setup PresentationContext(s)
scu.SetPresentationContexts( generator.GetPresentationContexts() );

// Start ASSOCIATION
if( !scu.StartAssociation() )
{
    std::cerr << "Could not Start" << std::endl;
    return 1;
}

// Send C-STORE
if( !scu.SendStore( filename ) )
{
    std::cerr << "Could not Store" << std::endl;
    std::cerr << "Error log is:" << std::endl;
    std::cerr << error_log.str() << std::endl;
    return 1;
}

// Stop ASSOCIATION
if( !scu.StopAssociation() )
{
    std::cerr << "Could not Stop" << std::endl;
    return 1;
}

win->show();

return a.exec();
}

```

## 14.37 ChangePrivateTags.cxx

```

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```

```

    PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmPrivateTag.h"

int main(int argc, char* argv[] )
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " path/to/05148044-mr-siemens-avanto-syngo.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    gdcm::Reader reader;
    reader.SetFileName( filename );
    if ( ! reader.Read() )
    {
        return 1;
    }

    // (0029,0010) LO [SIEMENS CSA HEADER] # 18,1 Private Creator
    // (0029,0011) LO [SIEMENS MEDCOM HEADER ] # 22,1 Private Creator
    // (0029,0012) LO [SIEMENS MEDCOM HEADER2] # 22,1 Private Creator
    // [...]
    // (0029,1018) CS [MR] # 2,1 CSA Series Header Type
    // (0029,1134) CS [DB TO DICOM ] # 12,1 PMTF Information 4
    // (0029,1260) LO [com ] # 4,1 Series Workflow Status

    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();

    // Declare private tag we need to find:
    gdcm::PrivateTag pt1( 0x29,0x18, "SIEMENS CSA HEADER" );
    gdcm::PrivateTag pt2( 0x29,0x34, "SIEMENS MEDCOM HEADER" );
    gdcm::PrivateTag pt3( 0x29,0x60, "SIEMENS MEDCOM HEADER2" );

    const char str1[] = "GDCM was here 3!";
    if( !ds.FindDataElement( pt1 ) ) return 1;
    gdcm::DataElement de1 = ds.GetDataElement( pt1 ); // Convert Private tag, into actual DataElement
    std::cout << de1 << std::endl;
    de1.SetByteValue( str1, (uint32_t)strlen(str1) );
    ds.Replace( de1 );

    const char str2[] = "GDCM was here 2!";
    if( !ds.FindDataElement( pt2 ) ) return 1;
    gdcm::DataElement de2 = ds.GetDataElement( pt2 );
    std::cout << de2 << std::endl;
    de2.SetByteValue( str2, (uint32_t)strlen(str2) );
    ds.Replace( de2 );

    const char str3[] = "GDCM was here 3!";
    if( !ds.FindDataElement( pt3 ) ) return 1;
    gdcm::DataElement de3 = ds.GetDataElement( pt3 );
    std::cout << de3 << std::endl;
    de3.SetByteValue( str3, (uint32_t)strlen(str3) );
    ds.Replace( de3 );

    gdcm::Writer writer;
    writer.SetFile( file );
    writer.SetFileName( outfile );
    if ( !writer.Write() )
    {
        return 1;
    }

    return 0;
}

```

## 14.38 ChangeSequenceUltrasound.cxx

```

/*=====

```



```

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=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmSmartPointer.h"
#include "gdcmDataSetHelper.h"

/*
./ChangeSequenceUltrasound gdcmData/D_CLUNIE_CT1_J2KI.dcm myoutput.dcm

This is the exact C++ translation of the original python example: ManipulateSequence.py
*/

int main(int argc, char* argv[] )
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    gdcm::Reader reader;
    reader.SetFileName( filename );
    if (! reader.Read() )
    {
        return 1;
    }

    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    gdcm::Tag tsis(0x0008,0x2112); // SourceImageSequence
    if ( ds.FindDataElement( tsis ) )
    {
        const gdcm::DataElement &sis = ds.GetDataElement( tsis );
        gdcm::SmartPointer<gdcm::SequenceOfItems> sqsis = sis.GetValueAsSQ();
        if ( sqsis && sqsis->GetNumberOfItems() )
        {
            gdcm::Item &item1 = sqsis->GetItem(1);
            gdcm::DataSet &nestedds = item1.GetNestedDataSet();
            gdcm::Tag tprcs(0x0040,0xa170); // PurposeOfReferenceCodeSequence
            if( nestedds.FindDataElement( tprcs ) )
            {
                const gdcm::DataElement &prcs = nestedds.GetDataElement( tprcs );
                gdcm::SmartPointer<gdcm::SequenceOfItems> sqprcs = prcs.GetValueAsSQ();
                if ( sqprcs && sqprcs->GetNumberOfItems() )
                {
                    gdcm::Item &item2 = sqprcs->GetItem(1);
                    gdcm::DataSet &nestedds2 = item2.GetNestedDataSet();
                    // (0008,0104) LO [Uncompressed predecessor] # 24, 1 CodeMeaning
                    gdcm::Tag tcm(0x0008,0x0104);
                    if( nestedds2.FindDataElement( tcm ) )
                    {
                        gdcm::DataElement cm = nestedds2.GetDataElement( tcm );
                        std::string mystr = "GDCM was here";
                        cm.SetByteValue( mystr.c_str(), (uint32_t)mystr.size() );
                        nestedds2.Replace( cm );
                    }
                }
            }
        }
    }

    gdcm::Writer writer;
    writer.SetFile( file );
    writer.SetFileName( outfile );
    if ( !writer.Write() )
    {
        return 1;
    }
}

```

```

    }
    return 0;
}

```

## 14.39 CheckBigEndianBug.cxx

```

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=====*/

/*
 * WARNING: This is a dev tool, do not use !
 *
 * Usage: after a gdcmconv, you would like to know if the conversion process is acceptable
 * sometime a vbindiff is acceptable, sometime it is not. In the case of the famous Philips
 * Little/Big Endian Explicit Transfer Syntax it is not easy to compare two files. However
 * this only impact byte ordering, thus we can compute byte-independant information to still
 * compare the files.
 */

#include "gdcmImageReader.h"
#include "gdcmImage.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmSystem.h"

#include <iostream>
#include <fstream>

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input1.dcm input2.dcm" << std::endl;
        return 1;
    }
    const char *filename1 = argv[1];
    const char *filename2 = argv[2];

    gdcm::ImageReader reader1;
    reader1.SetFileName( filename1 );
    if( !reader1.Read() )
    {
        std::cerr << "Could not read: " << filename1 << std::endl;
        return 1;
    }

    gdcm::ImageReader reader2;
    reader2.SetFileName( filename2 );
    if( !reader2.Read() )
    {
        std::cerr << "Could not read: " << filename2 << std::endl;
        return 1;
    }

    // TODO: need a DataSet== operator implementation

    std::cout << "Both files can be read and looks like DICOM" << std::endl;

    size_t s1 = gdcm::System::FileSize(filename1);
    size_t s2 = gdcm::System::FileSize(filename2);

    if( s1 != s2 )
    {
        std::cout << "Size mismatch: " << s1 << " != " << s2 << std::endl;
        return 1;
    }
}

```

```

    }
else
{
    std::cout << "Size match: " << s1 << " = " << s2 << std::endl;
}

std::ifstream is1( filename1, std::ios::binary );
char *buffer1 = new char[s1];
is1.read(buffer1, s1);

std::ifstream is2( filename2, std::ios::binary );
char *buffer2 = new char[s2];
is2.read(buffer2, s2);

assert( s1 == s2 );
if( memcmp(buffer1, buffer2, s1 ) == 0 )
{
    std::cout << "memcmp succeed ! File are bit identical" << std::endl;
}
else
{
    std::cout << "memcmp failed!" << std::endl;
}

// Hum...memcmp failed, for big endian/ little endian inversion the histogram of bytes
// should still be the same. So let's compute it
// buffer2[0] = 1; // let's make the test fail
std::multiset<char> set1( buffer1, buffer1 + s1 );
std::multiset<char> set2( buffer2, buffer2 + s2 );

if( set1 == set2 )
{
    std::cout << "set1 == set2. Byte histogram seems valid" << std::endl;
}
else
{
    std::cout << "set1 != set2" << std::endl;
}
delete[] buffer1;
delete[] buffer2;

return 0;
}

```

## 14.40 ClinicalTrialAnnotate.cxx

```

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=====*/
/*
 * Dummy implementation of C.7.1.3 Clinical Trial Subject Module
 *
 * Usage:
 * ClinicalTrialAnnotate gdcmData/012345.002.050.dcm out.dcm
 */

#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAnonymizer.h"

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {

```

```

    std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
    return 1;
}
const char *filename = argv[1];
const char *outfilename = argv[2];

gdcm::Reader reader;
reader.SetFileName( filename );
if( !reader.Read() )
{
    std::cerr << "Could not read: " << filename << std::endl;
    return 1;
}

// The output of gdcm::Reader is a gdcm::File
//gdcm::File &file = reader.GetFile();

// the dataset is the the set of element we are interested in:
//gdcm::DataSet &ds = file.GetDataSet();

gdcm::Anonymizer ano;
ano.SetFile( reader.GetFile() );
ano.RemoveGroupLength();
ano.RemovePrivateTags();

// PS 3.3 - 2008
// C.7.1.3 Clinical Trial Subject Module
// <entry group="0012" element="0010" vr="LO" vm="1" name="Clinical Trial Sponsor Name"/>
ano.Replace( gdcm::Tag(0x12,0x10), "BigCompany name" );
// <entry group="0012" element="0020" vr="LO" vm="1" name="Clinical Trial Protocol ID"/>
ano.Replace( gdcm::Tag(0x12,0x20), "My Clinical Trial Protocol ID" );
// <entry group="0012" element="0021" vr="LO" vm="1" name="Clinical Trial Protocol Name"/>
ano.Replace( gdcm::Tag(0x12,0x21), "My Clinical Trial Protocol Name" );
// <entry group="0012" element="0030" vr="LO" vm="1" name="Clinical Trial Site ID"/>
ano.Replace( gdcm::Tag(0x12,0x30), "My Clinical Trial Site ID" );
// <entry group="0012" element="0031" vr="LO" vm="1" name="Clinical Trial Site Name"/>
ano.Replace( gdcm::Tag(0x12,0x31), "My Clinical Trial Site Name" );
// <entry group="0012" element="0040" vr="LO" vm="1" name="Clinical Trial Subject ID"/>
ano.Replace( gdcm::Tag(0x12,0x40), "My Clinical Trial Subject ID" );
// <entry group="0012" element="0042" vr="LO" vm="1" name="Clinical Trial Subject Reading ID"/>
ano.Replace( gdcm::Tag(0x12,0x42), "My Clinical Trial Subject Reading ID" );

gdcm::Writer writer;
writer.SetFile( reader.GetFile() );
writer.SetFileName( outfile );
if( !writer.Write() )
{
    return 1;
}

return 0;
}

```

## 14.41 CompressImage.cxx

```

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=====*/
/*
*
*/
#include "gdcmImageReader.h"
#include "gdcmImage.h"
#include "gdcmWriter.h"

```

```

#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"
#include "gdcmImageChangeTransferSyntax.h"

#include <iostream>
#include <fstream>

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
        return 1;
    }

    // The output of gdcm::Reader is a gdcm::File
    //gdcm::File &file = reader.GetFile();

    // the dataset is the the set of element we are interested in:
    //gdcm::DataSet &ds = file.GetDataSet();

    gdcm::Image &image = reader.GetImage();
    // image.SetSpacing(0, 0.1);
    // image.SetSpacing(1, 0.2);
    image.Print( std::cout );

    gdcm::ImageChangeTransferSyntax change;
    change.SetTransferSyntax( gdcm::TransferSyntax::JPEG2000Lossless );
    change.SetTransferSyntax( gdcm::TransferSyntax::JPEGLosslessProcess14_1 );
    //change.SetTransferSyntax( gdcm::TransferSyntax::JPEGBaselineProcess1 );
    //change.SetTransferSyntax( image.GetTransferSyntax() );
    change.SetInput( image );
    bool b = change.Change();
    if( !b )
    {
        std::cerr << "Could not change the Transfer Syntax" << std::endl;
        return 1;
    }

    //std::ofstream out( outfile, std::ios::binary );
    //image.GetBuffer2(out);
    //out.close();
    gdcm::ImageWriter writer;
    writer.SetImage( change.GetOutput() );
    writer.SetFile( reader.GetFile() );
    writer.SetFileName( outfile );
    if( !writer.Write() )
    {
        return 1;
    }

    return 0;
}

```

## 14.42 ConvertToQImage.cxx

```

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```

```

    PURPOSE. See the above copyright notice for more information.

=====*/
/*
 * This example shows how to setup the pipeline from a gdcm::ImageReader into a
 * Qt QImage data structure.
 * It only handles 2D image.
 *
 * Ref:
 * http://doc.trolltech.com/4.5/qimage.html
 *
 * Usage:
 * ConvertToQImage gdcmData/012345.002.050.dcm output.png
 *
 * Thanks:
 * Sylvain ADAM (sylvain51 hotmail com) for contributing this example
 */

#include "gdcmImageReader.h"
#include <QImage>
#include <QImageWriter>

bool ConvertToFormat_RGB888(gdcm::Image const &gimage, char *buffer, QImage* &imageQt)
{
    const unsigned int* dimension = gimage.GetDimensions();

    unsigned int dimX = dimension[0];
    unsigned int dimY = dimension[1];

    gimage.GetBuffer(buffer);

    // Let's start with the easy case:
    if( gimage.GetPhotometricInterpretation() == gdcm::PhotometricInterpretation::RGB )
    {
        if( gimage.GetPixelFormat() != gdcm::PixelFormat::UINT8 )
        {
            return false;
        }
        unsigned char *ubuffer = (unsigned char*)buffer;
        // QImage::Format_RGB888 13 The image is stored using a 24-bit RGB format (8-8-8).
        imageQt = new QImage((unsigned char *)ubuffer, dimX, dimY, 3*dimX, QImage::Format_RGB888);
    }
    else if( gimage.GetPhotometricInterpretation() == gdcm::PhotometricInterpretation::MONOCHROME2 )
    {
        if( gimage.GetPixelFormat() == gdcm::PixelFormat::UINT8 )
        {
            // We need to copy each individual 8bits into R / G and B:
            unsigned char *ubuffer = new unsigned char[dimX*dimY*3];
            unsigned char *pubuffer = ubuffer;
            for(unsigned int i = 0; i < dimX*dimY; i++)
            {
                *pubuffer++ = *buffer;
                *pubuffer++ = *buffer;
                *pubuffer++ = *buffer++;
            }

            imageQt = new QImage(ubuffer, dimX, dimY, QImage::Format_RGB888);
        }
        else if( gimage.GetPixelFormat() == gdcm::PixelFormat::INT16 )
        {
            // We need to copy each individual 16bits into R / G and B (truncate value)
            short *buffer16 = (short*)buffer;
            unsigned char *ubuffer = new unsigned char[dimX*dimY*3];
            unsigned char *pubuffer = ubuffer;
            for(unsigned int i = 0; i < dimX*dimY; i++)
            {
                // Scalar Range of gdcmData/012345.002.050.dcm is [0,192], we could simply do:
                // *pubuffer++ = *buffer16;
                // *pubuffer++ = *buffer16;
                // *pubuffer++ = *buffer16;
                // instead do it right:
                *pubuffer++ = (unsigned char)std::min(255, (32768 + *buffer16) / 255);
                *pubuffer++ = (unsigned char)std::min(255, (32768 + *buffer16) / 255);
                *pubuffer++ = (unsigned char)std::min(255, (32768 + *buffer16) / 255);
                buffer16++;
            }

            imageQt = new QImage(ubuffer, dimX, dimY, QImage::Format_RGB888);
        }
        else
        {

```

```

        std::cerr << "Pixel Format is: " << gimage.GetPixelFormat() << std::endl;
        return false;
    }
}
else
{
    std::cerr << "Unhandled PhotometricInterpretation: " << gimage.GetPhotometricInterpretation() << std::endl;
    return false;
}

return true;
}

int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    gdcm::ImageReader ir;
    ir.SetFileName( filename );
    if(!ir.Read())
    {
        //Read failed
        return 1;
    }

    std::cout<<"Getting image from ImageReader..."<<std::endl;

    const gdcm::Image &gimage = ir.GetImage();
    std::vector<char> vbuffer;
    vbuffer.resize( gimage.GetBufferLength() );
    char *buffer = &vbuffer[0];

    QImage *imageQt = NULL;
    if( !ConvertToFormat_RGB888( gimage, buffer, imageQt ) )
    {
        return 1;
    }

    QImageWriter writer;
    writer.setFormat("png");
    writer.setFileName( outfile );
    if( !writer.write( *imageQt ) )
    {
        return 1;
    }

    return 0;
}

```

## 14.43 CreateARGBImage.cxx

```

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=====*/
/*
 * http://www.w3.org/Graphics/PNG/inline-alpha.html
 * alphatest.png: PNG image data, 380 x 287, 8-bit/color RGBA, non-interlaced
 *
 * $ convert alphatest.png alphatest.rgba
 */

#include "gdcmImageReader.h"

```

```

#include "gdcmSequenceOfFragments.h"
#include "gdcmSystem.h"
#include "gdcmImageWriter.h"

#include <iostream>
#include <fstream>

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.rgb output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    size_t len = gdcm::System::FileSize(filename);
    std::ifstream is(filename, std::ios::binary);

    char * buf = new char[len];
    is.read(buf, len);

    gdcm::ImageWriter writer;
    gdcm::Image &image = writer.GetImage();
    image.SetNumberOfDimensions( 2 );
    unsigned int dims[3] = {};
    dims[0] = 380;
    dims[1] = 287;
    image.SetDimensions( dims );
    gdcm::PixelFormat pf = gdcm::PixelFormat::UINT8;
    pf.SetSamplesPerPixel( 4 );
    image.SetPixelFormat( pf );
    gdcm::PhotometricInterpretation pi = gdcm::PhotometricInterpretation::ARGB;
    image.SetPhotometricInterpretation( pi );
    image.SetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );

    gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
    pixeldata.SetByteValue( buf, (uint32_t)len );
    image.SetDataElement( pixeldata );

    writer.SetFileName( outfile );
    if( !writer.Write() )
    {
        return 1;
    }
    delete[] buf;

    return 0;
}

```

## 14.44 CreateCMYKImage.cxx

```

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=====*/
/*
 * http://www.w3.org/Graphics/PNG/inline-alpha.html
 * alphatest.png: PNG image data, 380 x 287, 8-bit/color RGBA, non-interlaced
 *
 * $ convert alphatest.png alphatest.cmyk
 */

#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"

```



```

#include "gdcmSystem.h"
#include "gdcmImageWriter.h"

#include <iostream>
#include <fstream>

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.cmyk output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    size_t len = gdcm::System::FileSize(filename);
    std::ifstream is(filename, std::ios::binary);

    char * buf = new char[len];
    is.read(buf, len);

    gdcm::ImageWriter writer;
    gdcm::Image &image = writer.GetImage();
    image.SetNumberOfDimensions( 2 );
    unsigned int dims[3] = {};
    dims[0] = 380;
    dims[1] = 287;
    image.SetDimensions( dims );
    gdcm::PixelFormat pf = gdcm::PixelFormat::UINT8;
    pf.SetSamplesPerPixel( 4 );
    image.SetPixelFormat( pf );
    gdcm::PhotometricInterpretation pi = gdcm::PhotometricInterpretation::CMYK;
    image.SetPhotometricInterpretation( pi );
    image.SetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );

    gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
    pixeldata.SetByteValue( buf, (uint32_t)len );
    image.SetDataElement( pixeldata );

    writer.SetFileName( outfile );
    if( !writer.Write() )
    {
        return 1;
    }
    delete[] buf;

    return 0;
}

```

## 14.45 CreateJPIPDataSet.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
 * This example was created during the GSOC 2011 project for
 * JPIP
 */
#include "gdcmAnonymizer.h"
#include "gdcmWriter.h"
#include "gdcmUIDGenerator.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmSystem.h"

```

```

#include "gdcmAttribute.h"

int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " output.dcm" << std::endl;
        return 1;
    }
    const char *outfilename = argv[1];

    gdcm::Writer w;
    gdcm::File &file = w.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    //w.SetCheckFileMetaInformation( true );
    w.SetFileName( outfile );

    file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::JPIPReferenced );

    gdcm::Anonymizer anon;
    anon.SetFile( file );

    gdcm::MediaStorage ms = gdcm::MediaStorage::SecondaryCaptureImageStorage;

    gdcm::UIDGenerator gen;
    anon.Replace( gdcm::Tag(0x0008,0x16), ms.GetString() );
    std::cout << ms.GetString() << std::endl;
    anon.Replace( gdcm::Tag(0x0008,0x18), gen.Generate() );
    //
    anon.Replace( gdcm::Tag(0x0010,0x10), "JPIP^EXAMPLE" );
    anon.Replace( gdcm::Tag(0x0010,0x20), "012345" );
    anon.Empty( gdcm::Tag(0x0010,0x30) );
    anon.Empty( gdcm::Tag(0x0010,0x40) );
    anon.Empty( gdcm::Tag(0x0008,0x20) );
    anon.Empty( gdcm::Tag(0x0008,0x30) );
    anon.Empty( gdcm::Tag(0x0008,0x90) );
    anon.Empty( gdcm::Tag(0x0020,0x10) );
    anon.Empty( gdcm::Tag(0x0020,0x11) );
    anon.Empty( gdcm::Tag(0x0008,0x50) );
    anon.Empty( gdcm::Tag(0x0020,0x0013) );
    anon.Replace( gdcm::Tag(0x0020,0xd), gen.Generate() );
    anon.Replace( gdcm::Tag(0x0020,0xe), gen.Generate() );
    anon.Replace( gdcm::Tag(0x0008,0x64), "WSD " );
    anon.Replace( gdcm::Tag(0x0008,0x60), "OT" );

    gdcm::Attribute<0x0028,0x7FE0> at;
    at.SetValue( "http://dicom.example.com/jpipserver.cgi?target=img.jp2" );
    ds.Insert( at.GetAsDataElement() );

    // Need to retrieve the PixelFormat information from the given file

    if (!w.Write() )
    {
        std::cerr << "Could not write: " << outfile << std::endl;
        return 1;
    }

    return 0;
}

```

## 14.46 DeriveSeries.cxx

```

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=====*/
#include "gdcmReader.h"

```

```

#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmFileDerivation.h"
#include "gdcmUIDGenerator.h"

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        return 1;
    }
    const char * ref = argv[1];
    const char * in  = argv[2];

    gdcm::Reader r1;
    r1.SetFileName( ref );
    if( !r1.Read() ) return 1;

    gdcm::Reader r2;
    r2.SetFileName( in );
    if( !r2.Read() ) return 1;

    // Fix Spatial info:
    gdcm::DataSet & ds1 = r1.GetFile().GetDataSet();
    gdcm::File & file2 = r2.GetFile();
    gdcm::DataSet & ds2 = file2.GetDataSet();
    //gdcm::Attribute<0x8,0x8> img_type = { "ORIGINAL", "PRIMARY" };
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0008,0x0008) ) );
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x0032) ) );
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x0037) ) );
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x0088) ) ); // Spacing between slices
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x0013) ) ); // Instance Number
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x5100) ) ); // Patient Position
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x0050) ) ); // Slice Thickness
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0008,0x0070) ) ); // Manufacturer
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x0081) ) ); // Echo Time
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x1041) ) ); // Slice Location

    gdcm::Attribute<0x8,0x16> sopclassuid;
    sopclassuid.SetFromDataSet( ds1 );
    gdcm::Attribute<0x8,0x18> sopinstanceuid;
    sopinstanceuid.SetFromDataSet( ds1 );

    // Step 2: DERIVED object
    gdcm::FileDerivation fd;
    fd.AddReference( sopclassuid.GetValue(), sopinstanceuid.GetValue() );

    // http://dicom.nema.org/MEDICAL/dicom/current/output/chtml/part16/chapter_D.html#DCM_121321
    // CID 7202 "Source Image Purposes of Reference"
    // DCM 121321 "Mask image for image processing operation"
    fd.SetPurposeOfReferenceCodeSequenceCodeValue( 121321 );
    // CID 7203 "Image Derivation"
    // DCM 113047 "Pixel by pixel mask"
    fd.SetDerivationCodeSequenceCodeValue( 113047 );
    fd.SetFile( file2 );
    // If all Code Value are ok the filter will execute properly
    if( !fd.Derive() )
    {
        std::cerr << "Sorry could not derive using input info" << std::endl;
        return 1;
    }

    gdcm::Writer w;
    w.SetFile( r2.GetFile() );
    w.SetFileName( "derived.dcm" );
    if( !w.Write() )
    {
        return 1;
    }

    return 0;
}

```

## 14.47 DiffFile.cxx

```

/*=====

```

```

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=====*/
#include "gdcmReader.h"

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input1.dcm input2.dcm" << std::endl;
        return 1;
    }
    const char *filename1 = argv[1];
    const char *filename2 = argv[2];

    gdcm::Reader reader1;
    reader1.SetFileName( filename1 );
    if( !reader1.Read() )
    {
        return 1;
    }

    gdcm::Reader reader2;
    reader2.SetFileName( filename2 );
    if( !reader2.Read() )
    {
        return 1;
    }

    const gdcm::File &file1 = reader1.GetFile();
    const gdcm::File &file2 = reader2.GetFile();

    const gdcm::DataSet &ds1 = file1.GetDataSet();
    const gdcm::DataSet &ds2 = file2.GetDataSet();

    gdcm::DataSet::ConstIterator it1 = ds1.Begin();
    gdcm::DataSet::ConstIterator it2 = ds2.Begin();

    const gdcm::DataElement &de1 = *it1;
    const gdcm::DataElement &de2 = *it2;
    if( de1 == de2 )
    {
    }
    while( it1 != ds1.End() && it2 != ds2.End() && *it1 == *it2 )
    {
        ++it1;
        ++it2;
    }

    if( it1 != ds1.End() || it2 != ds2.End() )
    {
        std::cerr << "Problem with:" << std::endl;
        if( it1 != ds1.End() )
        {
            std::cerr << "ds1: " << *it1 << std::endl;
        }
        if( it2 != ds2.End() )
        {
            std::cerr << "ds2: " << *it2 << std::endl;
        }
        return 1;
    }

    return 0;
}

```

## 14.48 DiscriminateVolume.cxx

```

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=====*/
#include "gdcmScanner.h"
#include "gdcmTesting.h"
#include "gdcmIPPSorter.h"
#include "gdcmDirectionCosines.h"
#include <cmath>

/*
 * The following example is a basic sorted which should work in generic cases.
 * It sort files based on:
 * Study Instance UID
 *   Series Instance UID
 *     Frame of Reference UID
 *       Image Orientation (Patient)
 *         Image Position (Patient) (Sorting based on IPP + IOP)
 */

namespace gdcm {
    const Tag t1(0x0020,0x000d); // Study Instance UID
    const Tag t2(0x0020,0x000e); // Series Instance UID
    const Tag t3(0x0020,0x0052); // Frame of Reference UID
    const Tag t4(0x0020,0x0037); // Image Orientation (Patient)

    class DiscriminateVolume
    {
    private:
        std::vector< Directory::FileNamesType > SortedFiles;
        std::vector< Directory::FileNamesType > UnsortedFiles;

        Directory::FileNamesType GetAllFileNamesFromTagToValue(
            Scanner const & s, Directory::FileNamesType const & filesubset, Tag const & t, const char *valueref)
        {
            Directory::FileNamesType theReturn;
            if( valueref )
            {
                size_t len = strlen( valueref );
                Directory::FileNamesType::const_iterator file = filesubset.begin();
                for( ; file != filesubset.end(); ++file )
                {
                    const char *filename = file->c_str();
                    const char * value = s.GetValue(filename, t);
                    if( value && strncmp(value, valueref, len ) == 0 )
                    {
                        theReturn.push_back( filename );
                    }
                }
            }
            return theReturn;
        }
    };

    void ProcessAIOP(Scanner const & , Directory::FileNamesType const & subset, const char *iopval)
    {
        std::cout << "IOP: " << iopval << std::endl;
        IPPSorter ipp;
        ipp.SetComputeZSpacing( true );
        ipp.SetZSpacingTolerance( 1e-3 ); // ??
        bool b = ipp.Sort( subset );
        if( !b )
        {
            // If you reach here this means you need one more parameter to discriminiat this
            // series. Eg. T1 / T2 intertwined. Multiple Echo (0018,0081)
            std::cerr << "Failed to sort: " << subset.begin()->c_str() << std::endl;
            for(
                Directory::FileNamesType::const_iterator file = subset.begin();
                file != subset.end(); ++file )
            {

```

```

        std::cerr << *file << std::endl;
    }
    UnsortedFiles.push_back( subset );
    return ;
}
ipp.Print( std::cout );
SortedFiles.push_back( ipp.GetFilesNames() );
}

void ProcessAFrameOfRef(Scanner const & s, Directory::FileNamesType const & subset, const char * frameuid)
{
    // In this subset of files (belonging to same series), let's find those
    // belonging to the same Frame ref UID:
    Directory::FileNamesType files = GetAllFileNamesFromTagToValue(
        s, subset, t3, frameuid);

    std::set< std::string > iopset;

    for(
        Directory::FileNamesType::const_iterator file = files.begin();
        file != files.end(); ++file)
    {
        //std::cout << *file << std::endl;
        const char * value = s.GetValue(file->c_str(), gdcm::t4 );
        assert( value );
        iopset.insert( value );
    }
    size_t n = iopset.size();
    if ( n == 0 )
    {
        assert( files.empty() );
        return;
    }

    std::cout << "Frame of Ref: " << frameuid << std::endl;
    if ( n == 1 )
    {
        ProcessAIOP(s, files, iopset.begin()->c_str() );
    }
    else
    {
        const char *f = files.begin()->c_str();
        std::cerr << "More than one IOP: " << f << std::endl;
        // Make sure that there is actually 'n' different IOP
        gdcm::DirectionCosines ref;
        gdcm::DirectionCosines dc;
        for(
            std::set< std::string >::const_iterator it = iopset.begin();
            it != iopset.end(); ++it )
        {
            ref.SetFromString( it->c_str() );
            for(
                Directory::FileNamesType::const_iterator file = files.begin();
                file != files.end(); ++file)
            {
                std::string value = s.GetValue(file->c_str(), gdcm::t4 );
                if( value != it->c_str() )
                {
                    dc.SetFromString( value.c_str() );
                    const double crossdot = ref.CrossDot(dc);
                    const double eps = std::fabs( 1. - crossdot );
                    if( eps < 1e-6 )
                    {
                        std::cerr << "Problem with IOP discrimination: " << file->c_str()
                            << " " << it->c_str() << std::endl;
                        return;
                    }
                }
            }
        }
        // If we reach here this means there is actually 'n' different IOP
        for(
            std::set< std::string >::const_iterator it = iopset.begin();
            it != iopset.end(); ++it )
        {
            const char *iopvalue = it->c_str();
            Directory::FileNamesType iopfiles = GetAllFileNamesFromTagToValue(
                s, files, t4, iopvalue );
            ProcessAIOP(s, iopfiles, iopvalue );
        }
    }
}

```

```

}

void ProcessASeries(Scanner const & s, const char * seriesuid)
{
    std::cout << "Series: " << seriesuid << std::endl;
    // let's find all files belonging to this series:
    Directory::FileNamesType seriesfiles = GetAllFileNamesFromTagToValue(
        s, s.GetFileNames(), t2, seriesuid);

    gdcm::Scanner::ValuesType vt3 = s.GetValues(t3);
    for(
        gdcm::Scanner::ValuesType::const_iterator it = vt3.begin()
        ; it != vt3.end(); ++it )
    {
        ProcessAFrameOfRef(s, seriesfiles, it->c_str());
    }
}

void ProcessAStudy(Scanner const & s, const char * studyuid)
{
    std::cout << "Study: " << studyuid << std::endl;
    gdcm::Scanner::ValuesType vt2 = s.GetValues(t2);
    for(
        gdcm::Scanner::ValuesType::const_iterator it = vt2.begin()
        ; it != vt2.end(); ++it )
    {
        ProcessASeries(s, it->c_str());
    }
}

public:

void Print( std::ostream & os )
{
    os << "Sorted Files: " << std::endl;
    for(
        std::vector< Directory::FileNamesType >::const_iterator it = SortedFiles.begin();
        it != SortedFiles.end(); ++it )
    {
        os << "Group: " << std::endl;
        for(
            Directory::FileNamesType::const_iterator file = it->begin();
            file != it->end(); ++file)
        {
            os << *file << std::endl;
        }
    }
    os << "Unsorted Files: " << std::endl;
    for(
        std::vector< Directory::FileNamesType >::const_iterator it = UnsortedFiles.begin();
        it != UnsortedFiles.end(); ++it )
    {
        os << "Group: " << std::endl;
        for(
            Directory::FileNamesType::const_iterator file = it->begin();
            file != it->end(); ++file)
        {
            os << *file << std::endl;
        }
    }
}

std::vector< Directory::FileNamesType > const & GetSortedFiles() const { return SortedFiles; }
std::vector< Directory::FileNamesType > const & GetUnsortedFiles() const { return UnsortedFiles; }

void ProcessIntoVolume( Scanner const & s )
{
    gdcm::Scanner::ValuesType vt1 = s.GetValues( gdcm::t1 );
    for(
        gdcm::Scanner::ValuesType::const_iterator it = vt1.begin()
        ; it != vt1.end(); ++it )
    {
        ProcessAStudy( s, it->c_str() );
    }
}

```

```

    }
}

};

} // namespace gdcmm

int main(int argc, char *argv[])
{
    std::string dirl;
    if( argc < 2 )
    {
        const char *extradataroot = nullptr;
#ifdef GDCM_BUILD_TESTING
        extradataroot = gdcmm::Testing::GetDataExtraRoot();
#endif
        if( !extradataroot )
        {
            return 1;
        }
        dirl = extradataroot;
        dirl += "/gdcmmSampleData/ForSeriesTesting/VariousIncidences/ST1";
    }
    else
    {
        dirl = argv[1];
    }

    gdcmm::Directory d;
    d.Load( dirl, true ); // recursive !

    gdcmm::Scanner s;
    s.AddTag( gdcmm::t1 );
    s.AddTag( gdcmm::t2 );
    s.AddTag( gdcmm::t3 );
    s.AddTag( gdcmm::t4 );
    bool b = s.Scan( d.GetFilesNames() );
    if( !b )
    {
        std::cerr << "Scanner failed" << std::endl;
        return 1;
    }

    gdcmm::DiscriminateVolume dv;
    dv.ProcessIntoVolume( s );
    dv.Print( std::cout );

    return 0;
}

```

## 14.49 DumpADAC.cxx

```

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Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
 * the goal of this example is to mimic the behavior of disp_img_header
 * see http://www.gmecorp-usa.com/IM/NM/GC/ADAC/SV/adactechtips/Released_01Q3.pdf
 */
#include "gdcmmReader.h"
#include "gdcmmPrivateTag.h"
#include "gdcmmAttribute.h"
#include "gdcmmImageWriter.h"

#include <iostream>

```



```

#include <fstream>
#include <vector>

#include <string.h>
#include <assert.h>
#include <stdint.h>

struct dict
{
    uint16_t key;
    const char *name;
};

dict Array[] = {
    { 0x01, "Patient name" },
    { 0x02, "Patient ID" },
    { 0x03, "Patient sex" },
    { 0x04, "Patient age" },
    { 0x05, "Patient height" },
    { 0x06, "Patient weight" },
    { 0x07, "Exam date" },
    { 0x08, "Dose admin. time" },
    { 0x09, "Unique exam key" },
    { 0x0a, "Exam procedure" },
    { 0x0b, "Referring physician" },
    { 0x0c, "Attending physician" },
    { 0x0d, "Imaging modality" },
    { 0x0e, "Hospital ID" },
    { 0x0f, "Histogram crv file" },
    { 0x10, "Acq. start time" },
    { 0x11, "Object data type" },
    { 0x12, "Image viewid" },
    { 0x13, "Imaging device name" },
    { 0x14, "Device serial number" },
    { 0x15, "Collimator" },
    { 0x16, "Software version" },
    { 0x17, "Radiopharmaceutical #1" },
    { 0x18, "Energy window #1 center" },
    { 0x19, "Radiopharmaceutical #2" },
    { 0x1a, "Energy window #1 width" },
    { 0x1b, "Isotope imaging mode" },
    { 0x1c, "Energy window #2 center" },
    { 0x1d, "Energy window #2 width" },
    { 0x1e, "Energy window #3 center" },
    { 0x1f, "Energy window #3 width" },
    { 0x20, "Energy window #4 center" },
    { 0x21, "Energy window #4 width" },
    { 0x22, "??Energy window #5 center" },
    { 0x23, "??Energy window #5 width" },
    { 0x24, "Patient orientation" },
    { 0x25, "Spatial resolution" },
    { 0x26, "Slice thickness" },
    { 0x27, "Image X dimension" },
    { 0x28, "Image Y dimension" },
    { 0x29, "Image Z dimension" },
    { 0x2a, "Image pixel width" },
    { 0x2b, "Uniformity corr. file" },
    { 0x2c, "Acquisition zoom factor" },
    { 0x2d, "Total counts in set" },
    { 0x2e, "Time / frame" },
    { 0x2f, "Total acq. time" },
    { 0x30, "Maximum pixel value" },
    { 0x31, "Minimum pixel value" },
    { 0x32, "R-R interval time" },
    { 0x33, "Percent of cycle imaged" },
    { 0x34, "# of cycles accepted" },
    { 0x35, "# of cycles rejected" },
    { 0x36, "Approximate ED frame" },
    { 0x37, "Approximate ES frame" },
    { 0x38, "Approximate EF" },
    { 0x39, "Starting angle" },
    { 0x3a, "Degrees of rotation" },
    { 0x3b, "Direction of rotation" },
    { 0x3c, "Cont. or step/shoot" },
    { 0x3d, "Lim recon start frame" },
    { 0x3e, "Upper window grey shade" },
    { 0x3f, "Lower lvl grey shade" },
    { 0x40, "Associated color map" },
    { 0x41, "Custom color map file" },
    { 0x42, "Manipulated image" },
    { 0x43, "Axis of rotation corr." },

```

```

    { 0x44, "Reorientation azimuth" },
    { 0x45, "Reorientation elevation" },
    { 0x46, "Filter type" },
    { 0x47, "Filter order" },
    { 0x48, "Filter cutoff frequency" },
    { 0x49, "Reconstruction type" },
    { 0x4a, "Attenuation coefficient" },
    { 0x4b, "Associated parent file" },
    { 0x4c, "Unique patient key" },
    { 0x52, "Normalization crv file" },
    { 0x53, "Unique object key" },
    { 0x54, "This phase of VFR is" },
    { 0x55, "True color value" },
    { 0x56, "# of sets of x,y,z grps" },
    { 0x57, "Scale factor of set" },
    { 0x6d, "Date of birth" },
    { 0x6e, "Directional orientation" },
    { 0x6f, "Number of VFR studies" },
    { 0x70, "R-R low tolerance" },
    { 0x71, "R-R high tolerance" },
    { 0x72, "Prog specific results:" },

    { 0x99, nullptr }
};

void printname( int , int , uint16_t v )
{
    if( v == 0x1 )
    {
        std::cout << "DATABASE PARAMETERS" << std::endl;
        std::cout << "_____" << std::endl;
    }
    else if( v == 0x27 )
    {
        std::cout << "IMAGE PARAMETERS" << std::endl;
        std::cout << "_____" << std::endl;
    }
    else if( v == 0x13 )
    {
        std::cout << "EXTRA PARAMETERS" << std::endl;
        std::cout << "_____" << std::endl;
    }
    else if( v == 0x2e )
    {
        std::cout << "*** NOT CURRENTLY USED :" << std::endl;
    }
    static const unsigned int n = sizeof( Array ) / sizeof( *Array ) - 1;
    for( unsigned int i = 0; i < n; ++i )
    {
        if( v == Array[i].key )
        {
            std::cout << /*" << std::dec << len << "," << mult << " " << */ Array[i].name;
            std::cout << " : ";
            return;
        }
    }
    std::cout << /*"\t# " << std::dec << len << "," << mult << */ std::hex << v << "\t: ";
}

uint16_t readint16(std::istream &is )
{
    uint16_t val;
    is.read( (char*)&val, sizeof( val ));
    return (uint16_t)((val>>8) | (val<<8));
}

uint32_t readint32(std::istream &is )
{
    uint32_t val;
    is.read( (char*)&val, sizeof( val ));
    val = ((val>>8)&0xFF00FF00) | ((val>>8)&0x00FF00FF);
    return (val>>16) | (val<<16);
}

float readfloat32(std::istream &is )
{
    union { uint32_t val; float f; } dual;
    dual.val = readint32(is);
    return dual.f;
}

```

```

}

struct el
{
    uint16_t v1;
    uint16_t v2;
    uint16_t v3;
    void read( std::istream & is )
    {
        v1 = readint16(is);
        v2 = readint16(is);
        v3 = readint16(is);
    }
    void print( std::ostream & os )
    {
        os << std::hex << v1 << "\\t" << v2 << "\\t" << v3 << std::endl;
    }
};

std::vector<el> Vel;

void readelement( std::istream & is )
{
    el e;
    e.read( is );
    Vel.push_back( e );
}

void printascii( uint16_t tag, const char *buffer, size_t len )
{
    std::ostream & os = std::cout;
    if( tag == 0x72 )
    {
        os << "\\n ";
        for( size_t i = 0; i < len; ++i )
        {
            const char &c = buffer[i];
            if( c == 0x0 ) os << "!";
            else if( c == 0x0f ) os << " ";
            else if( c == 0x17 ) os << ":";
            else if( c == 0x14 ) os << ":";
            else if( c == 0x10 ) os << ":";
            else if( c == 0x16 ) os << ":";
            else if( c == 0x08 ) os << ":";
            else if( c == 0x0b ) os << ":";
            else if( c == 0x0e ) os << ":";
            else if( c == 0x07 ) os << ":";
            else os << c;
        }
        os << " ";
    }
    else
    {
        (void)len;
        os << " " << buffer << " ";
    }
}

bool DumpADAC( std::istream & is )
{
    std::ostream &os = std::cout;

    char magic[6 + 1];
    magic[6] = 0;
    is.read( magic, 6);
    // std::cout << magic << " ";
    assert( strcmp( magic, "adac01" ) == 0 );
    int c = is.get();
    assert( c == 0 ); (void)c;
    c = is.get();
    assert( c == 'X' );

    uint16_t v;
    v = readint16(is);
    // std::cout << v << std::endl;
    assert( v == 512 ); (void)v; // ??

    int nel = 87;
    for (int i = 0; i <= nel; ++i )
    {
        readelement( is );
    }
}

```

```

    }

    char buffer[512];
    for( int i = 0; i <= nel; ++i )
    {
        const el &e = Vel[i];
        int diff;
        if( i == nel )
        {
            diff = 2048 - e.v3;
            if( diff > 512 ) diff = 512;
        }
        else
        {
            const el &enext = Vel[i+1];
            diff = enext.v3 - e.v3;
        }
        is.seekg( e.v3, std::ios::beg );
        //std::cout << "(" << std::hex << std::setw( 2 ) << std::setfill( '0' ) << e.v1 << " " << std::hex << std::setw( 3 )
        << std::setfill( '0' ) << e.v2 << " ";
        printname( diff, 0, e.v1 );
        int mult = 1;
        if( e.v2 == 0 )
        {
            is.read( buffer, diff);
            buffer[ diff ] = 0;
            printascii( e.v1, buffer, diff);
        }
        else if( e.v2 == 0x100 )
        {
            mult = diff / 2;
            assert( diff == 2 * mult );
            for ( int ii = 0; ii < mult; ++ii )
            {
                if ( ii ) os << "\\ ";
                uint16_t val = readint16(is);
                os << " " << std::dec << val << " ";
            }
        }
        else if( e.v2 == 0x200 )
        {
            assert( diff == 4 );
            uint32_t val = readint32(is);
            os << " " << std::dec << val << " ";
        }
        else if( e.v2 == 0x300 )
        {
            assert( diff == 4 );
            float val = readfloat32(is);
            os << " " << std::dec << val << " ";
        }
        else
        {
            assert( 0 );
        }
        os << std::endl;
    }
    return true;
}

int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();

    // (0019,1061) UN (OB) 61\64\61\63\30 # 2048,1 Ver200 ADAC Pegasys Headers
    const gdcm::PrivateTag tver200adacpegasysheaders(0x0019,0x61,"ADAC_IMG");
    if( !ds.FindDataElement( tver200adacpegasysheaders ) ) return 1;
    const gdcm::DataElement& ver200adacpegasysheaders = ds.GetDataElement( tver200adacpegasysheaders );
    if ( ver200adacpegasysheaders.IsEmpty() ) return 1;
    const gdcm::ByteValue *bv = ver200adacpegasysheaders.GetByteValue();

    // (0019,1021) US 1 # 2,1 Ver200 Number of ADAC Headers

```

```
// TODO

// (0019,1041) IS [2048\221184 ] # 12,1-n Ver200 ADAC Header/Image Size
if( bv->GetLength() != 2048 ) return 1;

gdcmm::Element<gdcmm::VR::IS,gdcmm::VM::VM2> el;
const gdcmm::PrivateTag tver200adacheaderimagesize(0x0019,0x41,"ADAC_IMG");
if( !ds.FindDataElement( tver200adacheaderimagesize ) ) return 1;
const gdcmm::DataElement& ver200adacheaderimagesize = ds.GetDataElement( tver200adacheaderimagesize );
el.SetFromDataElement( ver200adacheaderimagesize );
if( el.GetValue(0) != 2048 ) return 1;

std::stringstream is;
std::string dup( bv->GetPointer(), bv->GetLength() );
is.str( dup );
bool b = DumpADAC( is );
if( !b ) return 1;

return 0;
}
```

## 14.50 DumpExamCard.cxx

```
/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
PURPOSE. See the above copyright notice for more information.
=====*/
/*

Try to extract contents of Philips RAW storage class:

(0002,0002) UI [1.2.840.10008.5.1.4.1.1.66] # 26,1 Media Storage SOP Class UID
(0002,0003) UI [1.3.46.670589.11.17240.5.23.4.1.3012.2010032409482568018] # 56,1 Media Storage SOP
Instance UID
(0002,0010) UI [1.2.840.10008.1.2.1] # 20,1 Transfer Syntax UID
(0002,0012) UI [1.3.46.670589.11.0.0.51.4.4.1] # 30,1 Implementation Class UID
(0002,0013) SH [MR DICOM 4.1] # 12,1 Implementation Version Name

* Everything done in this code is for the sole purpose of writing interoperable
* software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
* If you believe anything in this code violates any law or any of your rights,
* please contact us (gdcm-developers@lists.sourceforge.net) so that we can
* find a solution.
*
* Everything you do with this code is at your own risk, since decompression
* algorithm was not written from specification documents.
*
* Special thanks to:
* Triplett,William T for bringing to your attention on this ExamCard stuff
*/
#include "gdcmReader.h"
#include "gdcmDataSet.h"
#include "gdcmPrivateTag.h"
#include "gdcmBase64.h"

#include <iomanip>

static bool compfn(const char *s1, const char *s2)
{
    return strcmp(s1,s2) < 0 ? true : false;
}

static const char *PDFStrings[] = { // Keep me ordered please
    "COILSTATE", // series of string ?
    "HARDWARE_CONFIG", // series of number ?
}
```

```

    "PDF_CONTROL_GEN_PARS",
    "PDF_CONTROL_PREP_PARS",
    "PDF_CONTROL_RECON_PARS",
    "PDF_CONTROL_SCAN_PARS",
    "PDF_EXAM_PARS",
    "PDF_HARDWARE_PARS",
    "PDF_PREP_PARS",
    "PDF_PRESCAN_COIL_PARS",
    "PDF_SPT_PARS",
};

static bool isvalidpdfstring( const char *pdfstring )
{
    assert( pdfstring );
    static const size_t n = sizeof( PDFStrings ) / sizeof( *PDFStrings );
    static const char **begin = PDFStrings;
    static const char **end = begin + n;
    return std::binary_search(begin, end, pdfstring, compfn);
}

typedef enum
{
    param_float = 0,
    param_integer = 1, // 1 « 0
    param_string = 2, // 1 « 1
    param_3, // ??
    param_enum = 4 // 1 « 2
} param_type;

static const char *gettypenamefromtype( int i)
{
    const char *ret = nullptr;
    param_type e = (param_type)i;
    switch( e )
    {
        case param_float:
            ret = "float";
            break;
        case param_integer:
            ret = "int";
            break;
        case param_string:
            ret = "string";
            break;
        case param_3:
            ret = "??";
            break;
        case param_enum:
            ret = "enum";
            break;
    }
    assert( ret );
    return ret;
}

struct header
{
    /*
    * TODO:
    * Looks as if we could read all int*, float* and string* at once...
    */
    int32_t v1; // offset to int pointer array ?
    uint16_t nints; // number of ints (max number?)
    uint16_t v3; // always 0 ?
    int32_t v4; // offset to float pointer array ?
    uint32_t nfloats;
    int32_t v6; // offset to string pointer array ?
    uint32_t nstrings;
    int32_t v8; // always 8 ??
    uint32_t numparams;
    uint32_t getnints() const { return nints; }
    uint32_t getnfloats() const { return nfloats; }
    uint32_t getnstrings() const { return nstrings; }
    uint32_t getnparams() const { return numparams; }
    void read( std::istream & is )
    {
        is.read( (char*)&v1, sizeof(v1));
        if( v1 == 0x01 ) {
            // direct (FIXME how should we detect this, much like TIFF ??)
            nints = 0;
            v3 = 0;

```

```

    v4 = 0;
    nfloats = 0;
    v6 = 0;
    nstrings = 0;
    v8 = 0;
    numparams = 0;
    uint32_t bla;
    is.read( (char*)&bla, sizeof(bla) );
    assert( bla == 0x2 || bla == 0x3 );
    nstrings = 1;
    numparams = 1;
} else {
    // indirect
    is.read( (char*)&nints, sizeof(nints) );
    is.read( (char*)&v3, sizeof(v3) );
    assert( v3 == 0 ); // looks like this is always 0
    is.read( (char*)&v4, sizeof(v4) );
    is.read( (char*)&nfloats, sizeof(nfloats) );
    is.read( (char*)&v6, sizeof(v6) );
    is.read( (char*)&nstrings, sizeof(nstrings) );
    is.read( (char*)&v8, sizeof(v8) );
    assert( v8 == 8 );
    is.read( (char*)&numparams, sizeof(numparams) );
}
}
void print( std::ostream & os )
{
    os << v1 << ", ";
    os << nints << ", ";
    os << v3 << ", ";
    os << v4 << ", ";
    os << nfloats << ", ";
    os << v6 << ", ";
    os << nstrings << ", ";
    os << v8 << ", ";
    os << numparams << std::endl;
}
};

struct param
{
    char name[32+1];
    uint8_t boolean;
    int32_t type;
    uint32_t dim;
    union {
        uint32_t val;
        char * ptr; } v4;
    int32_t /*std::streamoff*/ offset;
    param_type gettype() const { return (param_type)type; }
    uint32_t getdim() const { return dim; }
    void read_direct_int( std::istream & is ) {
        uint32_t bla;
        int max = 9;
        std::vector<uint32_t> v;
        for( int i = 0; i < max; ++i ) {
            is.read( (char*)&bla, sizeof(bla) );
            v.push_back( bla );
        }
        is.read( (char*)&bla, sizeof(bla) );
        char name0[32];
        memset( name0, 0, sizeof(name0) );
        assert( bla < sizeof(name0) );
        is.read( name0, bla );
        size_t l = strlen(name0);
        assert( l == bla ); (void)l;
        char * ptr = strdup( name0 );
        v4.ptr = ptr;
        type = param_string;
        dim = 1;
        offset = 0; // important !
    }
    void read_direct_string( std::istream & is ) {
        uint32_t bla;
        is.read( (char*)&bla, sizeof(bla) );
        char name0[32];
        memset( name0, 0, sizeof(name0) );
        assert( bla < sizeof(name0) );
        is.read( name0, bla );
        size_t l = strlen(name0);
        assert( l == bla ); (void)l;
    }
};

```

```

memcpy( this->name, name0, bla );
is.read( (char*)&bla, sizeof(bla) );
assert( bla == 0x1 );
is.read( (char*)&bla, sizeof(bla) );
char value[32];
memset(value,0,sizeof(value));
assert( bla < sizeof(value) );
is.read( value, bla );
is.read( (char*)&bla, sizeof(bla) );
assert( bla == 0 ); // trailing stuff ?
is.read( (char*)&bla, sizeof(bla) );
assert( bla == 0 ); // trailing stuff ?
const uint32_t cur = (uint32_t)is.tellg();
std::cerr << "offset:" << cur << std::endl;
if( cur == 65 )
    is.read( (char*)&bla, 1 );
else if( cur == 66 )
    is.read( (char*)&bla, 1 );
else if( cur == 122 )
    is.read( (char*)&bla, 2 );
else
    assert(0);
type = param_string;
dim = 1;
// FIXME: store the value in v4 for now:
char * ptr = strdup( value );
v4.ptr = ptr;
offset = 0; // important !
}

void read( std::istream & is )
{
    is.read( name, 32 + 1 );
    // This is always the same issue the string can contains garbage from previous run,
    // we need to print only until the first \0 character:
    assert( strlen( name ) <= 32 );
    is.read( (char*)&boolean,1);
    assert( boolean == 0 || boolean == 1 || boolean == 0x69 ); // some kind of bool, or digital trash ?
    is.read( (char*)&type, sizeof( type ) );
    assert( gettypenamefromtype( type ) );
    is.read( (char*)&dim, sizeof( dim ) ); // number of elements
    is.read( (char*)&v4.val, sizeof( v4.val ) );
    //assert( v4.val == 0 ); // always 0 ? sometimes not...
    const uint32_t cur = (uint32_t)is.tellg();
    is.read( (char*)&offset, sizeof( offset ) );
    assert( offset != 0 );
    offset += cur;
}

void print( std::ostream & os ) const
{
    os << name << ",";
    os << (int)boolean << ",";
    os << type << ",";
    os << dim << ",";
    os << v4.val << ",";
    os << offset << std::endl;
}

void printvalue( std::ostream & os, std::istream & is ) const
{
    if( offset ) {
        is.seekg( offset );
        switch( type )
        {
            case param_float:
            {
                os.precision(2);
                os << std::fixed;
                for( uint32_t idx = 0; idx < dim; ++idx )
                {
                    if( idx ) os << ",";
                    float v;
                    is.read( (char*)&v, sizeof(v) );
                    os << v; // what if the string contains \0 ?
                }
            }
            break;
            case param_integer:
            {
                int32_t v;
                for( uint32_t idx = 0; idx < dim; ++idx )
                {

```



```

        if( idx ) os << ", ";
        is.read( (char*)&v, sizeof(v) );
        os << v;
    }
}
break;
case param_string:
{
    int size = 81;
    std::string v;
    v.resize( size );
    for( uint32_t idx = 0; idx < dim; ++idx )
    {
        if( idx ) os << ", ";
        is.read( &v[0], size );
        os << v.c_str();
    }
}
break;
case param_enum:
{
    int32_t v;
    for( uint32_t idx = 0; idx < dim; ++idx )
    {
        if( idx ) os << ", ";
        is.read( (char*)&v, sizeof(v) );
        os << v;
    }
}
break;
}
} else {
#ifdef 1
    // direct
    assert ( type == param_string );
    char * ptr = v4.ptr;
    //std::string v;
    //v.resize( dim );
    //is.read( &v[0], dim );
    os << ptr;
#endif
}
}

void printxml( std::ostream & os, std::istream & is ) const
{
    // <Attribute Name="CGEN_force_par_mode" Type="enum">0</Attribute>
    os << " <Attribute";
    os << " Name=\"" << name << "\"";
    os << " Type=\"" << gettypenamefromtype(type) << "\"";
    if( dim != 1 )
    {
        os << " ArraySize=\"" << dim << "\"";
    }
    os << ">";
    printvalue( os, is );
    os << "</Attribute>\n";
}

void printcsv( std::ostream & os, std::istream & is ) const
{
    os << std::setw(32) << std::left << name << ", ";
    os << std::setw(7) << std::right << gettypenamefromtype(type) << ", ";
    os << std::setw(4) << dim << ", ";
    os << " ";
    printvalue( os, is );
    os << ",\n";
}
};

static bool ProcessNested( gdc::DataSet & ds )
{
    /*
    TODO:
    Looks like the real length of the blob is stored here:
    (2005,1132) SQ # u/1,1 ?
    (fffe,e000) na (Item with undefined length)
    (2005,0011) LO [Philips MR Imaging DD 002 ] # 26,1 Private Creator
    (2005,1143) SL 3103 # 4,1 ?

    Wotsit ?
    (2005,1132) SQ # u/1,1 ?

```

```

(fffe,e000) na (Item with undefined length)
    (2005,0011) LO [Philips MR Imaging DD 002 ]          # 26,1 Private Creator
    (2005,1147) CS [Y ]                                  # 2,1 ?
*/
bool ret = false;

// (2005,1137) PN (LO) [PDF_CONTROL_GEN_PARS]           # 20,1 Protocol Data Name
const gdcm::PrivateTag pt0(0x2005,0x37,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt0 ) ) return false;
const gdcm::DataElement &de0 = ds.GetDataElement( pt0 );
if( de0.IsEmpty() ) return false;
const gdcm::ByteValue * bv0 = de0.GetByteValue();
std::string s0( bv0->GetPointer() , bv0->GetLength() );

// (2005,1139) LO [IEEE_PDF]                           # 8,1 Protocol Data Type
const gdcm::PrivateTag pt1(0x2005,0x39,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt1 ) ) return false;
const gdcm::DataElement &de1 = ds.GetDataElement( pt1 );

// (2005,1143) SL 53                                     # 4,1 Protocol Data Block Length (non-padded)
const gdcm::PrivateTag pt2(0x2005,0x43,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt2 ) ) return false;
const gdcm::DataElement &de2 = ds.GetDataElement( pt2 );

// (2005,1147) CS [Y ]                                  # 2,1 Protocol Data Boolean
const gdcm::PrivateTag pt3(0x2005,0x47,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt3 ) ) return false;
const gdcm::DataElement &de3 = ds.GetDataElement( pt3 );
(void)de3;

// (2005,1144) OW 00\00\00\00\05\00\00\00\35\2e\31\2e\37\00 # 54,1 Protocol Data Block
const gdcm::PrivateTag pt(0x2005,0x44,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt ) ) return false;
const gdcm::DataElement &de = ds.GetDataElement( pt );
if( de.IsEmpty() ) return false;
const gdcm::ByteValue * bv = de.GetByteValue();

if( s0 == "ExamCardBlob" )
{
    assert( de1.IsEmpty() );

    std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
    fn += ".xml";
    std::ofstream out( fn.c_str() );

    // remove trailing \0
    size_t len = strlen( bv->GetPointer() );
    out.write( bv->GetPointer() , len );
    out.close();

    // Extract binary64 thingy (this is a ugly hack, better use an XML parser)
    std::string dup( bv->GetPointer(), len );
    std::string::size_type pos1 = dup.find( "<ExamCardBlob>" );
    std::string::size_type pos2 = dup.find( "</ExamCardBlob>" );

    std::string b64( bv->GetPointer() + pos1 + 14, pos2 - (pos1 + 14) );

    // ugly hack to remove \r\n from input base64:
    std::string::iterator r_pos = std::remove(b64.begin(), b64.end(), '\r');
    b64.erase(r_pos, b64.end());
    std::string::iterator n_pos = std::remove(b64.begin(), b64.end(), '\n');
    b64.erase(n_pos, b64.end());
}
#ifdef 0
std::ofstream out2( "debug" );
out2.write( b64.c_str(), b64.size() );
out2.close();
#endif

const size_t dlen = gdcm::Base64::GetDecodeLength(b64.c_str(), b64.size() );

std::string decoded;
decoded.resize( dlen );
gdcm::Base64::Decode( &decoded[0], decoded.size(), b64.c_str(), b64.size() );

std::ofstream f64( "soap.xml" );
f64.write( decoded.c_str(), decoded.size() );
f64.close();

ret = true;
}
else

```

```

{
    if( del.IsEmpty() ) return false;
    const gdc::ByteValue * bv1 = del.GetByteValue();
    gdc::Element<gdc::VR::SL,gdc::VM::VM1> dlen = {{0L}};
    dlen.SetFromDataElement( de2 );
    std::string s1( bv1->GetPointer() , bv1->GetLength() );

    if( s1 == "IEEE_PDF" )
    {
        std::istringstream is;
        assert( bv->GetLength() == (size_t)dlen.GetValue() || bv->GetLength() == (size_t)(dlen.GetValue() + 1) );
        std::string dup( bv->GetPointer(), dlen.GetValue() /*bv->GetLength()*/ );
        is.str( dup );

        header h;
        h.read( is );
        //assert( is.peek() && is.eof() );
    }

    #if 1
        static int c = 0;
        std::string fn0 = gdc::LOComp::Trim( s1.c_str() ); // remove trailing space
        std::stringstream ss;
        ss << fn0 << "_" << c++;
        if( h.v1 == 0x01 )
            ss << ".direct";
        else
            ss << ".indirect";
        std::cout << "fn0=" << ss.str() << " Len= " << bv->GetLength() << std::endl;
        std::ofstream out( ss.str().c_str() );
        out.write( bv->GetPointer(), bv->GetLength() );
        out.close();
    #endif

    #if 1
        std::cout << dup.c_str() << std::endl;
        h.print( std::cout );
    #endif

    std::vector< param > params;
    if( h.v1 == 0x01 ) {
        for( uint32_t i = 0; i < 1 /* h.getnparams()*/; ++i ) {
            param p;
            if( s0 == "HARDWARE_CONFIG " )
            {
                p.read_direct_int( is );
            }
            else if( s0 == "COILSTATE " )
            {
                p.read_direct_string( is );
            }
            else
            {
                assert(0);
            }
            params.push_back( p );
        }
    } else {
        assert( is.tellg() == std::streampos(0x20) );
        is.seekg( 0x20 );

        param p;
        for( uint32_t i = 0; i < h.getnparams(); ++i )
        {
            p.read( is );
            //p.print( std::cout );
            params.push_back( p );
        }
    }

    std::string fn = gdc::LOComp::Trim( s0.c_str() ); // remove trailing space
    bool b1 = isvalidpdfstring( fn.c_str() );
    assert( b1 ); (void)b1;
    fn += ".csv";
    //fn += ".xml";
    std::ofstream csv( fn.c_str() );

    // let's do some bookkeeping:
    uint32_t nfloats = 0;
    uint32_t nints = 0;
    uint32_t nstrings = 0;
    for( std::vector<param>::const_iterator it = params.begin();
        it != params.end(); ++it )

```

```

    {
        param_type type = it->gettype();
        switch( type )
        {
            case param_float:
                nfloats += it->getdim();
                break;
            case param_integer:
                nints += it->getdim();
                break;
            case param_string:
                nstrings += it->getdim();
                break;
            default:
                ;
        }
    }
}

#if 0
std::cout << "Stats:" << std::endl;
std::cout << "nfloats:" << nfloats << std::endl;
std::cout << "nints:" << nints << std::endl;
std::cout << "nstrings:" << nstrings << std::endl;
#endif

assert( h.getnints() >= nints );
assert( h.getnfloats() >= nfloats );
assert( h.getnstrings() >= nstrings);

for( uint32_t i = 0; i < h.getnparams(); ++i )
{
    params[i].printcsv( csv, is );
    //params[i].printxml( csv, is );
}
csv.close();
ret = true;
}

else if( s1 == "ASCII " )
{
    #if 0
    std::cerr << "ASCII is not handled" << std::endl;
    std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
    fn += ".asc";
    std::ofstream out( fn.c_str() );
    out.write( bv->GetPointer() , bv->GetLength() );
    out.close();
    #endif

    std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
    fn += ".sin";
    std::ofstream sin( fn.c_str() );

    const char *beg = bv->GetPointer();
    const char *end = beg + bv->GetLength();
    assert( *beg == 0 );
    const char *p = beg + 1; // skip first \0
    size_t prev = 0;
    for( ; p != end; ++p )
    {
        if( *p == 0 )
        {
            const char *s = beg + prev + 1;
            if( *s )
            {
                sin << s << std::endl;
            }
            else
            {
                sin << std::endl;
            }
            prev = p - beg;
        }
    }
    sin.close();

    ret = true;
}

else if( s1 == "BINARY" )
{
    std::cerr << "BINARY is not handled" << std::endl;
    std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
    fn += ".bin";
    std::ofstream out( fn.c_str() );
    //out.write( bv->GetPointer() + 512, bv->GetLength() - 512);
}

```

```

        out.write( bv->GetPointer() , bv->GetLength() );
        out.close();

#ifdef 0
        int array[ 128 ];
        memcpy( array, bv->GetPointer(), 512 );
        for( int i = 0; i < 14; ++i )
        {
            std::cout << array[i] << std::endl;
        }
#endif

        ret = true;
    }
    // else -> ret == false
    assert( ret );

    return ret;
}

int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
    /*
(2005,1132) SQ                                     # u/1,1 ?
  (fffe,e000) na (Item with undefined length)
    (2005,0011) LO [Philips MR Imaging DD 002 ]      # 26,1 Private Creator
    (2005,1137) PN (LO) [PDF_CONTROL_GEN_PARS]      # 20,1 ?
    (2005,1138) PN (LO) (no value)                  # 0,1 ?
    (2005,1139) PN (LO) [IEEE_PDF]                  # 8,1 ?
    (2005,1140) PN (LO) (no value)                  # 0,1 ?
    (2005,1141) PN (LO) (no value)                  # 0,1 ?
    (2005,1143) SL 3103                              # 4,1 ?
    (2005,1144) OW
      66\05\00\00\3b\01\00\00\4a\0a\00\00\0e\00\00\00\7a\0a\00\00\95\01\00\00\08\00\00\00\1b\00\00\00\43\47\45\4e\5f\75\73\65\72\5
      # 3104,1 ?
    (2005,1147) CS [Y ]                              # 2,1 ?
  (fffe,e00d)
*/
    const gdcm::PrivateTag pt(0x2005,0x32,"Philips MR Imaging DD 002");
    if( !ds.FindDataElement( pt ) ) return 1;
    const gdcm::DataElement &de = ds.GetDataElement( pt );
    if( de.IsEmpty() ) return 1;

    gdcm::SequenceOfItems *sqi = de.GetValueAsSQ();
    if ( !sqi ) return 1;
    gdcm::SequenceOfItems::SizeType s = sqi->GetNumberOfItems();
    for( gdcm::SequenceOfItems::SizeType i = 1; i <= s; ++i )
    {
        gdcm::Item &item = sqi->GetItem(i);

        gdcm::DataSet &nestedds = item.GetNestedDataSet();

        if( !ProcessNested( nestedds ) ) {
            std::cerr << "Error processing Item #" << i << std::endl;
        }
    }

    return 0;
}

```

## 14.51 DumpGEMSMovieGroup.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

```

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```

=====*/
#include "gdcmReader.h"
#include "gdcmImage.h"
#include "gdcmImageWriter.h"
#include "gdcmDataElement.h"
#include "gdcmPrivateTag.h"
#include "gdcmUIDGenerator.h"

#include <iostream>
#include <string>

#include <map>

bool PrintNameValuePairMapping( gdcm::SequenceOfItems *sqi_values,
gdcm::SequenceOfItems *sqi_names, std::string const & indent )
{
    using namespace gdcm;
    // prepare names mapping:
    typedef VRToType<VR::UL>::Type UL;
    std::map< UL, std::string > names;
    assert( sqi_names );
    assert( sqi_values );
    SequenceOfItems::SizeType s = sqi_names->GetNumberOfItems();
    PrivateTag tindex(0x7fe1,0x71,"GEMS_Ultrasound_MovieGroup_001");
    PrivateTag tname (0x7fe1,0x72,"GEMS_Ultrasound_MovieGroup_001");
    // First sequence contains all possible names (this is a dict)
    for( SequenceOfItems::SizeType i = 1; i <= s; ++i )
    {
        const Item & item = sqi_names->GetItem( i );
        const DataSet & ds = item.GetNestedDataSet();
        if( !ds.FindDataElement( tindex )
            || !ds.FindDataElement( tname ) )
        {
            assert( 0 );
            return false;
        }
        const DataElement & index = ds.GetDataElement( tindex );
        const DataElement & name = ds.GetDataElement( tname );
        if( index.IsEmpty() || name.IsEmpty() )
        {
            assert( 0 );
            return false;
        }
        gdcm::Element<VR::UL, VM::VM1> el1;
        el1.SetFromDataElement( index );

        gdcm::Element<VR::LO, VM::VM1> el2;
        el2.SetFromDataElement( name );
        //      std::cout << el1.GetValue() << " " << el2.GetValue() << std::endl;
        names.insert( std::make_pair( el1.GetValue(), el2.GetValue() ) );
    }

    SequenceOfItems::SizeType s2 = sqi_values->GetNumberOfItems();
    assert( s2 <= s );
    PrivateTag tindex2(0x7fe1,0x48,"GEMS_Ultrasound_MovieGroup_001");
    for( SequenceOfItems::SizeType i = 1; i <= s2; ++i )
    {
        const Item & item = sqi_values->GetItem( i );
        const DataSet & ds = item.GetNestedDataSet();
        if( !ds.FindDataElement( tindex2 ) )
        {
            assert( 0 );
            return false;
        }
        const DataElement & index2 = ds.GetDataElement( tindex2 );
        if( index2.IsEmpty() )
        {
            assert( 0 );
            return false;
        }
        gdcm::Element<VR::FD, VM::VM1_2> el1;

```

```

    e11.SetFromDataElement( index2 );

    UL copy = (UL)e11.GetValue();
    #if 1
        std::cout << indent;
        std::cout << "( " << names[ copy ];
    #endif
        // (7fe1,1052) FD 1560 # 8,1 ?
        // (7fe1,1057) LT [MscSkelSup] # 10,1 ?
        //PrivateTag tvalue(0x7fe1,0x52,"GEMS_Ultrasound_MovieGroup_001");
        PrivateTag tvalueint(0x7fe1,0x49,"GEMS_Ultrasound_MovieGroup_001"); // UL
        PrivateTag tvaluefloat1(0x7fe1,0x51,"GEMS_Ultrasound_MovieGroup_001"); // FL
        PrivateTag tvaluefloat(0x7fe1,0x52,"GEMS_Ultrasound_MovieGroup_001"); // FD
        PrivateTag tvalueul(0x7fe1,0x53,"GEMS_Ultrasound_MovieGroup_001"); // UL
        PrivateTag tvaluesl(0x7fe1,0x54,"GEMS_Ultrasound_MovieGroup_001"); // SL
        PrivateTag tvalueob(0x7fe1,0x55,"GEMS_Ultrasound_MovieGroup_001"); // OB
        PrivateTag tvaluetext(0x7fe1,0x57,"GEMS_Ultrasound_MovieGroup_001"); // LT
        PrivateTag tvaluefd(0x7fe1,0x77,"GEMS_Ultrasound_MovieGroup_001"); // FD / 1-N
        PrivateTag tvaluesl3(0x7fe1,0x79,"GEMS_Ultrasound_MovieGroup_001"); // SL / 1-N
        PrivateTag tvaluesl2(0x7fe1,0x86,"GEMS_Ultrasound_MovieGroup_001"); // SL ??
        PrivateTag tvaluefdl(0x7fe1,0x87,"GEMS_Ultrasound_MovieGroup_001"); // FD / 1-N
        PrivateTag tvaluefloat2(0x7fe1,0x88,"GEMS_Ultrasound_MovieGroup_001"); // FD ??
    #if 1
        std::cout << " ) = ";
    #endif
    if( ds.FindDataElement( tvalueint ) )
    {
        const DataElement & value = ds.GetDataElement( tvalueint );
        gdcmm::Element<VR::UL,VM::VM1> e12;
        e12.SetFromDataElement( value );
        std::cout << e12.GetValue() << std::endl;
    }
    else if( ds.FindDataElement( tvaluefloat1 ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluefloat1 );
        gdcmm::Element<VR::FL,VM::VM1> e12;
        e12.SetFromDataElement( value );
        std::cout << e12.GetValue() << std::endl;
    }
    else if( ds.FindDataElement( tvaluefloat ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluefloat );
        gdcmm::Element<VR::FD,VM::VM1> e12;
        e12.SetFromDataElement( value );
        std::cout << e12.GetValue() << std::endl;
    }
    else if( ds.FindDataElement( tvaluesl ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluesl );
        gdcmm::Element<VR::SL,VM::VM1> e12;
        e12.SetFromDataElement( value );
        std::cout << e12.GetValue() << std::endl;
    }
    else if( ds.FindDataElement( tvalueul ) )
    {
        const DataElement & value = ds.GetDataElement( tvalueul );
        gdcmm::Element<VR::UL,VM::VM1_n> e12;
        e12.SetFromDataElement( value );
        assert( e12.GetLength() == 1 );
        std::cout << e12.GetValue() << std::endl;
    }
    else if( ds.FindDataElement( tvalueob ) )
    {
        const DataElement & value = ds.GetDataElement( tvalueob );
        gdcmm::Element<VR::SL,VM::VM1> e12;
        // e12.SetFromDataElement( value );
        // std::cout << e12.GetValue() << std::endl;
        std::cout << value << std::endl;
    }
    else if( ds.FindDataElement( tvaluetext ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluetext );
        gdcmm::Element<VR::LT,VM::VM1> e12;
        e12.SetFromDataElement( value );
        std::cout << e12.GetValue() << std::endl;
    }
    else if( ds.FindDataElement( tvaluesl2 ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluesl2 );
        gdcmm::Element<VR::SL,VM::VM1_n> e12;
        e12.SetFromDataElement( value );
    }

```

```

        el2.Print( std::cout );
        assert( el2.GetLength() == 4 );
        std::cout << std::endl;
    }
    else if( ds.FindDataElement( tvaluesl3 ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluesl3 );
        gdcm::Element<VR::SL,VM::VM1_n> el2;
        el2.SetFromDataElement( value );
        el2.Print( std::cout );
        // assert( el2.GetLength() == 4 );
        std::cout << std::endl;
    }
    else if( ds.FindDataElement( tvaluefd ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluefd );
        gdcm::Element<VR::FD,VM::VM1_n> el2;
        el2.SetFromDataElement( value );
        el2.Print( std::cout );
        // assert( el2.GetLength() == 4 || el2.GetLength() == 3 || el2.GetLength() == 8 );
        std::cout << std::endl;
    }
    else if( ds.FindDataElement( tvaluefloat2 ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluefloat2 );
        gdcm::Element<VR::FD,VM::VM1_n> el2;
        el2.SetFromDataElement( value );
        el2.Print( std::cout );
        assert( el2.GetLength() == 2 );
        std::cout << std::endl;
    }
    else if( ds.FindDataElement( tvaluefd1 ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluefd1 );
        gdcm::Element<VR::FD,VM::VM1_n> el2;
        el2.SetFromDataElement( value );
        el2.Print( std::cout );
        assert( el2.GetLength() == 4 );
        std::cout << std::endl;
    }
    else
    {
        std::cout << "(no value)" << std::endl;
        // std::cout << ds << std::endl;
        assert( ds.Size() == 2 );
    }
}
return true;
}

bool PrintNameValueMapping2( gdcm::PrivateTag const & privtag, const gdcm::DataSet & ds,
    gdcm::SequenceOfItems *sqi_names, std::string const & indent )
{
    if( !ds.FindDataElement( privtag ) ) return false;
    const gdcm::DataElement& seq_values = ds.GetDataElement( privtag );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = seq_values.GetValueAsSQ();

    return PrintNameValueMapping( sqi, sqi_names, indent);
}

bool PrintNameValueMapping3( gdcm::PrivateTag const & privtag1, gdcm::PrivateTag const & privtag2, const
    gdcm::DataSet & ds,
    gdcm::SequenceOfItems *sqi_names, std::string const & indent )
{
    if( !ds.FindDataElement( privtag1 ) )
    {
        assert( 0 );
        return false;
    }
    const gdcm::DataElement& valuesl0name = ds.GetDataElement( privtag1 );
    gdcm::Element<gdcm::VR::LO,gdcm::VM::VM1> el;
    el.SetFromDataElement( valuesl0name );
    std::cout << std::endl;
    std::cout << " <" << el.GetValue().c_str() << ">" << std::endl;

    return PrintNameValueMapping2( privtag2, ds, sqi_names, indent);
}

bool print73( gdcm::DataSet const & ds10, gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
    const gdcm::PrivateTag tseq_values73(0x7fe1,0x73,"GEMS_Ultrasound_MovieGroup_001");

```



```

if( !ds10.FindDataElement( tseq_values73 ) )
{
    std::cout << indent << "No group 73" << std::endl;
    return false;
}
const gdcm::DataElement& seq_values73 = ds10.GetDataElement( tseq_values73 );
gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values73 = seq_values73.GetValueAsSQ();

size_t ni3 = sqi_values73->GetNumberOfItems();
for( size_t i3 = 1; i3 <= ni3; ++i3 )
{
    gdcm::Item &item_73 = sqi_values73->GetItem(i3);
    gdcm::DataSet &ds73 = item_73.GetNestedDataSet();
    assert( ds73.Size() == 3 );

    const gdcm::PrivateTag tseq_values74name(0x7fe1,0x74,"GEMS_Ultrasound_MovieGroup_001");
    const gdcm::PrivateTag tseq_values75(0x7fe1,0x75,"GEMS_Ultrasound_MovieGroup_001");
    PrintNameValueMapping3( tseq_values74name, tseq_values75, ds73, sqi_dict, indent);
    std::cout << std::endl;
}
return true;
}

bool print36( gdcm::DataSet const & ds10, gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
    (void)sqi_dict;
    const gdcm::PrivateTag tseq_values36(0x7fe1,0x36,"GEMS_Ultrasound_MovieGroup_001");
    if( !ds10.FindDataElement( tseq_values36 ) )
    {
        std::cout << indent << "No group 36" << std::endl;
        return false;
    }
    const gdcm::DataElement& seq_values36 = ds10.GetDataElement( tseq_values36 );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values36 = seq_values36.GetValueAsSQ();

    size_t ni3 = sqi_values36->GetNumberOfItems();
    assert( ni3 >= 1 );
    for( size_t i3 = 1; i3 <= ni3; ++i3 )
    {
        gdcm::Item &item_36 = sqi_values36->GetItem(i3);
        gdcm::DataSet &ds36 = item_36.GetNestedDataSet();
        assert( ds36.Size() == 4 );

        // (7fe1,1037) UL 47 # 4,1 US MovieGroup Number of Frames
        // (7fe1,1043) OB 40\00\1c\c4\67\2f\0b\11\40 # 376,1 ?
        // (7fe1,1060) OB 4e\4e\49\4f\4e\47\46\43\2a # 4562714,1 US MovieGroup Image Data
        //
        const gdcm::PrivateTag timagedata(0x7fe1,0x60,"GEMS_Ultrasound_MovieGroup_001");
        assert( ds36.FindDataElement( timagedata ) );
        gdcm::DataElement const & imagedata = ds36.GetDataElement( timagedata );

        const gdcm::ByteValue * bv = imagedata.GetByteValue();
        assert( bv );
        static int c = 0;
        std::stringstream ss;
        ss << "/tmp/debug";
        ss << c++;
        std::ofstream os( ss.str().c_str(), std::ios::binary );
        os.write( bv->GetPointer(), bv->GetLength() );
        os.close();

        //const gdcm::PrivateTag tseq_values85(0x7fe1,0x85,"GEMS_Ultrasound_MovieGroup_001");
        //PrintNameValueMapping3( tseq_values84name, tseq_values85, ds83, sqi_dict, indent);
        //std::cout << std::endl;
    }
    return true;
}

bool print83( gdcm::DataSet const & ds10, gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
    const gdcm::PrivateTag tseq_values83(0x7fe1,0x83,"GEMS_Ultrasound_MovieGroup_001");
    if( !ds10.FindDataElement( tseq_values83 ) )
    {
        std::cout << indent << "No group 83" << std::endl;
        return false;
    }
    const gdcm::DataElement& seq_values83 = ds10.GetDataElement( tseq_values83 );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values83 = seq_values83.GetValueAsSQ();

    size_t ni3 = sqi_values83->GetNumberOfItems();
    for( size_t i3 = 1; i3 <= ni3; ++i3 )
    {

```

```

    gdc::Item &item_83 = sqi_values83->GetItem(i3);
    gdc::DataSet &ds83 = item_83.GetNestedDataSet();
    assert( ds83.Size() == 3 );

    const gdc::PrivateTag tseq_values84name(0x7fe1,0x84,"GEMS_Ultrasound_MovieGroup_001");
    const gdc::PrivateTag tseq_values85(0x7fe1,0x85,"GEMS_Ultrasound_MovieGroup_001");
    PrintNameValueMapping3( tseq_values84name, tseq_values85, ds83, sqi_dict, indent);
    std::cout << std::endl;
}
return true;
}

bool PrintNameValueMapping4( gdc::PrivateTag const &privtag0, const gdc::DataSet &subds, gdc::PrivateTag
    const &privtag1, gdc::PrivateTag const &privtag2,
    gdc::SequenceOfItems *sqi_dict, std::string const &indent )
{
    (void)indent;
    if( !subds.FindDataElement( privtag0 ) )
    {
        assert( 0 );
        return false;
    }
    const gdc::DataElement& seq_values10 = subds.GetDataElement( privtag0 );
    gdc::SmartPointer<gdc::SequenceOfItems> sqi_values10 = seq_values10.GetValueAsSQ();

    size_t nil = sqi_values10->GetNumberOfItems();
    // assert( nil == 1 );
    for( size_t i1 = 1; i1 <= nil; ++i1 )
    {
        gdc::Item &item_10 = sqi_values10->GetItem(i1);
        gdc::DataSet &ds10 = item_10.GetNestedDataSet();
        assert( ds10.Size() == 2 + 3 );
        // (7fe1,0010)
        // (7fe1,1012)
        // (7fe1,1018)
        // (7fe1,1020)
        // (7fe1,1083)

        PrintNameValueMapping3( privtag1, privtag2, ds10, sqi_dict, "  " );
        std::cout << std::endl;

        const gdc::PrivateTag tseq_values20(0x7fe1,0x20,"GEMS_Ultrasound_MovieGroup_001");
        if( !ds10.FindDataElement( tseq_values20 ) )
        {
            assert( 0 );
            return false;
        }
        const gdc::DataElement& seq_values20 = ds10.GetDataElement( tseq_values20 );
        gdc::SmartPointer<gdc::SequenceOfItems> sqi_values20 = seq_values20.GetValueAsSQ();

        size_t ni2 = sqi_values20->GetNumberOfItems();
        //assert( ni == 1 );
        for( size_t i2 = 1; i2 <= ni2; ++i2 )
        {
            gdc::Item &item_20 = sqi_values20->GetItem(i2);
            gdc::DataSet &ds20 = item_20.GetNestedDataSet();
            size_t count = ds20.Size(); (void)count;
            assert( ds20.Size() == 2 + 3 || ds20.Size() == 2 + 2 );
            // (7fe1,0010)
            // (7fe1,1024)
            // (7fe1,1026)
            // (7fe1,1036)
            // (7fe1,103a)
            // (7fe1,1083) (*)

            const gdc::PrivateTag tseq_values20name(0x7fe1,0x24,"GEMS_Ultrasound_MovieGroup_001");
            const gdc::PrivateTag tseq_values26(0x7fe1,0x26,"GEMS_Ultrasound_MovieGroup_001");
            PrintNameValueMapping3( tseq_values20name, tseq_values26, ds20, sqi_dict, "    ");
            std::cout << std::endl;

            print36(ds20, sqi_dict, "    ");
            print83(ds20, sqi_dict, "    ");
        }

        print83(ds10, sqi_dict, "  ");
    }
    return true;
}

int main(int argc, char *argv[])
{

```

```

if( argc < 2 ) return 1;
using namespace gdcm;
const char *filename = argv[1];
gdcm::Reader reader;
reader.SetFileName( filename );
if( !reader.Read() ) return 1;

gdcm::File &file = reader.GetFile();
gdcm::DataSet &ds = file.GetDataSet();
const PrivateTag tseq(0x7fe1,0x1,"GEMS_Ultrasound_MovieGroup_001");

if( !ds.FindDataElement( tseq ) ) return 1;
const DataElement& seq = ds.GetDataElement( tseq );

SmartPointer<SequenceOfItems> sqi = seq.GetValueAsSQ();
assert( sqi->GetNumberOfItems() == 1 );

Item &item = sqi->GetItem(1);
DataSet &subds = item.GetNestedDataSet();

const PrivateTag tseq_dict(0x7fe1,0x70,"GEMS_Ultrasound_MovieGroup_001");
if( !subds.FindDataElement( tseq_dict ) ) return 1;
const DataElement& seq_dict = subds.GetDataElement( tseq_dict );
SmartPointer<SequenceOfItems> sqi_dict = seq_dict.GetValueAsSQ();

const PrivateTag tseq_values8(0x7fe1,0x8,"GEMS_Ultrasound_MovieGroup_001");
if( !subds.FindDataElement( tseq_values8 ) ) return 1;
const DataElement& seq_values8 = subds.GetDataElement( tseq_values8 );
SmartPointer<SequenceOfItems> sqi_values8 = seq_values8.GetValueAsSQ();

const PrivateTag tseq_values8name(0x7fe1,0x2,"GEMS_Ultrasound_MovieGroup_001");
if( !subds.FindDataElement( tseq_values8name ) ) return 1;
const DataElement& values8name = subds.GetDataElement( tseq_values8name );
{
  Element<VR::LO,VM::VM1> el;
  el.SetFromDataElement( values8name );
  std::cout << el.GetValue() << std::endl;
}
size_t count = subds.Size(); (void)count;
assert( subds.Size() == 3 + 2 + 1 || subds.Size() == 3 + 2 + 2);

// (7fe1,0010) # 30,1 Private Creator
// (7fe1,1002) # 8,1 US MovieGroup Value 0008 Name
// (7fe1,1003) # 4,1 ?
// (7fe1,1008) # 8140,1 US MovieGroup Value 0008 Sequence
// (7fe1,1010) # 1372196,1 ?
// (7fe1,1070) # 33684,1 US MovieGroup Dict
// (7fe1,1073) (*)
PrintNameValueMapping( sqi_values8, sqi_dict, " ");

const PrivateTag tseq_values10(0x7fe1,0x10,"GEMS_Ultrasound_MovieGroup_001");
const PrivateTag tseq_values10name(0x7fe1,0x12,"GEMS_Ultrasound_MovieGroup_001");
const PrivateTag tseq_values18(0x7fe1,0x18,"GEMS_Ultrasound_MovieGroup_001");
PrintNameValueMapping4( tseq_values10, subds, tseq_values10name, tseq_values18, sqi_dict, " ");

print73( subds, sqi_dict, " ");

#if 0
gdcm::DataSet::ConstIterator it = subds.Begin();
for( ; it != subds.End(); ++it )
{
  const gdcm::DataElement &de = *it;
  std::cout << de.GetTag() << std::endl;
}
#endif

return 0;
}

```

## 14.52 DumpImageHeaderInfo.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library
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```



```

        os << " " << val << std::endl;
        p += sizeof(val);
    #if 0
        float f;
        memcpy( (char*)&f, p, sizeof(f) );
        os << " " << f << std::endl;
        p += sizeof(f);
    #else
        memcpy( (char*)&val, p, sizeof(val) );
        os << " " << val << std::endl;
        p += sizeof(val);
    #endif
        memcpy( (char*)&val, p, sizeof(val) );
        os << " " << val << std::endl;
        p += sizeof(val);
        char str2[17];
        memcpy( str2, p, 16 );
        str2[16] = 0;
        os << " " << str2 << std::endl;
    }

    #if 0
        std::ofstream out( str, std::ios::binary );
        out.write( (char*)&magic, sizeof( magic ) );
        out.write( (char*)&l, sizeof( l ) );
        out.write( str, 16 );
        out.write( &bytes[0], bytes.size() );
    #endif
    return is;
}

static bool DumpImageHeaderInfo( std::istream & is, size_t reflen )
{
    // TUSNONIMAGESTAM (5176)
    // TUSREMEASUREMEN (1352)
    // TUSBSINGLELAYOU (16)
    // TUSCLIPPAREMTE (104)

    element el;
    while( el.read( is ) )
    {
    }
    //size_t pos = is.tellg();
    //assert( pos == reflen );
    (void)reflen;

    return true;
}

int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();

    const gdcm::PrivateTag timageheaderinfo(0x0029,0x10,"TOSHIBA MDW HEADER");
    if( !ds.FindDataElement( timageheaderinfo ) ) return 1;
    const gdcm::DataElement& imageheaderinfo = ds.GetDataElement( timageheaderinfo );
    if ( imageheaderinfo.IsEmpty() ) return 1;
    const gdcm::ByteValue * bv = imageheaderinfo.GetByteValue();

    std::stringstream is;
    std::string dup( bv->GetPointer(), bv->GetLength() );
    is.str( dup );
    bool b = DumpImageHeaderInfo( is, bv->GetLength() );
    if( !b ) return 1;

    #if 0
        const float d1 = 0.00416666668839752674; // 89 88 88 3B // 0x44c
        //const float d1 = 0.053231674455417881;
        const float d2 = 0.10828025639057159; // 0A C2 DD 3D // 0x1ac
        //const float d1 = 0.17869562069272813;
        //const unsigned int d2 = 4294967280;
        const float d3 = 0.10828025639057159; // 0A C2 DD 3D // 0x15c
    #endif

```

```

const int32_t d4 = 134;
const uint32_t d5 = 1153476;
std::ofstream t("/tmp/debug", std::ios::binary );
//t.write( (char*)&d0, sizeof( d0 ) );
t.write( (char*)&d1, sizeof( d1 ) );
t.write( (char*)&d2, sizeof( d2 ) );
t.write( (char*)&d3, sizeof( d3 ) );
t.write( (char*)&d4, sizeof( d4 ) );
t.write( (char*)&d5, sizeof( d5 ) );
t.close();
#endif

return 0;
}

```

## 14.53 DumpPhilipsECHO.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====*/
#include "gdcmlReader.h"
#include "gdcmlDeflateStream.h"
#include "gdcml_zlib.h"

/*
 * This example extract the ZLIB compressed US image from a Philips private tag
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcml-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Usage:
 *
 * $ DumpPhilipsECHO private_us.dcm raw_us_img.raw
 * $ gdcmlimg --sop-class-uid 1.2.840.10008.5.1.4.1.1.3.1 --size 608,427,88 raw_us_img.raw raw_us_img.dcm
 */

// header:
struct hframe
{
    uint32_t val0; // 800 increment ?
    uint16_t val1[2];
    uint16_t val2[2];
    uint32_t imgsize;

    bool operator==(const hframe &h) const
    {
        return val0 == h.val0 &&
            val1[0] == h.val1[0] &&
            val1[1] == h.val1[1] &&
            val2[0] == h.val2[0] &&
            val2[1] == h.val2[1] &&
            imgsize == h.imgsize;
    }
};

static bool ProcessDeflate( const char *outfilename, const int nslices, const
    int buf_size, const char *buf, const std::streampos len,
    const char *crcbuf, const size_t crclen )
{

```

```

std::vector< hframe > crcheaders;
crcheaders.reserve( nslices );
{
    std::istringstream is;
    is.str( std::string( crcbuf, crclen ) );
    hframe header;
    for( int r = 0; r < nslices; ++r )
    {
        is.read( (char*)&header, sizeof( header ) );
    }
}

#ifdef 0
    std::cout << header.val0
        << " " << header.val1[0]
        << " " << header.val1[1]
        << " " << header.val2[0]
        << " " << header.val2[1]
        << " " << header.imgsize << std::endl;
#endif
crcheaders.push_back( header );
}

std::istringstream is;
is.str( std::string( buf, (size_t)len ) );

std::streamoff totalsize;
is.read( (char*)&totalsize, sizeof( totalsize ) );
assert( totalsize == len );

uint32_t nframes;
is.read( (char*)&nframes, sizeof( nframes ) );
assert( nframes == (uint32_t)nslices );

std::vector< std::streamoff > offsets;
offsets.reserve( nframes );
for( uint32_t frame = 0; frame < nframes; ++frame )
{
    uint32_t offset;
    is.read( (char*)&offset, sizeof( offset ) );
    offsets.push_back( offset );
}

std::vector<char> outbuf;

const int size[2] = { 608, 427 }; // FIXME: where does it comes from ?
std::stringstream ss;
ss << outfilename;
ss << '_';
//ss << crcheaders[0].imgsize; // FIXME: Assume all header are identical !
ss << size[0];
ss << '_';
ss << size[1];
ss << '_';
ss << nframes;
ss << ".raw";
std::ofstream os( ss.str().c_str(), std::ios::binary );

assert( buf_size >= size[0] * size[1] );
outbuf.resize( buf_size );

hframe header;
//uint32_t prev = 0;
for( unsigned int r = 0; r < nframes; ++r )
{
    is.read( (char*)&header, sizeof( header ) );

    assert( header == crcheaders[r] );
    assert( header.val1[0] == 2000 );
    assert( header.val1[1] == 3 );
    assert( header.val2[0] == 1 );
    assert( header.val2[1] == 1280 );

    uLongf destLen = buf_size; // >= 608,427
    Bytef *dest = (Bytef*)outbuf.data();
    assert( is.tellg() == offsets[r] + 16 );
    const Bytef *source = (const Bytef*)buf + offsets[r] + 16;
    uLong sourceLen;
    if( r + 1 == nframes )
        sourceLen = (uLong)totalsize - (uLong)offsets[r] - 16;
    else
        sourceLen = (uLong)offsets[r+1] - (uLong)offsets[r] - 16;
    // FIXME: in-memory decompression:

```

```

    int ret = uncompress (dest, &destLen, source, sourceLen);
    assert( ret == Z_OK ); (void)ret;
    assert( destLen >= (uLongf)size[0] * size[1] ); // 16bytes padding ?
    assert( header.imgsize == (uint32_t)size[0] * size[1] );
    //os.write( &outbuf[0], outbuf.size() );
    os.write( outbuf.data(), size[0] * size[1] );

    // skip data:
    is.seekg( sourceLen, std::ios::cur );
}
os.close();
assert( is.tellg() == totalsize );

return true;
}

static bool ProcessNone( const char *outfilename, const int nslices, const
    int buf_size, const char *buf, const std::streampos len,
    const char *crdbuf, const size_t crclen )
{
    std::vector< hframe > crcheaders;
    crcheaders.reserve( nslices );
    {
        std::istringstream is;
        is.str( std::string( crdbuf, crclen ) );
        hframe header;
        for( int r = 0; r < nslices; ++r )
        {
            is.read( (char*)&header, sizeof( header ) );
#ifdef 0
            std::cout << header.val0
                << " " << header.val1[0]
                << " " << header.val1[1]
                << " " << header.val2[0]
                << " " << header.val2[1]
                << " " << header.imgsize << std::endl;
#endif
            crcheaders.push_back( header );
        }

        std::istringstream is;
        is.str( std::string( buf, (size_t)len ) );

        std::streampos totalsize;
        is.read( (char*)&totalsize, sizeof( totalsize ) );
        assert( totalsize == len );

        uint32_t nframes;
        is.read( (char*)&nframes, sizeof( nframes ) );
        assert( nframes == (uint32_t)nslices );

        std::vector< uint32_t > offsets;
        offsets.reserve( nframes );
        for( uint32_t frame = 0; frame < nframes ; ++frame )
        {
            uint32_t offset;
            is.read( (char*)&offset, sizeof( offset ) );
            offsets.push_back( offset );
            //std::cout << offset << std::endl;
        }

        std::vector<char> outbuf;
        // No idea how to present the data, I'll just append everything, and present it as 2D
        std::stringstream ss;
        ss << outfile;
        ss << ' ';
        ss << crcheaders[0].imgsize; // FIXME: Assume all header are identical !
        ss << ' ';
        ss << nframes;
        ss << ".raw";
        std::ofstream os( ss.str().c_str(), std::ios::binary );
        outbuf.resize( buf_size ); // overallocated + 16
        char *buffer = outbuf.data();

        hframe header;
        for( unsigned int r = 0; r < nframes; ++r )
        {
            is.read( (char*)&header, sizeof( header ) );
#ifdef 0
            std::cout << header.val0

```



```

        « " " « header.val1[0]
        « " " « header.val1[1]
        « " " « header.val2[0]
        « " " « header.val2[1]
        « " " « header.imgsize « std::endl;
#endif
    assert( header == crchheaders[r] );

    is.read( buffer, buf_size - 16 );
    os.write( buffer, header.imgsize );
}
assert( is.tellg() == totalsize );
os.close();

return true;
}

#ifndef NDEBUG
static const char * const UDM_USD_DATATYPE_STRINGS[] = {
    "UDM_USD_DATATYPE_DIN_2D_ECHO",
    "UDM_USD_DATATYPE_DIN_2D_ECHO_CONTRAST",
    "UDM_USD_DATATYPE_DIN_DOPPLER_CW",
    "UDM_USD_DATATYPE_DIN_DOPPLER_PW",
    "UDM_USD_DATATYPE_DIN_DOPPLER_PW_TDI",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_FLOW",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_PMI",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_CPA",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_TDI",
    "UDM_USD_DATATYPE_DIN_MMODE_ECHO",
    "UDM_USD_DATATYPE_DIN_MMODE_COLOR",
    "UDM_USD_DATATYPE_DIN_MMODE_COLOR_TDI",
    "UDM_USD_DATATYPE_DIN_PARAM_BLOCK",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_VELOCITY",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_POWER",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_VARIANCE",
    "UDM_USD_DATATYPE_DIN_DOPPLER_AUDIO",
    "UDM_USD_DATATYPE_DIN_DOPPLER_HIGHQ",
    "UDM_USD_DATATYPE_DIN_PHYSIO",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_STRAIN",
    "UDM_USD_DATATYPE_DIN_COMPOSITE_RGB",
    "UDM_USD_DATATYPE_DIN_XFOV_REALTIME_GRAPHICS",
    "UDM_USD_DATATYPE_DIN_XFOV_MOSAIC",
    "UDM_USD_DATATYPE_DIN_COMPOSITE_R",
    "UDM_USD_DATATYPE_DIN_COMPOSITE_G",
    "UDM_USD_DATATYPE_DIN_COMPOSITE_B",
    "UDM_USD_DATATYPE_DIN_MMODE_COLOR_VELOCITY",
    "UDM_USD_DATATYPE_DIN_MMODE_COLOR_POWER",
    "UDM_USD_DATATYPE_DIN_MMODE_COLOR_VARIANCE",
    "UDM_USD_DATATYPE_DIN_2D_ELASTO",
};

static inline bool is_valid( const char * datatype_str )
{
    static const int n = sizeof( UDM_USD_DATATYPE_STRINGS ) / sizeof( *UDM_USD_DATATYPE_STRINGS );
    bool found = false;
    if( datatype_str )
    {
        for( int i = 0; !found && i < n; ++i )
        {
            found = strcmp( datatype_str, UDM_USD_DATATYPE_STRINGS[i] ) == 0;
        }
    }
    return found;
}
#endif

int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    using namespace gdcm;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() ) return 1;

    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds1 = file.GetDataSet();

    const PrivateTag tseq1(0x200d,0x3cf8,"Philips US Imaging DD 045");
    if( !ds1.FindDataElement( tseq1 ) ) return 1;

```

```

const DataElement& seq1 = dsl.GetDataElement( tseq1 );

SmartPointer<SequenceOfItems> sqil = seq1.GetValueAsSQ();
assert( sqil->GetNumberOfItems() >= 1 );

const size_t nitems = sqil->GetNumberOfItems();
for( size_t item = 1; item < nitems; ++item )
{
    Item &item1 = sqil->GetItem(item);
    DataSet &ds2 = item1.GetNestedDataSet();

    // (200d,300d) LO 28 UDM_USD_DATATYPE_DIN_2D_ECHO
    const PrivateTag tdatatype(0x200d,0x300d,"Philips US Imaging DD 033");
    if( !ds2.FindDataElement( tdatatype ) ) return 1;
    const DataElement& datatype = ds2.GetDataElement( tdatatype );
    const ByteValue *bvdatatype = datatype.GetByteValue();
    if( !bvdatatype ) return 1;

    const PrivateTag tseq2(0x200d,0x3cf1,"Philips US Imaging DD 045");
    if( !ds2.FindDataElement( tseq2 ) ) return 1;
    const DataElement& seq2 = ds2.GetDataElement( tseq2 );

    SmartPointer<SequenceOfItems> sqi2 = seq2.GetValueAsSQ();
    assert( sqi2->GetNumberOfItems() >= 1 );

    // FIXME: what if not in first Item ?
    assert( sqi2->GetNumberOfItems() == 1 );
    Item &item2 = sqi2->GetItem(1);
    DataSet &ds3 = item2.GetNestedDataSet();

    const PrivateTag tzlib(0x200d,0x3cfa,"Philips US Imaging DD 045");
    if( !ds3.FindDataElement( tzlib ) ) return 1;
    const DataElement& zlib = ds3.GetDataElement( tzlib );

    const ByteValue *bv = zlib.GetByteValue();
    if( !bv ) return 1;
    if( bv->GetLength() != 4 ) return 1;

    // (200d,3010) IS 2 88
    const PrivateTag tnslices(0x200d,0x3010,"Philips US Imaging DD 033");
    if( !ds3.FindDataElement( tnslices ) ) return 1;
    const DataElement& nslices = ds3.GetDataElement( tnslices );
    Element<VR::IS,VM::VM1> elnslices;
    elnslices.SetFromDataElement( nslices );
    const int nslicesref = elnslices.GetValue();
    assert( nslicesref >= 0 );
    // (200d,3011) IS 6 259648
    const PrivateTag tzalloc(0x200d,0x3011,"Philips US Imaging DD 033");
    if( !ds3.FindDataElement( tzalloc ) ) return 1;
    const DataElement& zalloc = ds3.GetDataElement( tzalloc );
    Element<VR::IS,VM::VM1> elzalloc;
    elzalloc.SetFromDataElement( zalloc );
    const int zallocref = elzalloc.GetValue();
    assert( zallocref >= 0 );
    // (200d,3021) IS 2 0
    const PrivateTag tzero(0x200d,0x3021,"Philips US Imaging DD 033");
    if( !ds3.FindDataElement( tzero ) ) return 1;
    const DataElement& zero = ds3.GetDataElement( tzero );
    Element<VR::IS,VM::VM1> elzero;
    elzero.SetFromDataElement( zero );
    const int zerocref = elzero.GetValue();
    assert( zerocref == 0 ); (void)zerocref;

    // (200d,3cf3) OB
    const PrivateTag tdeflate(0x200d,0x3cf3,"Philips US Imaging DD 045");
    if( !ds3.FindDataElement( tdeflate ) ) return 1;
    const DataElement& deflate = ds3.GetDataElement( tdeflate );
    const ByteValue *bv2 = deflate.GetByteValue();

    // (200d,3cfb) OB
    const PrivateTag tcrc(0x200d,0x3cfb,"Philips US Imaging DD 045");
    if( !ds3.FindDataElement( tcrc ) ) return 1;
    const DataElement& crc = ds3.GetDataElement( tcrc );
    const ByteValue *bv3 = crc.GetByteValue();

    std::string outfile = std::string( bvdatatype->GetPointer(), bvdatatype->GetLength() );
    outfile = LOComp::Trim( outfile.c_str() );
    const char *outfilename = outfile.c_str();
    assert( is_valid(outfilename) );
    if( bv2 )
    {

```

```

assert( bv3 );
assert( zallocref > 0 );
assert( nslicesref > 0 );
std::cout << ds2 << std::endl;

if( strcmp(bv->GetPointer(), "ZLib", 4) == 0 )
{
    if( !ProcessDeflate( outfilename, nslicesref, zallocref, bv2->GetPointer(),
        std::streampos(bv2->GetLength()), bv3->GetPointer(), bv3->GetLength() ) )
    {
        return 1;
    }
}
else if( strcmp(bv->GetPointer(), "None", 4) == 0 )
{
    if( !ProcessNone( outfilename, nslicesref, zallocref, bv2->GetPointer(),
        std::streampos(bv2->GetLength()), bv3->GetPointer(), bv3->GetLength() ) )
    {
        return 1;
    }
}
else
{
    std::string str( bv->GetPointer(), bv->GetLength() );
    std::cerr << "Unhandled: " << str << std::endl;
    return 1;
}
}
}

return 0;
}

```

## 14.54 DumpSiemensBase64.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
/*
 * https://groups.google.com/forum/#!msg/comp.protocols.dicom/2kZ2lP8EcM/WzjFrtjnAgAJ
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmPrinter.h"
#include "gdcmDictPrinter.h"
#include "gdcmCSAHeader.h"
#include "gdcmBase64.h"
#include "gdcmExplicitDataElement.h"
#include "gdcmSwapper.h"

#include <iostream>
#include <fstream>
#include <vector>

#include <assert.h>

int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
}

```

```

}
const gdcm::DataSet& ds = reader.GetFile().GetDataSet();

gdcm::CSAHeader csa;
const gdcm::PrivateTag &t1 = csa.GetCSAImageHeaderInfoTag();
if( !ds.FindDataElement( t1 ) ) return 1;
csa.LoadFromDataElement( ds.GetDataElement( t1 ) );

//const char name[] = "MRDiffusion";
const char name[] = "MR_AS_L";
if( csa.FindCSAElementByName(name) )
{
    const gdcm::CSAElement &el = csa.GetCSAElementByName(name);
    const gdcm::ByteValue* bv = el.GetByteValue();
    std::string str( bv->GetPointer(), bv->GetLength() );
    str.erase(std::remove(str.begin(), str.end(), '\n'), str.end());
    size_t dl = gdcm::Base64::GetDecodeLength( str.c_str(), str.size() );
    std::vector<char> buf;
    buf.resize( dl );
    size_t dl2 = gdcm::Base64::Decode( buf.data(), buf.size(), str.c_str(), str.size() );
    (void)dl2;
    std::stringstream ss;
    ss.str( std::string(buf.data(), buf.size()) );
    gdcm::File file;
    gdcm::DataSet &ds2 = file.GetDataSet();
    gdcm::DataElement xde;
    try
    {
        while( xde.Read<gdcm::ExplicitDataElement, gdcm::SwapperNoOp>( ss ) )
        {
            ds2.Insert( xde );
        }
        assert( ss.eof() );
    }
    catch(std::exception &)
    {
        return 1;
    }
    gdcm::Printer p;
    p.SetFile( file );
    p.Print(std::cout);
}

return 0;
}

```

## 14.55 DumpToSQLITE3.cxx

```

/*=====
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=====*/
/*
 * Ref:
 * http://massmail.spl.harvard.edu/public-archives/slicer-devel/2010/004408.html
 *
 * Implementation details:
 * http://www.sqlite.org/c3ref/bind_blob.html
 * http://www.adp-gmbh.ch/sqlite/bind_insert.html
 */
#include "gdcmScanner.h"
#include "gdcmDirectory.h"
#include "gdcmTag.h"

```

```

#include "gdcmTrace.h"

#include "sqlite3.h"

#include <stdio.h>
#include <time.h>

int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        return 1;
    }
    time_t time_start = time(nullptr);

    gdcm::Trace::SetDebug( false );
    gdcm::Trace::SetWarning( false );
    const char *inputdirectory = argv[1];

    gdcm::Directory d;
    unsigned int nfiles = d.Load( inputdirectory, true);

    gdcm::Scanner s;
    using gdcm::Tag;
    s.AddTag( Tag(0x20,0xd) ); // Study Instance UID
    s.AddTag( Tag(0x20,0xe) ); // Series Instance UID

    bool b0 = s.Scan( d.GetFilesNames() );
    if( !b0 ) return 1;
    time_t time_scanner = time(nullptr);

    std::cout << "Finished loading data from : " << nfiles << " files" << std::endl;
// MappingType const &mappings = s.GetMappings();

    sqlite3* db;
    sqlite3_open("./dicom.db", &db);

    if(db == nullptr)
    {
        std::cerr << "Could not open database." << std::endl;
        return 1;
    }

    const char sql_stmt[] = "create table browser (seriesuid, studyuid)";
    int ret;

    char *errmsg;
    ret = sqlite3_exec(db, sql_stmt, nullptr, nullptr, &errmsg);

    if(ret != SQLITE_OK)
    {
        printf("Error in statement: %s [%s].\n", sql_stmt, errmsg);
        return 1;
    }
    using gdcm::Directory;
    using gdcm::Scanner;
    const Directory::FileNamesType& files = d.GetFilesNames();
    Directory::FileNamesType::const_iterator file = files.begin();

    sqlite3_stmt *stmt;
    if ( sqlite3_prepare(
        db,
        "insert into browser values (?,?)", // stmt
        -1, // If than zero, then stmt is read up to the first nul terminator
        &stmt,
        nullptr // Pointer to unused portion of stmt
    )
    != SQLITE_OK)
    {
        printf("\nCould not prepare statement.");
        return 1;
    }
    //printf("\nThe statement has %d wildcards\n", sqlite3_bind_parameter_count(stmt));
    for(; file != files.end(); ++file)
    {
        const char *filename = file->c_str();
        bool b = s.IsKey(filename);
        if( b )
        {

```

```

const Scanner::TagToValue &mapping = s.GetMapping(filename);
Scanner::TagToValue::const_iterator it = mapping.begin();

sqlite3_reset(stmt);

for( int index = 1; it != mapping.end(); ++it, ++index)
{
    //const Tag & tag = it->first;
    const char *value = it->second;

    if (sqlite3_bind_text (
        stmt,
        index, // Index of wildcard
        value,
        (int)strlen(value), // length of text
        SQLITE_STATIC // SQLite assumes that the information is in static
    )
        != SQLITE_OK)
    {
        printf("\nCould not bind int.\n");
        return 1;
    }
}
if (sqlite3_step(stmt) != SQLITE_DONE)
{
    printf("\nCould not step (execute) stmt.\n");
    return 1;
}
}

sqlite3_close(db);

time_t time_sqlite = time(nullptr);

std::cout << "Time to scan DICOM files: " << (time_scanner - time_start) << std::endl;
std::cout << "Time to build SQLITE3: " << (time_sqlite - time_scanner) << std::endl;

return 0;
}

```

## 14.56 DumpToshibaDTI.cxx

```

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=====*/
/*
 * https://groups.google.com/d/msg/comp.protocols.dicom/7IaIkT0ZG5U/k7LPu81VvAMJ
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmPrinter.h"
#include "gdcmDictPrinter.h"

#include <iostream>
#include <fstream>
#include <vector>

#include <assert.h>

static bool DumpToshibaDTI( const char * input, size_t len )
{
    static int i = 0;
    ++i;
    if( len % 2 ) return false;

    std::vector<char> copy( input, input + len );

```

```

std::reverse( copy.begin(), copy.end() );

#if 0
std::ostream f;
f << "debug" << i;
std::ofstream of( f.str().c_str(), std::ios::binary );
of.write( &copy[0], copy.size() );
of.close();
#else

std::istream is;
std::string dup( copy.data(), copy.size() );
is.str( dup );

gdcm::File file;
gdcm::FileMetaInformation & fmi = file.GetHeader();
fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
gdcm::DataSet & ds = file.GetDataSet();
ds.Read<gdcm::ExplicitDataElement, gdcm::SwapperNoOp>( is );

//gdcm::DictPrinter p;
gdcm::Printer p;
p.SetFile( file );
p.SetColor( true );
p.Print( std::cout );
#endif

return true;
}

int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();

    // (0029,0010) ?? (LO) [PMTF INFORMATION DATA ] # 22,1 Private Creator
    // (0029,1001) ?? (SQ) (Sequence with undefined length) # u/1,1 ?

    const gdcm::PrivateTag tpmtf(0x0029,0x1,"PMTF INFORMATION DATA");
    if( !ds.FindDataElement( tpmtf ) ) return 1;
    const gdcm::DataElement& pmtf = ds.GetDataElement( tpmtf );
    if( pmtf.IsEmpty() ) return 1;
    gdcm::SmartPointer<gdcm::SequenceOfItems> seq = pmtf.GetValueAsSQ();
    if( !seq || !seq->GetNumberOfItems() ) return 1;

    size_t n = seq->GetNumberOfItems();
    for( size_t i = 1; i <= n; ++i )
    {
        gdcm::Item &item = seq->GetItem(i);
        gdcm::DataSet &subds = item.GetNestedDataSet();
        // (0029,0010) ?? (LO) [PMTF INFORMATION DATA ] # 22,1 Private Creator
        // (0029,1090) ?? (OB) 00\05\00\13\00\12\00\22\ # 202,1 ?
        const gdcm::PrivateTag tseq(0x0029,0x90,"PMTF INFORMATION DATA");

        if( subds.FindDataElement( tseq ) )
        {
            const gdcm::DataElement &de = subds.GetDataElement( tseq );
            const gdcm::ByteValue *bv = de.GetByteValue();
            if( !bv ) return 1;

            bool b = DumpToshibaDTI( bv->GetPointer(), bv->GetLength() );
            if( !b ) return 1;
        }
    }

    return 0;
}

```

## 14.57 DumpToshibaDTI2.cxx

```

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=====*/
/*
 *
 * https://gazelle.ihe.net/EVSCClient/dicomResult.seam;jsessionid=x+Rf9Zs+ip49P+jC3L8SLZb8?&oid=1.3.6.1.4.1.12559.11.1.2.1.4.16
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmPrinter.h"
#include "gdcmDictPrinter.h"

#include <iostream>
#include <fstream>
#include <vector>

#include <assert.h>

static bool DumpToshibaDTI2( const char * input, size_t len )
{
    static int i = 0;
    ++i;
    if( len % 2 ) return false;

    std::vector<char> copy( input, input + len );
    std::reverse( copy.begin(), copy.end() );

    #if 0
        std::ostringstream f;
        f << "debug" << i;
        std::ofstream of( f.str().c_str(), std::ios::binary );
        of.write( &copy[0], copy.size() );
        of.close();
    #else

        std::istringstream is;
        std::string dup( copy.data(), copy.size() );
        is.str( dup );

        gdcm::File file;
        gdcm::FileMetaInformation & fmi = file.GetHeader();
        fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
        gdcm::DataSet & ds = file.GetDataSet();
        ds.Read<gdcm::ExplicitDataElement, gdcm::SwapperNoOp>( is );

        //gdcm::DictPrinter p;
        gdcm::Printer p;
        p.SetFile( file );
        p.SetColor( true );
        p.Print( std::cout );
    #endif

    return true;
}

int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
}

```



```

const gdcm::DataSet& ds = reader.GetFile().GetDataSet();

/*
(0029,1001) SQ (Sequence with explicit length #=6)      # 18746, 1 Unknown Tag & Data
  (fffe,e000) na (Item with explicit length #=2)        # 206, 1 Item
    (0029,0010) LO [TOSHIBA_MEC_MR3]                   # 16, 1 PrivateCreator
    (0029,1090) OB 00\07\00\06\00\05\00\04\00\03\00\02\00\0c\00\01\00\00\00\00\12... # 170, 1 Unknown Tag &
    Data
  (fffe,e00d) na (ItemDelimitationItem for re-encoding) # 0, 0 ItemDelimitationItem
  (fffe,e000) na (Item with explicit length #=2)        # 866, 1 Item
    (0029,0010) LO [TOSHIBA_MEC_MR3]                   # 16, 1 PrivateCreator
    (0029,1090) OB 45\4e\49\50\53\4c\20\52\41\5c\45\4e\49\50\53\4c\54\5c\52\45\53\55... # 830, 1 Unknown Tag &
    Data
[... ]
(0029,1002) SQ (Sequence with explicit length #=1)      # 120, 1 Unknown Tag & Data
  (fffe,e000) na (Item with explicit length #=2)        # 112, 1 Item
    (0029,0010) LO [TOSHIBA_MEC_MR3]                   # 16, 1 PrivateCreator
    (0029,1090) OB 00\10\00\02\53\55\10\80\70\0d\30\31\5e\33\52\4d\5f\43\45\4d\5f\41... # 76, 1 Unknown Tag &
    Data
  (fffe,e00d) na (ItemDelimitationItem for re-encoding) # 0, 0 ItemDelimitationItem
*/

const gdcm::PrivateTag tmeccmr3(0x0029,0x1,"TOSHIBA_MEC_MR3");
if( !ds.FindDataElement( tmeccmr3 ) ) return 1;
const gdcm::DataElement& meccmr3 = ds.GetDataElement( tmeccmr3 );
if ( meccmr3.IsEmpty() ) return 1;
gdcm::SmartPointer<gdcm::SequenceOfItems> seq = meccmr3.GetValueAsSQ();
if ( !seq || !seq->GetNumberOfItems() ) return 1;

size_t n = seq->GetNumberOfItems();
for( size_t i = 1; i <= n; ++i )
{
  gdcm::Item &item = seq->GetItem(i);
  gdcm::DataSet &subds = item.GetNestedDataSet();
  const gdcm::PrivateTag tseq(0x0029,0x90,"TOSHIBA_MEC_MR3");

  if( subds.FindDataElement( tseq ) )
  {
    const gdcm::DataElement &de = subds.GetDataElement( tseq );
    const gdcm::ByteValue *bv = de.GetByteValue();
    if( !bv ) return 1;

    bool b = DumpToshibaDTI2( bv->GetPointer(), bv->GetLength() );
    if( !b ) return 1;
  }
}

return 0;
}

```

## 14.58 DumpVisusChange.cxx

```

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=====*/
#include "gdcmReader.h"
#include "gdcmDirectory.h"
#include "gdcmStringFilter.h"

#include <vector>
#include <algorithm>

/*
*/
static bool process( std::vector<gdcm::DataElement> & ms, const char * filename)

```

```

{
    using namespace gdcm;
    Tag pd(0x7fe0,0x0000);
    std::set<gdcm::Tag> skiptags;
    skiptags.insert( pd );

    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.ReadUpToTag( pd, skiptags ) )
    {
        std::cerr << "Failure to read: " << filename << std::endl;
        return false;
    }

    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds1 = file.GetDataSet();

    const gdcm::PrivateTag tseq1(0x5533,0x33,"Visus Change");
    if( !ds1.FindDataElement( tseq1 ) ) return true;
    const gdcm::DataElement& seq1 = ds1.GetDataElement( tseq1 );

    SmartPointer<SequenceOfItems> sqil = seq1.GetValueAsSQ();

    const size_t nitems = sqil->GetNumberOfItems();
    for( size_t item = 1; item < nitems; ++item )
    {
        Item &item1 = sqil->GetItem(item);
        DataSet &ds2 = item1.GetNestedDataSet();
        for(DataSet::ConstIterator it = ds2.Begin(); it != ds2.End(); ++it )
        {
            DataElement const &de = *it;
            // cannot simply use std::set here, see there is a discrepancy in between
            // operator== and operator<.
            // So only use operator== here:
            std::vector<DataElement>::iterator vit = std::find(ms.begin(), ms.end(), de);
            if( vit == ms.end() )
                ms.push_back(de);
        }
    }
    return true;
}

int main(int argc, char *argv[])
{
    bool usefastpath = true;

    if( argc < 2 ) return 1;
    using namespace gdcm;
    const char *filename = argv[1];
    gdcm::Directory::FileNamesType filenames;
    if( !gdcm::System::FileExists(filename) )
    {
        std::cerr << "Could not find file: " << filename << std::endl;
        return 1;
    }

    gdcm::Directory dir;
    if( gdcm::System::FileIsDirectory(filename) )
    {
        unsigned int nfiles = dir.Load(filename, false);
        if( nfiles == 0 )
        {
            std::cerr << "Could not find files: " << filename << std::endl;
            return 1;
        }
        filenames = dir.GetFilesNames();
    }
    else
    {
        filenames.push_back( filename );
    }
    gdcm::StringFilter sf;

    Tag pd(0x7fe0,0x0000);
    std::set<gdcm::Tag> skiptags;
    skiptags.insert( pd );

    gdcm::Reader reader;
    reader.SetFileName( filenames[0].c_str() );
    if( !reader.ReadUpToTag( pd, skiptags ) )
    {

```

```

        std::cerr << "Could not read file: " << filename << std::endl;
        return 1;
    }
    gdcm::File &file = reader.GetFile();
    sf.SetFile(file);

    if( usefastpath ) {
        // Heuristic, assume if private tag cannot be found in first file, skip the directory
        gdcm::DataSet &ds1 = file.GetDataSet();

        const gdcm::PrivateTag tseq1(0x5533,0x33,"Visus Change");
        if( !ds1.FindDataElement( tseq1 ) ){
            std::cerr << "Could not find private tag in first file skipping whole directory: " << filename << std::endl;
            return 0;
        }
    }

    std::vector<DataElement> ms;
    for(gdcm::Directory::FileNamesType::const_iterator cit = filenames.begin(); cit != filenames.end(); ++cit )
    {
        if( !process(ms, cit->c_str()) ) {
            return 1;
        }
    }

    if( !ms.empty() ) {
        std::sort(ms.begin(), ms.end());
        std::cout << filename << ",\n";
        for(std::vector<DataElement>::const_iterator it = ms.begin(); it != ms.end(); ++it )
        {
            DataElement const & de = *it;
            std::string const & s = sf.ToString( de );
            std::cout << de.GetTag() << " " << s << std::endl;
        }
        std::cout << "\n" << std::endl;
    }

    return 0;
}

```

## 14.59 DuplicatePCDE.cxx

```

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=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
/*
Usage:
DuplicatePCDE gdcmData/D_CLUNIE_CT1_J2KI.dcm out.dcm

aka:
medical.nema.org/medical/dicom/DataSets/WG04/IMAGES/J2KI/CT1_J2KI

See:
gdcmConformanceTests/CT1_J2KI_DuplicatePCDE.dcm

Original thread can be found at:
http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/82f28c4db28963af

```

Question:

1. There is no restriction for a specific Private Creator Data Element (PCDE) to be unique within the same group, right ?

Decoders of Private Data would have to handle the case where a PCDE would be repeated and should NOT stop on the first instance of a particular PCDE, right ?

Eg. when searching for the tag associated with (0x0029,0x0010,"SIEMENS CSA HEADER") in the following (pseudo) dataset:

```
(0029,0010) LO [SIEMENS CSA HEADER] # 18, 1
PrivateCreator
(0029,0011) LO [SIEMENS MEDCOM HEADER] # 22, 1
PrivateCreator
(0029,0012) LO [SIEMENS MEDCOM HEADER2] # 22, 1
PrivateCreator
(0029,0013) LO [SIEMENS CSA HEADER] # 18, 1
PrivateCreator
(0029,1008) CS [IMAGE NUM 4] # 12, 1
CSAImageHeaderType
(0029,1009) LO [20050723] # 8, 1
CSAImageHeaderVersion
(0029,1010) OB 53\56\31\30\04\03\02\01\38\00\00\00\4d
\00\00\00\45\63\68\6f\4c\69... # 6788, 1 CSAImageHeaderInfo
(0029,1018) CS [MR] # 2, 1
CSASeriesHeaderType
(0029,1019) LO [20050723] # 8, 1
CSASeriesHeaderVersion
(0029,1020) OB 53\56\31\30\04\03\02\01\2c\00\00\00\4d
\00\00\00\55\73\65\64\50\61... # 51520, 1 CSASeriesHeaderInfo
(0029,1131) LO [4.0.163088300] # 14, 1
PMTFInformation1
(0029,1132) UL 32768 # 4, 1
PMTFInformation2
(0029,1133) UL 0 # 4, 1
PMTFInformation3
(0029,1134) CS [DB TO DICOM] # 12, 1
PMTFInformation4
(0029,1260) ?? 63\6f\6d\20 # 4, 1
Unknown Tag & Data
(0029,1310) OB 53\56\31\30\04\03\02\01\38\00\00\00\4d
\00\00\00\45\63\68\6f\4c\69... # 6788, 1 CSAImageHeaderInfo
```

one should return two instances, correct ?

Answer:

I would say that this is covered in principle by the PS 3.5 7.1 "The Data Elements ... shall occur at most once in a Data Set" rule, since the data element is defined by the tuple (private creator,gggg,ee) where xxee is the element number and xx is arbitrary and has no inherent meaning and does not serve to disambiguate the data element.

E.g.:

```
(0019,0030) Private Creator ID = "Smith"
...
(0019,0032) Private Creator ID = "Smith"
...
(0019,3015) Fractal Index = "32"
...
(0019,3215) Fractal Index = "32"
```

would be illegal because even though they are assigned different (completely arbitrary) blocks, with the same group, element number and private creator, (0019,3015) and (0019,3215) are the "same" data element.

\*/

```
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
```

```

gdcM::Reader reader;
reader.SetFileName( filename );
if( !reader.Read() )
{
    return 1;
}

gdcM::File &file = reader.GetFile();
gdcM::DataSet &ds = file.GetDataSet();

// Let's get all private element from group 0x9:
/*
(0009,0010) LO [GEMS_IDEN_01] # 12,1 Private Creator
(0009,1001) LO [GE_GENESIS_FF ] # 14,1 Full fidelity
(0009,1002) SH [CT01] # 4,1 Suite id
(0009,1004) SH [HiSpeed CT/i] # 12,1 Product id
(0009,1027) SL 862399669 # 4,1 Image actual date
(0009,1030) SH (no value) # 0,1 Service id
(0009,1031) SH (no value) # 0,1 Mobile location number
(0009,10e6) SH [05] # 2,1 Genesis Version - now
(0009,10e7) UL 973283917 # 4,1 Exam Record checksum
(0009,10e9) SL 862399669 # 4,1 Actual series data time stamp
*/
gdcM::Tag start(0x0009,0x0);
// Create a temporary duplicate dataset, since we cannot insert data element as we go over them (std::set
// would reorganize itself as we go over it ...)
gdcM::DataSet dup;
gdcM::Tag new_private(0x0009,0x0);
while (start.GetGroup() == 0x9)
{
    const gdcM::DataElement& de = ds.FindNextDataElement(start);
    const gdcM::Tag &t = de.GetTag();
    if( t.IsPrivateCreator() )
    {
        std::cout << t << std::endl;
        // Ok let's duplicate into the next available attribute:
        gdcM::DataElement duplicate = de;
        duplicate.GetTag().SetElement( (uint16_t)(t.GetElement() + 1) );
        dup.Insert( duplicate );
        new_private = duplicate.GetTag();
    }
    else if( t.IsPrivate() && !t.IsPrivateCreator() )
    {
        //std::cout << de << std::endl;
        std::string owner = ds.GetPrivateCreator( de.GetTag() );
        //std::cout << owner << std::endl;
        gdcM::DataElement duplicate = de;
        duplicate.GetTag().SetPrivateCreator( new_private );
        if( const gdcM::ByteValue *bv = duplicate.GetByteValue() )
        {
            // Warning: when doing : duplicate = de, only the pointer to the ByteValue is passed
            // (to avoid large memory duplicate). We need to explicitly duplicate the bytevalue ourselves:
            gdcM::ByteValue *dupbv = new gdcM::ByteValue( bv->GetPointer(),
                bv->GetLength() );
            // Let's recognize the duplicated ASCII-type elements:
            if( duplicate.GetVR() & gdcM::VR::VRASCII )
                dupbv->Fill( 'X' );
            duplicate.SetValue( *dupbv );
        }
        dup.Insert( duplicate );
    }
    start = t;
    // move to next possible 'public' element
    start.SetElement( (uint16_t)(start.GetElement() + 1) );
}

gdcM::DataSet::ConstIterator it = dup.Begin();
for( ; it != dup.End(); ++it )
{
    ds.Insert( *it );
}

gdcM::Writer w;
w.SetFile( file );
w.SetFileName( outfilename );
if ( !w.Write() )
{
    return 1;
}

return 0;

```

```
}
```

## 14.60 ELSCINT1WaveToText.cxx

```
/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====*/
#include "gdcmlReader.h"
#include "gdcmlPrivateTag.h"

/*
 * This example shows how to read a Wave Information tag from ELSCINT1
 * The wave information is stored in Tag (01e1,18,ELSCINT1) hidden in a
 * Secondary Capture Image Storage (usually a 'N' Symbol is shown)
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcml-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Special thanks to:
 * Gauthier Bouilhol
 */

template <typename T>
bool dumpargs(std::ostream & os, T c1, T c2, T c3, T c4, T c5, T c6, T c7, T c8)
{
    static const char sep = '\t';
    os << c1 << sep << c2 << sep << c3 << sep << c4 << sep << c5 << sep << c6 << sep << c7 << sep << c8;
    os << std::endl;
    return true;
}

bool wave2stream( std::ostream &text_file, const char *in, size_t len )
{
    const short * buffer = (const short*)in;
    size_t length = len / sizeof( short );
    text_file << "COMPLETE_WAVE" << '\t' << "MASK" << '\t' << "AQUISITION_PROFIL" << '\t' << "END-INHALE" << '\t' <<
    "END-EXHALE" << '\t' << "AQUISITION_WAVE" << '\t' << "WAVE_STATISTICS" << '\t' << "MASK" << std::endl;
    for (size_t i=0; i<length-76; i+=2)
    {
        if ( i < 74 )
        {
            if (buffer[i+75] == 0)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 0 << '\t' << " " <<
                '\t' << " " << '\t' << " " << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
            if (buffer[i+75] == 16384)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 0 << '\t' << buffer[i+74] <<
                '\t' << " " << '\t' << " " << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
            if (buffer[i+75] == 256)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 0 << '\t' << " " <<
                '\t' << buffer[i+74] << '\t' << " " << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
            if (buffer[i+75] == -32768)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 1 << '\t' << " " <<
                '\t' << " " << '\t' << buffer[i+74] << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
            if (buffer[i+75] == -16384)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 1 << '\t' << buffer[i+74] <<
                '\t' << " " << '\t' << buffer[i+74] << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
        }
    }
}
```

```

    if (buffer[i+75] == -32512)
        text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 1 << '\t' << " " << '\t' << buffer[i+1] <<
        '\t' << buffer[i+74] << '\t' << buffer[i+74] << '\t' << buffer[i] << '\t' << buffer[i+1] <<
        std::endl;
    }
    else
    {
        if (buffer[i+75] == 0)
            text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 0 << '\t' << " " << '\t' << buffer[i+1] <<
            '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " <<
            std::endl;
        if (buffer[i+75] == 16384)
            text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 0 << '\t' << " " << '\t' << buffer[i+74] <<
            '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " <<
            std::endl;
        if (buffer[i+75] == 256)
            text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 0 << '\t' << " " << '\t' << " " << '\t' << " " <<
            '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " <<
            std::endl;
        if (buffer[i+75] == -32768)
            text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 1 << '\t' << " " << '\t' << buffer[i+74] <<
            '\t' << " " << '\t' << buffer[i+74] << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " <<
            std::endl;
        if (buffer[i+75] == -16384)
            text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 1 << '\t' << " " << '\t' << buffer[i+74] <<
            '\t' << " " << '\t' << buffer[i+74] << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " <<
            std::endl;
        if (buffer[i+75] == -32512)
            text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 1 << '\t' << " " << '\t' << buffer[i+74] <<
            '\t' << " " << '\t' << buffer[i+74] << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " << '\t' << " " <<
            std::endl;
    }
}

return true;
}

int main(int argc, char *argv [])
{
    if( argc < 3 ) return 1;
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();

    const gdcm::PrivateTag twave(0x01e1,0x18,"ELSCINT1");
    if( !ds.FindDataElement( twave ) ) return 1;
    const gdcm::DataElement& wave = ds.GetDataElement( twave );
    if ( wave.IsEmpty() ) return 1;
    const gdcm::ByteValue * bv = wave.GetByteValue();
    assert( bv );

    std::ofstream os( outfile, std::ios::binary );
    // Dump that to a CSV file:
    wave2stream( os, bv->GetPointer(), bv->GetLength() );
    os.close();

    return 0;
}

```

## 14.61 EmptyMask.cxx

```

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Program: GDCM (Grassroots DICOM). A DICOM library

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```

```

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=====*/
#include "gdcmEmptyMaskGenerator.h"

#include <string>
#include <cstring>

int main( int argc, char *argv[] )
{
    std::string inputdir;
    std::string outputdir;
    bool input_sopclassuid = true;
    bool grayscale_secondary_sopclassuid = false;
    if( argc < 3 ) return 1;
    inputdir = argv[1];
    outputdir = argv[2];
    // input_sopclassuid -> Use original SOP Class UID from input DICOM (Default).
    // grayscale_secondary_sopclassuid -> Use Grayscale Secondary Image Storage SOP Class UID.
    if( argc >= 3 )
    {
        input_sopclassuid = false;
        if( strcmp("input_sopclassuid", argv[3]) == 0 )
            input_sopclassuid = true;
        else if (strcmp("grayscale_secondary_sopclassuid", argv[3]) == 0 ) {
            grayscale_secondary_sopclassuid = true;
        }
    }

    //
    gdcm::EmptyMaskGenerator emg;
    if( input_sopclassuid )
        emg.SetSOPClassUIDMode( gdcm::EmptyMaskGenerator::UseOriginalSOPClassUID );
    else if( grayscale_secondary_sopclassuid )
        emg.SetSOPClassUIDMode( gdcm::EmptyMaskGenerator::UseGrayscaleSecondaryImageStorage );
    emg.SetInputDirectory( inputdir.c_str() );
    emg.SetOutputDirectory( outputdir.c_str() );
    if( !emg.Execute() )
    {
        return 1;
    }

    return 0;
}

```

## 14.62 EncapsulateFileInRawData.cxx

```

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=====*/
#include "gdcmAnonymizer.h"
#include "gdcmWriter.h"
#include "gdcmUIDGenerator.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmSystem.h"

#include "magic.h" // libmagic, API to file command line tool

/*
 * Let say you want to encapsulate a file type that is not defined in DICOM (exe, zip, png)
 * PNG is a bad example, unless it contains transparency (which has been deprecated).
 * It will take care of dispatching each chunk to an appropriate data item (pretty much like
 * WaveformData)

```



```

*
* Usage:
* ./EncapsulateFileInRawData large_input_file.exe large_input_file.dcm
*/

// TODO:
// $ file -bi /tmp/gdcm-2.1.0.pdf
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " inputfile output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    if( !gdcm::System::FileExists( filename ) ) return 1;

    size_t s = gdcm::System::FileSize(filename);
    if( !s ) return 1;

    magic_t cookie = magic_open(MAGIC_NONE);
    const char * file_type = magic_file(cookie, filename);
    if( !file_type ) return 1;
    magic_close(cookie);

    gdcm::Writer w;
    gdcm::File &file = w.GetFile();
    //gdcm::DataSet &ds = file.GetDataSet();
    //w.SetCheckFileMetaInformation( true );
    w.SetFileName( outfile );

    file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );

    gdcm::Anonymizer anon;
    anon.SetFile( file );

    gdcm::MediaStorage ms = gdcm::MediaStorage::RawDataStorage;

    gdcm::UIDGenerator gen;
    anon.Replace( gdcm::Tag(0x0008,0x16), ms.GetString() );
    std::cout << ms.GetString() << std::endl;
    anon.Replace( gdcm::Tag(0x0008,0x18), gen.Generate() );

    if( !w.Write() )
    {
        std::cerr << "Could not write: " << outfile << std::endl;
        return 1;
    }

    return 0;
}

```

## 14.63 ExtractEncryptedContent.cxx

```

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=====*/
#include "gdcmReader.h"

#include <fstream>

/*

```

```

openssl smime -encrypt -binary -aes256 -in outputfile.dcm -inform DER -out outputfile.der -outform DER
../trunk/Testing/Source/Data/certificate.pem

openssl smime -decrypt -binary -in out.der -inform DER -out outputfile.dcm -outform DER -inkey
../trunk/Testing/Source/Data/privatekey.pem ../trunk/Testing/Source/Data/certificate.pem

*/

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.der" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }

    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();

    const gdcm::DataElement &EncryptedAttributesSequence = ds.GetDataElement( gdcm::Tag( 0x0400,0x0500 ) );

    gdcm::SequenceOfItems *sqi = EncryptedAttributesSequence.GetValueAsSQ();

    if ( !sqi || sqi->GetNumberOfItems() != 1 ) return 1;

    gdcm::Item &item = sqi->GetItem(1);

    gdcm::DataSet &nestedds = item.GetNestedDataSet();

    if( ! nestedds.FindDataElement( gdcm::Tag( 0x0400,0x0520 ) ) ) return 1;

    const gdcm::DataElement &EncryptedContent = nestedds.GetDataElement( gdcm::Tag( 0x0400,0x0520 ) );

    const gdcm::ByteValue *bv = EncryptedContent.GetByteValue();

    std::ofstream of( outfile, std::ios::binary );
    of.write( bv->GetPointer(), bv->GetLength() );
    of.close();

    return 0;
}

```

## 14.64 ExtractIconFromFile.cxx

```

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=====*/
/*
 * This example shows how to either retrieve an Icon if present somewhere
 * in the file, or else generate one.
 */
#include "gdcmImageReader.h"
#include "gdcmPNMCodec.h"
#include "gdcmIconImageFilter.h"
#include "gdcmIconImageGenerator.h"

bool WriteIconAsPNM(const char* filename, const gdcm::IconImage& icon)

```

```

{
    gdcmm::PNMCodec pnm;
    pnm.SetDimensions( icon.GetDimensions() );
    pnm.SetPixelFormat( icon.GetPixelFormat() );
    pnm.SetPhotometricInterpretation( icon.GetPhotometricInterpretation() );
    pnm.SetLUT( icon.GetLUT() );
    const gdcmm::DataElement& in = icon.GetDataElement();
    bool b = pnm.Write( filename, in );
    assert( b );
    return b;
}

int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcmm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read (or not image): " << filename << std::endl;
        return 1;
    }

    gdcmm::IconImageFilter iif;
    iif.SetFile( reader.GetFile() );
    bool b = iif.Extract();

    if( b )
    {
        const gdcmm::IconImage &icon = iif.GetIconImage(0);
        icon.Print( std::cout );

        if( !icon.GetTransferSyntax().IsEncapsulated() )
        {
            // Let's write out this icon as PNM file
            WriteIconAsPNM("icon.ppm", icon);
        }
        else if( icon.GetTransferSyntax() == gdcmm::TransferSyntax::JPEGBaselineProcess1
            || icon.GetTransferSyntax() == gdcmm::TransferSyntax::JPEGExtendedProcess2_4
        )
        {
            const gdcmm::DataElement& in = icon.GetDataElement();
            const gdcmm::ByteValue *bv = in.GetByteValue();
            assert( bv );
            std::ofstream out( "icon.jpg", std::ios::binary );
            out.write( bv->GetPointer(), bv->GetLength() );
            out.close();
        }
    }
    else
    {
        assert( iif.GetNumberOfIconImages() == 0 );
        std::cerr << "No Icon Found anywhere in file" << std::endl;

        const gdcmm::Image &img = reader.GetImage();
        gdcmm::IconImageGenerator iig;
        iig.AutoPixelMinMax(true);
        iig.SetPixmap( img );
        const unsigned int idims[2] = { 64, 64 };
        iig.SetOutputDimensions( idims );
        //iig.SetPixelMinMax(60, 868);
        if( !iig.Generate() ) return 1;
        const gdcmm::IconImage &icon = iig.GetIconImage();
        WriteIconAsPNM("icon.ppm", icon);
    }

    return 0;
}

```

## 14.65 Extracting\_All\_Resolution.cxx

```

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Program: GDCM (Grassroots DICOM). A DICOM library

```

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 PURPOSE. See the above copyright notice for more information.

```

=====*/
// This work was realised during the GSOC 2011 by Manoj Alwani

#include <fstream>
#include <stdint.h>
#include <string.h>
#include <assert.h>
#include <gdcm_j2k.h>
#include <gdcm_jp2.h>
#include <iostream>
#include <cstring>
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <math.h>
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmSystem.h"
#include <fstream>

#include "gdcm_openjpeg.h"
#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmAttribute.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmAnonymizer.h"
#include "gdcmStreamImageWriter.h"
#include "gdcmImageHelper.h"
#include "gdcmTrace.h"

void error_callback(const char *msg, void *) {
    (void)msg;
}
void warning_callback(const char *msg, void *) {
    (void)msg;
}
void info_callback(const char *msg, void *) {
    (void)msg;
}

bool Write_Resolution(gdcm::StreamImageWriter & theStreamWriter, const char *filename, int res, std::ostream&
    of, int flag, gdcm::SequenceOfItems *sq, int No_Of_Resolutions)
{
    std::ifstream is;
    is.open( filename, std::ios::binary );
    opj_dparameters_t parameters; /* decompression parameters */
    opj_event_mgr_t event_mgr; /* event manager */
    opj_dinfo_t* dinfo; /* handle to a decompressor */
    opj_cio_t *cio;
    opj_image_t *image = NULL;
    // FIXME: Do some stupid work:
    is.seekg( 0, std::ios::end);
    std::streampos buf_size = is.tellg();
    char *dummy_buffer = new char[(unsigned int)buf_size];
    is.seekg(0, std::ios::beg);
    is.read( dummy_buffer, buf_size);
    unsigned char *src = (unsigned char*)dummy_buffer;
    uint32_t file_length = (uint32_t)buf_size; // 32bits truncation should be ok since DICOM cannot have larger
        than 2Gb image

    /* configure the event callbacks (not required) */
    memset(&event_mgr, 0, sizeof(opj_event_mgr_t));
    event_mgr.error_handler = error_callback;
    event_mgr.warning_handler = warning_callback;

```

```

event_mgr.info_handler = info_callback;

/* set decoding parameters to default values */
opj_set_default_decoder_parameters(&parameters);

// default blindly copied
parameters.cp_layer=0;
parameters.cp_reduce= res;
// parameters.decod_format=-1;
// parameters.cod_format=-1;

const char jp2magic[] = "\x00\x00\x00\x0C\x6A\x50\x20\x20\x0D\x0A\x87\x0A";
if( memcmp( src, jp2magic, sizeof(jp2magic) ) == 0 )
{
    /* JPEG-2000 compressed image data ... sigh */
    // gdcmData/ELSCINT1_JP2vsJ2K.dcm
    // gdcmData/MAROTECH_CT_JP2Lossy.dcm
    //gdcmWarningMacro( "J2K start like JPEG-2000 compressed image data instead of codestream" );
    parameters.decod_format = 1; //JP2_CFMT;
    //assert(parameters.decod_format == JP2_CFMT);
}
else
{
    /* JPEG-2000 codestream */
    //parameters.decod_format = J2K_CFMT;
    //assert(parameters.decod_format == J2K_CFMT);
    assert( 0 );
}
parameters.cod_format = 11; // PGX_DFMT;
//assert(parameters.cod_format == PGX_DFMT);

/* get a decoder handle */
dinfo = opj_create_decompress(CODEC_JP2);

/* catch events using our callbacks and give a local context */
opj_set_event_mgr((opj_common_ptr)dinfo, &event_mgr, NULL);

/* setup the decoder decoding parameters using user parameters */
opj_setup_decoder(dinfo, &parameters);

/* open a byte stream */
cio = opj_cio_open((opj_common_ptr)dinfo, src, file_length);

/* decode the stream and fill the image structure */
image = opj_decode(dinfo, cio);
if(!image) {
    opj_destroy_decompress(dinfo);
    opj_cio_close(cio);
    //gdcmErrorMacro( "opj_decode failed" );
    return 1;
}

    opj_cp_t * cp = ((opj_jp2_t*)dinfo->jp2_handle)->j2k->cp;
    opj_tcp_t * tcp = &cp->tcps[0];
    opj_tccp_t * tccp = &tcp->tccps[0];
    /* std::cout << "\n No of Cols In Image" << image->x1;
    std::cout << "\n No of Rows In Image" << image->y1;
    std::cout << "\n No of Components in Image" << image->numcomps;
    std::cout << "\n No of Resolutions" << tccp->numresolutions << "\n";
*/

    opj_j2k_t* j2k = NULL;
    opj_jp2_t* jp2 = NULL;
    jp2 = (opj_jp2_t*)dinfo->jp2_handle;
    int reversible = jp2->j2k->cp->tcps->tccps->qmfbid;
    //std::cout << reversible;
    int compno = 0;
    opj_image_comp_t *comp = &image->comps[compno];
    int Dimensions[2];
    Dimensions[0]= comp->w;
    Dimensions[1] = comp->h;
    opj_cio_close(cio);
    unsigned long len = Dimensions[0]*Dimensions[1] * image->numcomps;
    //std::cout << "\nTest" <<image->comps[0].factor;
    char *raw = new char[len];
    for (unsigned int compno = 0; compno < (unsigned int)image->numcomps; compno++)
    {
        opj_image_comp_t *comp = &image->comps[compno];

        int w = image->comps[compno].w;
        int h = image->comps[compno].h;
        uint8_t *data8 = (uint8_t*)raw + compno;

```

```

        for (int i = 0; i < w * h ; i++)
        {
            int v = image->comps[compno].data[i];
            *data8 = (uint8_t)v;
            data8 += image->numcomps;
        }
    }

    gdcm::Writer w;
    gdcm::File &file = w.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();

    file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );

    gdcm::UIDGenerator uid;
    gdcm::DataElement de( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
    de.SetVR( gdcm::VR::UI );
    const char *u = uid.Generate();
    de.SetByteValue( u, strlen(u) );
    ds.Insert( de );

    gdcm::DataElement del( gdcm::Tag(0x8,0x16) );
    del.SetVR( gdcm::VR::UI );
    gdcm::MediaStorage ms( gdcm::MediaStorage::CTImageStorage );
    del.SetByteValue( ms.GetString(), strlen(ms.GetString()) );
    ds.Insert( del );

    const char mystr[] = "MONOCHROME2 ";
    gdcm::DataElement de2( gdcm::Tag(0x28,0x04) );
    //de.SetTag(gdcm::Tag(0x28,0x04));
    de2.SetVR( gdcm::VR::CS );
    de2.SetByteValue(mystr, strlen(mystr));
    ds.Insert( de2 );

    gdcm::Attribute<0x0028,0x0010> row = {image->comps[0].w};
    //row.SetValue(512);
    ds.Insert( row.GetAsDataElement() );
    // w.SetCheckFileMetaInformation( true );
    gdcm::Attribute<0x0028,0x0011> col = {image->comps[0].h};
    ds.Insert( col.GetAsDataElement() );
    gdcm::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
    ds.Insert( Number_Of_Frames.GetAsDataElement() );

    gdcm::Attribute<0x0028,0x0100> at = {8};
    ds.Insert( at.GetAsDataElement() );

    gdcm::Attribute<0x0028,0x0002> at1 = {image->numcomps};
    ds.Insert( at1.GetAsDataElement() );

    gdcm::Attribute<0x0028,0x0101> at2 = {8};
    ds.Insert( at2.GetAsDataElement() );

    gdcm::Attribute<0x0028,0x0102> at3 = {7};
    ds.Insert( at3.GetAsDataElement() );

    if (flag == 1)
    {
        for (int i=0; i < No_Of_Resolutions; i++)
        {
            int a = 1;
            int b =1;

            while(a!=(No_Of_Resolutions)-i))
            {
                b = b*2;
                a = a+1;
            }
            uint16_t row = (image->y1)/b;
            uint16_t col = (image->x1)/b;
            //std::cout << row;
            gdcm::Element<gdcm::VR::IS, gdcm::VM::VM1> el2;
            el2.SetValue(i+1);
            gdcm::DataElement rfn = el2.GetAsDataElement(); //ulr --> upper left row
            rfn.SetTag( gdcm::Tag(0x0008,0x1160) );

            gdcm::Element<gdcm::VR::US, gdcm::VM::VM2> el;
            el.SetValue(1,0);

```

```

    el.SetValue(1,1);
    gdcM::DataElement ulr = el.GetAsDataElement(); //ulr --> upper left col/row
    ulr.SetTag( gdcM::Tag(0x0048,0x0201) );

    gdcM::Element<gdcM::VR::US,gdcM::VM::VM2> ell;
    ell.SetValue(col,0);
    ell.SetValue(row,1);
    gdcM::DataElement brr = ell.GetAsDataElement();
    brr.SetTag( gdcM::Tag(0x0048,0x0202) ); //brr --> bottom right col/row
    gdcM::Item it;
    gdcM::DataSet &nds = it.GetNestedDataSet();
    nds.Insert( rfn );
    nds.Insert(ulr);
    nds.Insert(brr);

    sq->AddItem(it);
}

gdcM::Writer w1;
gdcM::File &file1 = w1.GetFile();
gdcM::DataSet &ds1 = file1.GetDataSet();
file1.GetHeader().SetDataSetTransferSyntax( gdcM::TransferSyntax::ExplicitVRLittleEndian );

gdcM::UIDGenerator uid1;
gdcM::DataElement dea( gdcM::Tag(0x8,0x18) ); // SOP Instance UID
dea.SetVR( gdcM::VR::UI );
const char *ul = uid1.Generate();
dea.SetByteValue( ul, strlen(ul) );
ds1.Insert( dea );

gdcM::DataElement deb( gdcM::Tag(0x8,0x16) );
deb.SetVR( gdcM::VR::UI );
gdcM::MediaStorage msl( gdcM::MediaStorage::VLWholeSlideMicroscopyImageStorage );
deb.SetByteValue( msl.GetString(), strlen( msl.GetString() ) );
ds1.Insert( deb );

const char mystr1[] = "MONOCHROME2 ";
gdcM::DataElement dec( gdcM::Tag(0x28,0x04) );
//de.SetTag(gdcM::Tag(0x28,0x04));
dec.SetVR( gdcM::VR::CS );
dec.SetByteValue(mystr, strlen(mystr));
ds1.Insert( dec );

gdcM::Attribute<0x0028,0x0010> row1 = {image->y1};
//row.SetValue(512);
ds1.Insert( row1.GetAsDataElement() );
// w.SetCheckFileMetaInformation( true );
gdcM::Attribute<0x0028,0x0011> col1 = {image->x1};
ds1.Insert( col1.GetAsDataElement() );
gdcM::Attribute<0x0028,0x0008> Number_Of_Frames1 = {tccp->numresolutions};
ds1.Insert( Number_Of_Frames1.GetAsDataElement() );

gdcM::Attribute<0x0028,0x0100> ata = {8};
ds1.Insert( ata.GetAsDataElement() );

gdcM::Attribute<0x0028,0x0002> atb = {image->numcomps};
ds1.Insert( atb.GetAsDataElement() );

gdcM::Attribute<0x0028,0x0101> atc = {8};
ds1.Insert( atc.GetAsDataElement() );

gdcM::Attribute<0x0028,0x0102> atd = {7};
ds1.Insert( atd.GetAsDataElement() );

theStreamWriter.SetFile(file1);

gdcM::DataElement des( gdcM::Tag(0x0048,0x0200) );
des.SetVR(gdcM::VR::SQ);
//des.SetVR(gdcM::VM::VM1);
des.SetValue(*sq);
des.SetVLToUndefined();

ds1.Insert( des );

if (!theStreamWriter.WriteImageInformation()){
    std::cerr << "unable to write image information" << std::endl;
    return 1; //the CanWrite function should prevent getting here, else,
    //that's a test failure
}

```

```

    }
}

theStreamWriter.SetFile(file);

if (!theStreamWriter.CanWriteFile()){
    delete [] raw;
    std::cout << "Not able to write";
    return 0;//this means that the file was unwritable, period.
    //very similar to a ReadImageInformation failure
}
else
    std::cout<<"\nable to read";

// Important to write here
std::vector<unsigned int> extent = gdcm::ImageHelper::GetDimensionsValue(file);

unsigned short xmax = extent[0];
unsigned short ymax = extent[1];
unsigned short theChunkSize = 4;
unsigned short ychunk = extent[1]/theChunkSize; //go in chunk sizes of theChunkSize
unsigned short zmax = extent[2];
std::cout << "\n" << xmax << "\n" << ymax << "\n" << zmax << "\n" << "image->numcomps" << "\n";

if (xmax == 0 || ymax == 0)
{
    std::cerr << "Image has no size, unable to write zero-sized image." << std::endl;
    return 0;
}

int z, y, nexty;
unsigned long prevLen = 0; //when going through the char buffer, make sure to grab
//the bytes sequentially. So, store how far you got in the buffer with each iteration.
for (z = 0; z < zmax; ++z){
    for (y = 0; y < ymax; y += ychunk){
        nexty = y + ychunk;
        if (nexty > ymax) nexty = ymax;
        theStreamWriter.DefinePixelExtent(0, xmax, y, nexty, z, z+1);
        unsigned long len = theStreamWriter.DefineProperBufferLength();
        std::cout << "\n" << len;
        char* finalBuffer = new char[len];
        memcpy(finalBuffer, &(raw[prevLen]), len);
        std::cout << "\nable to write";
        if (!theStreamWriter.Write(finalBuffer, len)){
            std::cerr << "writing failure:" << "output.dcm" << " at y = " << y << " and z = " << z << std::endl;
            delete [] raw;
            delete [] finalBuffer;
            return 1;
        }
        delete [] finalBuffer;
        prevLen += len;
    }
}
delete raw;

delete[] src; //FIXME

if(dinfo) {
    opj_destroy_decompress(dinfo);
}

opj_image_destroy(image);

return true;
}

bool Different_Resolution( gdcm::StreamImageWriter & theStreamWriter, const char *filename, int res,
    std::ostream& of)
{
    //std::vector<std::string>::const_iterator it = filenames.begin();
    bool b = true;
    int flag = 1;

    gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();

```



```

sq->SetLengthToUndefined();

for(int i = res-1 ; i>=0; --i)
{
    b = b && Write_Resolution( theStreamWriter, filename, i, of ,flag,sq,res);
    // b = b && Get_Resolution( theStreamWriter, filename, i, of ,0);
    flag = 0;
}
//b = b && Get_Lowest_Resolution( writer, sq, filename, res-1 );
//b = b && PopulateSingeFile( writer, sq, jpeg, filename2 );
//image.SetDimension(2, res )
return b;
}

int main(int argc, char *argv[])
{

    if( argc < 4 )
    {
        std::cerr << argv[0] << " input.jp2 output.dcm No. Of Resolutions " << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    char *resolutions = argv[3];
    int res = int ((*resolutions)-48);
    //std::cout << "\nres" << res;
    gdcm::StreamImageWriter theStreamWriter;

    std::ofstream of;
    of.open( outfile, std::ios::out | std::ios::binary );
    theStreamWriter.SetStream(of);

    if( !Different_Resolution( theStreamWriter, filename,res,of ) ) return 1;

    uint16_t firstTag1 = 0xfffe;
    uint16_t secondTag1 = 0xe0dd;
    uint32_t thirdTag1 = 0x00000000;
    //uint16_t fourthTag1 = 0xffff;
    const int theBufferSize1 = 2*sizeof(uint16_t)+sizeof(uint32_t);
    char* tmpBuffer2 = new char[theBufferSize1];
    memcpy(&(tmpBuffer2[0]), &firstTag1, sizeof(uint16_t));
    memcpy(&(tmpBuffer2[sizeof(uint16_t)]), &secondTag1, sizeof(uint16_t));
    memcpy(&(tmpBuffer2[2*sizeof(uint16_t)]), &thirdTag1, sizeof(uint32_t));
    //memcpy(&(tmpBuffer2[3*sizeof(uint16_t)]), &fourthTag1, sizeof(uint16_t));
    assert( of && !of.eof() && of.good() );
    of.write(tmpBuffer2, theBufferSize1);
    of.flush();
    assert( of );

return 0;
}

```

## 14.66 Fake\_Image\_Using\_Stream\_Image\_Writer.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
PURPOSE. See the above copyright notice for more information.

=====*/
// This work was realised during the GSOC 2011 by Manoj Alwani

#include "gdcmReader.h"

```

```

#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmAttribute.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmAnonymizer.h"
#include "gdcmStreamImageWriter.h"
#include "gdcmImageHelper.h"
#include "gdcmTrace.h"

int main(int, char *[])
{
    char * buffer = new char[ 256 * 256 *3 ];
    // *p = (uint8_t*)buffer;
    char * p = buffer;

    gdcm::Trace::DebugOn();
    gdcm::Trace::WarningOn();

    for(int row = 0; row < 256; ++row)
    {
        for(int col = 0; col < 256; ++col)
            //for(int b = 0; b < 256; ++b)
            {
                *p++ = 255;
                *p++ = 0;
                *p++ = 0;
            }

        gdcm::Writer w;
        gdcm::File &file = w.GetFile();
        gdcm::DataSet &ds = file.GetDataSet();

        file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );

        gdcm::UIDGenerator uid;
        gdcm::DataElement de( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
        de.SetVR( gdcm::VR::UI );
        const char *u = uid.Generate();
        de.SetByteValue( u, strlen(u) );
        ds.Insert( de );

        gdcm::DataElement del( gdcm::Tag(0x8,0x16) );
        del.SetVR( gdcm::VR::UI );
        gdcm::MediaStorage ms( gdcm::MediaStorage::VLWholeSlideMicroscopyImageStorage );
        del.SetByteValue( ms.GetString(), strlen(ms.GetString()) );
        ds.Insert( del );

        const char mystr[] = "RGB";
        gdcm::DataElement de2( gdcm::Tag(0x28,0x04) );
        //de.SetTag(gdcm::Tag(0x28,0x04));
        de2.SetVR( gdcm::VR::CS );
        de2.SetByteValue(mystr, strlen(mystr));
        ds.Insert( de2 );

        gdcm::Attribute<0x0028,0x0010> row = {256};
        //row.SetValue(512);
        ds.Insert( row.GetAsDataElement() );
        // w.SetCheckFileMetaInformation( true );
        gdcm::Attribute<0x0028,0x0011> col = {256};
        ds.Insert( col.GetAsDataElement() );

        gdcm::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
        ds.Insert( Number_Of_Frames.GetAsDataElement() );

        gdcm::Attribute<0x0028,0x0100> at = {8};
        ds.Insert( at.GetAsDataElement() );

        gdcm::Attribute<0x0028,0x0002> at1 = {3}; //bits per pixel
        ds.Insert( at1.GetAsDataElement() );

        gdcm::Attribute<0x0028,0x0101> at2 = {8};
        ds.Insert( at2.GetAsDataElement() );

        gdcm::Attribute<0x0028,0x0102> at3 = {7};

```

```

    ds.Insert( at3.GetAsDataElement() );

    gdcm::Attribute<0x0028,0x006> at4 = {0};
    ds.Insert( at4.GetAsDataElement() );

    gdcm::Attribute<0x0028,0x0103> at5 = {0};
    ds.Insert( at5.GetAsDataElement() );

    //de.SetTag(gdcm::Tag(0x7fe0,0x0010));
    //ds.Insert(de);

    gdcm::StreamImageWriter theStreamWriter;
    gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
    sq->SetLengthToUndefined();

    uint16_t row1 = 256;
    uint16_t col1 = 256;
    //std::cout << row;

    gdcm::Element<gdcm::VR::IS, gdcm::VM::VM1> el2;
    el2.SetValue(1);
    gdcm::DataElement rfn = el2.GetAsDataElement(); //rfn ---> reference frame number
    rfn.SetTag( gdcm::Tag(0x0008,0x1160) );

    gdcm::Element<gdcm::VR::US, gdcm::VM::VM2> el;
    el.SetValue(1,0);
    el.SetValue(1,1);
    gdcm::DataElement ulr = el.GetAsDataElement(); //ulr --> upper left col/row
    ulr.SetTag( gdcm::Tag(0x0048,0x0201) );

    gdcm::Element<gdcm::VR::US, gdcm::VM::VM2> el1;
    el1.SetValue(col1,0);
    el1.SetValue(row1,1);
    gdcm::DataElement brr = el1.GetAsDataElement();
    brr.SetTag( gdcm::Tag(0x0048,0x0202) ); //brr --> bottom right col/row

    gdcm::Item it;
    gdcm::DataSet &nds = it.GetNestedDataSet();
    nds.Insert( rfn );
    nds.Insert(ulr);
    nds.Insert(brr);

    sq->AddItem(it);

    gdcm::DataElement des( gdcm::Tag(0x0048,0x0200) );
    des.SetVR(gdcm::VR::SQ);
    des.SetValue(*sq);
    des.SetVLToUndefined();

    ds.Insert( des );

    theStreamWriter.SetFile(file);

    std::ofstream of;
    of.open( "output.dcm", std::ios::out | std::ios::binary );
    theStreamWriter.SetStream(of);

    if (!theStreamWriter.CanWriteFile()){
        delete [] buffer;
        std::cout << "Not able to write";
        return 0; //this means that the file was unwritable, period.
        //very similar to a ReadImageInformation failure
    }
    else
        std::cout << "\nable to read";

    if (!theStreamWriter.WriteImageInformation()){
        std::cerr << "unable to write image information" << std::endl;
        delete [] buffer;
        return 1; //the CanWrite function should prevent getting here, else,
        //that's a test failure
    }

    std::vector<unsigned int> extent =
        gdcm::ImageHelper::GetDimensionsValue(file);

    unsigned short xmax = extent[0];
    unsigned short ymax = extent[1];
    unsigned short theChunkSize = 1;

```

```

unsigned short ychunk = extent[1]/theChunkSize; //go in chunk sizes of theChunkSize
unsigned short zmax = extent[2];

std::cout << xmax << ymax << zmax;

if (xmax == 0 || ymax == 0)
{
    std::cerr << "Image has no size, unable to write zero-sized image." << std::endl;
    return 0;
}

int z, y, nexty;
unsigned long prevLen = 0; //when going through the char buffer, make sure to grab
//the bytes sequentially. So, store how far you got in the buffer with each iteration.
for (z = 0; z < zmax; ++z){
    for (y = 0; y < ymax; y += ychunk){
        nexty = y + ychunk;
        if (nexty > ymax) nexty = ymax;
        theStreamWriter.DefinePixelExtent(0, xmax, y, nexty, z, z+1);
        unsigned long len = theStreamWriter.DefineProperBufferLength();
        std::cout << "\n" << len;
        char* finalBuffer = new char[len];
        memcpy(finalBuffer, &(buffer[prevLen]), len);
        std::cout << "\nable to write";
        if (!theStreamWriter.Write(finalBuffer, len)){
            std::cerr << "writing failure:" << "output.dcm" << " at y = " << y << " and z = " << z << std::endl;
            delete [] buffer;
            delete [] finalBuffer;
            return 1;
        }
        delete [] finalBuffer;
        prevLen += len;
    }
}
delete buffer;

uint16_t firstTag1 = 0xfffe;
uint16_t secondTag1 = 0xe0dd;
uint32_t thirdTag1 = 0x00000000;
//uint16_t fourthTag1 = 0xffff;
const int theBufferSize1 = 2*sizeof(uint16_t)+sizeof(uint32_t);
char* tmpBuffer2 = new char[theBufferSize1];
memcpy(&(tmpBuffer2[0]), &firstTag1, sizeof(uint16_t));
memcpy(&(tmpBuffer2[sizeof(uint16_t)]), &secondTag1, sizeof(uint16_t));
memcpy(&(tmpBuffer2[2*sizeof(uint16_t)]), &thirdTag1, sizeof(uint32_t));
//memcpy(&(tmpBuffer2[3*sizeof(uint16_t)]), &fourthTag1, sizeof(uint16_t));
assert( of && !of.eof() && of.good() );
of.write(tmpBuffer2, theBufferSize1);
of.flush();
assert( of );

return 0;
}

```

## 14.67 FixBrokenJ2K.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"
#include "gdcmFile.h"

// http://www.lost.in.ua/dicom/c.dcm

```

```

//
// -> BuggyJ2Kvvvua-fixed2-j2k.dcm

/*
 * This program attempts to fix a broken J2K/DICOM:
 * It contains 2 bugs:
 * 1. The first 8 bytes seems to be random bytes: remove them
 * 2. YCC is set to 1, while image is grayscale need to set it back to 0
 *
 * Ref:
 * It's a software from http://rentgenprom.ru/ , shipped with universal digital radiographic units
 * "ProScan-2000". The Ukrainian manufacturer developed own digital radiographic unit and it is
 * compatible with software from "ProScan-2000".
 * Information found in DICOM file is:
 *
 * (0008,0070) LO [ZAO "Renthenprom" (JSC Rentgenprom) ]          # 36,1 Manufacturer
 * (0018,1020) LO [2.13.1.7]                                     # 8,1-n Software Version(s)
 */
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }

    gdcm::File &file = reader.GetFile();
    const gdcm::DataElement &pixeldata0 = file.GetDataSet().GetDataElement( gdcm::Tag(0x7fe0,0x0010) );
    const gdcm::SequenceOfFragments *sqf = pixeldata0.GetSequenceOfFragments();
    if( !sqf )
    {
        return 1;
    }
    const gdcm::Fragment &frag0 = sqf->GetFragment(0);

    gdcm::ByteValue *bv = const_cast<gdcm::ByteValue*>(frag0.GetByteValue());
    char *ptr = (char*)bv->GetVoidPointer();
    size_t len = bv->GetLength();

    static const unsigned char sig[] = {0,0,0,0,0x6A,0x70,0x32,0x63};
    if( memcmp(ptr, sig, sizeof(sig)) != 0 )
    {
        std::cerr << "magic random signature not found" << std::endl;
        return 1;
    }

    // Apparently the flag to enable a color transform on 3 color components is set in
    // the COD marker. (YCC is byte[6] in the COD marker)
    // we need to disable this flag;
    char *cod_marker = ptr + 0x35; /* 0x2d + 0x8 */ // FIXME
    if( cod_marker[0] == (char)0xff && cod_marker[1] == 0x52 )
    {
        // found start of COD
        if( cod_marker[6+2] == 1 )
        {
            // Change in place:
            *((char*)cod_marker + 6+2) = 0;
            // Prepare a new DataElement:
            gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
            pixeldata.SetVR( gdcm::VR::OB );
            gdcm::SmartPointer<gdcm::SequenceOfFragments> sq = new gdcm::SequenceOfFragments;

            gdcm::Fragment frag;
            // remove 8 first bytes:
            frag.SetByteValue( ptr + 8, (uint32_t)(len - 8) );
            sq->AddFragment( frag );
            pixeldata.SetValue( *sq );
            file.GetDataSet().Replace( pixeldata );
        }
        else
        {
            return 1;
        }
    }
}

```

```

    }
}
else
{
    std::cerr << "COD not found" << (int)cod_marker[0] << std::endl;
    return 1;
}

gdcm::Writer writer;
writer.SetFile( reader.GetFile() );
writer.SetFileName( outfilename );
writer.CheckFileMetaInformationOff();
if( !writer.Write() )
{
    std::cerr << "Could not write" << std::endl;
}

// paranoid check:
gdcm::ImageReader ireader;
ireader.SetFileName( outfilename );
if( !ireader.Read() )
{
    std::cerr << "file written is still not valid, please report" << std::endl;
    return 1;
}

return 0;
}

```

## 14.68 FixJAIBugJPEGLS.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmImageReader.h"

#include <fstream>

#include "gdcm_charls.h"

/*
 * This small example should show how one can handle the famous JAI-JPEGLS bug
 * It will take in as invalid DICOM/JAI-JPEG-LS and write out as Explicit Little
 * Endian. One can use `gdcmconv --jpegls` to recompress properly
 *
 * References:
 * http://charls.codeplex.com/discussions/230307?ProjectName=charls
 * http://charls.codeplex.com/workitem/7297
 * http://www.dcm4che.org/jira/browse/DCM-442
 * http://www.dcm4che.org/jira/browse/DCMEE-1144
 * http://java.net/jira/browse/JAI_IMAGEIO_CORE-183
 *
 * Explanation of the issue:
 *
 * Seems, the error is in the calculation of the default values for thresholds T1,
 * T2, T3, in particular min(MAXVAL, 4095) is not applied in
 *
 * FACTOR = (min(MAXVAL, 4095) + 128)/256
 *
 * as specified in http://www.itu.int/rec/T-REC-T.87-199806-I/en .
 */
int main(int argc, char *argv[])

```

```

{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::FileMetaInformation::SetSourceApplicationEntityTitle( "FixJAIBugJPEGLS" );

    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }

    gdcm::Image &image = reader.GetImage();
    //unsigned long len = image.GetBufferLength();
    const gdcm::DataElement &in =
        reader.GetFile().GetDataSet().GetDataElement( gdcm::Tag(0x7fe0,0x0010) );
    const gdcm::SequenceOfFragments *sf = in.GetSequenceOfFragments();
    if( !sf )
    {
        std::cerr << "No pixel data (or not encapsulated)" << std::endl;
        return 1;
    }
    const unsigned int *dims = image.GetDimensions();
    if ( sf->GetNumberOfFragments() != dims[2] )
    {
        std::cerr << "Unsupported" << std::endl;
        return 1;
    }

    // unsigned long totalLen = sf->ComputeByteLength();
    std::vector<unsigned char> rgbyteOutall;
    for(unsigned int i = 0; i < sf->GetNumberOfFragments(); ++i)
    {
        const gdcm::Fragment &frag = sf->GetFragment(i);
        if( frag.IsEmpty() ) return 1;
        const gdcm::ByteValue *bv = frag.GetByteValue();
        if( !bv ) return 1;
        unsigned long totalLen = bv->GetLength();

        std::vector<char> vbuffer;
        vbuffer.resize( totalLen );
        char *buffer = vbuffer.data();
        bv->GetBuffer(buffer, totalLen);
        const unsigned char* pbyteCompressed0 = (const unsigned char*)buffer;
        while( totalLen > 0 && pbyteCompressed0[totalLen-1] != 0xd9 )
        {
            totalLen--;
        }

        JlsParameters metadata;
        char errorMsg[256+1]={'\0'};
        if (JpegLsReadHeader(buffer, totalLen, &metadata, errorMsg) != charls::ApiResult::OK)
        {
            std::cerr << "Can't parse jpegls: " << errorMsg << std::endl;
            return 1;
        }

        std::cout << metadata.width << std::endl;
        std::cout << metadata.height << std::endl;
        std::cout << metadata.bitsPerSample << std::endl;

        gdcm::PixelFormat const &pf = image.GetPixelFormat();
        std::cout << pf << std::endl;

        // http://charls.codeplex.com/discussions/230307?ProjectName=charls
        unsigned char marker_lse_13[] = {
            0xFF, 0xF8, 0x00, 0x0D,
            0x01,
            0x1F, 0xFF,
            0x00, 0x22, // T1 = 34
            0x00, 0x83, // T2 = 131
            0x02, 0x24, // T3 = 548
            0x00, 0x40
        };

        unsigned char marker_lse_14[] = {

```

```

    0xFF, 0xF8, 0x00, 0x0D,
    0x01,
    0x3F, 0xFF,
    0x00, 0x42, // T1 = 66
    0x01, 0x03, // T2 = 259
    0x04, 0x44, // T3 = 1092
    0x00, 0x40
};

unsigned char marker_lse_15[] = {
    0xFF, 0xF8, 0x00, 0x0D,
    0x01,
    0x7F, 0xFF,
    0x00, 0x82, // T1 = 130
    0x02, 0x03, // T2 = 515
    0x08, 0x84, // T3 = 2180
    0x00, 0x40
};

unsigned char marker_lse_16[] = {
    0xFF, 0xF8, 0x00, 0x0D,
    0x01,
    0xFF, 0xFF,
    0x01, 0x02, // T1 = 258
    0x04, 0x03, // T2 = 1027
    0x11, 0x04, // T3 = 4356
    0x00, 0x40
};

const unsigned char *marker_lse = nullptr;
switch( metadata.bitsPerSample )
{
case 13:
    marker_lse = marker_lse_13;
    break;
case 14:
    marker_lse = marker_lse_14;
    break;
case 15:
    marker_lse = marker_lse_15;
    break;
case 16:
    marker_lse = marker_lse_16;
    break;
}
if( !marker_lse )
{
    std::cerr << "Can't handle: " << metadata.bitsPerSample << std::endl;
    return 1;
}

// FIXME: One should recompute the value for 0x0F
vbuffer.insert( vbuffer.begin() + 0x0F, marker_lse, marker_lse+15);

#ifdef 0
    std::ofstream of( "/tmp/d.jls", std::ios::binary );
    of.write( &vbuffer[0], vbuffer.size() );
    of.close();
#endif

const char *pbyteCompressed = vbuffer.data();
size_t cbyteCompressed = vbuffer.size(); // updated length

JlsParameters params;
JpegLsReadHeader(pbyteCompressed, cbyteCompressed, &params, nullptr);

std::vector<unsigned char> rgbyteOut;
//rgbyteOut.resize( image.GetBufferLength() );
rgbyteOut.resize(params.height * params.width * ((params.bitsPerSample + 7)
    / 8) * params.components);

CharlsApiResultType result =
    JpegLsDecode(rgbyteOut.data(), rgbyteOut.size(), pbyteCompressed, cbyteCompressed, &params, errorMsg );
if (result != charls::ApiResult::OK)
{
    std::cerr << "Could not patch JAI-JPEGLS: " << errorMsg << std::endl;
    return 1;
}
rgbyteOutall.insert( rgbyteOutall.end(), rgbyteOut.begin(), rgbyteOut.end() );

```



```

    }

    gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
    pixeldata.SetVR( gdcm::VR::OW );
    pixeldata.SetByteValue( (char*)rgbyteOutall.data(), (uint32_t)rgbyteOutall.size() );

    // Add the pixel data element
    reader.GetFile().GetDataSet().Replace( pixeldata );
    reader.GetFile().GetHeader().SetDataSetTransferSyntax(
        gdcm::TransferSyntax::ExplicitVRLittleEndian);

    gdcm::Writer writer;
    writer.SetFileName( outfilename );
    writer.SetFile( reader.GetFile() );
    writer.Write();

    std::cout << "Success !" << std::endl;

    return 0;
}

```

## 14.69 FixOrientation.cxx

```

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=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmFile.h"
#include "gdcmOrientation.h"
#include "gdcmAttribute.h"

// Very simple orientation changer, fix invalid dataset
int main(int argc, char* argv[] )
{
    // assume AXIAL input for now
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    gdcm::Reader reader;
    reader.SetFileName( filename );
    if (! reader.Read() )
    {
        return 1;
    }

    const double axial[] = { 1,0,0, 0,1,0 };
    (void)axial;
    const double coronal[] = { 0,0,1, 1,0,0 };
    (void)coronal;
    const double sagittal[] = { 0,1,0, 0,0,1 };
    (void)sagittal;
    gdcm::Attribute<0x0020,0x0032> at1; // IPP
    (void)at1;
    gdcm::Attribute<0x0020,0x0037> at2; // IOP
    (void)at2;

    gdcm::File & f = reader.GetFile();
    gdcm::DataSet & ds = f.GetDataSet();
    at1.SetFromDataSet( ds );

```

```

#if 0
    at2.SetFromDataSet( ds );
    const double * iop = at2.GetValues();
    if( !std::equal(iop, iop + 6, axial ) )
    {
        gdcm::Orientation::OrientationType type = gdcm::Orientation::GetType ( iop );
        std::cerr << "Wrong orientation: " << gdcm::Orientation::GetLabel( type ) << std::endl;
        return 1;
    }
    at2.SetValues( sagittal );
    ds.Replace( at2.GetAsDataElement() );
#endif

    // for sagittal: swap element 0 & 2
    const double tmp0 = at1.GetValue(0);
    const double tmp2 = at1.GetValue(2);
    (void)tmp2;
    //at1.SetValue(tmp2, 0);
    //at1.SetValue(tmp0, 2);
    at1.SetValue( - tmp0 );
    ds.Replace( at1.GetAsDataElement() );

    gdcm::Writer writer;
    writer.SetFile( f );
    writer.SetFileName( outfilename );
    if ( !writer.Write() )
    {
        return 1;
    }

    return 0;
}

```

## 14.70 GenAllVR.cxx

```

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=====*/

#include "gdcmReader.h"
#include "gdcmGlobal.h"
#include "gdcmDummyValueGenerator.h"
#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmDict.h"
#include "gdcmDictEntry.h"
#include "gdcmDicts.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmFileExplicitFilter.h"

#include <cstdlib>
#include <cstring>

gdcm::Tag FindTagFromVR(gdcm::Dict const &dict, gdcm::VR const &vr)
{
    using gdcm::Dict;
    Dict::ConstIterator beg = dict.Begin();
    Dict::ConstIterator end = dict.End();
    Dict::ConstIterator it;
    for( it = beg; it != end; ++it)

```

```

    {
        const gdcmm::Tag &t = it->first;
        const gdcmm::DictEntry &de = it->second;
        const gdcmm::VR &vr_de = de.GetVR();
        if( vr == vr_de && !de.GetRetired() && t.GetGroup() >= 0x8 )
        {
            return t;
        }
    }
    return gdcmm::Tag(0xffff,0xffff);
}

struct rnd_gen {
    rnd_gen(char const* r = "abcdefghijklmnopqrstuvwxyz0123456789")
        : range(r), len(std::strlen(r)) { }

    char operator ()() const {
        return range[static_cast<std::size_t>(std::rand() * (1.0 / ((double)RAND_MAX + 1.0 )) * (double)len)];
    }
private:
    char const* range;
    std::size_t len;
};

/*
*/
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " output.dcm" << std::endl;
        return 1;
    }
    const char *outfilename = argv[1];
    static const gdcmm::Global &g = gdcmm::Global::GetInstance();
    static const gdcmm::Dicts &dicts = g.GetDicts();
    static const gdcmm::Dict &pubdict = dicts.GetPublicDict();
    using gdcmm::VR;
    using gdcmm::Tag;

    gdcmm::Writer w;

    gdcmm::File &f = w.GetFile();
    gdcmm::DataSet &ds = f.GetDataSet();

    gdcmm::FileExplicitFilter fef;
    //fef.SetChangePrivateTags( true );
    fef.SetFile( w.GetFile() );
    if( !fef.Change() )
    {
        std::cerr << "Failed to change" << std::endl;
        return 1;
    }

    gdcmm::SmartPointer<gdcmm::SequenceOfItems> sq = new gdcmm::SequenceOfItems();
    sq->SetLengthToUndefined();

    // gdcmm::DummyValueGenerator divg;

    const std::size_t len = 10;
    char ss[len+1];
    ss[len] = '\0';

    const char owner_str[] = "GDCM CONFORMANCE TESTS";
    gdcmm::DataElement owner( gdcmm::Tag(0x4d4d, 0x10) );
    owner.SetByteValue(owner_str, (uint32_t)strlen(owner_str));
    owner.SetVR( gdcmm::VR::LO );

    // Create an item
    gdcmm::Item it;
    it.SetVLToUndefined();
    gdcmm::DataSet &nds = it.GetNestedDataSet();
    // nds.Insert(owner);
    // nds.Insert(de);

    // Insert sequence into data set
    gdcmm::DataElement des( gdcmm::Tag(0x4d4d, 0x1001) );
    des.SetVR(gdcmm::VR::SQ);
    des.SetValue(*sq);

```

```

des.SetVLToUndefined();

ds.Insert(owner);
ds.Insert(des);

// avoid INVALID = 0
for(int i = 1; i < 27; ++i)
{
    VR vr = (VR::VRType)(1LL « i);
    Tag t = FindTagFromVR( pubdict, vr );
    if( vr != VR::UN && vr != VR::SQ )
    {
        assert( t != Tag(0xffff,0xffff) );
        gdcm::DataElement de( t );
        std::generate_n(ss, len, rnd_gen());
        de.SetVR( vr );
        de.SetByteValue( ss, (uint32_t)std::strlen( ss ) );
        nds.Insert( de );
    }
}
sq->AddItem(it);

// Make sure to override any UID stuff
gdcm::UIDGenerator uid;
gdcm::DataElement de( Tag(0x8,0x18) ); // SOP Instance UID
de.SetVR( VR::UI );
const char *u = uid.Generate();
de.SetByteValue( u, (uint32_t)strlen(u) );
ds.Insert( de );

de.SetTag( Tag(0x8,0x16) ); // SOP Class UID
de.SetVR( VR::UI );
gdcm::MediaStorage ms( gdcm::MediaStorage::RawDataStorage );
de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()) );
ds.Insert( de );

gdcm::FileMetaInformation &fmi = f.GetHeader();
//fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );
fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );

w.SetCheckFileMetaInformation( true );
w.SetFileName( outfilename );
if (!w.Write() )
{
    return 1;
}

return 0;
}

```

## 14.71 GenFakeldentifyFile.cxx

```

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=====*/
#include "gdcmReader.h"
#include "gdcmGlobal.h"
#include "gdcmDummyValueGenerator.h"
#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmAttribute.h"
#include "gdcmFile.h"
#include "gdcmTag.h"

```

```

#include "gdcmDict.h"
#include "gdcmDictEntry.h"
#include "gdcmDicts.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmAnonymizer.h"

#include <cstdlib>
#include <cstring>

gdcm::DataElement CreateFakeElement(gdcm::Tag const &tag, bool toremove)
{
    static const gdcm::Global &g = gdcm::Global::GetInstance();
    static const gdcm::Dicts &dicts = g.GetDicts();
    static const gdcm::Dict &pubdict = dicts.GetPublicDict();
    static size_t countglobal = 0;
    static std::vector<gdcm::Tag> balcptags =
        gdcm::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes();
    size_t count = countglobal % balcptags.size();

    const gdcm::DictEntry &dictentry = pubdict.GetDictEntry(tag);

    gdcm::DataElement de;
    de.SetTag( tag );
    using gdcm::VR;
    const VR &vr = dictentry.GetVR();
    //if( vr != VR::INVALID )
    if( vr.IsDual() )
    {
        if( vr == VR::US_SS )
        {
            de.SetVR( VR::US );
        }
        else if( vr == VR::US_SS_OW )
        {
            de.SetVR( VR::OW );
        }
        else if( vr == VR::OB_OW )
        {
            de.SetVR( VR::OB );
        }
    }
    else
    {
        de.SetVR( vr );
    }
    const char str[] = "BasicApplicationLevelConfidentialityProfileAttributes";
    const char safe[] = "This is safe to keep";
    if( de.GetVR() != VR::SQ )
    {
        if( toremove )
            de.SetByteValue( str, (uint32_t)strlen(str) );
        else
            de.SetByteValue( safe, (uint32_t)strlen(safe) );
    }
    else
    {
        // Create an item
        gdcm::Item it;
        it.SetVLToUndefined();
        gdcm::DataSet &nds = it.GetNestedDataSet();
        // Insert sequence into data set
        assert(de.GetVR() == gdcm::VR::SQ );
        gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
        sq->SetLengthToUndefined();
        de.SetValue(*sq);
        de.SetVLToUndefined();
        //ds.Insert( de );

        if( !toremove )
        {
            nds.Insert( CreateFakeElement( balcptags[count], true ) );
            countglobal++;
        }
        else
        {
            gdcm::Attribute<0x0008,0x0000> at1 = { 0 }; // This element has no reason to be 'anonymized'...
            nds.Insert( at1.GetAsDataElement() );
            gdcm::Attribute<0x000a,0x0000> at2 = { 0 };
            nds.Insert( at2.GetAsDataElement() );
        }
    }
}

```

```

        sq->AddItem(it);
    }
    return de;
}

/*
*/
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " output.dcm" << std::endl;
        return 1;
    }
    using gdcm::Tag;
    using gdcm::VR;
    const char *outfilename = argv[1];

    std::vector<gdcm::Tag> balcptags =
        gdcm::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes();

    gdcm::Writer w;
    gdcm::File &f = w.GetFile();
    gdcm::DataSet &ds = f.GetDataSet();

    // Add attribute that need to be anonymized:
    std::vector<gdcm::Tag>::const_iterator it = balcptags.begin();
    for(; it != balcptags.end(); ++it)
    {
        ds.Insert( CreateFakeElement( *it, true ) );
    }

    // Add attribute that do NOT need to be anonymized:
    static const gdcm::Global &g = gdcm::Global::GetInstance();
    static const gdcm::Dicts &dicts = g.GetDicts();
    static const gdcm::Dict &pubdict = dicts.GetPublicDict();

    using gdcm::Dict;
    Dict::ConstIterator dictit = pubdict.Begin();
    for(; dictit != pubdict.End(); ++dictit)
    {
        const gdcm::Tag &dicttag = dictit->first;
        if( dicttag == Tag(0x6e65,0x6146) ) break;
        //const gdcm::DictEntry &dictentry = dictit->second;
        ds.Insert( CreateFakeElement( dicttag, false ) );
    }
    ds.Remove( gdcm::Tag(0x400,0x500) );
    ds.Remove( gdcm::Tag(0x12,0x62) );
    ds.Remove( gdcm::Tag(0x12,0x63) );

    // Make sure to override any UID stuff
    gdcm::UIDGenerator uid;
    gdcm::DataElement de( Tag(0x8,0x18) ); // SOP Instance UID
    de.SetVR( VR::UI );
    const char *u = uid.Generate();
    de.SetByteValue( u, (uint32_t)strlen(u) );
    //ds.Insert( de );
    ds.Replace( de );

    de.SetTag( Tag(0x8,0x16) ); // SOP Class UID
    de.SetVR( VR::UI );
    gdcm::MediaStorage ms( gdcm::MediaStorage::RawDataStorage );
    de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()) );
    ds.Replace( de ); // replace !

    gdcm::FileMetaInformation &fmi = f.GetHeader();
    //fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );
    fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );

    w.SetCheckFileMetaInformation( true );
    w.SetFileName( outfile );
    if (!w.Write() )
    {
        return 1;
    }

    return 0;
}

```

## 14.72 GenLongSeqs.cxx

```

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=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"
#include "gdcmTag.h"

/*
 * This example is used to generate the file:
 *
 *
 * There is a flaw in the DICOM design where it is assumed that Sequence can be
 * either represented as undefined length or defined length. This should work
 * in most case, but the undefined length is a little more general and can
 * store sequence of items that a defined length cannot.
 * We need to make sure that we can store numerous Item in a SQ
 *
 * Warning: do not try to compute the group length elements !
 * Warning: You may need a 64bits machine for this example to work.
 */
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }

    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();

    // Create a Sequence
    gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
    sq->SetLengthToUndefined();

    const char owner_str[] = "GDCM CONFORMANCE TESTS";
    gdcm::DataElement owner( gdcm::Tag(0x4d4d, 0x10) );
    owner.SetByteValue( owner_str, (uint32_t)strlen(owner_str));
    owner.SetVR( gdcm::VR::LO );

    size_t nitems = 1000;
    nitems += std::numeric_limits<uint32_t>::max();
    for(unsigned int idx = 0; idx < nitems; ++idx)
    {
        // Create a dataelement
        //gdcm::DataElement de( gdcm::Tag(0x4d4d, 0x1002) );
        //de.SetByteValue(ptr, ptr_len);
        //de.SetVR( gdcm::VR::OB );

        // Create an item
        gdcm::Item it;
        it.SetVLToUndefined();
        //gdcm::DataSet &nds = it.GetNestedDataSet();
        //nds.Insert(owner);

```

```

        //nds.Insert(de);

        sq->AddItem(it);
    }

    // Insert sequence into data set
    gdcm::DataElement des( gdcm::Tag(0x4d4d,0x1001) );
    des.SetVR(gdcm::VR::SQ);
    des.SetValue(*sq);
    des.SetVLToUndefined();

    ds.Insert(owner);
    ds.Insert(des);

    gdcm::Writer w;
    w.SetFile( file );
    //w.SetCheckFileMetaInformation( true );
    w.SetFileName( outfilename );
    if ( !w.Write() )
    {
        return 1;
    }

    return 0;
}

```

## 14.73 GenSeqs.cxx

```

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=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"
#include "gdcmTag.h"

/*
 * This example is used to generate the file:
 *
 * gdcmConformanceTests/SequenceWithUndefinedLengthNotConvertibleToDefinedLength.dcm
 *
 * There is a flaw in the DICOM design where it is assumed that Sequence can be
 * either represented as undefined length or defined length. This should work
 * in most case, but the undefined length is a little more general and can
 * store sequence of items that a defined length cannot.
 * Deflated syntax was used in this case since this synthetic example can be
 * nicely compressed using this transfer syntax.
 *
 * Warning: do not try to compute the group length elements !
 * Warning: You may need a 64bits machine for this example to work.
 */
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )

```



```

    {
        return 1;
    }

    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();

    //const unsigned int nitems = 1000;
    const unsigned int ptr_len = 42; /*94967296 / nitems; */
    //assert( ptr_len == 42949672 );
    char *ptr = new char[ptr_len];
    memset(ptr,0,ptr_len);

    // Create a Sequence
    gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
    sq->SetLengthToUndefined();

    const char owner_str[] = "GDCM CONFORMANCE TESTS";
    gdcm::DataElement owner( gdcm::Tag(0x4d4d, 0x10) );
    owner.SetByteValue(owner_str, (uint32_t)strlen(owner_str));
    owner.SetVR( gdcm::VR::LO );

    for(unsigned int idx = 0; idx < 10/* nitems*/; ++idx)
    {
        // Create a dataelement
        gdcm::DataElement de( gdcm::Tag(0x4d4d, 0x1002) );
        de.SetByteValue(ptr, ptr_len);
        de.SetVR( gdcm::VR::OB );

        // Create an item
        gdcm::Item it;
        it.SetVLToUndefined();
        gdcm::DataSet &nds = it.GetNestedDataSet();
        nds.Insert(owner);
        nds.Insert(de);

        sq->AddItem(it);
    }

    // Insert sequence into data set
    gdcm::DataElement des( gdcm::Tag(0x4d4d,0x1001) );
    des.SetVR(gdcm::VR::SQ);
    des.SetValue(*sq);
    des.SetVLToUndefined();

    ds.Insert(owner);
    ds.Insert(des);

    gdcm::Writer w;
    w.SetFile( file );
    //w.SetCheckFileMetaInformation( true );
    w.SetFileName( outfilename );
    if (!w.Write() )
    {
        return 1;
    }

    return 0;
}

```

## 14.74 GenerateStandardSOPClasses.cxx

```

/*=====
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=====*/
/*

```

```

*/

#include "gdcmDefs.h"
#include "gdcmUIDs.h"
#include "gdcmGlobal.h"
#include "gdcmMediaStorage.h"
#include "gdcmSOPClassUIDToIOD.h"

int main(int , char *[])
{
    using gdcm::MediaStorage;
    gdcm::Global& g = gdcm::Global::GetInstance();
    if( !g.LoadResourcesFiles() )
    {
        std::cerr << "Could not LoadResourcesFiles" << std::endl;
        return 1;
    }

    const gdcm::Defs &defs = g.GetDefs();

    int ret = 0;

    //std::cout << "Table B.5-1 STANDARD SOP CLASSES" << std::endl;
    std::cout << "SOP Class Name,SOP Class UID,IOD Specification (defined in PS 3.3)" << std::endl;

    gdcm::MediaStorage::MSType mst;
    for ( mst = gdcm::MediaStorage::MediaStorageDirectoryStorage; mst < gdcm::MediaStorage::MS_END;
          mst = (gdcm::MediaStorage::MSType)(mst + 1) )
    {
        const char *iod = defs.GetIODNameFromMediaStorage(mst);
        gdcm::UIDs uid;
        uid.SetFromUID( gdcm::MediaStorage::GetMSString(mst) /*mst.GetString()*/ );
        if( iod )
        {
            const char *iod_ref = gdcm::SOPClassUIDToIOD::GetIOD(uid);
            if( iod_ref )
            {
                std::string iod_ref_str = iod_ref;
                //iod_ref_str += " IOD Modules";
                //if( iod_ref_str != iod )
                {
                    //std::cout << "UID: " << uid << " ";
                    std::cout << "' ' << uid.GetName() << "' << uid.GetString() << "' << ", " << "' ' << iod << "' ' <<
                    std::endl;
                    //std::cout << "Incompatible IODs: [" << iod << "] versus ref= [" << iod_ref_str << "]" << std::endl;
                    ++ret;
                }
            }
        }
    }

    return 0;
}

```

## 14.75 GetJPEGSamplePrecision.cxx

```

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PURPOSE. See the above copyright notice for more information.

=====*/
/*
 * This example is a little helper to detect the famous SIEMENS JPEG lossless compressed image
 * where DICOM is declared as:
 *
 * (0028,0100) US 16                                     # 2,1 Bits Allocated

```

```

* (0028,0101) US 12 # 2,1 Bits Stored
* (0028,0102) US 11 # 2,1 High Bit
* (0028,0103) US 0 # 2,1 Pixel Representation
*
* But where JPEG is:
*
*     JPEG_SOF_Parameters:
*         SamplePrecision = 16
*         nLines = 192
*         nSamplesPerLine = 192
*         nComponentsInFrame = 1
*         component 0
*             ComponentIdentifier = 1
*             HorizontalSamplingFactor = 1
*             VerticalSamplingFactor = 1
*             QuantizationTableDestinationSelector = 0
*
* This case is valid. One simply has to use the 16bits jpeg decoder to decode the 12bits stored image.
* This used to be an issue in GDCM 1.2.x (fixed in GDCM 1.2.5)
*
* The main return 0 (no error) when the file read is actually a potential problem. At the end of the main
* function, the jpeg stream is stored in the filename specified as second argument
*/

#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"
#include "gdcmJPEGCodec.h"

#include <iostream>
#include <fstream>

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.jpg" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
        return 1;
    }

    // The output of gdcm::Reader is a gdcm::File
    const gdcm::File &file = reader.GetFile();
    const gdcm::Image &image = reader.GetImage();

    const gdcm::TransferSyntax &ts = file.GetHeader().GetDataSetTransferSyntax();

    if( ts != gdcm::TransferSyntax::JPEGLosslessProcess14 && ts != gdcm::TransferSyntax::JPEGLosslessProcess14_1 )
    {
        std::cerr << "Input is not a lossless JPEG" << std::endl;
        return 1;
    }

    // the dataset is the the set of element we are interested in:
    const gdcm::DataSet &ds = file.GetDataSet();

    const gdcm::Tag rawTag(0x7fe0, 0x0010); // Default to Pixel Data
    const gdcm::DataElement& pdde = ds.GetDataElement( rawTag );
    const gdcm::SequenceOfFragments *sf = pdde.GetSequenceOfFragments();
    if( sf )
    {
        std::ofstream output(outfilename, std::ios::binary);
        sf->WriteBuffer(output);
    }
    else
    {
        std::cerr << "Error" << std::endl;
        return 1;
    }

    gdcm::JPEGCodec jpeg;
    std::ifstream is(outfilename, std::ios::binary);

```

```

gdcM::PixelFormat pf ( gdcM::PixelFormat::UINT8 ); // let's pretend it's a 8bits jpeg
jpeg.SetPixelFormat( pf );
gdcM::TransferSyntax ts_jpg;
bool b = jpeg.GetHeaderInfo( is, ts_jpg );
if( !b )
{
    return 1;
}

//jpeg.Print( std::cout );
if( jpeg.GetPixelFormat().GetBitsAllocated() != image.GetPixelFormat().GetBitsAllocated()
|| jpeg.GetPixelFormat().GetBitsStored() != image.GetPixelFormat().GetBitsStored() )
{
    std::cerr << "There is a mismatch in between DICOM declared Pixel Format and Sample Precision used in the
    JPEG stream" << std::endl;
    return 0;
}

std::cout << jpeg.GetPixelFormat() << std::endl;
std::cout << image.GetPixelFormat() << std::endl;

return 1;
}

```

## 14.76 GetSequenceUltrasound.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcMReader.h"
#include "gdcMAttribute.h"

bool Region ( char* nomefile, unsigned int* X_min, unsigned int* Y_min, unsigned int* X_max, unsigned int* Y_max
);

int main(int argc, char* argv[] )
{
    // Controllo del numero di argomenti introdotti da riga di comando
    if( argc < 2 )
    {
        std::cerr << "Usage: " << std::endl;
        std::cerr << argv[0] << " inputImageFile " << std::endl;
        return EXIT_FAILURE;
    }

    unsigned int x_min = 1;
    unsigned int y_min = 1;
    unsigned int x_max = 1;
    unsigned int y_max = 1;

    if( Region ( argv[1], &x_min, &y_min, &x_max, &y_max ) )
    {
        std::cout << "x_min = " << x_min << std::endl;
        std::cout << "y_min = " << y_min << std::endl;
        std::cout << "x_max = " << x_max << std::endl;
        std::cout << "y_max = " << y_max << std::endl;
    }

    else
    {
        std::cout << "no\n";
    }
}

bool Region ( char* nomefile, unsigned int* X_min, unsigned int* Y_min, unsigned int* X_max, unsigned int* Y_max

```

```

    )
{
    gdcm::Reader reader;
    reader.SetFileName( nomefile );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << nomefile << std::endl;
        return false;
    }

    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();

    gdcm::Tag tsqr(0x0018,0x6011);
    if( !ds.FindDataElement( tsqr ) )
    {
        return false;
    }

    const gdcm::DataElement &sqr= ds.GetDataElement( tsqr );
    //std::cout << sqr << std::endl;
    const gdcm::SequenceOfItems *sqi = sqr.GetValueAssQ();
    if( !sqi || !sqi->GetNumberOfItems() )
    {
        return false;
    }
    //std::cout << sqi << std::endl;

    const gdcm::Item &item = sqi->GetItem(1);
    //std::cout << item << std::endl;
    const gdcm::DataSet& nestedds = item.GetNestedDataSet();
    //std::cout << nestedds << std::endl;

    gdcm::Tag tX0(0x0018,0x6018);
    gdcm::Tag tY0(0x0018,0x601a);
    gdcm::Tag tX1(0x0018,0x601c);
    gdcm::Tag tY1(0x0018,0x601e);

    if( (!nestedds.FindDataElement( tX0 ))||(!nestedds.FindDataElement( tY0 ))||(!nestedds.FindDataElement( tX1
        ))||(!nestedds.FindDataElement( tY1 )) )
    {
        return false;
    }

    const gdcm::DataElement& deX0 = nestedds.GetDataElement( tX0 );
    const gdcm::DataElement& deY0 = nestedds.GetDataElement( tY0 );
    const gdcm::DataElement& deX1 = nestedds.GetDataElement( tX1 );
    const gdcm::DataElement& deY1 = nestedds.GetDataElement( tY1 );
    //std::cout << deX0 << std::endl << deY0 << std::endl << deX1 << std::endl << deY1 << std::endl;

    //const gdcm::ByteValue *bvX0 = deX0.GetByteValue();
    //const gdcm::ByteValue *bvY0 = deY0.GetByteValue();
    //const gdcm::ByteValue *bvX1 = deX1.GetByteValue();
    //const gdcm::ByteValue *bvY1 = deY1.GetByteValue();
    //std::cout << bvX0 << std::endl << bvY0 << std::endl << bvX1 << std::endl << bvY1 << std::endl;

    gdcm::Attribute<0x0018,0x6018> atX0;
    gdcm::Attribute<0x0018,0x601a> atY0;
    gdcm::Attribute<0x0018,0x601c> atX1;
    gdcm::Attribute<0x0018,0x601e> atY1;
    atX0.SetFromDataElement( deX0 );
    atY0.SetFromDataElement( deY0 );
    atX1.SetFromDataElement( deX1 );
    atY1.SetFromDataElement( deY1 );
    uint32_t X0 = atX0.GetValue();
    uint32_t Y0 = atY0.GetValue();
    uint32_t X1 = atX1.GetValue();
    uint32_t Y1 = atY1.GetValue();
    std::cout << X0 << std::endl << Y0 << std::endl << X1 << std::endl << Y1 << std::endl;

    *X_min = static_cast<unsigned int>(X0);
    *Y_min = static_cast<unsigned int>(Y0);
    *X_max = static_cast<unsigned int>(X1);
    *Y_max = static_cast<unsigned int>(Y1);

    //std::cout << "X_min = " << *X_min << std::endl;
    //std::cout << "Y_min = " << *Y_min << std::endl;
    //std::cout << "X_max = " << *X_max << std::endl;
    //std::cout << "Y_max = " << *Y_max << std::endl;

    return true;
}

```

```
}
```

## 14.77 GetSubSequenceData.cxx

```
/*=====
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=====*/
#include "gdcmlReader.h"
#include "gdcmlImage.h"
#include "gdcmlImageWriter.h"
#include "gdcmlDataElement.h"
#include "gdcmlPrivateTag.h"
#include "gdcmlUIDGenerator.h"

#include <iostream>
#include <string>

#include <map>

/*
 * This example will extract the Movie from the private group of
 * GEMS_Ultrasound_MovieGroup_001 See Attribute
 * (7fe1,60,GEMS_Ultrasound_MovieGroup_001)
 *
 * The output file will be stored in 'outvid.dcm' as
 * MultiframeGrayscaleByteSecondaryCaptureImageStorage
 */
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    using namespace gdcml;
    const char *filename = argv[1];
    gdcml::Reader reader;
    reader.SetFileName( filename );
    reader.Read();

    gdcml::File &file = reader.GetFile();
    gdcml::DataSet &ds = file.GetDataSet();
    const PrivateTag tseq(0x7fe1,0x1,"GEMS_Ultrasound_MovieGroup_001");

    if( !ds.FindDataElement( tseq ) ) return 1;
    const DataElement& seq = ds.GetDataElement( tseq );

    SmartPointer<SequenceOfItems> sqi = seq.GetValueAsSQ();
    assert( sqi->GetNumberOfItems() == 1 );
    Item &item = sqi->GetItem(1);
    DataSet &subds = item.GetNestedDataSet();

    const PrivateTag tseq1(0x7fe1,0x10,"GEMS_Ultrasound_MovieGroup_001");

    if( !subds.FindDataElement( tseq1 ) ) return 1;
    const DataElement& seq1 = subds.GetDataElement( tseq1 );

    SmartPointer<SequenceOfItems> sqi2 = seq1.GetValueAsSQ();
    //int n = sqi2->GetNumberOfItems();
    int index = 1;
    Item &item2 = sqi2->GetItem(index);
    DataSet &subds2 = item2.GetNestedDataSet();

    const PrivateTag tseq2(0x7fe1,0x20,"GEMS_Ultrasound_MovieGroup_001");

    if( !subds2.FindDataElement( tseq2 ) ) return 1;
    const DataElement& seq2 = subds2.GetDataElement( tseq2 );

    // std::cout << seq2 << std::endl;

    SmartPointer<SequenceOfItems> sqi3 = seq2.GetValueAsSQ();
```

```

size_t ni3 = sqi3->GetNumberOfItems(); (void)ni3;
assert( sqi3->GetNumberOfItems() >= 1 );
Item &item3 = sqi3->GetItem(1);
DataSet &subds3 = item3.GetNestedDataSet();

const PrivateTag tseq6(0x7fel,0x26,"GEMS_Ultrasound_MovieGroup_001");
if( !subds3.FindDataElement( tseq6 ) ) return true;
const DataElement& seq6 = subds3.GetDataElement( tseq6 );
SmartPointer<SequenceOfItems> sqi6 = seq6.GetValueAsSQ();
size_t ni6= sqi6->GetNumberOfItems();
assert( sqi6->GetNumberOfItems() >= 1 );
const PrivateTag tseq7(0x7fel,0x86,"GEMS_Ultrasound_MovieGroup_001");
int dimx = 0, dimy = 0;
for( size_t i6 = 1; i6 <= ni6; ++i6 )
{
    Item &item6 = sqi6->GetItem(i6);
    DataSet &subds6 = item6.GetNestedDataSet();

    if( subds6.FindDataElement( tseq7 ) )
    {
        Element<VR::SL, VM::VM4> el;
        el.SetFromDataElement( subds6.GetDataElement( tseq7 ) );
        std::cout << "El= " << el.GetValue() << std::endl;
        dimx = el.GetValue(0);
        dimy = el.GetValue(1);
    }
}

const PrivateTag tseq3(0x7fel,0x36,"GEMS_Ultrasound_MovieGroup_001");
if( !subds3.FindDataElement( tseq3 ) ) return true;
const DataElement& seq3 = subds3.GetDataElement( tseq3 );

//      std::cout << seq3 << std::endl;

SmartPointer<SequenceOfItems> sqi4 = seq3.GetValueAsSQ();
size_t ni4= sqi4->GetNumberOfItems();
assert( sqi4->GetNumberOfItems() >= 1 );
const PrivateTag tseq8(0x7fel,0x37,"GEMS_Ultrasound_MovieGroup_001");
const PrivateTag tseq4(0x7fel,0x43,"GEMS_Ultrasound_MovieGroup_001");
const PrivateTag tseq5(0x7fel,0x60,"GEMS_Ultrasound_MovieGroup_001");

std::vector<char> imbuffer;
int dimz = 0;
for( size_t i4 = 1; i4 <= ni4; ++i4 )
{
    Item &item4 = sqi4->GetItem(i4);
    DataSet &subds4 = item4.GetNestedDataSet();

    if( !subds4.FindDataElement( tseq8 ) ) return true;
    const DataElement& de8 = subds4.GetDataElement( tseq8 );
    Element<VR::UL, VM::VM1> ldimz;
    ldimz.SetFromDataElement( de8 );
    dimz += ldimz.GetValue();
    if( !subds4.FindDataElement( tseq4 ) ) return true;
    const DataElement& seq4 = subds4.GetDataElement( tseq4 );
    if( !subds4.FindDataElement( tseq5 ) ) return true;
    const DataElement& seq5 = subds4.GetDataElement( tseq5 );

    //      std::cout << seq4 << std::endl;
    //      std::cout << seq5 << std::endl;

    const ByteValue *bv4 = seq4.GetByteValue();
    (void)bv4;
    #if 0
    {
        std::ofstream out( "/tmp/mo4", std::ios::binary );
        out.write( bv4->GetPointer(), bv4->GetLength());
        out.close();
    }
#endif
    const ByteValue *bv5 = seq5.GetByteValue();
    #if 0
    {
        std::ofstream out( "/tmp/mo5", std::ios::binary );
        out.write( bv5->GetPointer(), bv5->GetLength());
        out.close();
    }
#endif

    std::cout << bv5->GetLength() << std::endl;
    imbuffer.insert( imbuffer.begin(), bv5->GetPointer(), bv5->GetPointer() + bv5->GetLength() );
}

```

```

    }
    DataElement fakedata;
    fakedata.SetByteValue( imbuffer.data(), (uint32_t)imbuffer.size() );

    gdcm::SmartPointer<gdcm::Image> im = new gdcm::Image;
    im->SetNumberOfDimensions( 3 );

    im->SetDimension(0, dimx );
    im->SetDimension(1, dimy );
    im->SetDimension(2, dimz );
    size_t l1 = imbuffer.size();
    (void)l1;
    size_t l2 = im->GetBufferLength();
    (void)l2;
    assert( im->GetBufferLength() == imbuffer.size() );
    im->SetPhotometricInterpretation( gdcm::PhotometricInterpretation::MONOCHROME2 );

    im->SetDataElement( fakedata );

    gdcm::ImageWriter w;
    w.SetImage( *im );
    DataSet &dataset = w.GetFile().GetDataSet();

    gdcm::UIDGenerator uid;
    gdcm::DataElement de( Tag(0x8,0x18) ); // SOP Instance UID
    de.SetVR( VR:UI );
    const char *u = uid.Generate();
    de.SetByteValue( u, (uint32_t)strlen(u) );
    //ds.Insert( de );
    dataset.Replace( de );

    de.SetTag( Tag(0x8,0x16) ); // SOP Class UID
    de.SetVR( VR:UI );
    gdcm::MediaStorage ms(
        gdcm::MediaStorage::MultiframeGrayscaleByteSecondaryCaptureImageStorage );
    de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()) );
    dataset.Replace( de ); // replace !

    w.SetFileName( "outvid.dcm" );
    if( !w.Write() )
    {
        return 1;
    }

    return 0;
}

```

## 14.78 HelloVizWorld.cxx

```

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=====*/
/*
 * Basic example for dealing with a DICOM file that contains an Image
 * (read: Pixel Data element)
 */

#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmImage.h"
#include "gdcmPhotometricInterpretation.h"

#include <iostream>

int main(int argc, char *argv[])

```



```

{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    // Instantiate the image reader:
    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
        return 1;
    }
    // If we reach here, we know for sure 2 things:
    // 1. It is a valid DICOM
    // 2. And it contains an Image !

    // The output of superclass gdcm::Reader is a gdcm::File
    //gdcm::File &file = reader.GetFile();

    // The other output of gdcm::ImageReader is a gdcm::Image
    const gdcm::Image &image = reader.GetImage();

    // Let's get some property from the image:
    unsigned int ndim = image.GetNumberOfDimensions();
    // Dimensions of the image:
    const unsigned int *dims = image.GetDimensions();
    // Origin
    const double *origin = image.GetOrigin();
    const gdcm::PhotometricInterpretation &pi = image.GetPhotometricInterpretation();
    for(unsigned int i = 0; i < ndim; ++i)
    {
        std::cout << "Dim(" << i << "): " << dims[i] << std::endl;
    }
    for(unsigned int i = 0; i < ndim; ++i)
    {
        std::cout << "Origin(" << i << "): " << origin[i] << std::endl;
    }
    std::cout << "PhotometricInterpretation: " << pi << std::endl;

    // Write the modified DataSet back to disk
    gdcm::ImageWriter writer;
    writer.SetImage( image );
    writer.SetFileName( outfile );
    //writer.SetFile( file ); // We purposely NOT copy the meta information from the input
    // file, and instead only pass the image
    if( !writer.Write() )
    {
        std::cerr << "Could not write: " << outfile << std::endl;
        return 1;
    }

    return 0;
}

```

## 14.79 HelloWorld.cxx

```

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Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
 * This example is ... guess what this is for :)

```

```

*/

#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"

#include <iostream>

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    // Instantiate the reader:
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
        return 1;
    }

    // If we reach here, we know for sure only 1 thing:
    // It is a valid DICOM file (potentially an old ACR-NEMA 1.0/2.0 file)
    // (Maybe, it's NOT a Dicom image -could be a DICOMDIR, a RTSTRUCT, etc-)

    // The output of gdcm::Reader is a gdcm::File
    gdcm::File &file = reader.GetFile();

    // the dataset is the the set of element we are interested in:
    gdcm::DataSet &ds = file.GetDataSet();

    // Construct a static(*) type for Image Comments :
    gdcm::Attribute<0x0020,0x4000> imagecomments;
    imagecomments.SetValue( "Hello, World !" );

    // Now replace the Image Comments from the dataset with our:
    ds.Replace( imagecomments.GetAsDataElement() );

    // Write the modified DataSet back to disk
    gdcm::Writer writer;
    writer.CheckFileMetaInformationOff(); // Do not attempt to reconstruct the file meta to preserve the file
                                         // as close to the original as possible.
    writer.SetFileName( outfile );
    writer.SetFile( file );
    if( !writer.Write() )
    {
        std::cerr << "Could not write: " << outfile << std::endl;
        return 1;
    }

    return 0;
}

/*
 * (*) static type, means that extra DICOM information VR & VM are computed at compilation time.
 * The compiler is deducing those values from the template arguments of the class.
 */

```

## 14.80 LargeVRDSExplicit.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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```

```

    PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmFileExplicitFilter.h"
#include "gdcmSequenceOfItems.h"

bool interpolate(const double * pts, size_t npts, std::vector<double> &out )
{
    out.clear();
    for(size_t i = 0; i < 2*npts; ++i )
    {
        const size_t j = i / 2;
        if( i % 2 )
        {
            if( j != npts - 1 )
            {
                assert( 3*j+5 < 3*npts );
                const double midpointx = (pts[3*j+0] + pts[3*j+3]) / 2;
                const double midpointy = (pts[3*j+1] + pts[3*j+4]) / 2;
                const double midpointz = (pts[3*j+2] + pts[3*j+5]) / 2;
                out.push_back( midpointx );
                out.push_back( midpointy );
                out.push_back( midpointz );
            }
        }
        else
        {
            assert( j < npts );
            out.push_back( pts[3*j+0] );
            out.push_back( pts[3*j+1] );
            out.push_back( pts[3*j+2] );
        }
    }
    assert( out.size() == 2 * npts * 3 - 3 );
    return true;
}

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }

    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();

    gdcm::FileExplicitFilter fef;
    //fef.SetChangePrivateTags( changeprivatetags );
    fef.SetFile( reader.GetFile() );
    if( !fef.Change() )
    {
        std::cerr << "Failed to change: " << filename << std::endl;
        return 1;
    }

    // (3006,0039) SQ (Sequence with undefined length #=4)      # u/1, 1 ROIContourSequence
    gdcm::Tag tag(0x3006,0x0039);

    const gdcm::DataElement &roicsq = ds.GetDataElement( tag );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = roicsq.GetValueAsSQ();
    //sqi->SetNumberOfItems( 1 );
    const gdcm::Item &item = sqi->GetItem(1); // Item start at #1
    const gdcm::DataSet& nestedds = item.GetNestedDataSet();

    gdcm::Tag tcsq(0x3006,0x0040);
    if( !nestedds.FindDataElement( tcsq ) )
    {

```

```

        return 0;
    }
    const gdcm::DataElement& csq = nesteddds.GetDataElement( tcsq );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi2 = csq.GetValueAsSQ();
    if( !sqi2 || !sqi2->GetNumberOfItems() )
    {
        return 0;
    }
    //unsigned int nitems = sqi2->GetNumberOfItems();
    gdcm::Item & item2 = sqi2->GetItem(1); // Item start at #1

    gdcm::DataSet& nesteddds2 = item2.GetNestedDataSet();
    //item2.SetVLTToUndefined();
    //std::cout << nesteddds2 << std::endl;
    // (3006,0050) DS [43.57636\65.52504\ -10.0\46.043102\62.564945\ -10.0\49.126537\60.714... # 398,48 ContourData
    gdcm::Tag tcontourdata(0x3006,0x0050);
    const gdcm::DataElement & contourdata = nesteddds2.GetDataElement( tcontourdata );
    //std::cout << contourdata << std::endl;

    //const gdcm::ByteValue *bv = contourdata.GetByteValue();
    gdcm::Attribute<0x3006,0x0046> ncontourpoints;
    ncontourpoints.Set( nesteddds2 );

    gdcm::Attribute<0x3006,0x0050> at;
    at.SetFromDataElement( contourdata );
    const double* pts = at.GetValues();
    unsigned int npts = at.GetNumberOfValues() / 3;

    std::vector<double> out( pts, pts + npts * 3 );
    std::vector<double> out2;

    //const unsigned int niter = 7;
    const unsigned int niter = 8;
    for( unsigned int i = 0; i < niter; ++i)
    {
        //bool b =
        interpolate(out.data(), out.size() / 3, out2);
        //const double *pout = &out[0];
        out = out2;
        out2.clear();
    }
    assert( out.size() % 3 == 0 );

    gdcm::Attribute<0x3006,0x0050> at_interpolate;
    at_interpolate.SetNumberOfValues( (unsigned int) out.size() / 3 );
    at_interpolate.SetValues( out.data(), (uint32_t)out.size() );

    ncontourpoints.SetValue( at_interpolate.GetNumberOfValues() / 3 );
    nesteddds2.Replace( at_interpolate.GetAsDataElement() );
    nesteddds2.Replace( ncontourpoints.GetAsDataElement() );

    //assert(0);

    // Let's take item one and subdivide it

    gdcm::TransferSyntax ts = gdcm::TransferSyntax::ImplicitVRLittleEndian;
    ts = gdcm::TransferSyntax::ExplicitVRLittleEndian;

    gdcm::FileMetaInformation &fmi = file.GetHeader();
    const char *tsuid = gdcm::TransferSyntax::GetTSString( ts );
    // const char * is ok since padding is \0 anyway...
    gdcm::DataElement de( gdcm::Tag(0x0002,0x0010) );
    de.SetByteValue( tsuid, (uint32_t)strlen(tsuid) );
    de.SetVR( gdcm::Attribute<0x0002, 0x0010>::GetVR() );
    fmi.Replace( de );
    fmi.Remove( gdcm::Tag(0x0002,0x0012) ); // will be regenerated
    fmi.Remove( gdcm::Tag(0x0002,0x0013) ); // ' ' ' '
    fmi.SetDataSetTransferSyntax(ts);

    gdcm::Writer w;
    w.SetFile( file );
    w.SetFileName( outfilename );
    if ( !w.Write() )
    {
        return 1;
    }

    return 0;
}

```

## 14.81 MakeTemplate.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====*/
#include "gdcmlFileAnonymizer.h"
#include "gdcmlReader.h"
#include "gdcmlWriter.h"

int main(int argc, char *argv[])
{
    if( argc < 3 ) return 1;
    const char* filename = argv[1];
    const char* outfilename = argv[2];

    //gdcml::Trace::DebugOn();

    // Remove Pixel Data element:
    gdcml::FileAnonymizer fa;
    fa.SetInputFileName( filename );
    fa.SetOutputFileName( outfilename );

    fa.Empty( gdcml::Tag(0x7fe0,0x10) );
    // cannot replace in-place DICOM header:
    //fa.Replace( gdcml::Tag(0x2,0x2), "1.2.840.10008.5.1.4.1.1.7" );

    if( !fa.Write() )
    {
        std::cerr << "impossible to remove Pixel Data attribute" << std::endl;
        return 1;
    }

    // Update the DICOM Header:
    gdcml::Reader reader;
    reader.SetFileName( outfilename );
    if( !reader.Read() )
    {
        std::cerr << "could not read back" << std::endl;
        return 1;
    }

    gdcml::File & file = reader.GetFile();
    gdcml::FileMetaInformation &fmi = file.GetHeader();
    gdcml::TransferSyntax ts = gdcml::TransferSyntax::ImplicitVRLittleEndian;
    ts = gdcml::TransferSyntax::ExplicitVRLittleEndian;
    fmi.SetDataSetTransferSyntax(ts);

    gdcml::Writer writer;
    writer.SetFile( file );
    writer.SetFileName( outfilename ); // warning overwrite file !
    if( !writer.Write() )
    {
        std::cerr << "could not write back" << std::endl;
        return 1;
    }

    return 0;
}

```

## 14.82 MergeTwoFiles.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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```

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PURPOSE. See the above copyright notice for more information.

```
=====*/
/*
 * This example will show how one can read in two DICOM files, use the dataset
 * from file1 and use image from file2 to save it in a 3rd file.
 *
 * Eg:
 * MergeTwoFiles gdcmData/012345.002.050.dcm gdcmData/test.acr merge.dcm
 */

#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmWriter.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        return 1;
    }
    const char *file1 = argv[1];
    const char *file2 = argv[2];
    const char *file3 = argv[3];

    // Read file1
    gdcm::ImageReader reader1;
    reader1.SetFileName( file1 );
    if( !reader1.Read() )
    {
        return 1;
    }

    // Read file2
    gdcm::ImageReader reader2;
    reader2.SetFileName( file2 );
    if( !reader2.Read() )
    {
        return 1;
    }

    // Ok now let's take the DataSet from file1 and the Image from file2
    // Warning: if file2 is -for example- a Secondary Capture Storage, then it has no
    // Image Orientation (Patient) thus any Image Orientation (Patient) from file1
    // will be discarded...

    // let's be fancy. In case reader2 contains explicit, but reader1 is implicit
    // we would rather see an implicit output
    if( reader1.GetFile().GetHeader().GetDataSetTransferSyntax() == gdcm::TransferSyntax::ImplicitVRLittleEndian )
    {
        reader2.GetImage().SetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );
    }

    gdcm::ImageWriter writer;
    writer.SetFileName( file3 );
    writer.SetFile( reader1.GetFile() );
    // ImageWriter will always use all of gdcm::Image information and override anything wrong from
    // reader1.GetFile(), including the Transfer Syntax
    writer.SetImage( reader2.GetImage() );

    gdcm::DataSet &ds = reader1.GetFile().GetDataSet();

    // Make sure that SOPInstanceUID are different
    // Simply removing it is sufficient as gdcm::ImageWriter will generate one by default
    // if not found.
    ds.Remove( gdcm::Tag(0x0008,0x0018) );
    if( !writer.Write() )
    {
        return 1;
    }

    return 0;
}
```

## 14.83 MrProtocol.cxx

```
/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
/*
 *
 */

/*
28 - 'MrProtocol' VM 1, VR UN, SyngoDT 0, NoOfItems 6, Data '### ASCCONV BEGIN ###'
ulVersion = 0xbee332
tSequenceFileName = "%SiemensSeq%\fl_fq_shphs"
tProtocolName = "flash+AF8-100+AF8-through-plane+AF8-V"
tReferenceImage0 = "1.3.12.2.1107.5.2.9.16041.30000007062106100181200004658"
tReferenceImage1 = "1.3.12.2.1107.5.2.9.16041.30000007062106100181200004635"
tReferenceImage2 = "1.3.12.2.1107.5.2.9.16041.30000007062106100181200004683"
ucScanRegionPosValid = 0x1
sProtConsistencyInfo.tBaselineString = "N4_VB11A_LATEST_20031004"
sProtConsistencyInfo.flNominalB0 = 1.494
sProtConsistencyInfo.flGMax = 22
sProtConsistencyInfo.flRiseTime = 10
sGRADSPEC.sEddyCompensationX.aflAmplitude[0] = 0.0141111
sGRADSPEC.sEddyCompensationX.aflAmplitude[1] = 0.057038
sGRADSPEC.sEddyCompensationX.aflAmplitude[2] = -0.00986504
sGRADSPEC.sEddyCompensationX.aflAmplitude[3] = 0.00247627
sGRADSPEC.sEddyCompensationX.aflAmplitude[4] = 0.0026377
sGRADSPEC.sEddyCompensationX.aflTimeConstant[0] = 1.53826
sGRADSPEC.sEddyCompensationX.aflTimeConstant[1] = 0.746617
sGRADSPEC.sEddyCompensationX.aflTimeConstant[2] = 0.339236
sGRADSPEC.sEddyCompensationX.aflTimeConstant[3] = 0.0309809
sGRADSPEC.sEddyCompensationX.aflTimeConstant[4] = 0.00067694
sGRADSPEC.sEddyCompensationY.aflAmplitude[0] = 0.0156411
sGRADSPEC.sEddyCompensationY.aflAmplitude[1] = 0.0440623
sGRADSPEC.sEddyCompensationY.aflAmplitude[2] = -0.00782663
sGRADSPEC.sEddyCompensationY.aflAmplitude[3] = 0.00186828
sGRADSPEC.sEddyCompensationY.aflAmplitude[4] = 0.00154504
sGRADSPEC.sEddyCompensationY.aflTimeConstant[0] = 1.47145
sGRADSPEC.sEddyCompensationY.aflTimeConstant[1] = 0.750538
sGRADSPEC.sEddyCompensationY.aflTimeConstant[2] = 0.339397
sGRADSPEC.sEddyCompensationY.aflTimeConstant[3] = 0.0312962
sGRADSPEC.sEddyCompensationY.aflTimeConstant[4] = 0.000895133
sGRADSPEC.sEddyCompensationZ.aflAmplitude[0] = 0.00618504
sGRADSPEC.sEddyCompensationZ.aflAmplitude[1] = 0.00313121
sGRADSPEC.sEddyCompensationZ.aflAmplitude[2] = 0.000289346
sGRADSPEC.sEddyCompensationZ.aflAmplitude[3] = -0.00019677
sGRADSPEC.sEddyCompensationZ.aflAmplitude[4] = 7.66445e-005
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[0] = 3.37462
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[1] = 0.999351
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[2] = 0.0174646
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[3] = 0.0110094
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[4] = 0.00199922
sGRADSPEC.bEddyCompensationValid = 1
sGRADSPEC.sB0CompensationX.aflAmplitude[0] = 0.307474
sGRADSPEC.sB0CompensationX.aflAmplitude[1] = 0.029337
sGRADSPEC.sB0CompensationX.aflAmplitude[2] = -0.187118
sGRADSPEC.sB0CompensationX.aflTimeConstant[0] = 0.98583
sGRADSPEC.sB0CompensationX.aflTimeConstant[1] = 0.0308443
sGRADSPEC.sB0CompensationX.aflTimeConstant[2] = 0.000466792
sGRADSPEC.sB0CompensationY.aflAmplitude[0] = 0.365257
sGRADSPEC.sB0CompensationY.aflAmplitude[1] = -0.318647
sGRADSPEC.sB0CompensationY.aflAmplitude[2] = -0.0118978
sGRADSPEC.sB0CompensationY.aflTimeConstant[0] = 0.61535
sGRADSPEC.sB0CompensationY.aflTimeConstant[1] = 0.488831
sGRADSPEC.sB0CompensationY.aflTimeConstant[2] = 0.00199991
sGRADSPEC.sB0CompensationZ.aflAmplitude[0] = -0.44647
sGRADSPEC.sB0CompensationZ.aflAmplitude[1] = -0.0455154
sGRADSPEC.sB0CompensationZ.aflAmplitude[2] = -0.0304901
sGRADSPEC.sB0CompensationZ.aflTimeConstant[0] = 0.959231
sGRADSPEC.sB0CompensationZ.aflTimeConstant[1] = 0.0720189
```

```

sGRADSPEC.sB0CompensationZ.aflTimeConstant[2] = 0.00190141
sGRADSPEC.sB0CompensationValid              = 1
sGRADSPEC.sCrossTermCompensationXY.aflAmplitude[0] = 0.00105046
sGRADSPEC.sCrossTermCompensationXY.aflTimeConstant[0] = 0.842014
sGRADSPEC.sCrossTermCompensationXZ.aflAmplitude[0] = -0.00150189
sGRADSPEC.sCrossTermCompensationXZ.aflTimeConstant[0] = 0.736169
sGRADSPEC.sCrossTermCompensationYX.aflAmplitude[0] = -5.5278e-005
sGRADSPEC.sCrossTermCompensationYX.aflTimeConstant[0] = 0.228697
sGRADSPEC.sCrossTermCompensationYZ.aflAmplitude[0] = 0.000307999
sGRADSPEC.sCrossTermCompensationYZ.aflTimeConstant[0] = 1.19431
sGRADSPEC.sCrossTermCompensationZX.aflAmplitude[0] = -0.000286868
sGRADSPEC.sCrossTermCompensationZX.aflTimeConstant[0] = 0.665979
sGRADSPEC.sCrossTermCompensationZY.aflAmplitude[0] = 0.000355175
sGRADSPEC.sCrossTermCompensationZY.aflTimeConstant[0] = 0.844189
sGRADSPEC.bCrossTermCompensationValid       = 1
sGRADSPEC.lOffsetX                          = 25
sGRADSPEC.lOffsetY                          = 84
sGRADSPEC.lOffsetZ                          = 47
sGRADSPEC.bOffsetValid                      = 1
sGRADSPEC.lDelayX                           = 12
sGRADSPEC.lDelayY                           = 11
sGRADSPEC.lDelayZ                           = 9
sGRADSPEC.bDelayValid                       = 1
sGRADSPEC.flSensitivityX                    = 0.000264087
sGRADSPEC.flSensitivityY                    = 0.000272009
sGRADSPEC.flSensitivityZ                    = 0.000272677
sGRADSPEC.bSensitivityValid                 = 1
sGRADSPEC.alShimCurrent[0]                  = 183
sGRADSPEC.alShimCurrent[1]                  = -25
sGRADSPEC.alShimCurrent[2]                  = -85
sGRADSPEC.alShimCurrent[3]                  = 378
sGRADSPEC.alShimCurrent[4]                  = 82
sGRADSPEC.bShimCurrentValid                 = 1
sGRADSPEC.ucMode                            = 0x2
sTXSPEC.asNucleusInfo[0].tNucleus           = "1H"
sTXSPEC.asNucleusInfo[0].lFrequency          = 63684693
sTXSPEC.asNucleusInfo[0].bFrequencyValid     = 1
sTXSPEC.asNucleusInfo[0].flReferenceAmplitude = 359.734
sTXSPEC.asNucleusInfo[0].bReferenceAmplitudeValid = 1
sTXSPEC.asNucleusInfo[0].flAmplitudeCorrection = 1
sTXSPEC.asNucleusInfo[0].bAmplitudeCorrectionValid = 1
sTXSPEC.asNucleusInfo[1].bFrequencyValid     = 1
sTXSPEC.asNucleusInfo[1].bReferenceAmplitudeValid = 1
sTXSPEC.asNucleusInfo[1].bAmplitudeCorrectionValid = 1
sTXSPEC.arFPULSE[0].tName                   = "03GreFCE"
sTXSPEC.arFPULSE[0].bAmplitudeValid          = 0x1
sTXSPEC.arFPULSE[0].flAmplitude              = 147.095
sTXSPEC.arFPULSE[1].tName                   = "02GreFCE"
sTXSPEC.arFPULSE[1].bAmplitudeValid          = 0x1
sTXSPEC.arFPULSE[1].flAmplitude              = 147.095
sTXSPEC.arFPULSE[2].tName                   = "01GreFCE"
sTXSPEC.arFPULSE[2].bAmplitudeValid          = 0x1
sTXSPEC.arFPULSE[2].flAmplitude              = 147.095
sTXSPEC.lNoOfTraPulses                      = 3
sTXSPEC.lBTB1ParallelCapacity                = 2
sTXSPEC.lBTB1SerialCapacity                  = 24
sTXSPEC.lBTB2ParallelCapacity                = 2
sTXSPEC.lBTB2SerialCapacity                  = 26
sTXSPEC.bBTBValid                           = 1
sTXSPEC.flKDynMagnitudeMin                   = 0.5
sTXSPEC.flKDynMagnitudeMax                   = 1.5
sTXSPEC.flKDynMagnitudeClipLow                = 0.96
sTXSPEC.flKDynMagnitudeClipHigh              = 1.04
sTXSPEC.flKDynPhaseMax                       = 0.698132
sTXSPEC.flKDynPhaseClip                      = 0.174533
sTXSPEC.bKDynValid                           = 1
sTXSPEC.ucRFPulseType                        = 0x1
sTXSPEC.ucExcitMode                          = 0x1
sTXSPEC.ucSimultaneousExcitation             = 0x1
sRXSPEC.lGain                                = 1
sRXSPEC.bGainValid                           = 1
sRXSPEC.aFFT_SCALE[0].lRxChannel              = 1
sRXSPEC.aFFT_SCALE[0].flFactor                = 1.06857
sRXSPEC.aFFT_SCALE[0].bValid                  = 1
sRXSPEC.aFFT_SCALE[1].lRxChannel              = 2
sRXSPEC.aFFT_SCALE[1].flFactor                = 1.07454
sRXSPEC.aFFT_SCALE[1].bValid                  = 1
sRXSPEC.aFFT_SCALE[2].lRxChannel              = 3
sRXSPEC.aFFT_SCALE[2].flFactor                = 1.06622
sRXSPEC.aFFT_SCALE[2].bValid                  = 1
sRXSPEC.aFFT_SCALE[3].lRxChannel              = 4

```



```

sRXSPEC.aFFT_SCALE[3].flFactor      = 1.06524
sRXSPEC.aFFT_SCALE[3].bValid        = 1
sRXSPEC.aFFT_SCALE[4].lRxChannel    = 5
sRXSPEC.aFFT_SCALE[4].flFactor      = 0.982692
sRXSPEC.aFFT_SCALE[4].bValid        = 1
sRXSPEC.aFFT_SCALE[5].lRxChannel    = 6
sRXSPEC.aFFT_SCALE[5].flFactor      = 0.988603
sRXSPEC.aFFT_SCALE[5].bValid        = 1
sRXSPEC.aFFT_SCALE[6].lRxChannel    = 7
sRXSPEC.aFFT_SCALE[6].flFactor      = 0.981538
sRXSPEC.aFFT_SCALE[6].bValid        = 1
sRXSPEC.aFFT_SCALE[7].lRxChannel    = 8
sRXSPEC.aFFT_SCALE[7].flFactor      = 1.00856
sRXSPEC.aFFT_SCALE[7].bValid        = 1
sRXSPEC.bVariCapVoltagesValid      = 1
sRXSPEC.alDwellTime[0]              = 8500
sAdjFreSpec.ulMode                  = 0x1
sAdjFreSpec.ucAdjWithBC              = 0x1
sAdjTraSpec.ucAdjWithBC              = 0x1
sAdjShimSpec.ulMode                 = 0x1
sAdjShimSpec.ucAdjWithBC              = 0x1
sAdjWatSupSpec.ulMode               = 0x1
sAdjWatSupSpec.ucAdjWithBC           = 0x1
alTR[0]                             = 37000
lContrasts                          = 1
alTE[0]                             = 4000
acFlowComp[0]                      = 1
lCombinedEchoes                     = 1
sSliceArray.asSlice[0].sPosition.dSag = 35.31199581
sSliceArray.asSlice[0].sPosition.dCor = -8.387765754
sSliceArray.asSlice[0].sPosition.dTra = -23.13178296
sSliceArray.asSlice[0].sNormal.dSag   = 0.771051253
sSliceArray.asSlice[0].sNormal.dCor   = 0.5863890019
sSliceArray.asSlice[0].sNormal.dTra   = -0.2482496801
sSliceArray.asSlice[0].dThickness     = 6
sSliceArray.asSlice[0].dPhaseFOV      = 187.5
sSliceArray.asSlice[0].dReadoutFOV    = 250
sSliceArray.lSize                     = 1
sSliceArray.lSag                      = 1
sSliceArray.lConc                     = 1
sSliceArray.ucMode                     = 0x1
sSliceArray.sTSat.dThickness          = 40
sSliceArray.sTSat.dGap                 = 10
sGroupArray.asGroup[0].nSize          = 1
sGroupArray.asGroup[0].dDistFact      = 0.2
sGroupArray.anMember[1]               = -1
sGroupArray.lSize                     = 1
sGroupArray.sPSat.dThickness          = 50
sGroupArray.sPSat.dGap                 = 10
sAutoAlign.dAAMatrix[0]               = 1
sAutoAlign.dAAMatrix[5]               = 1
sAutoAlign.dAAMatrix[10]              = 1
sAutoAlign.dAAMatrix[15]              = 1
sNavigatorPara.ucRespComp              = 0x4
sPrepPulses.ucFatSat                  = 0x4
sPrepPulses.ucWaterSat                = 0x4
sPrepPulses.ucInversion                = 0x4
sPrepPulses.ucSatRecovery              = 0x1
sPrepPulses.ucFatSatMode               = 0x2
sKSpace.lBaseResolution                = 256
sKSpace.lPhaseEncodingLines            = 192
sKSpace.dPhaseResolution                = 1
sKSpace.lPartitions                    = 32
sKSpace.lImagesPerSlab                 = 32
sKSpace.dSliceResolution                = 1
sKSpace.ucPhasePartialFourier           = 0x10
sKSpace.ucSlicePartialFourier           = 0x10
sKSpace.ucAveragingMode                 = 0x2
sKSpace.ucMultiSliceMode                = 0x1
sKSpace.ucDimension                     = 0x2
sKSpace.ucAsymmetricEchoAllowed         = 0x1
sKSpace.unReordering                    = 0x1
sFastImaging.lEPIFactor                 = 1
sFastImaging.lTurboFactor               = 1
sFastImaging.lSegments                  = 3
sFastImaging.ulEnableRFSpoiling         = 0x1
sPhysioImaging.lSignal1                 = 2
sPhysioImaging.lMethod1                 = 2
sPhysioImaging.lSignal2                 = 1
sPhysioImaging.lMethod2                 = 1
sPhysioImaging.lPhases                  = 21

```

```

sPhysioImaging.lRetroGatedImages      = 16
sPhysioImaging.sPhysioECG.lScanWindow = 805
sPhysioImaging.sPhysioECG.lTriggerPulses = 1
sPhysioImaging.sPhysioECG.lTriggerWindow = 5
sPhysioImaging.sPhysioECG.lArrhythmiaDetection = 1
sPhysioImaging.sPhysioECG.lCardiacGateOnThreshold = 100000
sPhysioImaging.sPhysioECG.lCardiacGateOffThreshold = 700000
sPhysioImaging.sPhysioPulse.lTriggerPulses = 1
sPhysioImaging.sPhysioPulse.lTriggerWindow = 5
sPhysioImaging.sPhysioPulse.lCardiacGateOnThreshold = 100000
sPhysioImaging.sPhysioPulse.lCardiacGateOffThreshold = 700000
sPhysioImaging.sPhysioExt.lTriggerPulses = 1
sPhysioImaging.sPhysioExt.lTriggerWindow = 5
sPhysioImaging.sPhysioExt.lCardiacGateOnThreshold = 100000
sPhysioImaging.sPhysioExt.lCardiacGateOffThreshold = 700000
sPhysioImaging.sPhysioResp.lRespGateThreshold = 20
sPhysioImaging.sPhysioResp.lRespGatePhase = 2
sPhysioImaging.sPhysioResp.dGatingRatio = 0.3
sSpecPara.lPhaseCyclingType           = 1
sSpecPara.lPhaseEncodingType          = 1
sSpecPara.lRFExcitationBandwidth      = 1
sSpecPara.ucRemoveOversampling         = 0x1
sSpecPara.lDecouplingType             = 1
sSpecPara.lNOEType                    = 1
sSpecPara.lExcitationType              = 1
sSpecPara.lSpectralSuppression         = 1
sDiffusion.ulMode                     = 0x1
sAngio.sFlowArray.asElm[0].nVelocity   = 100
sAngio.sFlowArray.asElm[0].nDir        = 0x4
sAngio.sFlowArray.lSize                = 1
sAngio.ucPCFlowMode                   = 0x2
sAngio.ucTOFInflow                    = 0x4
sAngio.ucRephasedImage                 = 0x1
sAngio.ucPhaseImage                   = 0x1
sEllipticalFilter.ucMode               = 0x1
sPat.lAccelFactPE                     = 1
sPat.lAccelFact3D                     = 1
sPat.ucPATMode                        = 0x1
sPat.ucRefScanMode                    = 0x1
ucAutoMovie                           = 0x1
ucDisableChangeStoreImages            = 0x1
ucReconstructionMode                  = 0x1
ucPHAPSMODE                           = 0x1
ucDixon                               = 0x1
lAverages                             = 2
adFlipAngleDegree[0]                  = 30
lScanTimeSec                          = 103
lTotalScanTimeSec                     = 112
dRefSNR                               = 165404.1473
dRefSNR_VOI                           = 165404.1473
tdefaultEVAProt                       = "%SiemensEvaDefProt%\Inline\Inline.evp"
tcurrentEVAProt                       = "%CURRENTEVAProt%\EVA2A5.tmp"
sCOIL_SELECT_MEAS.asList[0].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[0].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[0].sCoilElementID.tElement = "PP6"
sCOIL_SELECT_MEAS.asList[0].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[0].lRxChannelConnected = 1
sCOIL_SELECT_MEAS.asList[1].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[1].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[1].sCoilElementID.tElement = "PP5"
sCOIL_SELECT_MEAS.asList[1].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[1].lRxChannelConnected = 1
sCOIL_SELECT_MEAS.asList[2].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[2].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[2].sCoilElementID.tElement = "PP3"
sCOIL_SELECT_MEAS.asList[2].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[2].lRxChannelConnected = 2
sCOIL_SELECT_MEAS.asList[3].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[3].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[3].sCoilElementID.tElement = "PP4"
sCOIL_SELECT_MEAS.asList[3].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[3].lRxChannelConnected = 3
sCOIL_SELECT_MEAS.asList[4].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[4].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[4].sCoilElementID.tElement = "PP2"
sCOIL_SELECT_MEAS.asList[4].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[4].lRxChannelConnected = 4
sCOIL_SELECT_MEAS.asList[5].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[5].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[5].sCoilElementID.tElement = "PP1"
sCOIL_SELECT_MEAS.asList[5].lElementSelected = 1

```

```

sCOIL_SELECT_MEAS.asList[5].lRxChannelConnected = 4
sCOIL_SELECT_MEAS.asList[6].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[6].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[6].sCoilElementID.tElement = "PA6"
sCOIL_SELECT_MEAS.asList[6].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[6].lRxChannelConnected = 5
sCOIL_SELECT_MEAS.asList[7].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[7].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[7].sCoilElementID.tElement = "PA5"
sCOIL_SELECT_MEAS.asList[7].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[7].lRxChannelConnected = 5
sCOIL_SELECT_MEAS.asList[8].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[8].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[8].sCoilElementID.tElement = "PA3"
sCOIL_SELECT_MEAS.asList[8].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[8].lRxChannelConnected = 6
sCOIL_SELECT_MEAS.asList[9].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[9].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[9].sCoilElementID.tElement = "PA4"
sCOIL_SELECT_MEAS.asList[9].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[9].lRxChannelConnected = 7
sCOIL_SELECT_MEAS.asList[10].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[10].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[10].sCoilElementID.tElement = "PA2"
sCOIL_SELECT_MEAS.asList[10].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[10].lRxChannelConnected = 8
sCOIL_SELECT_MEAS.asList[11].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[11].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[11].sCoilElementID.tElement = "PA1"
sCOIL_SELECT_MEAS.asList[11].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[11].lRxChannelConnected = 8
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[0] = 0xff
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[1] = 0x76
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[2] = 0x78
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[3] = 0x87
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[4] = 0x67
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrOfNibbles[0] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrOfNibbles[1] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrOfNibbles[2] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrOfNibbles[3] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrOfNibbles[4] = 0x2
sEFISPEC.bEFIDataValid = 1
### ASCCONV END ###
,
*/

/*
 * Table of equivalence:
 *
ulVersion = 0xbee332
<=>
27 - 'MrProtocolVersion' VM 1, VR IS, SyngoDT 6, NoOfItems 6, Data '12510002'
*/

#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmCSAHeader.h"
#include "gdcmAttribute.h"
#include "gdcmGlobal.h"
#include "gdcmDicts.h"

#include <map>

#include <math.h>

int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }

    gdcm::CSAHeader csa;

```

```

const gdcm::DataSet& ds = reader.GetFile().GetDataSet();

//const gdcm::PrivateTag &t1 = csa.GetCSAImageHeaderInfoTag();
const gdcm::PrivateTag &t2 = csa.GetCSASeriesHeaderInfoTag();

if( ds.FindDataElement( t2 ) )
{
    csa.LoadFromDataElement( ds.GetDataElement( t2 ) );
    //csa.Print( std::cout );
}

if( !csa.FindCSAElementByName( "MrProtocol" ) )
{
    return 1;
}

const gdcm::CSAElement &csael = csa.GetCSAElementByName( "MrProtocol" );
//std::cout << csael << std::endl;

const gdcm::ByteValue *bv = csael.GetByteValue();
if( !bv )
{
    return 1;
}

std::string str(bv->GetPointer(), bv->GetLength());
std::istream is(str);
std::string s;
typedef std::map< std::string, std::string > MyMapType;
MyMapType mymap;
while( std::getline(is, s) )
{
    std::string::size_type pos = s.find( '=' );
    if( pos != std::string::npos )
    {
        std::string sub1 = s.substr(0, pos);
        sub1.erase( sub1.find_last_not_of(' ') + 1);
        std::string sub2 = s.substr(pos+1); // skip the '=' char
        sub2.erase( 0, sub2.find_first_not_of(' '));
        //std::cout << sub1 << std::endl;
        mymap.insert( MyMapType::value_type(sub1, sub2) );
    }
    else
    {
        // ### ASCCONV BEGIN ###
        // ### ASCCONV END ###
    }
}

const char fourierstr[] = "sKSpace.ucSlicePartialFourier";
const gdcm::CSAHeaderDict &csadict = gdcm::Global::GetInstance().GetDicts().GetCSAHeaderDict();
const gdcm::CSAHeaderDictEntry &fourier = csadict.GetCSAHeaderDictEntry( fourierstr );
std::cout << fourier << std::endl;
MyMapType::const_iterator it = mymap.find( fourierstr );
if( it == mymap.end() ) return 1;
//std::cout << it->second << std::endl;
const std::string &partial_fourier = it->second;
if( partial_fourier == "0x1" )
{
    std::cout << "partial fourier is 4/8" << std::endl;
}
else if( partial_fourier == "0x2" )
{
    std::cout << "partial fourier is 5/8" << std::endl;
}
else if( partial_fourier == "0x4" )
{
    std::cout << "partial fourier is 6/8" << std::endl;
}
else if( partial_fourier == "0x8" )
{
    std::cout << "partial fourier is 7/8" << std::endl;
}
else if( partial_fourier == "0x10" )
{
    std::cout << "partial fourier is 8/8" << std::endl;
}
else
{
    std::cerr << "Impossible: " << partial_fourier << std::endl;
    return 1;
}
}

/*
This is the Flip Angle:

```

```
adFlipAngleDegree[0] = 30
```

One can find it also in the protocol:

```
...
    <ParamFunctor."<TlmapFunctor">">
    {
        <Class> "<TlmapFunctor@IceImagePostProcFunctors">"

        <ParamBool."<EXECUTE">"> { }
        <ParamDouble."<Flip1_deg">"> { <Precision> 16 14.7378520000000000 }
    }
...

*/
// Below is an attempt to play with the CSAHeader dict:
#ifdef 0
const char gspec[] = "sGRADSPEC.flSensitivityX";
it = mymap.find( gspec );
if( it == mymap.end() ) return 1;
const std::string &dummy = it->second;
std::cout << dummy << std::endl;

const gdcm::CSAHeaderDictEntry &csaentry = csadict.GetCSAHeaderDictEntry( gspec );
std::cout << csaentry << std::endl;
#endif

/*
    sSliceArray.ucMode -- should be in (1, 2, 4)
    enum SeriesMode
    {
        ASCENDING    = 0x01,
        DESCENDING    = 0x02,
        INTERLEAVED   = 0x04
    };
*/
const char sliceorderstr[] = "sSliceArray.ucMode";
const gdcm::CSAHeaderDictEntry &sliceorder = csadict.GetCSAHeaderDictEntry( sliceorderstr );
std::cout << sliceorder << std::endl;

it = mymap.find ( sliceorderstr );
if( it == mymap.end() ) return 1;
const std::string &slice_order = it->second;
if( slice_order == "0x1" )
{
    std::cout << "slice_order: ASCENDING" << std::endl;
}
else if( slice_order == "0x2" )
{
    std::cout << "slice_order: DESCENDING" << std::endl;
}
else if( slice_order == "0x4" )
{
    std::cout << "slice_order: INTERLEAVED" << std::endl;
}
else
{
    std::cerr << "Impossible: " << slice_order << std::endl;
    return 1;
}

gdcm::MrProtocol mrprot;
if( csa.GetMrProtocol(ds, mrprot) )
{
    std::cout << mrprot << std::endl;
}

return 0;
}
```

## 14.84 PrintLUT.cxx

```
/*=====
Program: GDCM (Grassroots DICOM). A DICOM library
```

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 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR  
 PURPOSE. See the above copyright notice for more information.

```

=====*/
/*
*/

#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmImage.h"
#include "gdcmPhotometricInterpretation.h"

#include <iostream>

int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " input.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];

    // Instantiate the image reader:
    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
        return 1;
    }
    const gdcm::Image &image = reader.GetImage();

    const gdcm::LookupTable & lut = image.GetLUT();
    lut.Print( std::cout );

    return 0;
}

```

## 14.85 PublicDict.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
PURPOSE. See the above copyright notice for more information.

=====*/
/*
* Dummy example to show GDCM Dict(s) API (Part 6) + Collected Private Attributes:
*/

#include "gdcmGlobal.h"
#include "gdcmDicts.h"
#include "gdcmDict.h"
#include "gdcmCSAHeader.h"
#include "gdcmPrivateTag.h"

int main(int , char *[])
{
    const gdcm::Global& g = gdcm::Global::GetInstance(); // sum of all knowledge !
    const gdcm::Dicts &dicts = g.GetDicts();

```

```

const gdcmm::Dict &pub = dictss.GetPublicDict(); // Part 6

//std::cout << pub << std::endl;

// 3 different ways to access the same information

// 1. From the public dict only:
gdcmm::Tag patient_name(0x10,0x10);
const gdcmm::DictEntry &entry1 = pub.GetDictEntry(patient_name);
std::cout << entry1 << std::endl;

// 2. From all dicts:
const gdcmm::DictEntry &entry2 = dictss.GetDictEntry(patient_name);
std::cout << entry2 << std::endl;

// 3. This solution is the most flexible solution as you can request using the same
// API either a public tag or a private tag
const char *strowner = nullptr;
const gdcmm::DictEntry &entry3 = dictss.GetDictEntry(patient_name,strowner);
std::cout << entry3 << std::endl;

// Private attributes:

// try with a private tag now:
const gdcmm::PrivateTag &private_tag = gdcmm::CSAHeader::GetCSAImageHeaderInfoTag();
//std::cout << private_tag << std::endl;
const gdcmm::DictEntry &entry4 = dictss.GetDictEntry(private_tag,private_tag.GetOwner());
std::cout << entry4 << std::endl;

// Let's pretend that private lookup is on 0x10xx elements:
gdcmm::PrivateTag dummy = private_tag;
dummy.SetElement( (uint16_t) (0x1000 + dummy.GetElement()) );
const gdcmm::DictEntry &entry5 = dictss.GetDictEntry(dummy,dummy.GetOwner());
std::cout << entry5 << std::endl;

return 0;
}

```

## 14.86 QIDO-RS.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmmReader.h"
#include "gdcmmWriter.h"
#include "gdcmmJSON.h"

/*
 * Simple QIDO-RS round-trip to test implementation of gdcmm::JSON
 * See Supl66 for details
 */
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    using namespace gdcmm;
    const char *filename = argv[1];
    gdcmm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() ) return 1;

    gdcmm::JSON json;
    json.PrettyPrintOn();
    std::stringstream ss;
    const gdcmm::File & f = reader.GetFile();

```

```

json.Code( f.GetDataSet(), ss);

std::cout << ss.str() << std::endl;

gdcm::Writer w;
gdcm::File & ff = w.GetFile();
ff.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
if( !json.Decode(ss, ff.GetDataSet() ) )
{
    std::cerr << "Could not decode" << std::endl;
    return 1;
}
w.SetFileName( "/tmp/debug.dcm" );
if( !w.Write() ) return 1;

return 0;
}

```

## 14.87 ReadAndDumpDICOMDIR.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====*/

/*
 * This example shows how to read and dump a DICOMDIR File
 *
 * Thanks:
 * Tom Marynowski (lordglub gmail) for contributing this example
 */
#include "gdcmReader.h"
#include "gdcmMediaStorage.h"

typedef std::set<gdcm::DataElement> DataElementSet;
typedef DataElementSet::const_iterator ConstIterator;

int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];

    gdcm::Reader reader;
    reader.SetFileName( filename);
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
        return 1;
    }
    std::stringstream strm;

    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    gdcm::FileMetaInformation &fmi = file.GetHeader();

    gdcm::MediaStorage ms;
    ms.SetFromFile(file);
    if( ms != gdcm::MediaStorage::MediaStorageDirectoryStorage )
    {
        std::cout << "This file is not a DICOMDIR" << std::endl;
        return 1;
    }

    if (fmi.FindDataElement( gdcm::Tag (0x0002, 0x0002)))
    {
        strm.str("");
        fmi.GetDataElement( gdcm::Tag (0x0002, 0x0002) ).GetValue().Print(strm);
    }
    else

```



```

{
    std::cerr << " Media Storage Sop Class UID not present" << std::endl;
}

//TODO il faut trimer strm.str() avant la comparaison au cas ou...
if ("1.2.840.10008.1.3.10"!=strm.str())
{
    std::cout << "This file is not a DICOMDIR" << std::endl;
    return 1;
}

ConstIterator it = ds.GetDES().begin();

for( ; it != ds.GetDES().end(); ++it)
{
    if (it->GetTag()==gdcm::Tag (0x0004, 0x1220))
    {
        const gdcm::DataElement &de = (*it);
        // ne pas utiliser GetSequenceOfItems pour extraire les items
        gdcm::SmartPointer<gdcm::SequenceOfItems> sqi =de.GetValueAsSQ();
        unsigned int itemused = 1;
        while (itemused<=sqi->GetNumberOfItems())
        {
            strm.str("");

            if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
                sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);

            //TODO il faut trimer strm.str() avant la comparaison
            while((strm.str()=="PATIENT")||((strm.str()=="PATIENT ")))
            {
                std::cout << strm.str() << std::endl;
                strm.str("");
                if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0010, 0x0010)))
                    sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0010, 0x0010)).GetValue().Print(strm);
                std::cout << "PATIENT NAME : " << strm.str() << std::endl;

                //PATIENT ID
                strm.str("");
                if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0010, 0x0020)))
                    sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0010, 0x0020)).GetValue().Print(strm);
                std::cout << "PATIENT ID : " << strm.str() << std::endl;

                /*ADD TAG TO READ HERE*/
                std::cout << "===== " << std::endl;
                itemused++;
                strm.str("");
                if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
                    sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);

                //TODO il faut trimer strm.str() avant la comparaison
                while((strm.str()=="STUDY")||((strm.str()=="STUDY ")))
                {
                    std::cout << " " << strm.str() << std::endl;
                    //UID
                    strm.str("");
                    if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0020, 0x000d)))
                        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0020, 0x000d)).GetValue().Print(strm);
                    std::cout << "          STUDY UID : " << strm.str() << std::endl;

                    //STUDY DATE
                    strm.str("");
                    if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x0020)))
                        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x0020)).GetValue().Print(strm);
                    std::cout << "          STUDY DATE : " << strm.str() << std::endl;

                    //STUDY DESCRIPTION
                    strm.str("");
                    if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x1030)))
                        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x1030)).GetValue().Print(strm);
                    std::cout << "          STUDY DESCRIPTION : " << strm.str() << std::endl;

                    /*ADD TAG TO READ HERE*/
                    std::cout << "          " << "===== " << std::endl;

                    itemused++;
                    strm.str("");
                }
            }
        }
    }
}

```

```

if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
    sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);

//TODO il faut trimer strm.str() avant la comparaison
while ((strm.str()=="SERIES")||((strm.str()=="SERIES ")))
{
    std::cout << "          " << strm.str() << std::endl;
    strm.str("");
    if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0020, 0x000e)))
        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0020, 0x000e)).GetValue().Print(strm);
    std::cout << "          SERIE UID" << strm.str() << std::endl;

    //SERIE MODALITY
    strm.str("");
    if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x0060)))
        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x0060)).GetValue().Print(strm);
    std::cout << "          SERIE MODALITY" << strm.str() << std::endl;

    //SERIE DESCRIPTION
    strm.str("");
    if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x103e)))
        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x103e)).GetValue().Print(strm);
    std::cout << "          SERIE DESCRIPTION" << strm.str() << std::endl;

    /*ADD TAG TO READ HERE*/

    std::cout << "          " << "===== " << std::endl;
    itemused++;
    strm.str("");
    if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);

    //TODO il faut trimer strm.str() avant la comparaison
    while ((strm.str()=="IMAGE")||((strm.str()=="IMAGE ")))
        // if(tmp=="IMAGE")
        {
            std::cout << "          " << strm.str() << std::endl;

            //UID
            strm.str("");
            if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1511)))
                sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1511)).GetValue().Print(strm);
            std::cout << "          IMAGE UID : " << strm.str() << std::endl;

            //PATH de l'image
            strm.str("");
            if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1500)))
                sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1500)).GetValue().Print(strm);
            std::cout << "          IMAGE PATH : " << strm.str() << std::endl;
            /*ADD TAG TO READ HERE*/

            if(itemused < sqi->GetNumberOfItems())
                {itemused++;}
            else{break;}

            strm.str("");

            if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
                sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);

        }
    }
    itemused++;
}
return 0;
}

```

## 14.88 ReadAndDumpDICOMDIR2.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/

/*
 * This example shows how to read and dump a DICOMDIR File
 *
 * Thanks:
 *   Tom Marynowski (lordglub gmail) for contributing the original
 *   ReadAndDumpDICOMDIR.cxx example
 *   Mihail Isakov for contributing offset calculation code here:
 *   https://sourceforge.net/p/gdcm/mailman/gdcm-developers/?viewmonth=201707&viewday=15
 *   Tod Baudais for combining the above and cleaning up this example
 */

#include <string>
#include <unordered_map>
#include <iostream>
#include <memory>

#include "gdcmReader.h"
#include "gdcmAttribute.h"
#include "gdcmDirectory.h"

//=====
//=====

#define TAG_MEDIA_STORAGE_SOP_CLASS_UID 0x0002,0x0002
#define TAG_DIRECTORY_RECORD_SEQUENCE 0x0004,0x1220
#define TAG_DIRECTORY_RECORD_TYPE 0x0004,0x1430
#define TAG_PATIENTS_NAME 0x0010,0x0010
#define TAG_PATIENT_ID 0x0010,0x0020
#define TAG_STUDY_DATE 0x0008,0x0020
#define TAG_STUDY_DESCRIPTION 0x0008,0x1030
#define TAG_MODALITY 0x0008,0x0060
#define TAG_SERIES_DESCRIPTION 0x0008,0x103E
#define TAG_REFERENCED_FILE_ID 0x0004,0x1500
#define TAG_REFERENCED_LOWER_LEVEL_DIRECTORY_ENTITY_OFFSET 0x0004,0x1420
#define TAG_NEXT_DIRECTORY_RECORD_OFFSET 0x0004,0x1400

//=====
// Some handy utility functions
//=====

std::string left_trim(const std::string &s) {
    std::string ss(s);
    ss.erase(ss.begin(), std::find_if(ss.begin(), ss.end(), std::not1(std::ptr_fun<int, int>(std::isspace))));
    return ss;
}

std::string right_trim(const std::string &s) {
    std::string ss(s);
    ss.erase(std::find_if(ss.rbegin(), ss.rend(), std::not1(std::ptr_fun<int, int>(std::isspace))).base(),
              ss.end());
    return ss;
}

std::string trim(const std::string &s) {
    return left_trim(right_trim(s));
}

//=====
// This code could be put in a header file somewhere
//=====

class DICOMDIRReader {
public:
    DICOMDIRReader() {}
    DICOMDIRReader(const DICOMDIRReader &rhs) = delete;

```

```

        DICOMDIRReader & operator = (DICOMDIRReader &&rhs) = delete;
        DICOMDIRReader & operator = (const DICOMDIRReader &rhs) = delete;
        virtual ~DICOMDIRReader (DICOMDIRReader &&rhs) = delete;
        (void) {}

public:
    struct Common {
        int64_t child_offset;
        int64_t sibling_offset;
    };

    struct Image: public Common {
        std::string path;
    };

    struct Series: public Common {
        std::string modality;
        std::string description;

        std::vector<std::shared_ptr<Image>> children;
    };

    struct Study: public Common {
        std::string date;
        std::string description;

        std::vector<std::shared_ptr<Series>> children;
    };

    struct Patient: public Common {
        std::string name;
        std::string id;

        std::vector<std::shared_ptr<Study>> children;
    };

    struct Other: public Common {
    };

    const std::vector<std::shared_ptr<Patient>>& load (const std::string &path);

    const std::vector<std::shared_ptr<Patient>>& patients (void) { return _patients; }

private:
    template <class T>
    std::string get_string (const T &ds, const gdcm::Tag &tag)
    {
        std::stringstream strm;
        if (ds.FindDataElement(tag)) {
            auto &de = ds.GetDataElement(tag);
            if (!de.IsEmpty() && !de.IsUndefinedLength())
                de.GetValue().Print(strm);
        }
        return trim(strm.str());
    }

    template <class P, class C, class O>
    void reassemble_hierarchy (P &parent_offsets, C &child_offsets, O &other_offsets)
    {
        for (auto &parent : parent_offsets) {
            int64_t sibling_offset;
            auto c = child_offsets[parent.second->child_offset];
            if (!c) {
                auto o = other_offsets[parent.second->child_offset];
                if (!o) {
                    continue;
                } else {
                    sibling_offset = o->sibling_offset;
                }
            } else {
                parent.second->children.push_back(c);
                sibling_offset = c->sibling_offset;
            }

            // Get all siblings
            while (sibling_offset) {
                c = child_offsets[sibling_offset];
                if (!c) {
                    auto o = other_offsets[sibling_offset];
                    if (!o) {

```

```

        break;
    } else {
        sibling_offset = o->sibling_offset;
    }
} else {
    parent.second->children.push_back(c);
    sibling_offset = c->sibling_offset;
}
}
}

std::vector<std::shared_ptr<Patient> _patients;
};

//=====
// This code could be put in an implementation file somewhere
//=====

const std::vector<std::shared_ptr<DICOMDIRReader::Patient>>& DICOMDIRReader::load (const std::string &path)
{
    _patients.clear();

    //
    // Read the dataset from the DICOMDIR file
    //

    gdcm::Reader reader;
    reader.SetFileName(path.c_str());
    if(!reader.Read()) {
        throw std::runtime_error("Unable to read file");
    }

    // Retrieve information from file
    auto &file = reader.GetFile();
    auto &data_set = file.GetDataSet();
    auto &file_meta_information = file.GetHeader();

    // Retrieve and check the Media Storage class from file
    gdcm::MediaStorage media_storage;
    media_storage.SetFromFile(file);
    if(media_storage != gdcm::MediaStorage::MediaStorageDirectoryStorage) {
        throw std::runtime_error("This file is not a DICOMDIR");
    }

    auto media_storage_sop_class_uid = get_string(file_meta_information,
        gdcm::Tag(TAG_MEDIA_STORAGE_SOP_CLASS_UID));

    // Make sure we have a DICOMDIR file
    if (media_storage_sop_class_uid != "1.2.840.10008.1.3.10") {
        throw std::runtime_error("This file is not a DICOMDIR");
    }

    //
    // Offset to first item courtesy of Mihail Isakov
    //

    gdcm::VL first_item_offset = 0;
    auto it = data_set.Begin();
    for(; it != data_set.End() && it->GetTag() != gdcm::Tag(TAG_DIRECTORY_RECORD_SEQUENCE); ++it) {
        first_item_offset += it->GetLength<gdcm::ExplicitDataElement>();
    }
    // Tag (4 bytes)
    first_item_offset += it->GetTag().GetLength();
    // VR field
    first_item_offset += it->GetVR().GetLength();
    // VL field
    // For Explicit VR: adventitiously VL field length = VR field length,
    // for SQ 4 bytes:
    // http://dicom.nema.org/medical/dicom/current/output/html/part05.html#table_7.1-1
    first_item_offset += it->GetVR().GetLength();

    //
    // Iterate all data elements
    //

    // For each item in data set
    for(auto data_element : data_set.GetDES()) {

        // Only look at Directory sequence
        if (data_element.GetTag() != gdcm::Tag(TAG_DIRECTORY_RECORD_SEQUENCE))

```

```

        continue;

    auto item_sequence = data_element.GetValueAsSQ();
    auto num_items = item_sequence->GetNumberOfItems();

    //
    // Compute an offset table
    //

    // Start calculation of offset to each item courtesy of Mihail Isakov
    std::vector<int64_t> item_offsets(num_items+1);
    item_offsets[0] = file_meta_information.GetFullLength() + static_cast<int64_t>(first_item_offset);

    //
    // Extract out all of the items
    //

    std::unordered_map<int64_t, std::shared_ptr<Patient> patient_offsets;
    std::unordered_map<int64_t, std::shared_ptr<Study> study_offsets;
    std::unordered_map<int64_t, std::shared_ptr<Series> series_offsets;
    std::unordered_map<int64_t, std::shared_ptr<Image> image_offsets;
    std::unordered_map<int64_t, std::shared_ptr<Other> other_offsets;

    for (uint32_t item_index = 1; item_index <= num_items; ++item_index) {
        auto &item = item_sequence->GetItem(item_index);

        // Add offset for item to offset table
        item_offsets[item_index] = item_offsets[item_index-1] + item.GetLength<gdcm::ExplicitDataElement>();

        // Child offset
        gdcm::Attribute<TAG_REFERENCED_LOWER_LEVEL_DIRECTORY_ENTITY_OFFSET> child_offset;
        child_offset.SetFromDataElement(item.GetDataElement(gdcm::Tag
(TAG_REFERENCED_LOWER_LEVEL_DIRECTORY_ENTITY_OFFSET)));

        // Sibling offset
        gdcm::Attribute<TAG_NEXT_DIRECTORY_RECORD_OFFSET> sibling_offset;
        sibling_offset.SetFromDataElement(item.GetDataElement(gdcm::Tag
(TAG_NEXT_DIRECTORY_RECORD_OFFSET)));

        // Record Type
        auto record_type = trim(get_string(item, gdcm::Tag (TAG_DIRECTORY_RECORD_TYPE)));

        // std::cout << "record_type " << record_type << " at " << item_offsets[item_index-1] << std::endl;
        // std::cout << " child_offset " << child_offset.GetValue() << std::endl;
        // std::cout << " sibling_offset " << sibling_offset.GetValue() << std::endl;

        // Extract patient information
        if (record_type == "PATIENT") {
            auto patient = std::make_shared<Patient>();
            patient->name = get_string(item, gdcm::Tag (TAG_PATIENTS_NAME));
            patient->id = get_string(item, gdcm::Tag (TAG_PATIENT_ID));

            patient->child_offset = child_offset.GetValue();
            patient->sibling_offset = sibling_offset.GetValue();
            patient_offsets[item_offsets[item_index-1]] = patient;

        // Extract study information
        } else if (record_type == "STUDY") {
            auto study = std::make_shared<Study>();
            study->date = get_string(item, gdcm::Tag (TAG_STUDY_DATE));
            study->description = get_string(item, gdcm::Tag (TAG_STUDY_DESCRIPTION));

            study->child_offset = child_offset.GetValue();
            study->sibling_offset = sibling_offset.GetValue();
            study_offsets[item_offsets[item_index-1]] = study;

        // Extract series information
        } else if (record_type == "SERIES") {
            auto series = std::make_shared<Series>();
            series->modality = get_string(item, gdcm::Tag (TAG_MODALITY));
            series->description = get_string(item, gdcm::Tag (TAG_SERIES_DESCRIPTION));

            series->child_offset = child_offset.GetValue();
            series->sibling_offset = sibling_offset.GetValue();
            series_offsets[item_offsets[item_index-1]] = series;

        // Extract image information
        } else if (record_type == "IMAGE") {
            auto image = std::make_shared<Image>();

```

```

        image->path = get_string(item, gdcm::Tag (TAG_REFERENCED_FILE_ID));

        image->child_offset = child_offset.GetValue();
        image->sibling_offset = sibling_offset.GetValue();
        image_offsets[item_offsets[item_index-1]] = image;
    } else {
        auto other = std::make_shared<Other>();

        other->child_offset = child_offset.GetValue();
        other->sibling_offset = sibling_offset.GetValue();
        other_offsets[item_offsets[item_index-1]] = other;
    }
}

// Check validity
if (patient_offsets.size() == 0)
    throw std::runtime_error("Unable to find patient record");

reassemble_hierarchy(series_offsets, image_offsets, other_offsets);
reassemble_hierarchy(study_offsets, series_offsets, other_offsets);
reassemble_hierarchy(patient_offsets, study_offsets, other_offsets);

// Set the new root
for (auto &patient : patient_offsets) {
    _patients.push_back(patient.second);
}

return _patients;
}

//=====
// Quick test
//=====

int main(int argc, const char *argv[]) {
    DICOMDIRReader reader;

    try {
        if (argc != 2)
            throw std::runtime_error("Wrong number of arguments");

        auto &patients = reader.load(argv[1]);

        for (auto &patient : patients) {

            std::cout << "PATIENT" << std::endl;
            std::cout << "NAME: " << patient->name << std::endl;
            std::cout << "ID: " << patient->id << std::endl;

            int x = 0;
            for (auto &study : patient->children) {
                std::cout << "    STUDY" << std::endl;
                std::cout << "        DESCRIPTION: " << study->description << std::endl;
                std::cout << "        DATE: " << study->date << std::endl;

                for (auto &series : study->children) {
                    x+=1;
                    std::cout << "            SERIES " << x << std::endl;
                    std::cout << "            DESCRIPTION: " << series->description << std::endl;
                    std::cout << "            MODALITY: " << series->modality << std::endl;

                    for (auto &image : series->children) {
                        std::cout << "                IMAGE PATH: " << image->path << std::endl;
                    }
                }
            }
        }
    }
    catch (...) {
        // TODO handle this
        return EXIT_FAILURE;
    }

    return EXIT_SUCCESS;
}

```

## 14.89 ReadAndPrintAttributes.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
 * This small example will show how one can read and print
 * a DICOM Attribute using different technique (by tag or by name)
 */

#include "gdcmReader.h"
#include "gdcmGlobal.h"
#include "gdcmDicts.h"
#include "gdcmDict.h"
#include "gdcmAttribute.h"
#include "gdcmStringFilter.h"

#include <iostream>

int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " input.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];

    // Instantiate the reader:
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
        return 1;
    }

    // The output of gdcm::Reader is a gdcm::File
    gdcm::File &file = reader.GetFile();

    // the dataset is the the set of element we are interested in:
    gdcm::DataSet &ds = file.GetDataSet();

    const gdcm::Global& g = gdcm::Global::GetInstance();
    const gdcm::Dicts &dicts = g.GetDicts();
    const gdcm::Dict &pubdict = dicts.GetPublicDict();

    using namespace gdcm;

    // In this example we will show why using name to lookup attribute can be
    // dangerous.
    Tag tPatientName(0x00,0x00);
    //const DictEntry &del =
    pubdict.GetDictEntryByName("Patient Name", tPatientName);

    std::cout << "Found: " << tPatientName << std::endl;

    // Indeed the attribute could not be found. Since DICOM 2003, Patient Name
    // has become Patient's Name.

    Tag tPatientsName;
    //const DictEntry &de2 =
    pubdict.GetDictEntryByName("Patient's Name", tPatientsName);

    std::cout << "Found: " << tPatientsName << std::endl;

    // Let's try to read an arbitrary DICOM Attribute:
    Tag tDoseGridScaling;
    //const DictEntry &de3 =

```



```

pubdict.GetDictEntryByName("Dose Grid Scaling", tDoseGridScaling);

std::cout << "Found: " << tDoseGridScaling << std::endl;

if( ds.FindDataElement( tDoseGridScaling ) )
{
    gdcm::StringFilter sf;
    sf.SetFile(file);
    std::cout << "Attribute Value as String: " << sf.ToString( tDoseGridScaling ) << std::endl;

    // Let's check the name again:
    std::pair<std::string, std::string> pss
        = sf.ToStringPair( tDoseGridScaling );
    std::cout << "Attribute Name Checked: " << pss.first << std::endl;
    std::cout << "Attribute Value (string): " << pss.second << std::endl;

    //const DataElement &dgs = ds.GetDataElement( tDoseGridScaling );

    // Let's assume for a moment we knew the tag number:
    Attribute<0x3004,0x000e> at;
    assert( at.GetTag() == tDoseGridScaling );
    at.SetFromDataSet( ds );
    // For the sake of long term maintenance, we will not write
    // that this particular attribute is stored as a double. What if
    // a user made a mistake. It is much safer to rely on GDCM internal
    // mechanism to deduce the VR::DS type (represented as a iieee double)
    Attribute<0x3004,0x000e>::ArrayType v = at.GetValue();
    std::cout << "DoseGridScaling=" << v << std::endl;
}

return 0;
}

```

## 14.90 ReadExplicitLengthSQIVR.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "gdcmByteValue.h"
#include "gdcmDataSet.h"
#include "gdcmImplicitDataElement.h"
#include "gdcmPrivateTag.h"
#include "gdcmReader.h"
#include "gdcmSequenceOfItems.h"

using namespace gdcm;

int main(int argc, char *argv[])
{
    if ( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader r;
    r.SetFileName( filename );
    r.Read();

    //gdcm::PrivateTag pt(0x01,0x42,"ELSCINT1");
    //gdcm::Tag pt(0x88,0x200);
    gdcm::Tag pt(0x8,0x1140);
    DataSet &ds = r.GetFile().GetDataSet();
    const DataElement &de = ds.GetDataElement( pt );

    std::cout << de << std::endl;
    const ByteValue *bv = de.GetByteValue();
    SmartPointer<SequenceOfItems> sqi = new SequenceOfItems;
    sqi->SetLength( bv->GetLength() );
}

```

```

std::stringstream ss;
ss.str( std::string( bv->GetPointer(), bv->GetLength() ) );
sqi->Read<ImplicitDataElement, SwapperNoOp>( ss );

std::cout << *sqi << std::endl;

return 0;
}

```

## 14.91 ReadGEMSSDO.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmlReader.h"
#include "gdcmlDataElement.h"
#include "gdcmlPrivateTag.h"

#include <iostream>
#include <string>

using namespace gdcml;

struct SDOElement
{
    typedef std::vector<std::string>::size_type SizeType;
    const char *GetData(SizeType index) const {
        return Data[index].c_str();
    }
    SizeType GetNumberOfData() const {
        return Data.size();
    }
    void SetData(SizeType index, const char *data) {
        Data[index] = data;
    }
    const char *GetDataFormat() const {
        return DataFormat.c_str();
    }
    void SetDataFormat(const char *dataformat, SizeType num) {
        DataFormat = dataformat;
        Data.resize( num );
    }
    void Print( std::ostream &os ) const {
        os << DataFormat << ":" << std::endl;
        std::vector<std::string>::const_iterator it = Data.begin();
        size_t s = 0;
        for( ; it != Data.end(); ++it )
        {
            os << " (" << s++ << ") " << *it << std::endl;
        }
    }
private:
    std::string DataFormat;
    std::vector<std::string> Data;
};

class SDOHeader
{
public:
    typedef std::vector<SDOElement> SDOElements;
    typedef SDOElements::size_type SizeType;
    SizeType GetNumberOfSDOElements() const {
        return InternalSDODataset.size();
    }
    void AddSDOElement(SDOElement const &sdoelement) {
        InternalSDODataset.push_back( sdoelement );
    }

```

```

    }
    const SDOElement &GetSDOElement(SizeType index) const {
        return InternalSDODataset[index];
    }
    const SDOElement &GetSDOElementByName(const char *) const {
        return InternalSDODataset[0];
    }
    void LoadFromAttributes(std::string const &s1, std::string const &s2)
    {
        std::string tok;
        std::string tok2;
        std::stringstream strstr(s1);
        std::stringstream strstr2(s2);

        SDOElement element;
        // Do format
        size_t count = 0;
        while ( std::getline ( strstr2, tok, '\\') )
        {
            //std::cout << tok << " ";
            std::getline ( strstr2, tok2, '\\' );
            //std::cout << tok2 << std::endl;
            count += atoi( tok2.c_str() );
            element.SetDataFormat( tok.c_str(), atoi( tok2.c_str() ) );
            for( size_t t = 0; t < element.GetNumberOfData(); ++t )
            {
                std::getline ( strstr, tok, '\\' );
                element.SetData(t, tok.c_str() );
            }
            AddSDOElement( element );
        }
        //while ( std::getline ( strstr, tok, '^' ) )
        // while ( std::getline ( strstr, tok, '\\') )
        // {
        //     std::cout << tok << std::endl;
        //     count++;
        // }
        // std::cout << "Count: " << count << std::endl;
        // count = 0;

        // std::cout << "Count: " << count << std::endl;

    }
    void Print( std::ostream &os ) const {
        SDOElements::const_iterator it = InternalSDODataset.begin();
        for( ; it != InternalSDODataset.end(); ++it )
        {
            it->Print ( os );
        }
    }
private:
    SDOElements InternalSDODataset;
};

bool sdo_decode( DataElement const &stringdata, DataElement const &stringdataformat )
{
    const char *sd = stringdata.GetByteValue()->GetPointer();
    const size_t len_sd = stringdata.GetByteValue()->GetLength();

    std::string s1 = std::string( sd, len_sd );

    const char *sdf = stringdataformat.GetByteValue()->GetPointer();
    const size_t len_sdf = stringdataformat.GetByteValue()->GetLength();

    std::string s2 = std::string( sdf, len_sdf );

    // std::cout << s1 << std::endl;
    // std::cout << s2 << std::endl;

    SDOHeader header;
    header.LoadFromAttributes( s1, s2 );

    header.Print( std::cout );

    return true;
}

int main(int argc, char *argv[])
{
    if( argc < 2 )
    {

```

```

    std::cerr << argv[0] << " input.dcm" << std::endl;
    return 1;
}
const char *filename = argv[1];
Reader reader;
reader.SetFileName( filename );
if( !reader.Read() )
{
    return 1;
}

File &file = reader.GetFile();
DataSet &ds = file.GetDataSet();

// StringData (0033,xx1F) 3 "GEMS_GENIE_1" List of SDO parameters stored as
// list of strings
const PrivateTag tstringdata(0x33,0x1f,"GEMS_GENIE_1");
// StringDataFormat (0033,xx23) 3 "GEMS_GENIE_1" Format of string parameters;
// contains information about name and number of strings in list
const PrivateTag tstringdataformat(0x33,0x23,"GEMS_GENIE_1");

if( !ds.FindDataElement( tstringdata ) ) return 1;
const DataElement& stringdata = ds.GetDataElement( tstringdata );
if( !ds.FindDataElement( tstringdataformat ) ) return 1;
const DataElement& stringdataformat = ds.GetDataElement( tstringdataformat );

sdo_decode( stringdata, stringdataformat );

return 0;
}

```

## 14.92 ReadMultiTimesException.cxx

```

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Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
// The intention of this sample program is to provoke bad_alloc exceptions in gdcm code

#include "gdcmImageReader.h"

int main(int argc, char* argv[])
{
    // We pre-allocate some memory (about 1Gb) to help the issue to show up earlier
    char *dummyBuffer = new char[1024*1024*1100]; (void)dummyBuffer;
    // Check the number of parameters given
    if (argc < 3)
    {
        std::cerr << "Usage: " << argv[0] << " Filename numberOfTries" << std::endl;
        return 1;
    }

    std::cout << "We are going to read the file: " << argv[1] << " " << argv[2] << " times" << std::endl;
    // We hold the pointers in an array to avoid the memory to be released
    // We read the input file n-times
    for (int i = 0; i < atoi(argv[2]); ++i)
    {
        gdcm::ImageReader reader;
        std::cout << "Reading try: " << i << std::endl;
        // Read files
        reader.SetFileName(argv[1]);
        try
        {
            reader.Read();
            gdcm::Image &img = reader.GetImage();
            unsigned long len = img.GetBufferLength();
            char *buffer = new char[ len ];

```

```

        img.GetBuffer( buffer ); // do NOT de-allocate buffer !
    }
    catch (std::bad_alloc &ba)
    {
        (void)ba;
        std::cerr << "BAD ALLOC Exception caught!" << std::endl;
    }
    catch (...)
    {
        std::cerr << "Exception caught!" << std::endl;
    }
}

return 0;
}

```

## 14.93 ReadUTF8QtDir.cxx

```

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=====*/
/*
 * GDCM API expect a const char * as input for SetFileName
 * In order to use this API from Qt, here is a simple test that
 * shows how to do it in a portable manner:
 *
 * http://doc.qt.nokia.com/latest/qdir.html#navigation-and-directory-operations
 */

#include "gdcmReader.h"
#include "gdcmDirectory.h"

#include <QDir>
#include <QString>
#include <QCoreApplication>

#include <string>
#include <fstream>

#include <stdio.h> // fopen

static int TestBothFuncs(const char *info , const char *ba_str)
{
    int res = 0;
    FILE *f = fopen( ba_str, "r" );
    if( f )
    {
        std::cout << info << " fopen: " << ba_str << std::endl;
        fclose(f);
        ++res;
    }
    gdcm::Reader reader;
    std::ifstream is( ba_str, std::ios::binary );
    if( is.is_open() )
    {
        std::cout << info << " is_open: " << ba_str << std::endl;
        ++res;
    }
    reader.SetStream( is );
    if( reader.CanRead() == true )
    {
        std::cout << info << " SetStream/CanRead:" << ba_str << std::endl;
        ++res;
    }
    is.close();
    reader.SetFileName( ba_str );
}

```

```

    if( reader.CanRead() == true )
    {
        std::cout << info << " SetFileName/CanRead:" << ba_str << std::endl;
        ++res;
    }
    return 4 - res;
}

static int scanFolder(const char dirname[])
{
    int res = 0;
    gdcm::Directory dir;
    unsigned int nfiles = dir.Load( dirname, true );
    const gdcm::Directory::FileNamesType &filenames = dir.GetFileNames();

    for( unsigned int i = 0; i < nfiles; ++i )
    {
        const char *ba_str = filenames[i].c_str();
        res += TestBothFuncs("GDCM",ba_str);
    }
    return res;
}

static int scanFolderQt(QDir const &dir, QStringList& files)
{
    int res = 0;
    QFileInfoList children = dir.entryInfoList(QDir::AllEntries|QDir::NoDotAndDotDot);
    for ( int i=0; i<children.count(); i++ ) {
        QFileInfo file = children.at(i);
        if ( file.isDir() == true ) {
            res += scanFolderQt(QDir(file.absoluteFilePath()), files);
            continue;
        }
        // Convert back from the internal representation to 8bits
        // toLocal8Bit() returns by copy. Need to store explicitly the QByteArray
        QByteArray str = file.absoluteFilePath().toLocal8Bit();
        const char *ba_str1 = str.constData();
        res += TestBothFuncs("QString", ba_str1);
    }
    return res;
}

int main(int argc, char *argv[])
{
    // very important:
    QCoreApplication qCoreApp( argc , argv );
    if( argc < 2 )
    {
        std::cerr << argv[0] << " dir " << std::endl;
        return 1;
    }

    int res = 0;
    const char *dirname = argv[1];
    res += scanFolder( dirname );

    QDir dir( QString::fromLocal8Bit(dirname) );
    QStringList files;
    res += scanFolderQt( dir, files);

    if( res )
        std::cerr << "Problem with UTF-8" << std::endl;
    else
        std::cerr << "Success with UTF-8" << std::endl;

    return res;
}

```

## 14.94 SimpleScanner.cxx

```

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```

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```

=====*/
/*
 * Simple example to show how to use Scanner API.
 * It exposes the three different cases:
 * - DICOM Attribute is present and has a value
 * - DICOM Attribute is present and has no value
 * - DICOM Attribute is not present at all
 * It also shows the purpose of the function 'IsKey' to detect whether or
 * not the file has been read by the gdcm::Scanner. Technically most of the time
 * if a file is not a 'Key' this is because it is not a DICOM file. You need to use
 * gdcm::System::FileExists to decide whether or not the file actually exist on the disk.
 *
 * It was tested on this particular image:
 * ./SimpleScanner gdcmData/012345.002.050.dcm
 */

#include "gdcmStrictScanner.h"
#include "gdcmSimpleSubjectWatcher.h"
#include "gdcmFileNameEvent.h"

class MyFileWatcher : public gdcm::SimpleSubjectWatcher
{
public:
    MyFileWatcher(gdcm::Subject * s, const char *comment = ""):
        gdcm::SimpleSubjectWatcher(s,comment){}
    void ShowFileName(gdcm::Subject *, const gdcm::Event &evt) override
    {
        const gdcm::FileNameEvent &pe = dynamic_cast<const gdcm::FileNameEvent&>(evt);
        const char *fn = pe.GetFileName();
        std::cout << "FileName: " << fn << " FileSize: " << gdcm::System::FileSize( fn ) << std::endl;
    }
};

int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        return 1;
    }
    const char *filename = argv[1];
    const char filename_invalid[] = "this is a file that may not exist on this disk.dcm";

    gdcm::SmartPointer<gdcm::StrictScanner> sp = new gdcm::StrictScanner;
    gdcm::StrictScanner &s = *sp;
    //gdcm::SimpleSubjectWatcher w(&s, "TestFileName" );
    MyFileWatcher w(&s, "TestFileName" );

    const gdcm::Tag tag_array[] = {
        gdcm::Tag(0x8,0x50),
        gdcm::Tag(0x8,0x51),
        gdcm::Tag(0x8,0x60),
        gdcm::Tag(0x8,0x80),
    };
    s.AddTag( tag_array[0] );
    s.AddTag( tag_array[1] );
    s.AddTag( tag_array[2] );
    s.AddTag( tag_array[3] );

    gdcm::Directory::FileNamesType filenames;
    filenames.push_back( filename );
    filenames.push_back( filename_invalid );

    if( !s.Scan( filenames ) )
    {
        return 1;
    }

    //s.Print( std::cout );

    for(gdcm::Directory::FileNamesType::const_iterator it = filenames.begin();
        it != filenames.end(); ++it )
    {
        if( s.IsKey( it->c_str() ) )

```

```

        {
            std::cout << "INFO:" << it->c_str() << " is a proper Key for the Scanner (this is a DICOM file)" << std::endl;
        }
    else
    {
        std::cout << "INFO:" << it->c_str() << " is not a proper Key for the Scanner (this is either not a DICOM file
        or file does not exist)" << std::endl;
    }
}

gdcmm::StrictScanner::TagToValue const &ttv = s.GetMapping(filename);

const gdcmm::Tag *ptag = tag_array;
for( ; ptag != tag_array + 3; ++ptag )
{
    gdcmm::StrictScanner::TagToValue::const_iterator it = ttv.find( *ptag );
    if( it != ttv.end() )
    {
        std::cout << *ptag << " was properly found in this file" << std::endl;
        // it contains a pair of value. the first one is the actual tag, so the following is always true:
        // *ptag == it->first
        // The second part is the actual value (stored as RAW strings). You will have to reinterpret this string
        // if VR for *ptag is not VR::VRASCII !
        const char *value = it->second;
        if( *value )
        {
            std::cout << " It has the value: " << value << std::endl;
        }
    else
    {
        std::cout << " It has no value (empty)" << std::endl;
    }
}
else
{
    std::cout << "Sorry " << *ptag << " could not be found in this file" << std::endl;
}
}

return 0;
}

```

## 14.95 SortImage.cxx

```

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=====*/
/*
*/
#include "gdcmmSorter.h"
#include "gdcmmScanner.h"
#include "gdcmmDataSet.h"
#include "gdcmmAttribute.h"

bool mysort(gdcmm::DataSet const & ds1, gdcmm::DataSet const & ds2 )
{
    //gdcmm::Attribute<0x0020,0x0013> at1; // Instance Number
    gdcmm::Attribute<0x0018,0x1060> at1; // Trigger Time
    gdcmm::Attribute<0x0020,0x0032> at11; // Image Position (Patient)
    at1.Set( ds1 );
    at11.Set( ds1 );
    //gdcmm::Attribute<0x0020,0x0013> at2;
    gdcmm::Attribute<0x0018,0x1060> at2;
    gdcmm::Attribute<0x0020,0x0032> at22;
    at2.Set( ds2 );
}

```



```

    at22.Set( ds2 );
    if( at11 == at22 )
    {
        return at1 < at2;
    }
    return at11 < at22;
}

bool mysort_part1(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    gdcm::Attribute<0x0018,0x1060> at1;
    at1.Set( ds1 );
    gdcm::Attribute<0x0018,0x1060> at2;
    at2.Set( ds2 );
    return at1 < at2;
}

bool mysort_part2(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    gdcm::Attribute<0x0020,0x0032> at1;
    at1.Set( ds1 );
    gdcm::Attribute<0x0020,0x0032> at2;
    at2.Set( ds2 );
    return at1 < at2;
}

// technically all files are in the same Frame of Reference, so this function
// should be a no-op
bool mysort_dummy(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    gdcm::Attribute<0x0020,0x0052> at1; // FrameOfReferenceUID
    at1.Set( ds1 );
    gdcm::Attribute<0x0020,0x0052> at2;
    at2.Set( ds2 );
    return at1 < at2;
}

int main(int argc, char *argv[])
{
    if (argc < 2 ) return 1;
    const char *dirname = argv[1];
    gdcm::Directory dir;
    unsigned int nfiles = dir.Load( dirname );

    dir.Print( std::cout );

    gdcm::Sorter sorter;
    sorter.SetSortFunction( mysort );
    sorter.Sort( dir.GetFilesNames() );

    std::cout << "Sorter:" << std::endl;
    sorter.Print( std::cout );

    gdcm::Sorter sorter2;
    sorter2.SetSortFunction( mysort_part1 );
    sorter2.StableSort( dir.GetFilesNames() );
    sorter2.SetSortFunction( mysort_part2 );
    sorter2.StableSort( sorter2.GetFilesNames() ); // IMPORTANT
    sorter2.SetSortFunction( mysort_dummy );
    sorter2.StableSort( sorter2.GetFilesNames() ); // IMPORTANT

    std::cout << "Sorter2:" << std::endl;
    sorter2.Print( std::cout );

    gdcm::Scanner s;
    s.AddTag( gdcm::Tag(0x20,0x32) ); // Image Position (Patient)
    //s.AddTag( gdcm::Tag(0x20,0x37) ); // Image Orientation (Patient)
    s.Scan( dir.GetFilesNames() );

    //s.Print( std::cout );

    // Count how many different IPP there are:
    const gdcm::Scanner::ValueType &values = s.GetValues();
    size_t nvalues = values.size();
    std::cout << "There are " << nvalues << " different type of values" << std::endl;

    //std::cout << "nfiles=" << nfiles << std::endl;
    if( nfiles % nvalues != 0 )
    {
        std::cerr << "Impossible: this is a not a proper series" << std::endl;
        return 1;
    }
}

```

```

    }
    std::cout << "Series is composed of " << (nfiles/nvalues) << " different 3D volumes" << std::endl;
    return 0;
}

```

## 14.96 StreamImageReaderTest.cxx

```

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=====*/
// This work was realised during the GSOC 2011 by Manoj Alwani

#include "gdcmlStreamImageReader.h"
#include "gdcmlFileMetaInformation.h"
#include "gdcmlSystem.h"
#include "gdcmlFilename.h"
#include "gdcmlByteSwap.h"
#include "gdcmlTrace.h"
#include "gdcmlTesting.h"
#include "gdcmlImageHelper.h"
#include "gdcmlImageReader.h"
#include "gdcmlImage.h"
#include "gdcmlMediaStorage.h"
#include "gdcmlRAWCodec.h"
#include "gdcmlJPEGGLSCodec.h"
#include "gdcmlUIDGenerator.h"
#include "gdcmlStreamImageWriter.h"
#include "gdcmlAttribute.h"
#include "gdcmlFile.h"
#include "gdcmlTag.h"

bool StreamImageRead(gdcml::StreamImageWriter & theStreamWriter,
    const char* filename, const char* outfilename, int resolution)
{
    gdcml::StreamImageReader reader;

    reader.SetFileName( filename );

    if (!reader.ReadImageInformation())
    {
        std::cerr << "unable to read image information" << std::endl;
        return 1; //unable to read tags as expected.
    }
    //let's be tricky; each image will be read in portions, first the top half, then the bottom
    //that way, we can test how the stream handles fragmentation of the data
    //we could also loop this to get various different size combinations, but I'm not sure
    //that's useful, yet.
    std::vector<unsigned int> extent =
        gdcml::ImageHelper::GetDimensionsValue(reader.GetFile());
    // std::cout << extent[0];
    //at this point, these values aren't used, but may be in the future
    //unsigned short xmin = 0;
    //unsigned short xmax = extent[0];
    //unsigned short ymin = 0;
    //unsigned short ymax = extent[1];
    //unsigned short zmin = 0;
    //unsigned short zmax = extent[2];

    std::cout<< "\n Row: " << extent[0] << "\n Col : " << extent[1] << "\n Resolution : " << extent[2] << std::endl;

    int a = 1;
    for (int i=1; i<=(extent[2]-resolution); ++i)

```

```

    a = a*2;

    reader.DefinePixelExtent(0, extent[0]/a, 0, extent[1]/a, resolution-1, resolution);

    unsigned long len = reader.DefineProperBufferLength();
    char* finalBuffer = new char[len];
    memset(finalBuffer, 0, sizeof(char)*len);

    if (reader.CanReadImage())
    {
        bool result = reader.Read(finalBuffer, len);
        if( !result )
        {
            std::cout << "res2 failure:" << filename << std::endl;
            delete [] finalBuffer;
            return 1;
        }
        else
        {
            std::cout<< "Able to read";
        }
    }
    else
    {
        std::cerr<< "Not able to put in buffer"<< std::endl;
    }

/*
    //now, read in smaller buffer extents
    reader.DefinePixelExtent(xmin, xmax, ymin, ymax);
    len = reader.DefineProperBufferLength();

    char* buffer = new char[len];
    bool res2 = reader.Read(buffer, len);
    if( !res2 ){
        std::cerr << "res2 failure:" << filename << std::endl;
        return 1;
    }
    //copy the result into finalBuffer
    memcpy(finalBuffer, buffer, len);

    //now read the next half of the image
    ymin = ymax;
    ymax = extent[1];

    reader.DefinePixelExtent(xmin, xmax, ymin, ymax);

    //std::cerr << "Success to read image from file: " << filename << std::endl;
    unsigned long len2 = reader.DefineProperBufferLength();

    char* buffer2 = new char[len2];
    bool res3 = reader.Read(buffer2, len2);
    if( !res3 ){
        std::cerr << "res3 failure:" << filename << std::endl;
        return 1;
    }
    //copy the result into finalBuffer
    memcpy(&(finalBuffer[len]), buffer2, len2);

    delete [] buffer;
    delete [] buffer2;
*/

    gdcm::Writer w;
    gdcm::File &file = w.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();

    file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );

    gdcm::UIDGenerator uid;
    gdcm::DataElement de( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
    de.SetVR( gdcm::VR::UI );
    const char *u = uid.Generate();
    de.SetByteValue( u, strlen(u) );
    ds.Insert( de );

    gdcm::DataElement del( gdcm::Tag(0x8,0x16) );
    del.SetVR( gdcm::VR::UI );
    gdcm::MediaStorage ms( gdcm::MediaStorage::VLWholeSlideMicroscopyImageStorage );
    del.SetByteValue( ms.GetString(), strlen(ms.GetString()) );

```

```

ds.Insert( del );

const char mystr[] = "MONOCHROME2 ";
gdcm::DataElement de2( gdcm::Tag(0x28,0x04) );
//de.SetTag(gdcm::Tag(0x28,0x04));
de2.SetVR( gdcm::VR::CS );
de2.SetByteValue(mystr, strlen(mystr));
ds.Insert( de2 );

gdcm::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
ds.Insert( Number_Of_Frames.GetAsDataElement() );

gdcm::Attribute<0x0028,0x0010> row = {extent[0]/a};//
ds.Insert( row.GetAsDataElement() );

gdcm::Attribute<0x0028,0x0011> col = {extent[1]/a};//
ds.Insert( col.GetAsDataElement() );

gdcm::Attribute<0x0028,0x0100> at = {8};
ds.Insert( at.GetAsDataElement() );

gdcm::Attribute<0x0028,0x0002> at1 = {1};//
ds.Insert( at1.GetAsDataElement() );

gdcm::Attribute<0x0028,0x0101> at2 = {8};
ds.Insert( at2.GetAsDataElement() );

gdcm::Attribute<0x0028,0x0102> at3 = {7};
ds.Insert( at3.GetAsDataElement() );
/*
ds1.Remove( gdcm::Tag(0x0028,0x0008) );

gdcm::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
ds1.Insert( Number_Of_Frames.GetAsDataElement() );
*/
theStreamWriter.SetFile(file);

if (!theStreamWriter.WriteImageInformation())
{
    std::cerr << "unable to write image information" << std::endl;
    return 1; //the CanWrite function should prevent getting here, else,
    //that's a test failure
}
std::vector<unsigned int> extent1 = gdcm::ImageHelper::GetDimensionsValue(file);

unsigned short xmax = extent1[0];
unsigned short ymax = extent1[1];
unsigned short theChunkSize = 1;
unsigned short ychunk = extent1[1]/theChunkSize; //go in chunk sizes of theChunkSize
unsigned short zmax = 1;

std::cout << "\n Row: " << extent1[0] << "\n Col : " << extent1[1] << "\n Resolution : " << extent1[2] << std::endl;

if (xmax == 0 || ymax == 0)
{
    std::cerr << "Image has no size, unable to write zero-sized image." << std::endl;
    return 0;
}

int z, y, nexty;
unsigned long prevLen = 0; //when going through the char buffer, make sure to grab
//the bytes sequentially. So, store how far you got in the buffer with each iteration.

for (z = 0; z < zmax; ++z){
    for (y = 0; y < ymax; y += ychunk){
        nexty = y + ychunk;
        if (nexty > ymax) nexty = ymax;
        theStreamWriter.DefinePixelExtent(0, xmax, y, nexty, z, z+1);
        unsigned long len = theStreamWriter.DefineProperBufferLength();
        std::cout << "\n" << len;
        char* finalBuffer1 = new char[len];
        memcpy(finalBuffer1, &(finalBuffer[prevLen]), len);
        std::cout << "\nable to write";

        if (!theStreamWriter.Write(finalBuffer1, len)){
            std::cerr << "writing failure:" << "output.dcm" << " at y = " << y << " and z = " << z << std::endl;
            delete [] finalBuffer1;
            delete [] finalBuffer;
            return 1;
        }
        delete [] finalBuffer1;
    }
}

```

```

        prevLen += len;
    }
}
delete [] finalBuffer;
std::cout << "all is set";

return true;
}

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm Resolution" << std::endl;
        return 1;
    }

    const char *filename = argv[1];
    const char *outfilename = argv[2];
    char *res = argv[3];

    int resolution = atoi(res);

    gdcm::StreamImageWriter theStreamWriter;

    std::ofstream of;
    of.open( outfile, std::ios::out | std::ios::binary );
    theStreamWriter.SetStream(of);

    // else
    // First of get rid of warning/debug message
    gdcm::Trace::DebugOn();
    gdcm::Trace::WarningOn();

    if(!StreamImageRead( theStreamWriter, filename, outfile, resolution))
        return 1;

    uint16_t firstTag1 = 0xfffe;
    uint16_t secondTag1 = 0xe0dd;
    uint32_t thirdTag1 = 0x00000000;
    //uint16_t fourthTag1 = 0xffff;
    const int theBufferSize = 2*sizeof(uint16_t)+sizeof(uint32_t);
    char* tmpBuffer2 = new char[theBufferSize];
    memcpy(&(tmpBuffer2[0]), &firstTag1, sizeof(uint16_t));
    memcpy(&(tmpBuffer2[sizeof(uint16_t)]), &secondTag1, sizeof(uint16_t));
    memcpy(&(tmpBuffer2[2*sizeof(uint16_t)]), &thirdTag1, sizeof(uint32_t));
    //memcpy(&(tmpBuffer2[3*sizeof(uint16_t)]), &fourthTag1, sizeof(uint16_t));
    assert( of && !of.eof() && of.good() );
    of.write(tmpBuffer2, theBufferSize);
    of.flush();
    assert( of );

    return 0;
}

```

## 14.97 TemplateEmptyImage.cxx

```

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=====*/
#include "gdcmFileStreamer.h"
#include "gdcmTag.h"
#include "gdcmTrace.h"
#include "gdcmImageRegionReader.h"
#include "gdcmImageHelper.h"

```

```

#include "gdcmWriter.h"
#include "gdcmImageWriter.h"
#include "gdcmTagKeywords.h"
#include "gdcmUIDGenerator.h"

int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char * filename = argv[1];
    gdcm::ImageRegionReader irr;
    irr.SetFileName( filename );
    const bool b3 = irr.ReadInformation();
    std::cout << b3 << std::endl;
    gdcm::Image & img = irr.GetImage();
    std::cout << img << std::endl;
    // const gdcm::Region & r = irr.GetRegion();
    // std::cout << r << std::endl;
    gdcm::ImageWriter w;
    gdcm::File & file = w.GetFile();
    gdcm::DataSet & ds = file.GetDataSet();

    gdcm::UIDGenerator uid;
    namespace kwd = gdcm::Keywords;
    kwd::FrameOfReferenceUID frameref;
    frameref.SetValue( uid.Generate() );
    // ContentDate
    char date[22];
    const size_t datelen = 8;
    int res = gdcm::System::GetCurrentDateTime(date);
    (void)res;
    kwd::ContentDate contentdate;
    // Do not copy the whole cstring:
    contentdate.SetValue( gdcm::DAComp( date, datelen ) );
    ds.Insert( contentdate.GetAsDataElement() );
    // ContentTime
    const size_t timelen = 6 + 1 + 6; // time + milliseconds
    kwd::ContentTime contenttime;
    // Do not copy the whole cstring:
    contenttime.SetValue( gdcm::TMComp(date+datelen, timelen) );
    ds.Insert( contenttime.GetAsDataElement() );
    gdcm::MediaStorage ms0 = w.ComputeTargetMediaStorage();
    std::cout << ms0 << std::endl;
    kwd::SeriesNumber seriesnumber = { 1 };
    kwd::InstanceNumber instancenum = { 1 };
    kwd::StudyID studyid = { "St1" };
    kwd::PatientID patientid = { "P1" };
    kwd::SOPClassUID sopclassuid;
    kwd::PositionReferenceIndicator pri;
    //kwd::Laterality lat;
    //kwd::BodyPartExamined bodypartex = { "HEAD" };
    kwd::BodyPartExamined bodypartex = { "ANKLE" };
    kwd::PatientOrientation pator;
    kwd::BurnedInAnnotation bia = { "NO" };
    kwd::ConversionType convtype = { "SYN" };
    kwd::PresentationLUTShape plutshape = { "IDENTITY" }; // MONOCHROME2
    // gdcm will pick the Word in case Byte class is not compatible:
    gdcm::MediaStorage ms = gdcm::MediaStorage::MultiframeGrayscaleByteSecondaryCaptureImageStorage;
    sopclassuid.SetValue( ms.GetString() );
    ds.Insert( instancenum.GetAsDataElement() );
    ds.Insert( sopclassuid.GetAsDataElement() );
    ds.Insert( seriesnumber.GetAsDataElement() );
    ds.Insert( patientid.GetAsDataElement() );
    ds.Insert( studyid.GetAsDataElement() );
    ds.Insert( frameref.GetAsDataElement() );
    ds.Insert( pri.GetAsDataElement() );
    //ds.Insert( lat.GetAsDataElement() );
    ds.Insert( bodypartex.GetAsDataElement() );
    ds.Insert( pator.GetAsDataElement() );
    ds.Insert( bia.GetAsDataElement() );
    ds.Insert( convtype.GetAsDataElement() );
    ds.Insert( plutshape.GetAsDataElement() );
    // gdcm::MediaStorage ms1 = w.ComputeTargetMediaStorage();
    // std::cout << ms1 << std::endl;
    std::cout << ds << std::endl;
    gdcm::PixelFormat & pf = img.GetPixelFormat();
    pf.SetPixelRepresentation(0); // always overwrite
    img.SetSlope(1);
    img.SetIntercept(0);
    w.SetImage( img );
    w.SetFileName( "TemplateImage.dcm" );
    if( !w.Write() )

```

```

    {
        return 1;
    }

    return 0;
}

```

## 14.98 TraverseModules.cxx

```

/*=====
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=====*/
/*
*/

#include "gdcmDefs.h"
#include "gdcmGlobal.h"
#include "gdcmIODs.h"
#include "gdcmIOD.h"
#include "gdcmMacros.h"
#include "gdcmIODEntry.h"
#include "gdcmModules.h"
#include "gdcmModule.h"
#include "gdcmAnonymizer.h"
#include "gdcmDicts.h"

int main(int , char *[])
{
    using namespace gdcm;
    static Global &g = Global::GetInstance();

    if( !g.LoadResourcesFiles() )
    {
        return 1;
    }

    static const Defs &defs = g.GetDefs();
    static const Modules &modules = defs.GetModules();
    static const IODs &iods = defs.GetIODs();
    static const Macros &macros = defs.GetMacros();
    static const Dicts &dicts = g.GetDicts();

    std::vector<Tag> tags = gdcm::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes();
    for( std::vector<Tag>::const_iterator tit = tags.begin(); tit != tags.end(); ++tit )
    {
        const Tag &tag = *tit;
        const DictEntry &dictentry = dicts.GetDictEntry(tag);
        std::cout << "Processing Attribute: " << tag << " " << dictentry << std::endl;

        IODs::IODMapTypeConstIterator it = iods.Begin();
        for( ; it != iods.End(); ++it )
        {
            const IODs::IODName &name = it->first;
            const IOD &iod = it->second;

            const size_t niods = iod.GetNumberOfIODs();
            // Iterate over each iod entry in order:
            for(unsigned int idx = 0; idx < niods; ++idx)
            {
                const IODEntry &iodentry = iod.GetIODEntry(idx);
                const char *ref = iodentry.GetRef();
                //Usage::UsageType ut = iodentry.GetUsageType();

                const Module &module = modules.GetModule( ref );
                if( module.FindModuleEntryInMacros(macros, tag) )

```

```

        {
            const ModuleEntry &module_entry = module.GetModuleEntryInMacros(macros,tag);
            Type type = module_entry.GetType();
            std::cout << "IOD Name: " << name << std::endl;
            std::cout << "Type: " << type << std::endl;
        }
    }
}

return 0;
}

```

## 14.99 VolumeSorter.cxx

```

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=====*/
*/
#include "gdcmSorter.h"
#include "gdcmIPPSorter.h"
#include "gdcmScanner.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"
#include "gdcmTesting.h"

bool mysort1(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    gdcm::Attribute<0x0020,0x000d> at1;
    at1.Set( ds1 );
    gdcm::Attribute<0x0020,0x000d> at2;
    at2.Set( ds2 );
    return at1 < at2;
}

bool mysort2(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    gdcm::Attribute<0x0020,0x000e> at1;
    at1.Set( ds1 );
    gdcm::Attribute<0x0020,0x000e> at2;
    at2.Set( ds2 );
    return at1 < at2;
}

bool mysort3(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    // This is a floating point number is the comparison ok ?
    gdcm::Attribute<0x0020,0x0037> at1;
    at1.Set( ds1 );
    gdcm::Attribute<0x0020,0x0037> at2;
    at2.Set( ds2 );
    return at1 < at2;
}

bool mysort4(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    // Do the IPP sorting here
    gdcm::Attribute<0x0020,0x0032> ipp1;
    gdcm::Attribute<0x0020,0x0037> iop1;
    ipp1.Set( ds1 );
    iop1.Set( ds1 );
    gdcm::Attribute<0x0020,0x0032> ipp2;
    gdcm::Attribute<0x0020,0x0037> iop2;

```



```

ipp2.Set( ds2 );
iop2.Set( ds2 );
if( iop1 != iop2 )
{
    return false;
}

// else
double normal[3];
normal[0] = iop1[1]*iop1[5] - iop1[2]*iop1[4];
normal[1] = iop1[2]*iop1[3] - iop1[0]*iop1[5];
normal[2] = iop1[0]*iop1[4] - iop1[1]*iop1[3];
double dist1 = 0;
for( int i = 0; i < 3; ++i) dist1 += normal[i]*ipp1[i];
double dist2 = 0;
for( int i = 0; i < 3; ++i) dist2 += normal[i]*ipp2[i];

std::cout << dist1 << "," << dist2 << std::endl;
return dist1 < dist2;
}

int main(int argc, char *argv[])
{
    const char *extradataroot = gdcm::Testing::GetDataExtraRoot();
    std::string dir1;
    if( argc < 2 )
    {
        if( !extradataroot )
        {
            return 1;
        }
        dir1 = extradataroot;
        dir1 += "/gdcmSampleData/ForSeriesTesting/VariousIncidences/ST1";
    }
    else
    {
        dir1 = argv[1];
    }

    gdcm::Directory d;
    d.Load( dir1, true ); // recursive !
    const gdcm::Directory::FileNamesType &l1 = d.GetFileNames();
    const size_t nfiles = l1.size();
    std::cout << nfiles << std::endl;

    //if( nfiles != 280 )
    // {
    //     return 1;
    // }

    //d.Print( std::cout );

    gdcm::Scanner s0;
    const gdcm::Tag t1(0x0020,0x000d); // Study Instance UID
    const gdcm::Tag t2(0x0020,0x000e); // Series Instance UID
    //const gdcm::Tag t3(0x0010,0x0010); // Patient's Name
    s0.AddTag( t1 );
    s0.AddTag( t2 );
    //s0.AddTag( t3 );
    //s0.AddTag( t4 );
    //s0.AddTag( t5 );
    //s0.AddTag( t6 );
    bool b = s0.Scan( d.GetFileNames() );
    if( !b )
    {
        std::cerr << "Scanner failed" << std::endl;
        return 1;
    }

    //s0.Print( std::cout );

    // Only get the DICOM files:
    gdcm::Directory::FileNamesType l2 = s0.GetKeys();
    const size_t nfiles2 = l2.size();
    std::cout << nfiles2 << std::endl;

    if ( nfiles2 > nfiles )
    {
        return 1;
    }
}

```

```

    }

    gdcmm::Sorter sorter;
    sorter.SetSortFunction( mysort1 );
    sorter.StableSort( 12 );

    sorter.SetSortFunction( mysort2 );
    sorter.StableSort( sorter.GetFileNames() );

    sorter.SetSortFunction( mysort3 );
    sorter.StableSort( sorter.GetFileNames() );

    sorter.SetSortFunction( mysort4 );
    sorter.StableSort( sorter.GetFileNames() );

    //sorter.Print( std::cout );

    // Let's try to check our result:
    // assume that IPP is precise enough so that we can test floating point equality:
    size_t nvalues = 0;
{
    gdcmm::Scanner s;
    s.AddTag( gdcmm::Tag(0x20,0x32) ); // Image Position (Patient)
    //s.AddTag( gdcmm::Tag(0x20,0x37) ); // Image Orientation (Patient)
    s.Scan( d.GetFileNames() );

    //s.Print( std::cout );

    const gdcmm::Scanner::ValueType &values = s.GetValues();
    nvalues = values.size();
    std::cout << "There are " << nvalues << " different type of values" << std::endl;
    assert( nfiles2 % nvalues == 0 );
    std::cout << "Series is composed of " << (nfiles/nvalues) << " different 3D volumes" << std::endl;
}

    gdcmm::Directory::FileNamesType sorted_files = sorter.GetFileNames();

    // Which means we can take nvalues files at a time and execute gdcmm::IPPSorter on it:
    gdcmm::IPPSorter ippsorter;
    gdcmm::Directory::FileNamesType sub( sorted_files.begin(), sorted_files.begin() + nvalues);
    std::cout << sub.size() << std::endl;
    std::cout << sub[0] << std::endl;
    std::cout << sub[nvalues-1] << std::endl;
    ippsorter.SetComputeZSpacing( false );
    if( !ippsorter.Sort( sub ) )
    {
        std::cerr << "Could not sort" << std::endl;
        return 1;
    }

    std::cout << "IPPSorter:" << std::endl;
    ippsorter.Print( std::cout );

    return 0;
}

```

## 14.100 csa2img.cxx

```

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Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
 * I do not know what the format is, just guessing from info found on the net:
 */

```

```

* http://atonal.ucdavis.edu/matlab/fmri/spm5/spm_dicom_convert.m
*
* This example is an attempt at understanding the format used by SIEMENS
* their "SIEMENS CSA NON-IMAGE" DICOM file (1.3.12.2.1107.5.9.1)
*
* Everything done in this code is for the sole purpose of writing interoperable
* software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
* If you believe anything in this code violates any law or any of your rights,
* please contact us (gdcms-developers@lists.sourceforge.net) so that we can
* find a solution.
*
*/
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmCSAHeader.h"
#include "gdcmAttribute.h"
#include "gdcmPrivateTag.h"

#include <math.h>

int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    // gdcmDataExtra/gdcmNonImageData/exCSA_Non-Image_Storage.dcm
    // PHANTOM.MR.CARDIO_COEUR_S_SEQUENCE_DE_REP_RAGE.9.257.2008.03.20.14.53.25.578125.43151705.IMA
    const char *filename = argv[1];

    gdcm::Reader reader; // Do not use ImageReader
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }

    gdcm::CSAHeader csa;
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();

    const gdcm::PrivateTag &t1 = csa.GetCSAImageHeaderInfoTag();
    //std::cout << t1 << std::endl;
    //const gdcm::PrivateTag &t2 = csa.GetCSASeriesHeaderInfoTag();

    if( ds.FindDataElement( t1 ) )
    {
        csa.LoadFromDataElement( ds.GetDataElement( t1 ) );
        csa.Print( std::cout );
    }

    int dims[2] = {};
    if( csa.FindCSAElementByName( "Columns" ) )
    {
        const gdcm::CSAElement &cсаel = csa.GetCSAElementByName( "Columns" );
        std::cout << cсаel << std::endl;
        //const gdcm::ByteValue *bv = cсаel.GetByteValue();
        gdcm::Element<gdcm::VR::IS, gdcm::VM::VM1> el;
        el.Set( cсаel.GetValue() );
        dims[0] = el.GetValue();
        std::cout << "Columns:" << el.GetValue() << std::endl;
    }

    if( csa.FindCSAElementByName( "Rows" ) )
    {
        const gdcm::CSAElement &cсаel2 = csa.GetCSAElementByName( "Rows" );
        std::cout << cсаel2 << std::endl;
        gdcm::Element<gdcm::VR::IS, gdcm::VM::VM1> el2;
        el2.Set( cсаel2.GetValue() );
        dims[1] = el2.GetValue();
        std::cout << "Rows:" << el2.GetValue() << std::endl;
    }

    double spacing[2] = { 1. , 1. };
    bool spacingfound = false;
    if( csa.FindCSAElementByName( "PixelSpacing" ) )
    {
        const gdcm::CSAElement &cсаel3 = csa.GetCSAElementByName( "PixelSpacing" );
        if( !cсаel3.IsEmpty() )
        {
            std::cout << cсаel3 << std::endl;
            gdcm::Element<gdcm::VR::DS, gdcm::VM::VM2> el3;
            el3.Set( cсаel3.GetValue() );
            spacing[0] = el3.GetValue();

```

```

        spacing[1] = el3.GetValue(1);
        std::cout << "PixelSpacing:" << el3.GetValue() << ", " << el3.GetValue(1) << std::endl;
        spacingfound = true;
    }
}

if( !spacingfound )
{
    std::cerr << "Problem with PixelSpacing" << std::endl;
    //return 1;
}
if( !dims[0] || !dims[1] )
{
    std::cerr << "Problem with dims" << std::endl;
    return 1;
}

gdcm::ImageWriter writer;

gdcm::Image &image = writer.GetImage();
image.SetNumberOfDimensions( 2 ); // good default
image.SetDimension(0, dims[0] );
image.SetDimension(1, dims[1] );
image.SetSpacing(0, spacing[0] );
image.SetSpacing(1, spacing[1] );
gdcm::PixelFormat pixeltype = gdcm::PixelFormat::INT16; // bytewidth = spm_type('int16','bits')/8;

//unsigned long l = image.GetBufferLength();
//const int p = 1 / (dims[0] * dims[1]);

//image.SetNumberOfDimensions( 3 );
//image.SetDimension(2, p / pixeltype.GetPixelSize() );

gdcm::PhotometricInterpretation pi;
pi = gdcm::PhotometricInterpretation::MONOCHROME2;
//pixeltype.SetSamplesPerPixel( );
image.SetPhotometricInterpretation( pi );
image.SetPixelFormat( pixeltype );
//image.SetIntercept( inputimage.GetIntercept() );
//image.SetSlope( inputimage.GetSlope() );

//gdcm::DataElement pixeldata( gdcm::Tag(0x7fe1,0x1010) );
//pixeldata.SetByteValue( &outbuf[0], outbuf.size() );
gdcm::PrivateTag csanonimaget(0x7fe1,0x10,"SIEMENS CSA NON-IMAGE");
const gdcm::DataElement &pixeldata = ds.GetDataElement( csanonimaget );
image.SetDataElement( pixeldata );

std::string outfilename = "outcsa.dcm";
//writer.SetFile( reader.GetFile() );
writer.SetFileName( outfilename.c_str() );
if( !writer.Write() )
{
    std::cerr << "could not write: " << outfilename << std::endl;
    return 1;
}

return 0;
}

```

## 14.101 iU22tomultisc.cxx

```

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=====*/
/*

```

```

* iU22 Raw Data extractor
*/
#include "gdcmReader.h"
#include "gdcmImageWriter.h"
#include "gdcmAttribute.h"
#include "gdcmPrivateTag.h"

#include <math.h>

int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    // IM_001
    const char *filename = argv[1];

    gdcm::Reader reader; // Do not use ImageReader
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }

    // * The data is simply 8-bit unsigned in the obvious x/y/z order
    // * 200D,300B contains the data
    // * 200D,3001 contains the no. of voxels (416,412,256 in this case)
    // * 200D,3003 contains the voxel sizes (0.156184527398215 /
    // 0.1223749613981957 / 0.328479990704639 in this case)

    const gdcm::File &file = reader.GetFile();
    const gdcm::DataSet &ds = file.GetDataSet();
    const gdcm::PrivateTag trawdataus( 0x200d, 0x0b, "Philips US Imaging DD 033" );
    const gdcm::DataElement &rawdataus = ds.GetDataElement( trawdataus );

    const gdcm::PrivateTag tcolsrowsframes( 0x200d, 0x01, "Philips US Imaging DD 036" );
    const gdcm::DataElement &colsrowsframes = ds.GetDataElement( tcolsrowsframes );
    // const gdcm::PrivateTag tcolsrowsframes( 0x200d, 0x02, "Philips US Imaging DD 036" );
    // this is just a duplicate previous tag.
    const gdcm::PrivateTag tvoxelspacing( 0x200d, 0x03, "Philips US Imaging DD 036" );
    const gdcm::DataElement &voxelspacing = ds.GetDataElement( tvoxelspacing );

    gdcm::Element<gdcm::VR::DS,gdcm::VM::VM3> dims; // Use DS to interpret value stored in LO
    dims.SetFromDataElement( colsrowsframes );

    gdcm::Element<gdcm::VR::DS,gdcm::VM::VM3> spacing;
    spacing.SetFromDataElement( voxelspacing );

    gdcm::ImageWriter writer;

    gdcm::Image &image = writer.GetImage();
    image.SetNumberOfDimensions( 3 ); // good default
    image.SetDimension(0, (unsigned int)dims[0] );
    image.SetDimension(1, (unsigned int)dims[1] );
    image.SetDimension(2, (unsigned int)dims[2] );
    image.SetSpacing(0, spacing[0] );
    image.SetSpacing(1, spacing[1] );
    image.SetSpacing(2, spacing[2] );
    gdcm::PixelFormat pixeltype = gdcm::PixelFormat::UINT8;

    gdcm::PhotometricInterpretation pi;
    pi = gdcm::PhotometricInterpretation::MONOCHROME2;
    image.SetPhotometricInterpretation( pi );
    image.SetPixelFormat( pixeltype );

    image.SetDataElement( rawdataus );

    std::string outfilename = "outiu22.dcm";

    gdcm::DataElement de( gdcm::Tag(0x8,0x16) ); // SOP Class UID
    de.SetVR( gdcm::VR::UI );
    gdcm::MediaStorage ms(
        gdcm::MediaStorage::UltrasoundMultiFrameImageStorage );
    // gdcm::MediaStorage::MultiframeGrayscaleByteSecondaryCaptureImageStorage );
    de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()) );
    writer.GetFile().GetDataSet().Replace( de );

    writer.SetFileName( outfilename.c_str() );
    if( !writer.Write() )
    {
        std::cerr << "could not write: " << outfilename << std::endl;
        return 1;
    }
}

```

```

    }

    return 0;
}

```

## 14.102 pmsct\_rgb1.cxx

```

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=====*/
/*
 * This example shows how to rewrite a ELSCINT1/PMSCT_RGB1 compressed
 * image so that it is readable by most 3rd party software (DICOM does
 * not specify this particular encoding).
 * This is required for the sake of interoperability with any standard
 * conforming DICOM system.
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcml-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Special thanks to:
 * Jean-Pierre Roux for providing the sample datasets
 */
#include "gdcmlReader.h"
#include "gdcmlPrivateTag.h"
#include "gdcmlAttribute.h"
#include "gdcmlImageWriter.h"

void delta_decode(const unsigned char *data_in, size_t data_size,
                 std::vector<unsigned char> &new_stream, unsigned short pc, size_t w, size_t h)
{
    const size_t plane_size = h * w;
    const size_t outputlen = 3 * plane_size;
    new_stream.resize( outputlen );

    assert( data_size != outputlen );
    if( data_size == outputlen )
    {
        return;
    }
    typedef unsigned char byte;
    enum {
        COLORMODE   = 0x81,
        ESCMODE     = 0x82,
        REPEATMODE  = 0x83
    };

    const byte* src = (const byte*)data_in;
    byte* dest = (byte*)new_stream.data();
    union { byte gray; byte rgb[3]; } pixel;
    pixel.rgb[0] = pixel.rgb[1] = pixel.rgb[2] = 0;
    // always start in grayscale mode
    bool graymode = true;
    size_t dx = 1;
    size_t dy = 3;
    // algorithm works with both planar configuration
    // It does produce surprising greenish background color for planar
    // configuration is 0, while the nested Icon SQ display a nice black
    // background

```

```

if (pc)
{
    dx = plane_size;
    dy = 1;
}
size_t ps = plane_size;

// The following is highly unoptimized as we have nested if statement in a while loop
// we need to switch from one algorithm to the other (RGB <-> GRAY)
while (ps)
{
    // next byte:
    byte b = *src++;
    assert( src < data_in + data_size );
    // mode selection:
    switch ( b )
    {
        case ESCMODE:
            // Used to treat a byte 81/82/83 as a normal byte
            if (graymode)
            {
                pixel.gray += *src++;
                dest[0*dx] = pixel.gray;
                dest[1*dx] = pixel.gray;
                dest[2*dx] = pixel.gray;
            }
            else
            {
                pixel.rgb[0] += *src++;
                pixel.rgb[1] += *src++;
                pixel.rgb[2] += *src++;
                dest[0*dx] = pixel.rgb[0];
                dest[1*dx] = pixel.rgb[1];
                dest[2*dx] = pixel.rgb[2];
            }
            dest += dy;
            ps--;
            break;
        case REPEATMODE:
            // repeat mode (RLE)
            b = *src++;
            ps -= b;
            if (graymode)
            {
                while (b-- > 0)
                {
                    dest[0*dx] = pixel.gray;
                    dest[1*dx] = pixel.gray;
                    dest[2*dx] = pixel.gray;
                    dest += dy;
                }
            }
            else
            {
                while (b-- > 0)
                {
                    dest[0*dx] = pixel.rgb[0];
                    dest[1*dx] = pixel.rgb[1];
                    dest[2*dx] = pixel.rgb[2];
                    dest += dy;
                }
            }
            break;
        case COLORMODE:
            // We are switching from one mode to the other. The stream contains an intermixed
            // compression of RGB codec and GRAY codec. Each one not knowing of the other
            // reset old value to 0.
            if (graymode)
            {
                graymode = false;
                pixel.rgb[0] = pixel.rgb[1] = pixel.rgb[2] = 0;
            }
            else
            {
                graymode = true;
                pixel.gray = 0;
            }
            break;
        default:
            // This is identical to ESCMODE, it would be nicer to use fall-through
            if (graymode)

```

```

        {
            pixel.gray += b;
            dest[0*dx] = pixel.gray;
            dest[1*dx] = pixel.gray;
            dest[2*dx] = pixel.gray;
        }
    else
    {
        pixel.rgb[0] += b;
        pixel.rgb[1] += *src++;
        pixel.rgb[2] += *src++;
        dest[0*dx] = pixel.rgb[0];
        dest[1*dx] = pixel.rgb[1];
        dest[2*dx] = pixel.rgb[2];
    }
    dest += dy;
    ps--;
    break;
} // end switch
} // end while
}

int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();

    // (07a1,1011) CS [PMSCT_RGB1] # 10,1 Tamar Compression Type
    const gdcm::PrivateTag tcompressiontype(0x07a1,0x0011,"ELSCINT1");
    if( !ds.FindDataElement( tcompressiontype ) ) return 1;
    const gdcm::DataElement& compressiontype = ds.GetDataElement( tcompressiontype );
    if ( compressiontype.IsEmpty() ) return 1;
    const gdcm::ByteValue * bv = compressiontype.GetByteValue();
    std::string comprle = "PMSCT_RLE1";
    std::string comprgb = "PMSCT_RGB1";
    bool isrle = false;
    bool isrgb = false;
    if( strncmp( bv->GetPointer(), comprle.c_str(), comprle.size() ) == 0 )
    {
        isrle = true;
        return 1;
    }
    if( strncmp( bv->GetPointer(), comprgb.c_str(), comprgb.size() ) == 0 )
    {
        isrgb = true;
    }
    if( !isrgb && !isrle ) return 1;

    const gdcm::PrivateTag tcompressedpixeldata(0x07a1,0x000a,"ELSCINT1");
    if( !ds.FindDataElement( tcompressedpixeldata ) ) return 1;
    const gdcm::DataElement& compressionpixeldata = ds.GetDataElement( tcompressedpixeldata );
    if ( compressionpixeldata.IsEmpty() ) return 1;
    const gdcm::ByteValue * bv2 = compressionpixeldata.GetByteValue();

    gdcm::Attribute<0x0028,0x0006> at0;
    at0.SetFromDataSet( ds );
    gdcm::Attribute<0x0028,0x0010> at1;
    at1.SetFromDataSet( ds );
    gdcm::Attribute<0x0028,0x0011> at2;
    at2.SetFromDataSet( ds );

    std::vector<unsigned char> buffer;
    delta_decode((const unsigned char*)bv2->GetPointer(), bv2->GetLength(), buffer,
        at0.GetValue(), at1.GetValue(), at2.GetValue() );

    gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
    pixeldata.SetVR( gdcm::VR::OW );
    pixeldata.SetByteValue( (char*)buffer.data(), (uint32_t)buffer.size() );
    // TODO we should check that decompress byte buffer match the expected size (row*col*...)

    // Add the pixel data element

```



```

reader.GetFile().GetDataSet().Replace( pixeldata );

reader.GetFile().GetHeader().SetDataSetTransferSyntax(
    gdcm::TransferSyntax::ExplicitVRLittleEndian);
gdcm::Writer writer;
writer.SetFile( reader.GetFile() );

// Cleanup stuff:
// remove the compressed pixel data:
// FIXME: should I remove more private tags ? all of them ?
// oh well this is just an example
// use gdcm::Anonymizer::RemovePrivateTags if needed...
writer.GetFile().GetDataSet().Remove( compressionpixeldata.GetTag() );
std::string outfilename;
if (argc > 2)
    outfilename = argv[2];
else
    outfilename = "outrgb.dcm";
writer.SetFileName( outfilename.c_str() );
if( !writer.Write() )
{
    std::cerr << "Failed to write" << std::endl;
    return 1;
}

std::cout << "success !" << std::endl;

return 0;
}

```

## 14.103 rle2img.cxx

```

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=====*/

/*
 * This example shows how to rewrite a ELSCINT1/PMSCT_RLE1 compressed
 * image so that it is readable by most 3rd party software (DICOM does
 * not specify this particular encoding).
 * This is required for the sake of interoperability with any standard
 * conforming DICOM system.
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Special thanks to:
 * Mauro Maiorca for bringing to our attention on this new ELSCINT1
 * compression algorithm : PMSCT_RLE1 (different from the 'LOSSLESS RICE')
 * See post at:
 * http://groups.google.com/group/comp.protocols.dicom/msg/f2b99bf706a7f8ca
 *
 * Thanks to Jesus Spinola, for more datasets,
 * http://www.itk.org/pipermail/insight-users/2008-April/025571.html
 *
 * And last but not least, a very big thank to Ivo van Poorten, without
 * whom we would still be looking at this compressed byte stream as if
 * it was RLE compressed.
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"

```

```

#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"

/* FIXME: Why is PhilipsLosslessRice.dcm a 512x512 image ... */
void delta_decode(const char *inbuffer, size_t length, std::vector<unsigned short> &output)
{
    // RLE pass
    std::vector<char> temp;
    for(size_t i = 0; i < length; ++i)
    {
        if( inbuffer[i] == (char)0xa5 )
        {
            //unsigned char repeat = (unsigned char)inbuffer[i+1] + 1;
            //assert( (unsigned char)inbuffer[i+1] != 255 );
            int repeat = (unsigned char)inbuffer[i+1] + 1;
            char value = inbuffer[i+2];
            while(repeat)
            {
                temp.push_back( value );
                --repeat;
            }
            i+=2;
        }
        else
        {
            temp.push_back( inbuffer[i] );
        }
    }

    // Delta encoding pass
    unsigned short delta = 0;
    for(size_t i = 0; i < temp.size(); ++i)
    {
        if( temp[i] == 0x5a )
        {
            unsigned char v1 = (unsigned char)temp[i+1];
            unsigned char v2 = (unsigned char)temp[i+2];
            unsigned short value = (unsigned short)(v2 * 256 + v1);
            output.push_back( value );
            delta = value;
            i+=2;
        }
        else
        {
            unsigned short value = (unsigned short)(temp[i] + delta);
            output.push_back( value );
            delta = value;
        }
        //assert( output[output.size()-1] == ref[output.size()-1] );
    }

    if ( output.size() % 2 )
    {
        output.resize( output.size() - 1 );
    }
    std::cout << length << " -> " << output.size() * 2 << std::endl;
}

int main(int argc, char *argv [])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << "input.dcm [output.dcm]" << std::endl;
        std::cerr << "will default to 'out.rle.dcm' unless output.dcm is specified."
        << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();

    // (07a1,1011) CS [PMSCT_RLE1] # 10,1 Tamar Compression Type
    const gdcm::PrivateTag tcompressiontype(0x07a1,0x0011,"ELSCINT1");
    if( !ds.FindDataElement( tcompressiontype ) ) return 1;
    const gdcm::DataElement& compressiontype = ds.GetDataElement( tcompressiontype );

```

```

if ( compressiontype.IsEmpty() ) return 1;
const gdcm::ByteValue * bv = compressiontype.GetByteValue();
std::string comprle = "PMSCT_RLE1";
std::string comprgb = "PMSCT_RGB1";
bool isrle = false;
bool isrgb = false;
if( strcmp( bv->GetPointer(), comprle.c_str(), comprle.size() ) == 0 )
{
    isrle = true;
}
if( strcmp( bv->GetPointer(), comprgb.c_str(), comprgb.size() ) == 0 )
{
    isrgb = true;
    std::cerr << "See: pmsct_rgb1.cxx instead" << std::endl;
    return 1;
}
if( !isrgb && !isrle ) return 1;

// check if compressed pixel data reside in private or standard tag
const gdcm::PrivateTag tprivatepixeldata(0x07a1,0x100a,"ELSCINT1");
const gdcm::Tag tstandardpixeldata(0x7fe0, 0x0010);
gdcm::Tag tpixeldata;
if(ds.FindDataElement(tprivatepixeldata)) tpixeldata = tprivatepixeldata;
else if(ds.FindDataElement(tstandardpixeldata)) tpixeldata = tstandardpixeldata;
if(!ds.FindDataElement(tpixeldata)) return 1;

const gdcm::DataElement& compressionpixeldata = ds.GetDataElement( tpixeldata);
if ( compressionpixeldata.IsEmpty() ) return 1;
const gdcm::ByteValue * bv2 = compressionpixeldata.GetByteValue();

gdcm::Attribute<0x0028,0x0010> at1;
at1.SetFromDataSet( ds );
gdcm::Attribute<0x0028,0x0011> at2;
at2.SetFromDataSet( ds );

gdcm::DataElement pixeldata;
// if standard voxel data element does not exist, create it
if( !reader.GetFile().GetDataSet().FindDataElement( tpixeldata ) )
{
    pixeldata = gdcm::DataElement( tpixeldata, 0, gdcm::VR::OW );
}
else{
    pixeldata = reader.GetFile().GetDataSet().GetDataElement( tpixeldata );
}

pixeldata.SetVR( gdcm::VR::OW );
gdcm::VL bv2l = bv2->GetLength();
gdcm::VL at1l = at1.GetValue() * at2.GetValue() * 2; /* sizeof(unsigned short) == 2 */
// Handle special case that is not compressed:
if( bv2l == at1l )
{
    pixeldata.SetByteValue( bv2->GetPointer(), bv2->GetLength() );
}
else
{
    std::vector<unsigned short> buffer;
    delta_decode(bv2->GetPointer(), bv2->GetLength(), buffer);
    pixeldata.SetByteValue( (char*)buffer.data(), (uint32_t)(buffer.size() * sizeof( unsigned short )) );
}
// TODO we should check that decompress byte buffer match the expected size (row*col*...)

// Add the pixel data element
if( reader.GetFile().GetDataSet().FindDataElement( tpixeldata ) )
{
    reader.GetFile().GetDataSet().Replace( pixeldata );
}
else
{
    reader.GetFile().GetDataSet().ReplaceEmpty( pixeldata );
}

reader.GetFile().GetHeader().SetDataSetTransferSyntax(
    gdcm::TransferSyntax::ExplicitVRLittleEndian);
gdcm::Writer writer;
writer.SetFile( reader.GetFile() );

// Cleanup stuff:
// This makes the code equivalent to Philips workstation IntelliSpace Portal
if( writer.GetFile().GetDataSet().FindDataElement( tcompressiontype ) )
{

```

```

    writer.GetFile().GetDataSet().Remove( gdcm::Tag(0x07a1,0x1011) );
}
if( writer.GetFile().GetDataSet().FindDataElement( tprivatepixeldata ) )
{
    writer.GetFile().GetDataSet().Remove( gdcm::Tag(0x07a1,0x100a) );
}

std::string outfilename;
if (argc > 2)
    outfilename = argv[2];
else
    outfilename = "out.rle.dcm";
writer.SetFileName( outfilename.c_str() );
if( !writer.Write() )
{
    std::cerr << "Failed to write" << std::endl;
    return 1;
}

std::cout << "success !" << std::endl;

return 0;
}

```

## 14.104 uid\_unique.cxx

```

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=====*/
#include "gdcmUIDGenerator.h"

#include <iostream>
#include <string>
#include <set>

int main()
{
    gdcm::UIDGenerator uid;
    //const char myroot[] = "9876543210.9876543210.9876543210.9876543210.9876543210"; // fails in ~40000 tries
    const char myroot[] = "9876543210.9876543210.9876543210";
    uid.SetRoot( myroot );
    std::set<std::string> uids;
    uint64_t wrap = 0;
    uint64_t c = 0;
    while(true)
    {
        const char *unique = uid.Generate();
        //std::cout << unique << std::endl;
        if( c % 10000 == 0 )
        {
            std::cout << "wrap=" << wrap << ",c=" << c << std::endl;
        }
        ++c;
        if( c == 0 )
        {
            wrap++;
        }
        if ( uids.count(unique) == 1 )
        {
            std::cerr << "Failed with: " << unique << std::endl;
            return 1;
        }
        uids.insert( unique );
    }
}

```

## 14.105 DecompressImage.java

```

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=====*/

/*
 * This example will take in a DICOM file, and tries to decompress it (actually write it
 * as ImplicitVRLittleEndian Transfer Syntax).
 *
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/DecompressImage.java -d .
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java DecompressImage gdcmData/012345.002.050.dcm out.dcm
 */
import gdcm.*;

public class DecompressImage
{
    public static void main(String[] args) throws Exception
    {
        String file1 = args[0];
        String file2 = args[1];
        ImageReader reader = new ImageReader();
        reader.SetFileName( file1 );
        boolean ret = reader.Read();
        if( !ret )
        {
            throw new Exception("Could not read: " + file1 );
        }

        ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
        change.SetTransferSyntax( new TransferSyntax(TransferSyntax.TSType.ImplicitVRLittleEndian) );
        change.SetInput( reader.GetImage() );
        if( !change.Change() )
        {
            throw new Exception("Could not change: " + file1 );
        }

        Image out = change.GetOutput();
        System.out.println( out.toString() );

        // Set the Source Application Entity Title
        FileMetaInformation.SetSourceApplicationEntityTitle( "Just For Fun" );

        ImageWriter writer = new ImageWriter();
        writer.SetFileName( file2 );
        writer.SetFile( reader.GetFile() );
        writer.SetImage( out );
        ret = writer.Write();
        if( !ret )
        {
            throw new Exception("Could not write: " + file2 );
        }
    }
}

```

## 14.106 DecompressPixmap.java

```

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```

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```

=====*/

/*
 * This example will take in a DICOM file, and tries to decompress it (actually write it
 * as ImplicitVRLittleEndian Transfer Syntax).
 *
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/DecompressPixmap.java -d .
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java DecompressPixmap gdcmData/012345.002.050.dcm out.dcm
 */
import gdcm.*;

public class DecompressPixmap
{
    public static void main(String[] args) throws Exception
    {
        String file1 = args[0];
        String file2 = args[1];
        PixmapReader reader = new PixmapReader();
        reader.SetFileName( file1 );
        boolean ret = reader.Read();
        if( !ret )
        {
            throw new Exception("Could not read: " + file1 );
        }

        ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
        change.SetTransferSyntax( new TransferSyntax(TransferSyntax.TSType.ImplicitVRLittleEndian) );
        PixmapToPixmapFilter filter = (PixmapToPixmapFilter)change;
        filter.SetInput( reader.GetPixmap() );
        if( !change.Change() )
        {
            throw new Exception("Could not change: " + file1 );
        }

        // The following does not work in Java/swig 2.0.7
        //Pixmap p = ((PixmapToPixmapFilter)change).GetOutput();
        Pixmap p = change.GetOutputAsPixmap(); // be explicit
        //System.out.println( p.toString() );

        // Set the Source Application Entity Title
        FileMetaInformation.SetSourceApplicationEntityTitle( "Just For Fun" );

        PixmapWriter writer = new PixmapWriter();
        writer.SetFileName( file2 );
        writer.SetFile( reader.GetFile() );
        writer.SetImage( p );
        ret = writer.Write();
        if( !ret )
        {
            throw new Exception("Could not write: " + file2 );
        }
    }
}

```

## 14.107 ExtractImageRegion.java

```

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```

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=====*/

/*
 * This small code shows how to use the gdcm.ImageRegionReader API
 * In this example we are taking each frame by frame and dump them to
 * /tmp/frame.raw.
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java ExtractImageRegion input.dcm
 */
import gdcm.*;
import java.io.FileOutputStream;

public class ExtractImageRegion
{
    public static void main(String[] args) throws Exception
    {
        String filename = args[0];

        // instantiate the reader:
        ImageRegionReader reader = new ImageRegionReader();
        reader.SetFileName( filename );

        // pull DICOM info:
        if (!reader.ReadInformation()) return;
        // Get file infos
        File f = reader.GetFile();

        // get some info about image
        UIntArrayType dims = ImageHelper.GetDimensionsValue(f);
        PixelFormat pf = ImageHelper.GetPixelFormatValue (f);
        int pixelsize = pf.GetPixelSize();

        // buffer to get the pixels
        long buffer_length = dims.get(0) * dims.get(1) * pixelsize;
        byte[] buffer = new byte[ (int)buffer_length ];

        // define a simple box region.
        BoxRegion box = new BoxRegion();
        for (int z = 0; z < dims.get(2); z++)
        {
            // Define that I want the image 0, full size (dimx x dimy pixels)
            // and do that for each z:
            box.SetDomain(0, dims.get(0) - 1, 0, dims.get(1) - 1, z, z);
            //System.Console.WriteLine( box.toString() );
            reader.SetRegion( box );

            // reader will try to load the uncompressed image region into buffer.
            // the call returns an error when buffer.Length is too small. For instance
            // one can call:
            // long buf_len = reader.ComputeBufferLength(); // take into account pixel size
            // to get the exact size of minimum buffer
            if (reader.ReadIntoBuffer(buffer, buffer_length))
            {
                FileOutputStream fos = new FileOutputStream("/tmp/frame.raw");
                fos.write(buffer);
                fos.close();
            }
            else
            {
                throw new Exception("can't read pixels error");
            }
        }
    }
}

```

## 14.108 FileAnonymize.java

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

```

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```

=====*/

import gdc.*;

public class FileAnonymize
{
    public static class MyWatcher extends SimpleSubjectWatcher
    {
        public MyWatcher(Subject s) { super(s,"Override String"); }
        protected void ShowProgress(Subject caller, Event evt)
        {
            ProgressEvent pe = ProgressEvent.Cast(evt);
            System.out.println( "This is my progress: " + pe.GetProgress() );
        }
    }

    public static void main(String[] args) throws Exception
    {
        String input = args[0];
        String output = args[1];

        FileAnonymizer fa = new FileAnonymizer();
        fa.SetInputFileName( input );
        fa.SetOutputFileName( output );

        // Empty Operations
        // It will create elements, since those tags are non-registered public elements (2011):
        fa.Empty( new Tag(0x0008,0x1313) );
        fa.Empty( new Tag(0x0008,0x1317) );
        // Remove Operations
        // The following Tag are actually carefully chosen, since they refer to SQ:
        fa.Remove( new Tag(0x0008,0x2112) );
        fa.Remove( new Tag(0x0008,0x9215) );
        // Replace Operations
        // do not call replace operation on SQ attribute !
        fa.Replace( new Tag(0x0018,0x5100), "MYVALUE " );
        fa.Replace( new Tag(0x0008,0x1160), "MYOTHERVAL" );

        if( !fa.Write() )
        {
            System.out.println( "Could not write" );
            return;
        }

        System.out.println( "success" );
    }
}

```

## 14.109 HelloSimple.java

```

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=====*/

/*
 * Compilation:
 * $ CLASSPATH=gdc.jar javac ../../gdc/Examples/Java/HelloSimple.java -d .
 *
 * Usage:

```



```

* $ LD_LIBRARY_PATH=. CLASSPATH=gdc.jar:. java HelloSimple gdcData/012345.002.050.dcm
*/
import gdc.*;

public class HelloSimple
{
    public static void main(String[] args) throws Exception
    {
        String filename = args[0];
        Reader reader = new Reader();
        reader.SetFileName( filename );
        boolean ret = reader.Read();
        if( !ret )
        {
            throw new Exception("Could not read: " + filename );
        }
        File f = reader.GetFile();
        DataSet ds = f.GetDataSet();

        System.out.println( ds.toString() );

        System.out.println("Success reading: " + filename );
    }
}

```

## 14.110 ReadFiles.java

```

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Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
import gdc.*;
import java.io.File;

public class ReadFiles
{
    static int i = 0;
    public static void process(String path)
    {
        //String path = file.getPath();
        assert PosixEmulation.FileExists(path) : "Problem converting to 8bits";

        System.out.println("Reading: " + path );
        System.out.println("File: " + i++);
        Reader r = new Reader();
        try
        {
            r.SetFileName( path );
            TagSetType skip = new TagSetType();
            skip.insert( new Tag(0x7fe0,0x10) );
            boolean b = r.ReadUpToTag( new Tag(0x88,0x200), skip );
            //System.out.println("DS:\n" + r.GetFile().GetDataSet().toString() );
        }
        finally
        {
            r.delete(); // will properly call C++ destructor and close file descriptor
        }
    }

    // Process only files under dir
    public static void visitAllFiles(File dir)
    {
        if (dir.isDirectory())
        {
            String[] children = dir.list();
            for (int i=0; i<children.length; i++)
            {

```

```

        visitAllFiles(new File(dir, children[i]));
    }
}
else
{
    process(dir.getPath());
}
}

public static void waiting (int n)
{
    long t0, t1;
    t0 = System.currentTimeMillis();
    do
    {
        t1 = System.currentTimeMillis();
    }
    while ((t1 - t0) < (n * 1000));
}

public static void main(String[] args) throws Exception
{
    String directory = args[0];

    Directory gdir = new Directory();
    long n = gdir.Load( directory, true );
    System.out.println( gdir.toString() );
    FilenamesType files = gdir.GetFilenames();
    for( long i = 0; i < n; ++i )
    {
        String path = files.get( (int)i );
        process( path );
    }

    System.out.println( "Java API" );

    //waiting( 10 );
    for( int i = 0; i < 2; ++i )
    {
        File dir = new File(directory);
        visitAllFiles(dir);
    }
}
}

```

## 14.111 ScanDirectory.java

```

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Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/

import gdcm.*;
import gdcm.Reader;
import gdcm.LookupTable;
import java.io.File;
import java.io.*;
import java.awt.image.*;
import javax.imageio.ImageIO;

public class ScanDirectory
{
    public static class MyWatcher extends SimpleSubjectWatcher
    {
        public MyWatcher(Subject s) { super(s,"Override String"); }
        protected void ShowProgress(Subject caller, Event evt)
        {

```

```

        ProgressEvent pe = ProgressEvent.Cast(evt);
        System.out.println( "This is my progress: " + pe.GetProgress() );
    }
}

public static byte[] GetAsByte(Bitmap input)
{
    long len = input.GetBufferLength();
    byte[] buffer = new byte[ (int)len ];
    PhotometricInterpretation pi = input.GetPhotometricInterpretation();
    if( pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME1 )
    {
        ImageChangePhotometricInterpretation icpi = new ImageChangePhotometricInterpretation();
        icpi.SetInput( input );
        icpi.SetPhotometricInterpretation(
            new PhotometricInterpretation(
                PhotometricInterpretation.PIType.MONOCHROME2 ) );
        if( icpi.Change() )
        {
            Bitmap output = icpi.GetOutput();
            output.GetArray( buffer );
        }
        return buffer;
    }
    else
    {
        input.GetArray( buffer );
        return buffer;
    }
}

public static short[] GetAsShort(Bitmap input)
{
    long len = input.GetBufferLength(); // length in bytes
    short[] buffer = new short[ (int)len / 2 ];
    PhotometricInterpretation pi = input.GetPhotometricInterpretation();
    if( pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME1 )
    {
        ImageChangePhotometricInterpretation icpi = new ImageChangePhotometricInterpretation();
        icpi.SetInput( input );
        icpi.SetPhotometricInterpretation(
            new PhotometricInterpretation(
                PhotometricInterpretation.PIType.MONOCHROME2 ) );
        if( icpi.Change() )
        {
            Bitmap output = icpi.GetOutput();
            output.GetArray( buffer );
        }
        return buffer;
    }
    else
    {
        input.GetArray( buffer );
        return buffer;
    }
}

public static boolean WritePNG(Bitmap input, String outfilename )
{
    int imageType = BufferedImage.TYPE_CUSTOM;
    PixelFormat pf = input.GetPixelFormat();
    PhotometricInterpretation pi = input.GetPhotometricInterpretation();
    // We need to handle both public and private icon
    // It could well be that we are getting an RGB Icon or 16 bits Icon:
    ColorModel colorModel = null;
    if( pf.GetSamplesPerPixel() == 1 )
    {
        if( pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME1
            || pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME2 )
        {
            if( pf.GetScalarType() == PixelFormat.ScalarType.UINT8 )
            {
                imageType = BufferedImage.TYPE_BYTE_GRAY;
            }
            else if( pf.GetScalarType() == PixelFormat.ScalarType.UINT12 )
            {
                imageType = BufferedImage.TYPE_USHORT_GRAY;
            }
            else if( pf.GetScalarType() == PixelFormat.ScalarType.UINT16 )
            {
                imageType = BufferedImage.TYPE_USHORT_GRAY;
            }
        }
    }
}

```

```

else if( pi.GetType() == PhotometricInterpretation.PIType.PALETTE_COLOR )
{
    LookupTable lut = input.GetLUT();
    long r1 = lut.GetLUTLength( LookupTable.LookupTableType.RED );
    byte[] rbuf = new byte[ (int)r1 ];
    long r12 = lut.GetLUT( LookupTable.LookupTableType.RED, rbuf );
    assert r1 == r12;
    long g1 = lut.GetLUTLength( LookupTable.LookupTableType.GREEN );
    byte[] gbuf = new byte[ (int)g1 ];
    long g12 = lut.GetLUT( LookupTable.LookupTableType.GREEN, gbuf );
    assert g1 == g12;
    long b1 = lut.GetLUTLength( LookupTable.LookupTableType.BLUE );
    byte[] bbuf = new byte[ (int)b1 ];
    long b12 = lut.GetLUT( LookupTable.LookupTableType.BLUE, bbuf );
    assert b1 == b12;
    colorModel = new IndexColorModel(8, (int)r1, rbuf, gbuf, bbuf);
    // For code below
    imageType = BufferedImage.TYPE_BYTE_GRAY;
}
}
else if( pf.GetSamplesPerPixel() == 3 )
{
    if( pf.GetScalarType() == PixelFormat.ScalarType.UINT8 )
    {
        // FIXME should be TYPE_3BYTE_RGB
        imageType = BufferedImage.TYPE_3BYTE_BGR;
    }
}
//System.out.println( "pf: " + pf.toString() );
//System.out.println( "pi: " + pi.toString() );
long width = input.GetDimension(0);
long height = input.GetDimension(0);
BufferedImage bi;
if( pi.GetType() == PhotometricInterpretation.PIType.PALETTE_COLOR )
{
    bi = new BufferedImage(colorModel,
        colorModel.createCompatibleWritableRaster((int)width, (int)height),
        false, null);
}
else
{
    bi = new BufferedImage((int)width, (int)height, imageType);
}
WritableRaster wr = bi.getRaster();
//System.out.println( "imagetype: " + imageType );
if( imageType == BufferedImage.TYPE_BYTE_GRAY
    || imageType == BufferedImage.TYPE_3BYTE_BGR )
{
    byte[] buffer = GetAsByte( input );
    wr.setDataElements (0, 0, (int)width, (int)height, buffer);
}
else if( imageType == BufferedImage.TYPE_USHORT_GRAY )
{
    short[] buffer = GetAsShort( input );
    wr.setDataElements (0, 0, (int)width, (int)height, buffer);
}

File outputfile = new File( outfilename );
try {
    ImageIO.write(bi, "png", outputfile);
} catch (IOException e) {
    return false;
}
return true;
}

public static void main(String[] args) throws Exception
{
    String directory = args[0];

    Directory d = new Directory();
    long nfiles = d.Load( directory, true );
    if(nfiles == 0)
    {
        throw new Exception("No files found");
    }
    // System.out.println( "Files:\n" + d.toString() );
    FilenamesType fns = d.GetFilenames();

    //Scanner s = new Scanner();
    SmartPtrScan sscan = Scanner.New();

```

```

Scanner s = sscan.__ref__();
//SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(s, "MySimple");
MyWatcher watcher = new MyWatcher(s);
Tag[] tagarray = {
    new Tag(0x0010, 0x0010),    // PatientName
    new Tag(0x0010, 0x0020),    // PatientID
    new Tag(0x0010, 0x0030),    // PatientBirthDate
    new Tag(0x0010, 0x0040),    // PatientSex
    new Tag(0x0010, 0x1010),    // PatientAge
    new Tag(0x0020, 0x000d),    // StudyInstanceUID
    new Tag(0x0020, 0x0010),    // StudyID
    new Tag(0x0008, 0x0020),    // StudyDate
    new Tag(0x0008, 0x1030),    // StudyDescription
    new Tag(0x0020, 0x000e),    // SeriesInstanceUID
    new Tag(0x0020, 0x0011),    // SeriesNumber
    new Tag(0x0008, 0x0021),    // SeriesDate
    new Tag(0x0008, 0x103e),    // SeriesDescription
    new Tag(0x0008, 0x0090),    // ReferringPhysicianName
    new Tag(0x0008, 0x0060),    // Modality
    new Tag(0x0054, 0x0400),    // ImageID ?? Should be Instance number ??
    new Tag(0x0008, 0x0018),    // SOPInstanceUID
    new Tag(0x0008, 0x0032),    // AcquisitionTime
    new Tag(0x0008, 0x0033),    // ContentTime
    new Tag(0x0020, 0x0013),    // InstanceNumber
    new Tag(0x0020, 0x1041),    // SliceLocation
    new Tag(0x0018, 0x0050),    // SliceThickness ?? Eg. Enhanced MR Image Storage
    new Tag(0x0008, 0x0080),    // InstitutionName
    new Tag(0x0028, 0x1050),    // WindowCenter
    new Tag(0x0028, 0x1051),    // WindowWidth
};
for( Tag t : tagarray ) {
    //System.out.println( "Tag: " + t.toString() );
    s.AddTag( t );
}
boolean b = s.Scan( fns );
if(!b)
{
    throw new Exception("Could not scan");
}
String fn0 = fns.get(0);
TagToValue mappings = s.GetMapping( fn0 );
System.out.println( "mappings size: " + mappings.size() );
for( Tag tag : tagarray ) {
    if( mappings.has_key( tag ) ) {
        String val = mappings.get( tag );
        System.out.println( "tag/val: " + tag + "->" + val );
    }
}

for( long idx = 0; idx < fns.size(); ++idx )
{
    Reader r = new Reader();
    String fn = fns.get( (int)idx );
    String outfn = fn + ".png";
    r.SetFileName( fn );
    TagSetType tst = new TagSetType();
    tst.insert( new Tag(0x7fe0,0x10) );
    b = r.ReadUpToTag( new Tag(0x88,0x200), tst );
    UIntArrayType dims = ImageHelper.GetDimensionsValue( r.GetFile() );
    if( b )
    {
        IconImageFilter iif = new IconImageFilter();
        System.out.println( "Processing: " + fn );

        iif.SetFile( r.GetFile() );
        b = iif.Extract();
        if( b )
        {
            Bitmap icon = iif.GetIconImage(0);
            WritePNG(icon, outfn);
        }
        else
        {
            ImageReader ir = new ImageReader();
            ir.SetFileName( fn );
            if( ir.Read() )
            {
                Image img = ir.GetImage();
                StringFilter sf = new StringFilter();
                sf.SetFile( r.GetFile() );
                String strval = sf.ToString( new Tag(0x0028,0x0120) );
            }
        }
    }
}

```

```

        IconImageGenerator iig = new IconImageGenerator();
        iig.SetPixmap( img );
        iig.AutoPixelMinMax( true );
        try {
            double val = Double.parseDouble( strval );
            iig.SetOutsideValuePixel( val );
        }
        catch ( NumberFormatException e ) {
        }
        iig.ConvertRGBToPaletteColor( false );
        long idims[] = { 128, 128 };
        iig.SetOutputDimensions( idims );
        iig.Generate();
        Bitmap icon = iig.GetIconImage();
        WritePNG(icon, outfn);
    }
}

System.out.println( "Scan:\n" + s.toString() );

System.out.println( "success" );
}
}

```

## 14.112 SimplePrint.java

```

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Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/SimplePrint.java -d .
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java SimplePrint gdcmData/012345.002.050.dcm
 */
import gdcm.*;

public class SimplePrint
{
    public static void RecurseDataSet(File f, DataSet ds, String indent)
    {
        JavaDataSet cds = new JavaDataSet(ds);
        while(!cds.IsAtEnd())
        {
            DataElement de = cds.GetCurrent();
            // Compute VR from the toplevel file, and the currently processed dataset:
            VR vr = DataSetHelper.ComputeVR(f, ds, de.GetTag() );

            if( vr.Compatible( new VR(VRType.SQ) ) )
            {
                long uvl = de.GetVL().GetValueLength(); // Test cast is ok
                System.out.println( indent + de.GetTag().toString() + ":" + uvl ); // why not ?
                //SequenceOfItems sq = de.GetSequenceOfItems();
                // GetValueAsSQ handle more cases than GetSequenceOfItems
                SmartPtrSQ sq = de.GetValueAsSQ();
                long n = sq.GetNumberOfItems();
                for( long i = 1; i <= n; i++) // item starts at 1, not 0
                {
                    Item item = sq.GetItem( i );
                    DataSet nested = item.GetNestedDataSet();
                    RecurseDataSet( f, nested, indent + "  " );
                }
            }
        }
    }
}

```

```

        else
        {
            System.out.println( indent + de.toString() );
        }
        cds.Next();
    }
}

public static void main(String[] args) throws Exception
{
    String filename = args[0];
    Reader reader = new Reader();
    reader.SetFileName( filename );
    boolean ret = reader.Read();
    if( !ret )
    {
        throw new Exception("Could not read: " + filename );
    }
    File f = reader.GetFile();
    DataSet ds = f.GetDataSet();

    RecurseDataSet( f, ds, "" );
}
}

```

## 14.113 AddPrivateAttribute.py

```

00001
00014
00015 """
00016 Usage:
00017
00018     python AddPrivateAttribute.py input.dcm output.dcm
00019
00020
00021 """
00022
00023 import sys
00024 import gdcm
00025
00026 if __name__ == "__main__":
00027
00028     file1 = sys.argv[1]
00029     file2 = sys.argv[2]
00030
00031     r = gdcm.Reader()
00032     r.SetFileName( file1 )
00033     if not r.Read():
00034         sys.exit(1)
00035
00036     f = r.GetFile()
00037     ds = f.GetDataSet()
00038
00039     # Create a dataelement
00040     de = gdcm.DataElement(gdcm.Tag(0x0051, 0x1011))
00041     de.SetByteStringValue("p2")
00042     de.SetVR(gdcm.VR(gdcm.VR.SH))
00043
00044     ds.Insert(de)
00045
00046     w = gdcm.Writer()
00047     w.SetFile( f )
00048     w.SetFileName( file2 )
00049     if not w.Write():
00050         sys.exit(1)

```

## 14.114 ConvertMPL.py

```

00001
00014
00015 """
00016 display a DICOM image with matplotlib via numpy

```

```

00017
00018 Caveats:
00019 - Does not support UINT12/INT12
00020
00021 Usage:
00022
00023 python ConvertNumpy.py "IM000000"
00024
00025 Thanks:
00026 plotting example - Ray Schumacher 2009
00027 """
00028
00029 import gdc
00030 import numpy
00031 from pylab import *
00032
00033
00034 def get_gdcm_to_numpy_typemap():
00035     """Returns the GDCM Pixel Format to numpy array type mapping."""
00036     _gdcm_np = {gdcm.PixelFormat.UINT8 :numpy.int8,
00037                 gdcm.PixelFormat.INT8 :numpy.uint8,
00038                 gdcm.PixelFormat.UINT16 :numpy.uint16,
00039                 gdcm.PixelFormat.INT16 :numpy.int16,
00040                 gdcm.PixelFormat.UINT32 :numpy.uint32,
00041                 gdcm.PixelFormat.INT32 :numpy.int32,
00042                 gdcm.PixelFormat.FLOAT32:numpy.float32,
00043                 gdcm.PixelFormat.FLOAT64:numpy.float64 }
00044     return _gdcm_np
00045
00046 def get_numpy_array_type(gdcm_pixel_format):
00047     """Returns a numpy array typecode given a GDCM Pixel Format."""
00048     return get_gdcm_to_numpy_typemap()[gdcm_pixel_format]
00049
00050 def gdcm_to_numpy(image):
00051     """Converts a GDCM image to a numpy array.
00052     """
00053     pf = image.GetPixelFormat().GetScalarType()
00054     print 'pf', pf
00055     print image.GetPixelFormat().GetScalarTypeAsString()
00056     assert pf in get_gdcm_to_numpy_typemap().keys(), \
00057         "Unsupported array type %s"%pf
00058     d = image.GetDimension(0), image.GetDimension(1)
00059     print 'Image Size: %d x %d' % (d[0], d[1])
00060     dtype = get_numpy_array_type(pf)
00061     gdcm_array = image.GetBuffer()
00062
00063     result = numpy.frombuffer(gdcm_array, dtype=dtype).astype(float)
00064
00065     result.shape = d
00066     return result
00067
00068
00069
00070
00071 if __name__ == "__main__":
00072     import sys
00073     r = gdc.ImageReader()
00074     filename = sys.argv[1]
00075     r.SetFileName( filename )
00076     if not r.Read(): sys.exit(1)
00077     numpy_array = gdcm_to_numpy( r.GetImage() )
00078
00079     subplot(111)# one plot, on left
00080     title(filename)
00081
00082     imshow(numpy_array, interpolation='bilinear', cmap=cm.jet)
00083
00084     subplots_adjust(bottom=0.1, right=0.8, top=0.9)
00085     cax = axes([0.85, 0.1, 0.075, 0.8])
00086     colorbar(cax=cax)
00087     title('values')
00088     get_current_fig_manager().window.title('plot')
00089     show()

```

## 14.115 ConvertNumpy.py

```

00001
00014
00015 """

```



```

00016 This module add support for converting a gdcm.Image to a numpy array.
00017
00018 Caveats:
00019 - Does not support UINT12/INT12
00020
00021 Removed:
00022 - float16 is defined in GDCM API but no implementation exist for it ...
00023 """
00024
00025 import gdcm
00026 import numpy
00027
00028 def get_gdcm_to_numpy_typemap():
00029     """Returns the GDCM Pixel Format to numpy array type mapping."""
00030     _gdcm_np = {gdcm.PixelFormat.UINT8 :numpy.uint8,
00031                 gdcm.PixelFormat.INT8 :numpy.int8,
00032                 #gdcm.PixelFormat.UINT12 :numpy.uint12,
00033                 #gdcm.PixelFormat.INT12 :numpy.int12,
00034                 gdcm.PixelFormat.UINT16 :numpy.uint16,
00035                 gdcm.PixelFormat.INT16 :numpy.int16,
00036                 gdcm.PixelFormat.UINT32 :numpy.uint32,
00037                 gdcm.PixelFormat.INT32 :numpy.int32,
00038                 #gdcm.PixelFormat.FLOAT16:numpy.float16,
00039                 gdcm.PixelFormat.FLOAT32:numpy.float32,
00040                 gdcm.PixelFormat.FLOAT64:numpy.float64 }
00041     return _gdcm_np
00042
00043 def get_numpy_array_type(gdcm_pixel_format):
00044     """Returns a numpy array typecode given a GDCM Pixel Format."""
00045     return get_gdcm_to_numpy_typemap()[gdcm_pixel_format]
00046
00047 def gdcm_to_numpy(image):
00048     """Converts a GDCM image to a numpy array.
00049     """
00050     pf = image.GetPixelFormat()
00051
00052     assert pf.GetScalarType() in get_gdcm_to_numpy_typemap().keys(), \
00053         "Unsupported array type %s"%pf
00054
00055     shape = image.GetDimension(0) * image.GetDimension(1), pf.GetSamplesPerPixel()
00056     if image.GetNumberOfDimensions() == 3:
00057         shape = shape[0] * image.GetDimension(2), shape[1]
00058
00059     dtype = get_numpy_array_type(pf.GetScalarType())
00060     gdcm_array = image.GetBuffer()
00061     result = numpy.frombuffer(gdcm_array, dtype=dtype)
00062     result.shape = shape
00063     return result
00064
00065 if __name__ == "__main__":
00066     import sys
00067     r = gdcm.ImageReader()
00068     filename = sys.argv[1]
00069     r.SetFileName( filename )
00070     if not r.Read():
00071         sys.exit(1)
00072
00073     numpy_array = gdcm_to_numpy( r.GetImage() )
00074     print numpy_array

```

## 14.116 ConvertPIL.py

```

00001
00014
00015 """
00016 save a DICOM image with PIL via numpy
00017
00018 Caveats:
00019 - Does not support UINT12/INT12
00020
00021 Usage:
00022
00023 python ConvertNumpy.py "IM000000"
00024
00025 Thanks:
00026 plotting example - Ray Schumacher 2009

```

```

00027 """
00028
00029 import gdcm
00030 import numpy
00031 from PIL import Image, ImageOps
00032
00033
00034 def get_gdcm_to_numpy_typemap():
00035     """Returns the GDCM Pixel Format to numpy array type mapping."""
00036     _gdcm_np = {gdcm.PixelFormat.UINT8 :numpy.int8,
00037                 gdcm.PixelFormat.INT8 :numpy.uint8,
00038                 gdcm.PixelFormat.UINT16 :numpy.uint16,
00039                 gdcm.PixelFormat.INT16 :numpy.int16,
00040                 gdcm.PixelFormat.UINT32 :numpy.uint32,
00041                 gdcm.PixelFormat.INT32 :numpy.int32,
00042                 gdcm.PixelFormat.FLOAT32:numpy.float32,
00043                 gdcm.PixelFormat.FLOAT64:numpy.float64 }
00044     return _gdcm_np
00045
00046 def get_numpy_array_type(gdcm_pixel_format):
00047     """Returns a numpy array typecode given a GDCM Pixel Format."""
00048     return get_gdcm_to_numpy_typemap()[gdcm_pixel_format]
00049
00050 def gdcm_to_numpy(image):
00051     """Converts a GDCM image to a numpy array.
00052     """
00053     pf = image.GetPixelFormat().GetScalarType()
00054     print 'pf', pf
00055     print image.GetPixelFormat().GetScalarTypeAsString()
00056     assert pf in get_gdcm_to_numpy_typemap().keys(), \
00057         "Unsupported array type %s"%pf
00058     d = image.GetDimension(0), image.GetDimension(1)
00059     print 'Image Size: %d x %d' % (d[0], d[1])
00060     dtype = get_numpy_array_type(pf)
00061     gdcm_array = image.GetBuffer()
00062     result = numpy.frombuffer(gdcm_array, dtype=dtype)
00063     maxV = float(result[result.argmax()])
00064
00065     result = numpy.log(result+50)
00066     maxV = float(result[result.argmax()])
00067     result = result*(2.**8/maxV)
00068     result.shape = d
00069     return result
00070
00071 if __name__ == "__main__":
00072     import sys
00073     r = gdcm.ImageReader()
00074     filename = sys.argv[1]
00075     r.SetFileName( filename )
00076     if not r.Read(): sys.exit(1)
00077     numpy_array = gdcm_to_numpy( r.GetImage() )
00078
00079     pilImage = Image.frombuffer('L',
00080                                numpy_array.shape,
00081                                numpy_array.astype(numpy.uint8),
00082                                'raw','L',0,1)
00083
00084     pilImage = ImageOps.autocontrast(pilImage, cutoff=.1)
00085     pilImage.save(sys.argv[1]+' .jpg')

```

## 14.117 CreateRAWStorage.py

```

00001
00014
00015 """
00016     <uid value="1.2.840.10008.5.1.4.1.1.66" name="Raw Data Storage" type="SOP Class" part="PS 3.4"
00017     retired="false"/>
00018 """
00019 import gdcm
00020 import sys,os
00021
00022 if __name__ == "__main__":
00023     r = gdcm.Reader()
00024     # Will require Testing...
00025     dataroot = gdcm.Testing.GetDataRoot()

```

```
00026 filename = os.path.join( dataroot, '012345.002.050.dcm' )
00027 r.SetFileName( filename )
00028 r.Read()
00029 f = r.GetFile()
00030 ds = f.GetDataSet()
00031
00032 uid = "1.2.840.10008.5.1.4.1.1.66"
00033 # f = gdcm.File()
00034 # ds = f.GetDataSet()
00035 de = gdcm.DataElement( gdcm.Tag(0x0008,0x0016) )
00036 de.SetByteStringValue( uid )
00037 vr = gdcm.VR( gdcm.VR.UI )
00038 de.SetVR( vr )
00039 ds.Replace( de )
00040
00041 ano = gdcm.Anonymizer()
00042 ano.SetFile( r.GetFile() )
00043 ano.RemovePrivateTags()
00044 ano.RemoveGroupLength()
00045 taglist = [
00046     gdcm.Tag(0x0008,0x0008),
00047     gdcm.Tag(0x0008,0x0022),
00048     gdcm.Tag(0x0008,0x0032),
00049     gdcm.Tag(0x0008,0x2111),
00050     gdcm.Tag(0x0008,0x1150),
00051     gdcm.Tag(0x0008,0x1155),
00052     gdcm.Tag(0x0008,0x0100),
00053     gdcm.Tag(0x0008,0x0102),
00054     gdcm.Tag(0x0008,0x0104),
00055     gdcm.Tag(0x0040,0xa170),
00056     gdcm.Tag(0x0008,0x2112),
00057     gdcm.Tag(0x0008,0x0100),
00058     gdcm.Tag(0x0008,0x0102),
00059     gdcm.Tag(0x0008,0x0104),
00060     gdcm.Tag(0x0008,0x9215),
00061     gdcm.Tag(0x0018,0x0010),
00062     gdcm.Tag(0x0018,0x0022),
00063     gdcm.Tag(0x0018,0x0050),
00064     gdcm.Tag(0x0018,0x0060),
00065     gdcm.Tag(0x0018,0x0088),
00066     gdcm.Tag(0x0018,0x0090),
00067     gdcm.Tag(0x0018,0x1040),
00068     gdcm.Tag(0x0018,0x1100),
00069     gdcm.Tag(0x0018,0x1110),
00070     gdcm.Tag(0x0018,0x1111),
00071     gdcm.Tag(0x0018,0x1120),
00072     gdcm.Tag(0x0018,0x1130),
00073     gdcm.Tag(0x0018,0x1150),
00074     gdcm.Tag(0x0018,0x1151),
00075     gdcm.Tag(0x0018,0x1152),
00076     gdcm.Tag(0x0018,0x1160),
00077     gdcm.Tag(0x0018,0x1190),
00078     gdcm.Tag(0x0018,0x1210),
00079     gdcm.Tag(0x0020,0x0012),
00080     gdcm.Tag(0x0020,0x0032),
00081     gdcm.Tag(0x0020,0x0037),
00082     gdcm.Tag(0x0020,0x1041),
00083     gdcm.Tag(0x0020,0x4000),
00084     gdcm.Tag(0x0028,0x0002),
00085     gdcm.Tag(0x0028,0x0004),
00086     gdcm.Tag(0x0028,0x0010),
00087     gdcm.Tag(0x0028,0x0011),
00088     gdcm.Tag(0x0028,0x0030),
00089     gdcm.Tag(0x0028,0x0100),
00090     gdcm.Tag(0x0028,0x0101),
00091     gdcm.Tag(0x0028,0x0102),
00092     gdcm.Tag(0x0028,0x0103),
00093     gdcm.Tag(0x0028,0x1052),
00094     gdcm.Tag(0x0028,0x1053),
00095     gdcm.Tag(0x0028,0x2110),
00096     gdcm.Tag(0x0028,0x2112),
00097     gdcm.Tag(0x7fe0,0x0010),
00098     gdcm.Tag(0x0018,0x0020),
00099     gdcm.Tag(0x0018,0x0021),
00100     gdcm.Tag(0x0018,0x0023),
00101     gdcm.Tag(0x0018,0x0025),
00102     gdcm.Tag(0x0018,0x0080),
00103     gdcm.Tag(0x0018,0x0081),
00104     gdcm.Tag(0x0018,0x0083),
00105     gdcm.Tag(0x0018,0x0084),
00106     gdcm.Tag(0x0018,0x0085),
```

```

00107     gdc.Tag(0x0018,0x0086),
00108     gdc.Tag(0x0018,0x0087),
00109     gdc.Tag(0x0018,0x0091),
00110     gdc.Tag(0x0018,0x0093),
00111     gdc.Tag(0x0018,0x0094),
00112     gdc.Tag(0x0018,0x0095),
00113     gdc.Tag(0x0018,0x1088),
00114     gdc.Tag(0x0018,0x1090),
00115     gdc.Tag(0x0018,0x1094),
00116     gdc.Tag(0x0018,0x1250),
00117     gdc.Tag(0x0018,0x1251),
00118     gdc.Tag(0x0018,0x1310),
00119     gdc.Tag(0x0018,0x1312),
00120     gdc.Tag(0x0018,0x1314),
00121     gdc.Tag(0x0018,0x1315),
00122     gdc.Tag(0x0018,0x1316),
00123     gdc.Tag(0x0020,0x0110),
00124     gdc.Tag(0x0028,0x0120),
00125     gdc.Tag(0x0028,0x1050),
00126     gdc.Tag(0x0028,0x1051)
00127 ]
00128 for tag in taglist:
00129     #print tag
00130     ano.Remove( tag )
00131
00132 # special handling
00133 gen = gdc.UIDGenerator()
00134 ano.Replace( gdc.Tag(0x0008,0x9123), gen.Generate() )
00135 #ano.Empty( gdc.Tag(0x0040,0x0555) )
00136
00137
00138 #
00139 # uid = gen.Generate()
00140 # de.SetTag( gdc.Tag(0x0008,0x0018) )
00141 # de.SetByteStringValue( uid )
00142 # ds.Insert( de )
00143
00144 # init FMI now:
00145 #fmi = f.GetHeader()
00146 #ts = gdc.TransferSyntax()
00147 #print ts
00148 #fmi.SetDataSetTransferSyntax( ts ) # default
00149 #print fmi.GetDataSetTransferSyntax()
00150 #de.SetTag( gdc.Tag(0x0002,0x0010) )
00151 #uid = "1.2.840.10008.1.2"
00152 #de.SetByteStringValue( uid )
00153 #fmi.Insert( de )
00154 # f.SetHeader( r.GetFile().GetHeader() )
00155
00156 writer = gdc.Writer()
00157 writer.SetFile( ano.GetFile() )
00158 writer.SetFileName( "rawstorage.dcm" );
00159 writer.Write()

```

## 14.118 DecompressImage.py

```

00001
00014
00015 """
00016 Usage:
00017
00018 python DecompressImage.py gdcData/012345.002.050.dcm decompress.dcm
00019 """
00020
00021 import gdc
00022 import sys
00023
00024 if __name__ == "__main__":
00025
00026     file1 = sys.argv[1]
00027     file2 = sys.argv[2]
00028
00029     r = gdc.ImageReader()
00030     r.SetFileName( file1 )
00031     if not r.Read():
00032         sys.exit(1)

```

```

00033
00034 # check GetFragment API:
00035 pd = r.GetFile().GetDataSet().GetDataElement(gdcm.Tag(0x7fe0, 0x0010))
00036 frags = pd.GetSequenceOfFragments();
00037 frags.GetFragment(0);
00038
00039 ir = r.GetImage()
00040 w = gdcm.ImageWriter()
00041 image = w.GetImage()
00042
00043 image.SetNumberOfDimensions( ir.GetNumberOfDimensions() );
00044 dims = ir.GetDimensions();
00045 print ir.GetDimension(0);
00046 print ir.GetDimension(1);
00047 print "Dims:",dims
00048
00049 # Just for fun:
00050 dircos = ir.GetDirectionCosines()
00051 t = gdcm.Orientation.GetType(tuple(dircos))
00052 l = gdcm.Orientation.GetLabel(t)
00053 print "Orientation label:",l
00054
00055 image.SetDimension(0, ir.GetDimension(0) );
00056 image.SetDimension(1, ir.GetDimension(1) );
00057
00058 pixeltype = ir.GetPixelFormat();
00059 image.SetPixelFormat( pixeltype );
00060
00061 pi = ir.GetPhotometricInterpretation();
00062 image.SetPhotometricInterpretation( pi );
00063
00064 pixeldata = gdcm.DataElement( gdcm.Tag(0x7fe0,0x0010) )
00065 str1 = ir.GetBuffer()
00066 #print ir.GetBufferLength()
00067 pixeldata.SetByteStringValue( str1 )
00068 image.SetDataElement( pixeldata )
00069
00070 w.SetFileName( file2 )
00071 w.SetFile( r.GetFile() )
00072 w.SetImage( image )
00073 if not w.Write():
00074     sys.exit(1)

```

## 14.119 DumbAnonymizer.py

```

00001
00014
00015 """
00016 This example shows how one can use the gdcm.Anonymizer in 'dumb' mode.
00017 This class becomes really handy when one knows which particular tag to fill in.
00018
00019 Usage:
00020
00021 python DumbAnonymizer.py gdcmData/012345.002.050.dcm out.dcm
00022
00023 """
00024
00025 import gdcm
00026
00027 # http://www.oid-info.com/get/1.3.6.1.4.17434
00028 THERALYS_ORG_ROOT = "1.3.6.1.4.17434"
00029
00030 tag_rules={
00031     # Value
00032     (0x0012,0x0010):("Value","MySponsorName"),
00033     (0x0012,0x0020):("Value","MyProtocolID"),
00034     (0x0012,0x0021):("Value","MyProtocolName"),
00035     (0x0012,0x0062):("Value","YES"),
00036     (0x0012,0x0063):("Value","MyDeidentificationMethod"),
00037
00038     # Method
00039     (0x0002,0x0003):("Method","GenerateMSOPIId"),
00040     (0x0008,0x1155):("Method","GenerateMSOPIId"),
00041     (0x0008,0x0018):("Method","GenerateMSOPIId"),
00042     (0x0010,0x0010):("Method","GetSponsorInitials"),
00043     (0x0010,0x0020):("Method","GetSponsorId"),

```

```

00044 (0x0012,0x0030):("Method","GetSiteId"),
00045 (0x0012,0x0031):("Method","GetSiteName"),
00046 (0x0012,0x0040):("Method","GetSponsorId"),
00047 (0x0012,0x0050):("Method","GetTPId"),
00048 (0x0018,0x0022):("Method","KeepIfExist"),
00049 (0x0018,0x1315):("Method","KeepIfExist"),
00050 (0x0020,0x000d):("Method","GenerateStudyId"),
00051 (0x0020,0x000e):("Method","GenerateSeriesId"),
00052 (0x0020,0x1002):("Method","GetNumberOfFrames"),
00053 (0x0020,0x0020):("Method","GetPatientOrientation"),
00054 # Other:
00055 (0x0012,0x0051):("Patient Field","Type Examen"),
00056 (0x0018,0x1250):("Sequence Field","Receive Coil"),
00057 (0x0018,0x0088):("Sequence Field","Spacing Between Slice"),
00058 (0x0018,0x0095):("Sequence Field","Pixel Bandwidth"),
00059 (0x0018,0x0082):("Sequence Field","Inversion Time"),
00060 }
00061
00062 class MyAnon:
00063     def __init__(self):
00064         self.studyuid = None
00065         self.seriesuid = None
00066         generator = gdcm.UIDGenerator()
00067         if not self.studyuid:
00068             self.studyuid = generator.Generate()
00069         if not self.seriesuid:
00070             self.seriesuid = generator.Generate()
00071     def GetSponsorInitials(self):
00072         return "dummy^foobar"
00073     def GenerateStudyId(self):
00074         return self.studyuid
00075     def GenerateSeriesId(self):
00076         return self.seriesuid
00077     #def GenerateMSOPIId(self):
00078     def GenerateMSOPIId(self):
00079         generator = gdcm.UIDGenerator()
00080         return generator.Generate()
00081     def GetSiteId(self):
00082         return "MySiteId"
00083     def GetSiteName(self):
00084         return "MySiteName"
00085     def GetSponsorId(self):
00086         return "MySponsorId"
00087     def GetTPId(self):
00088         return "MyTP"
00089
00090 if __name__ == "__main__":
00091     import sys
00092     gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "DumbAnonymizer" )
00093     gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT )
00094
00095     r = gdcm.Reader()
00096     filename = sys.argv[1]
00097     r.SetFileName( filename )
00098     if not r.Read(): sys.exit(1)
00099
00100     obj = MyAnon()
00101
00102     w = gdcm.Writer()
00103     ano = gdcm.Anonymizer()
00104     ano.SetFile( r.GetFile() )
00105     ano.RemoveGroupLength()
00106     for tag,rule in tag_rules.items():
00107         if rule[0] == 'Value':
00108             print tag,rule
00109             ano.Replace( gdcm.Tag( tag[0], tag[1] ), rule[1] )
00110         elif rule[0] == 'Method':
00111             print tag,rule
00112             # result = locals()[rule[1]]()
00113             methodname = rule[1]
00114             if hasattr(obj, methodname):
00115                 _member = getattr(obj, methodname)
00116                 result = _member()
00117                 ano.Replace( gdcm.Tag( tag[0], tag[1] ), result )
00118             else:
00119                 print "Problem with: ", methodname
00120
00121     outfilename = sys.argv[2]
00122     w.SetFileName( outfilename )
00123     w.SetFile( ano.GetFile() )
00124     if not w.Write(): sys.exit(1)

```

## 14.120 ExtractImageRegion.py

```

00001
00014
00015 """
00016
00017 This small code shows how to use the gdcm.ImageRegionReader API
00018 In this example we are taking each frame by frame and dump them to
00019 /tmp/frame.raw.
00020
00021 Usage:
00022 $ ExtractImageRegion.py input.dcm
00023
00024 Example:
00025 $ ExtractImageRegion.py gdcmData/012345.002.050.dcm
00026 $ md5sum /tmp/frame.raw
00027 d594a5e2fde12f32b6633ca859b4d4a6 /tmp/frame.raw
00028 $ gdcminfo --md5sum gdcmData/012345.002.050.dcm
00029 [...]
00030 md5sum: d594a5e2fde12f32b6633ca859b4d4a6
00031 """
00032
00033 import gdcm
00034
00035 if __name__ == "__main__":
00036     import sys
00037     filename = sys.argv[1]
00038
00039     file_size = gdcm.System.FileSize(filename);
00040
00041     # instantiate the reader:
00042     reader = gdcm.ImageRegionReader();
00043     reader.SetFileName( filename );
00044
00045     # pull DICOM info:
00046     if not reader.ReadInformation():
00047         sys.exit(1)
00048
00049     # store current offset:
00050     cur_pos = reader.GetStreamCurrentPosition();
00051
00052     remaining = file_size - cur_pos;
00053
00054     print("Remaining bytes to read (Pixel Data): %d" % remaining );
00055
00056     # Get file infos
00057     f = reader.GetFile();
00058
00059     # get some info about image
00060     dims = gdcm.ImageHelper.GetDimensionsValue(f);
00061     print(dims)
00062     pf = gdcm.ImageHelper.GetPixelFormatValue(f);
00063     pixelsize = pf.GetPixelSize();
00064     pi = gdcm.ImageHelper.GetPhotometricInterpretationValue(f);
00065     print( pi );
00066
00067     # buffer to get the pixels
00068     buffer = bytearray( dims[0] * dims[1] * pixelsize )
00069
00070     # define a simple box region.
00071     box = gdcm.BoxRegion();
00072     for z in range(0, dims[2]):
00073         # Define that I want the image 0, full size (dimx x dimy pixels)
00074         # and do that for each z:
00075         box.SetDomain(0, dims[0] - 1, 0, dims[1] - 1, z, z);
00076         #print( box.toString() );
00077         reader.SetRegion( box );
00078
00079     # reader will try to load the uncompressed image region into buffer.
00080     # the call returns an error when buffer.Length is too small. For instance
00081     # one can call:
00082     # uint buf_len = reader.ComputeBufferLength(); // take into account pixel size
00083     # to get the exact size of minimum buffer
00084     if reader.ReadIntoBuffer(buffer):
00085         open('/tmp/frame.raw', 'wb').write(buffer)
00086     else:
00087         #throw new Exception("can't read pixels error");
00088         sys.exit(1)

```

## 14.121 FindAllPatientName.py

```

00001
00014 """
00015 This example shows how one can use the gdcmm.CompositeNetworkFunctions class
00016 for executing a C-FIND query
00017 It will print the list of patient name found
00018
00019 Usage:
00020
00021 python FindAllPatientName.py
00022
00023 """
00024
00025 import gdcmm
00026
00027 # Patient Name
00028 tag = gdcmm.Tag(0x10,0x10)
00029 de = gdcmm.DataElement(tag)
00030
00031 # Search all patient name where string match 'F*'
00032 de.SetByteStringValue('F*')
00033
00034 ds = gdcmm.DataSet()
00035 ds.Insert(de)
00036
00037 cnf = gdcmm.CompositeNetworkFunctions()
00038 theQuery = cnf.ConstructQuery(gdcmm.ePatientRootType,gdcmm.ePatient,ds)
00039
00040 #print theQuery.ValidateQuery()
00041
00042 # prepare the variable for output
00043 ret = gdcmm.DataSetArrayType()
00044
00045 # Execute the C-FIND query
00046 cnf.CFind('dicom.example.com',11112,theQuery,ret,'GDCM_PYTHON','ANY-SCP')
00047
00048 for i in range(0,ret.size()):
00049     print "Patient #",i
00050     print ret[i]

```

## 14.122 FixCommaBug.py

```

00001
00014 """
00015 Using LC_NUMERIC set to something not compatible with "C" it is possible to write out "," instead of
00016 "." as required by the DICOM standard
00017 Issue is still current (IMHO) with gdcmm 2.0.9
00018 """
00019
00020
00021 import gdcmm
00022 import sys
00023
00024 filename = sys.argv[1]
00025 outname = sys.argv[2]
00026
00027 # read
00028 r = gdcmm.Reader()
00029 r.SetFileName( filename )
00030 if not r.Read():
00031     print "not valid"
00032     sys.exit(1)
00033
00034 file = r.GetFile()
00035 dataset = file.GetDataSet()
00036
00037 ano = gdcmm.Anonymizer()
00038 ano.SetFile( file )
00039
00040 tags = [
00041     gdcmm.Tag(0x0018,0x1164),
00042     gdcmm.Tag(0x0018,0x0088),
00043     gdcmm.Tag(0x0018,0x0050),
00044     gdcmm.Tag(0x0028,0x0030),
00045 ]

```



```

00046
00047 for tag in tags:
00048     print tag
00049     if dataset.FindElement( tag ):
00050         pixelspacing = dataset.GetDataElement( tag )
00051         #print pixelspacing
00052         bv = pixelspacing.GetByteValue()
00053         str = bv.GetBuffer()
00054         #print bv.GetLength()
00055         #print len(str)
00056         new_str = str.replace(",",".")
00057         # Need to explicitly pass bv.GetLength() to remove any trailing garbage
00058         ano.Replace( tag, new_str, bv.GetLength() )
00059
00060 #print dataset
00061
00062 w = gdcm.Writer()
00063 w.SetFile( file )
00064 w.SetFileName( outname )
00065 if not w.Write():
00066     print "Cannot write"
00067     sys.exit(1)
00068
00069 # paranoid:
00070 image_reader = gdcm.ImageReader()
00071 image_reader.SetFileName( outname )
00072 if not image_reader.Read():
00073     print "there is still a comma"
00074     sys.exit(1)
00075
00076 print "Success!"
00077 sys.exit(0) # success

```

## 14.123 GetPortionCSAHeader.py

```

00001
00014
00015 """
00016 Usage:
00017
00018 python GetPortionCSAHeader.py input.dcm
00019
00020 Footnote:
00021 SIEMENS is not publishing any information on the CSA header. So any info extracted
00022 is at your own risk.
00023 """
00024
00025 import sys
00026 import gdcm
00027
00028 if __name__ == "__main__":
00029
00030     file = sys.argv[1]
00031
00032     r = gdcm.Reader()
00033     r.SetFileName( file )
00034     if not r.Read():
00035         sys.exit(1)
00036
00037     ds = r.GetFile().GetDataSet()
00038     csa_t1 = gdcm.CSAHeader()
00039     csa_t2 = gdcm.CSAHeader()
00040     #print csa
00041     t1 = csa_t1.GetCSAImageHeaderInfoTag();
00042     print t1
00043     t2 = csa_t2.GetCSASeriesHeaderInfoTag();
00044     print t2
00045     # Let's do it for t1:
00046     if ds.FindElement( t1 ):
00047         csa_t1.LoadFromDataElement( ds.GetDataElement( t1 ) )
00048         print csa_t1
00049
00050     # Now let's pretend we are only interested in B_value and DiffusionGradientDirection entries:
00051     bvalues = csa_t1.GetCSAElementByName( "B_value" ) # WARNING: it is case sensitive !
00052     print bvalues
00053

```

```

00054 diffgraddir = csa_t1.GetCSAElementByName( "DiffusionGradientDirection" ) # WARNING: it is case sensitive
!
00055 print diffgraddir
00056
00057 # repeat for t2 if you like it:
00058 if ds.FindDataElement( t2 ):
00059     csa_t2.LoadFromDataElement( ds.GetDataElement( t2 ) )
00060     # print csa_t2
00061
00062 gdt = csa_t2.GetCSAElementByName( "GradientDelayTime" )
00063 print gdt
00064
00065 bv = gdt.GetByteValue();
00066 #print bv
00067 str = bv.GetPointer()
00068 print str.split("\\")

```

## 14.124 HelloWorld.py

```

00001
00014
00015 """
00016 Hello World !
00017 """
00018
00019 import gdcm
00020 import sys
00021
00022 if __name__ == "__main__":
00023
00024     # verbosity:
00025     #gdcm.Trace.DebugOn()
00026     #gdcm.Trace.WarningOn()
00027     #gdcm.Trace.ErrorOn()
00028
00029     # Get the filename from the command line
00030     filename = sys.argv[1]
00031
00032     # Instantiate a gdcm.Reader
00033     # This is the main class to handle any type of DICOM object
00034     # You should check for gdcm.ImageReader for reading specifically DICOM Image file
00035     r = gdcm.Reader()
00036     r.SetFileName( filename )
00037     # If the reader fails to read the file, we should stop !
00038     if not r.Read():
00039         print "Not a valid DICOM file"
00040         sys.exit(1)
00041
00042     # Get the DICOM File structure
00043     file = r.GetFile()
00044
00045     # Get the DataSet part of the file
00046     dataset = file.GetDataSet()
00047
00048     # Ok let's print it !
00049     print dataset
00050
00051     # Use StringFilter to print a particular Tag:
00052     sf = gdcm.StringFilter()
00053     sf.SetFile(r.GetFile())
00054
00055     # Check if Attribute exist
00056     print dataset.FindElement( gdcm.Tag(0x0028,0x0010) )
00057
00058     # Let's print it as string pair:
00059     print sf.ToStringPair(gdcm.Tag(0x0028,0x0010))

```

## 14.125 ManipulateFile.py

```

00001
00014
00015 """

```

```

00016 Usage:
00017
00018 python ManipulateFile.py input.dcm output.dcm
00019
00020 Footnote:
00021 GDCM 1.2.x would create incorrect Multiframe MR Image Storage file. Try to recover from
00022 the issues to recreate a MultiframeGrayscaleByteSecondaryCaptureImageStorage file.
00023 e.g:
00024
00025 python ManipulateFile.py Insight/Testing/Temporary/itkGDCMImageIOTest5-j2k.dcm manipulated.dcm
00026 """
00027
00028 import sys
00029 import gdcm
00030
00031 if __name__ == "__main__":
00032
00033     file1 = sys.argv[1]
00034     file2 = sys.argv[2]
00035
00036     r = gdcm.Reader()
00037     r.SetFileName( file1 )
00038     if not r.Read():
00039         sys.exit(1)
00040
00041     ano = gdcm.Anonymizer()
00042     ano.SetFile( r.GetFile() )
00043     ano.RemovePrivateTags()
00044     ano.Remove( gdcm.Tag(0x0032,0x1030) )
00045     ano.Remove( gdcm.Tag(0x008,0x14) )
00046     ano.Remove( gdcm.Tag(0x008,0x1111) )
00047     ano.Remove( gdcm.Tag(0x008,0x1120) )
00048     ano.Remove( gdcm.Tag(0x008,0x1140) )
00049     ano.Remove( gdcm.Tag(0x10,0x21b0) )
00050     ano.Empty( gdcm.Tag(0x10,0x10) )
00051     ano.Empty( gdcm.Tag(0x10,0x20) )
00052     ano.Empty( gdcm.Tag(0x10,0x30) )
00053     ano.Empty( gdcm.Tag(0x20,0x10) )
00054     ano.Empty( gdcm.Tag(0x32,0x1032) )
00055     ano.Empty( gdcm.Tag(0x32,0x1033) )
00056     ano.Empty( gdcm.Tag(0x40,0x241) )
00057     ano.Empty( gdcm.Tag(0x40,0x254) )
00058     ano.Empty( gdcm.Tag(0x40,0x253) )
00059     ano.Empty( gdcm.Tag(0x40,0x1001) )
00060     ano.Empty( gdcm.Tag(0x8,0x80) )
00061     ano.Empty( gdcm.Tag(0x8,0x50) )
00062     ano.Empty( gdcm.Tag(0x8,0x1030) )
00063     ano.Empty( gdcm.Tag(0x8,0x103e) )
00064     ano.Empty( gdcm.Tag(0x18,0x1030) )
00065     ano.Empty( gdcm.Tag(0x38,0x300) )
00066     g = gdcm.UIDGenerator()
00067     ano.Replace( gdcm.Tag(0x0008,0x0018), g.Generate() )
00068     ano.Replace( gdcm.Tag(0x0020,0x00d), g.Generate() )
00069     ano.Replace( gdcm.Tag(0x0020,0x00e), g.Generate() )
00070     ano.Replace( gdcm.Tag(0x0020,0x052), g.Generate() )
00071     #ano.Replace( gdcm.Tag(0x0008,0x0016), "1.2.840.10008.5.1.4.1.1.7.2" )
00072     """
00073     ano.Remove( gdcm.Tag(0x0018,0x0020) ) # ScanningSequence
00074     ano.Remove( gdcm.Tag(0x0018,0x0021) ) # SequenceVariant
00075     ano.Remove( gdcm.Tag(0x0018,0x0022) ) # ScanOptions
00076     ano.Remove( gdcm.Tag(0x0018,0x0023) ) # MRAcquisitionType
00077     ano.Remove( gdcm.Tag(0x0018,0x0050) ) # SliceThickness
00078     ano.Remove( gdcm.Tag(0x0018,0x0080) ) # RepetitionTime
00079     ano.Remove( gdcm.Tag(0x0018,0x0081) ) # EchoTime
00080     ano.Remove( gdcm.Tag(0x0018,0x0088) ) # SpacingBetweenSlices
00081     ano.Remove( gdcm.Tag(0x0018,0x0091) ) # EchoTrainLength
00082     ano.Remove( gdcm.Tag(0x0018,0x1164) ) # ImagerPixelSpacing
00083
00084     ano.Remove( gdcm.Tag(0x0020,0x0032) ) # Image Position (Patient)
00085     ano.Remove( gdcm.Tag(0x0020,0x0037) ) # Image Orientation (Patient)
00086     ano.Remove( gdcm.Tag(0x0020,0x0052) ) # Frame of Reference UID
00087     ano.Remove( gdcm.Tag(0x0020,0x1040) ) # Position Reference Indicator
00088
00089     ano.Replace( gdcm.Tag(0x0028,0x0301), "NO" ) # Burned In Annotation
00090
00091     ano.Empty( gdcm.Tag(0x0020,0x0020) )
00092
00093     ano.Remove( gdcm.Tag(0x7fe0,0x0000) )
00094
00095     #ano.Empty( gdcm.Tag(0x0028,0x0009) ) # Frame Increment Pointer
00096

```

```

00097     #ano.Empty( gdcm.Tag(0x0028,0x1052) )  #<entry group="0028" element="1052" vr="DS" vm="1" name="Rescale
Intercept"/>
00098     #ano.Empty( gdcm.Tag(0x0028,0x1053) )  #<entry group="0028" element="1053" vr="DS" vm="1" name="Rescale
Slope"/>
00099     #ano.Replace( gdcm.Tag(0x0028,0x1054), "US" )  #<entry group="0028" element="1054" vr="LO" vm="1"
name="Rescale Type"/>
00100
00101     ano.Replace( gdcm.Tag(0x2050, 0x0020), "IDENTITY")
00102     ""
00103
00104     w = gdcm.Writer()
00105     w.SetFile( ano.GetFile() )
00106     w.SetFileName( file2 )
00107     if not w.Write():
00108         sys.exit(1)

```

## 14.126 ManipulateSequence.py

```

00001
00014
00015 """
00016 Usage:
00017
00018     python ManipulateSequence.py input.dcm output.dcm
00019
00020 This was tested using:
00021
00022     python ManipulateSequence.py gdcmData/D_CLUNIE_CT1_J2KI.dcm myoutput.dcm
00023
00024 This is a dummy example on how to modify a value set in a nested-nested dataset
00025
00026 WARNING:
00027 Do not use as-is in production, this is just an example
00028 This example works in an undefined length Item only (you need to explicitly recompute the length
otherwise)
00029 """
00030
00031 import sys
00032 import gdcm
00033
00034 if __name__ == "__main__":
00035
00036     file1 = sys.argv[1]
00037     file2 = sys.argv[2]
00038
00039     r = gdcm.Reader()
00040     r.SetFileName( file1 )
00041     if not r.Read():
00042         sys.exit(1)
00043
00044     f = r.GetFile()
00045     ds = f.GetDataSet()
00046     tsis = gdcm.Tag(0x0008,0x2112) # SourceImageSequence
00047     if ds.FindDataElement( tsis ):
00048         sis = ds.GetDataElement( tsis )
00049         #sqsis = sis.GetSequenceOfItems()
00050         # GetValueAsSQ handle more cases
00051         sqsis = sis.GetValueAsSQ()
00052         if sqsis.GetNumberOfItems():
00053             item1 = sqsis.GetItem(1)
00054             nestedds = item1.GetNestedDataSet()
00055             tprcs = gdcm.Tag(0x0040,0xa170) # PurposeOfReferenceCodeSequence
00056             if nestedds.FindDataElement( tprcs ):
00057                 prcs = nestedds.GetDataElement( tprcs )
00058                 sqprcs = prcs.GetSequenceOfItems()
00059                 if sqprcs.GetNumberOfItems():
00060                     item2 = sqprcs.GetItem(1)
00061                     nestedds2 = item2.GetNestedDataSet()
00062                     # (0008,0104) LO [Uncompressed predecessor] # 24, 1 CodeMeaning
00063                     tcm = gdcm.Tag(0x0008,0x0104)
00064                     if nestedds2.FindDataElement( tcm ):
00065                         cm = nestedds2.GetDataElement( tcm )
00066                         mystr = "GDCM was here"
00067                         cm.SetByteStringValue( mystr )
00068
00069     w = gdcm.Writer()

```

```

00070     w.SetFile( f )
00071     w.SetFileName( file2 )
00072     if not w.Write():
00073         sys.exit(1)

```

## 14.127 MergeFile.py

```

00001
00014
00015 """
00016 Usage:
00017
00018     python MergeFile.py input1.dcm input2.dcm
00019
00020     It will produce a 'merge.dcm' output file, which contains all meta information from input1.dcm
00021     and copy the Stored Pixel values from input2.dcm
00022     This script even works when input2.dcm is a Secondary Capture and does not contains information
00023     such as IOP and IPP...
00024 """
00025
00026 import sys
00027 import gdcm
00028
00029 if __name__ == "__main__":
00030
00031     file1 = sys.argv[1]
00032     file2 = sys.argv[2]
00033
00034     r1 = gdcm.ImageReader()
00035     r1.SetFileName( file1 )
00036     if not r1.Read():
00037         sys.exit(1)
00038
00039     r2 = gdcm.ImageReader()
00040     r2.SetFileName( file2 )
00041     if not r2.Read():
00042         sys.exit(1)
00043
00044     # Image from r2 could be Secondary Capture and thus would not contains neither IPP nor IOP
00045     # Instead always prefer to only copy the Raw Data Element.
00046     # Warning ! Image need to be identical ! Only the value of Stored Pixel can be different.
00047     r1.GetImage().SetDataElement( r2.GetImage().GetDataElement() )
00048
00049     w = gdcm.ImageWriter()
00050     w.SetFile( r1.GetFile() )
00051     #w.SetImage( r2.GetImage() ) # See comment above
00052     w.SetImage( r1.GetImage() )
00053
00054     w.SetFileName( "merge.dcm" )
00055     if not w.Write():
00056         sys.exit(1)
00057
00058     sys.exit(0)

```

## 14.128 NewSequence.py

```

00001
00014
00015 """
00016 Usage:
00017
00018     python NewSequence.py input.dcm output.dcm
00019
00020
00021 Thanks to Robert Irie for code
00022 """
00023
00024 import sys
00025 import gdcm
00026
00027 if __name__ == "__main__":
00028

```

```

00029 file1 = sys.argv[1]
00030 file2 = sys.argv[2]
00031
00032 r = gdcm.Reader()
00033 r.SetFileName( file1 )
00034 if not r.Read():
00035     sys.exit(1)
00036
00037 f = r.GetFile()
00038 ds = f.GetDataSet()
00039 #tsis = gdcm.Tag(0x0008,0x2112) # SourceImageSequence
00040
00041 # Create a dataelement
00042 de = gdcm.DataElement(gdcm.Tag(0x0010, 0x2180))
00043 de.SetByteStringValue("Occupation")
00044 de.SetVR(gdcm.VR(gdcm.VR.SH))
00045
00046 # Create an item
00047 it=gdcm.Item()
00048 it.SetVLToUndefined() # Needed to not popup error message
00049 #it.InsertDataElement(de)
00050 nds=it.GetNestedDataSet()
00051 nds.Insert(de)
00052
00053 # Create a Sequence
00054 sq=gdcm.SequenceOfItems().New()
00055 sq.SetLengthToUndefined()
00056 sq.AddItem(it)
00057
00058 # Insert sequence into data set
00059 des=gdcm.DataElement(gdcm.Tag(0x0400,0x0550))
00060 des.SetVR(gdcm.VR(gdcm.VR.SQ))
00061 des.SetValue(sq.__ref__())
00062 des.SetVLToUndefined()
00063
00064 ds.Insert(des)
00065
00066 w = gdcm.Writer()
00067 w.SetFile( f )
00068 w.SetFileName( file2 )
00069 if not w.Write():
00070     sys.exit(1)

```

## 14.129 PhilipsPrivateRescaleInterceptSlope.py

```

00001
00014
00015 """
00016 Usage:
00017
00018 python
00019 """
00020
00021 import gdcm
00022 import sys
00023
00024 filename = sys.argv[1]
00025 tmpfile = "/tmp/philips_rescaled.dcm"
00026
00027
00028 # Need to access some private tags, read the file :
00029 reader = gdcm.Reader()
00030 reader.SetFileName( filename )
00031 if not reader.Read():
00032     sys.exit(1)
00033
00034 ds = reader.GetFile().GetDataSet()
00035
00036 #print ds
00037 # (2005,1409)      DS      4      0.0
00038 # (2005,140a)      DS      16     1.52283272283272
00039
00040 # (2005,0014)      LO      26     Philips MR Imaging DD 005
00041 tag1 = gdcm.PrivateTag(0x2005,0x09,"Philips MR Imaging DD 005")
00042 tag2 = gdcm.PrivateTag(0x2005,0x0a,"Philips MR Imaging DD 005")
00043 print tag1

```

```

00044 print tag2
00045
00046 # make sure to do a copy, we want the private tag to remain
00047 # otherwise gdcm gives us a reference
00048 e11 = gdcm.DataElement( ds.GetDataElement( tag1 ) )
00049 print e11
00050 e12 = gdcm.DataElement( ds.GetDataElement( tag2 ) )
00051 print e12
00052
00053 # (0028,1052) DS [-1000] # 6, 1 RescaleIntercept
00054 # (0028,1053) DS [1] # 2, 1 RescaleSlope
00055
00056 e11.SetTag( gdcm.Tag(0x0028,0x1052) )
00057 e12.SetTag( gdcm.Tag(0x0028,0x1053) )
00058
00059 ds.Insert( e11 )
00060 ds.Insert( e12 )
00061
00062 w = gdcm.Writer()
00063 w.SetCheckFileMetaInformation( False )
00064 w.SetFileName( tmpfile )
00065 w.SetFile( reader.GetFile() )
00066 if not w.Write():
00067     sys.exit(1)
00068
00069 print "success"

```

## 14.130 PlaySound.py

```

00001
00014
00015 """
00016 Usage:
00017
00018 python PlaySound.py input.dcm
00019 """
00020
00021 import gdcm
00022 import sys
00023
00024 #filename = "/home/mmalaterre/Creatis/gdcmDataExtra/gdcmNonImageData/audio_from_rafael_sanguinetti.dcm"
00025 filename = sys.argv[1]
00026 print filename
00027
00028 r = gdcm.Reader()
00029 r.SetFileName( filename )
00030 if not r.Read():
00031     sys.exit(1)
00032
00033 ds = r.GetFile().GetDataSet()
00034
00035 waveformtag = gdcm.Tag(0x5400,0x0100)
00036 waveformsq = ds.GetDataElement( waveformtag )
00037 #print waveformsq
00038
00039 #print dir(waveformsq)
00040
00041 items = waveformsq.GetSequenceOfItems()
00042
00043 if not items.GetNumberOfItems():
00044     sys.exit(1)
00045
00046 item = items.GetItem(1)
00047 #print item
00048
00049 waveformds = item.GetNestedDataSet()
00050 #print waveformds
00051
00052 waveformdatatag = gdcm.Tag(0x5400,0x1010)
00053 waveformdata = waveformds.GetDataElement( waveformdatatag )
00054
00055 #print waveformdata.GetPointer()
00056 bv = waveformdata.GetByteValue()
00057 print dir(bv)
00058
00059 #print bv.GetPointer()

```

```

00060 print bv.GetLength()
00061 l = 116838
00062
00063 file='test.wav'
00064 myfile = open(file, "wb")
00065 s = bv.GetPointer()
00066 for i in range(0, l):
00067     myfile.write(s[i])
00068 myfile.close()
00069
00070 # http://mail.python.org/pipermail/python-list/2004-October/288905.html
00071 if sys.platform.startswith('win'):
00072     from winsound import PlaySound, SND_FILENAME, SND_ASYNC
00073     PlaySound(file, SND_FILENAME|SND_ASYNC)
00074 elif sys.platform.find('linux')>-1:
00075     from wave import open as waveOpen
00076     from ossaudiodev import open as ossOpen
00077     s = waveOpen(file,'rb')
00078     (nc,sw,fr,nf,comptype, compname) = s.getparams( )
00079     dsp = ossOpen('/dev/dsp','w')
00080     try:
00081         from ossaudiodev import AFMT_S16_NE
00082     except ImportError:
00083         if byteorder == "little":
00084             AFMT_S16_NE = ossaudiodev.AFMT_S16_LE
00085         else:
00086             AFMT_S16_NE = ossaudiodev.AFMT_S16_BE
00087     dsp.setparameters(AFMT_S16_NE, nc, fr)
00088     data = s.readframes(nf)
00089     s.close()
00090     dsp.write(data)
00091     dsp.close()

```

## 14.131 PrivateDict.py

```

00001
00014
00015 """
00016 """
00017
00018 import gdcmm
00019 import sys,os
00020
00021 if __name__ == "__main__":
00022     #gdcmm.Trace.DebugOn()
00023     globInst = gdcmm.Global.GetInstance()
00024     # Try to load Part3.xml file
00025     # This file is too big for being accessible directly at runtime.
00026     globInst.LoadResourcesFiles()
00027
00028
00029 # Get a private tag from the runtime dicts. LoadResourcesFiles could
00030 # have failed but this has no impact on the private dict
00031
00032 d = globInst.GetDicts()
00033 print d.GetDictEntry( gdcmm.Tag(0x0029,0x0010) ,"SIEMENS CSA HEADER" )
00034 pd = d.GetPrivateDict()
00035 print pd.GetDictEntry( gdcmm.PrivateTag(0x0029,0x0010,"SIEMENS CSA HEADER") )

```

## 14.132 ReWriteSCAsMR.py

```

00001
00014
00015 """
00016 GDCM 1.x would write out MR Image Storage as Secondary Capture Object while still setting Rescale
00017 Slope/Intercept
00018 and saving the Pixel Spacing in (0028,0030)
00019 """
00020
00021 import gdcmm
00022 import sys,os
00023
00024

```



```

00023 def CheckSecondaryCaptureObjectIsMRImageStorage(r):
00024     ds = r.GetFile().GetDataSet()
00025     # Check Source Image Sequence
00026     if ds.FindDataElement( gdcm.Tag(0x0008,0x2112) ):
00027         sis = ds.GetDataElement( gdcm.Tag(0x0008,0x2112) )
00028         sqsis = sis.GetSequenceOfItems()
00029         if sqsis.GetNumberOfItems():
00030             item1 = sqsis.GetItem(1)
00031             nestedds = item1.GetNestedDataSet()
00032             if nestedds.FindDataElement( gdcm.Tag(0x0008,0x1150) ):
00033                 ReferencedSOPClassUID = nestedds.GetDataElement( gdcm.Tag(0x0008,0x1150) )
00034                 raw = ReferencedSOPClassUID.GetByteValue().GetPointer()
00035                 uids = gdcm.UIDs()
00036                 # what is the actual object we are looking at ?
00037                 ms = gdcm.MediaStorage()
00038                 ms.SetFromDataSet(ds)
00039                 msuid = ms.GetString()
00040                 uids.SetFromUID( msuid )
00041                 msuidname = uids.GetName() # real Media Storage Name
00042                 uids.SetFromUID( raw )
00043                 sqmsuidname = uids.GetName() # Source Image Sequence Media Storage Name
00044                 # If object is SC and Source derivation is MRImageStorage then we can assume 'Pixel Spacing' is
correct
00045                 if( sqmsuidname == 'MR Image Storage' and msuidname == 'Secondary Capture Image Storage' ):
00046                     return True
00047                 # in all other case simply return the currentspacing:
00048                 return False
00049
00050 if __name__ == "__main__":
00051     r = gdcm.ImageReader()
00052     filename = sys.argv[1]
00053     r.SetFileName( filename )
00054     if not r.Read():
00055         sys.exit(1)
00056     f = r.GetFile()
00057
00058     if( CheckSecondaryCaptureObjectIsMRImageStorage(r) ):
00059         # Special handling of the spacing:
00060         # GDCM 1.2.0 would not rewrite correctly DICOM Object and would always set them as 'Secondary Capture
Image Storage'
00061         # while we would rather have 'MR Image Storage'
00062         gdcm.ImageHelper.SetForcePixelSpacing( True )
00063         mrspacing = gdcm.ImageHelper.GetSpacingValue( r.GetFile() )
00064         # TODO: I cannot do simply the following:
00065         #image.SetSpacing( mrspacing )
00066         image.SetSpacing(0, mrspacing[0] )
00067         image.SetSpacing(1, mrspacing[1] )
00068         image.SetSpacing(2, mrspacing[2] )
00069         gdcm.ImageHelper.SetForceRescaleInterceptSlope( True )
00070         ris = gdcm.ImageHelper.GetRescaleInterceptSlopeValue( r.GetFile() )
00071         image.SetIntercept( ris[0] )
00072         image.SetSlope( ris[1] )
00073
00074     outfilename = sys.argv[2]
00075     w = gdcm.ImageWriter()
00076     w.SetFileName( outfilename )
00077     w.SetFile( r.GetFile() )
00078     w.SetImage( image )
00079     if not w.Write():
00080         sys.exit(1)
00081
00082     sys.exit(0)

```

## 14.133 ReadAndDumpDICOMDIR.py

```

00001
00023
00024
00025
00026 import sys
00027 import gdcm
00028
00029 if __name__ == "__main__":
00030     # Check arguments
00031     if (len(sys.argv) < 2):
00032         # No filename passed

```

```

00033         print "No input filename found"
00034         quit()
00035
00036     filename = sys.argv[1]
00037
00038
00039     # Read file
00040     reader = gdcm.Reader()
00041     reader.SetFileName(filename)
00042     if (not reader.Read()):
00043         print "Unable to read %s" % (filename)
00044         quit()
00045
00046     file = reader.GetFile()
00047
00048     # Retrieve header information
00049     fileMetaInformation = file.GetHeader()
00050     print fileMetaInformation
00051
00052     # Retrieve data set
00053     dataSet = file.GetDataSet()
00054     #print dataSet
00055
00056     # Check media storage
00057     mediaStorage = gdcm.MediaStorage()
00058     mediaStorage.SetFromFile(file)
00059     if (gdcm.MediaStorage.GetMSType(str(mediaStorage)) != gdcm.MediaStorage.MediaStorageDirectoryStorage):
00060         # File is not a DICOMDIR
00061         print "This file is not a DICOMDIR (Media storage type: %s)" % (str(mediaStorage))
00062         quit()
00063
00064     # Check Media Storage SOP Class
00065     if (fileMetaInformation.FindDataElement(gdcm.Tag(0x0002, 0x0002))):
00066         sopClassUid = str(fileMetaInformation.GetDataElement(gdcm.Tag(0x0002, 0x0002)).GetValue())
00067         # Check SOP UID
00068         if (sopClassUid != "1.2.840.10008.1.3.10"):
00069             # File is not a DICOMDIR
00070             print "This file is not a DICOMDIR"
00071     else:
00072         # Not present
00073         print "Media Storage SOP Class not present"
00074         quit()
00075
00076     # Iterate through the DICOMDIR data set
00077     iterator = dataSet.GetDES().begin()
00078     while (not iterator.equal(dataSet.GetDES().end())):
00079         dataElement = iterator.next()
00080
00081         # Check the element tag
00082         if (dataElement.GetTag() == gdcm.Tag(0x004, 0x1220)):
00083             # The 'Directory Record Sequence' element
00084             sequence = dataElement.GetValueAsSQ()
00085
00086             # Loop through the sequence items
00087             itemNr = 1
00088             while (itemNr < sequence.GetNumberOfItems()):
00089                 item = sequence.GetItem(itemNr)
00090
00091                 # Check the element tag
00092                 if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
00093                     # The 'Directory Record Type' element
00094                     value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
00095
00096                     # PATIENT
00097                     while (value.strip() == "PATIENT"):
00098                         print value.strip()
00099                         # Print patient name
00100                         if (item.FindDataElement(gdcm.Tag(0x0010, 0x0010))):
00101                             value = str(item.GetDataElement(gdcm.Tag(0x0010, 0x0010)).GetValue())
00102                             print value
00103
00104                         # Print patient ID
00105                         if (item.FindDataElement(gdcm.Tag(0x0010, 0x0020))):
00106                             value = str(item.GetDataElement(gdcm.Tag(0x0010, 0x0020)).GetValue())
00107                             print value
00108
00109                     # Next
00110                     itemNr = itemNr + 1
00111                     item = sequence.GetItem(itemNr)
00112                 if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
00113                     value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())

```

```

00114
00115         # STUDY
00116         while (value.strip() == "STUDY"):
00117             print value.strip()
00118
00119             # Print study UID
00120             if (item.FindDataElement(gdcm.Tag(0x0020, 0x000d))):
00121                 value = str(item.GetDataElement(gdcm.Tag(0x0020, 0x000d)).GetValue())
00122                 print value
00123
00124             # Print study date
00125             if (item.FindDataElement(gdcm.Tag(0x0008, 0x0020))):
00126                 value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x0020)).GetValue())
00127                 print value
00128
00129             # Print study description
00130             if (item.FindDataElement(gdcm.Tag(0x0008, 0x1030))):
00131                 value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x1030)).GetValue())
00132                 print value
00133
00134             # Next
00135             itemNr = itemNr + 1
00136             item = sequence.GetItem(itemNr)
00137             if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
00138                 value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
00139
00140             # SERIES
00141             while (value.strip() == "SERIES"):
00142                 print value.strip()
00143
00144                 # Print series UID
00145                 if (item.FindDataElement(gdcm.Tag(0x0020, 0x000e))):
00146                     value = str(item.GetDataElement(gdcm.Tag(0x0020, 0x000e)).GetValue())
00147                     print value
00148
00149                 # Print series modality
00150                 if (item.FindDataElement(gdcm.Tag(0x0008, 0x0060))):
00151                     value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x0060)).GetValue())
00152                     print "Modality"
00153                     print value
00154
00155                 # Print series description
00156                 if (item.FindDataElement(gdcm.Tag(0x0008, 0x103e))):
00157                     value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x103e)).GetValue())
00158                     print "Description"
00159                     print value
00160
00161                 # Next
00162                 itemNr = itemNr + 1
00163                 item = sequence.GetItem(itemNr)
00164                 if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
00165                     value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
00166
00167                 # IMAGE
00168                 while (value.strip() == "IMAGE"):
00169                     print value.strip()
00170
00171                     # Print image UID
00172                     if (item.FindDataElement(gdcm.Tag(0x0004, 0x1511))):
00173                         value = str(item.GetDataElement(gdcm.Tag(0x0004,
00174                         0x1511)).GetValue())
00175                         print value
00176
00177                     # Next
00178                     if (itemNr < sequence.GetNumberOfItems()):
00179                         itemNr = itemNr + 1
00180                     else:
00181                         break
00182
00183                     item = sequence.GetItem(itemNr)
00184                     if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
00185                         value = str(item.GetDataElement(gdcm.Tag(0x0004,
00186                         0x1430)).GetValue())
00187
00188                     # Next
00189                     itemNr = itemNr + 1

```

## 14.134 RemovePrivateTags.py

```

00001
00014
00015 """
00016 Usage:
00017
00018     python RemovePrivateTags.py input.dcm output.dcm
00019 """
00020
00021 import sys
00022 import gdcm
00023
00024
00025 if __name__ == "__main__":
00026
00027     file1 = sys.argv[1]
00028     file2 = sys.argv[2]
00029
00030     # Instantiate the reader.
00031     r = gdcm.Reader()
00032     r.SetFileName( file1 )
00033     if not r.Read():
00034         sys.exit(1)
00035
00036     # Remove private tags
00037     ano = gdcm.Anonymizer()
00038     ano.SetFile( r.GetFile() )
00039     if not ano.RemovePrivateTags():
00040         sys.exit(1)
00041
00042     # Write DICOM file
00043     w = gdcm.Writer()
00044     w.SetFile( ano.GetFile() )
00045     #w.CheckFileMetaInformationOff() # Do not attempt to check meta header
00046     w.SetFileName( file2 )
00047     if not w.Write():
00048         sys.exit(1)
00049
00050     # It is usually a good idea to exit the script with an error, as gdcm does not remove partial
    (incorrect) DICOM file
00051     # (application level)

```

## 14.135 ScanDirectory.py

```

00001
00014
00015 import gdcm
00016 import sys,os
00017
00018 class ProgressWatcher(gdcm.SimpleSubjectWatcher):
00019     def ShowProgress(self, sender, event):
00020         pe = gdcm.ProgressEvent.Cast(event)
00021         print pe.GetProgress()
00022     def EndFilter(self):
00023         print "Yay ! I am done"
00024
00025 if __name__ == "__main__":
00026     directory = sys.argv[1]
00027
00028     # Define the set of tags we are interested in
00029     t1 = gdcm.Tag(0x8,0x8);
00030     t2 = gdcm.Tag(0x10,0x10);
00031
00032     # Iterate over directory
00033     d = gdcm.Directory();
00034     nfiles = d.Load( directory );
00035     if(nfiles == 0): sys.exit(1);
00036     # System.Console.WriteLine( "Files:\n" + d.toString() );
00037
00038     filenames = d.GetFilenames()
00039
00040     # Get rid of any Warning while parsing the DICOM files
00041     gdcm.Trace.WarningOff()
00042
00043     # instantiate Scanner:

```

```

00044 sp = gdcM.Scanner.New();
00045 s = sp.__ref__()
00046 w = ProgressWatcher(s, 'Watcher')
00047
00048 s.AddTag( t1 );
00049 s.AddTag( t2 );
00050 b = s.Scan( filenames );
00051 if(not b): sys.exit(1);
00052
00053 print "success" ;
00054 #print s
00055
00056 pttv = gdcM.PythonTagToValue( s.GetMapping( filenames[1] ) )
00057 pttv.Start()
00058 # iterate until the end:
00059 while( not pttv.IsAtEnd() ):
00060     # get current value for tag and associated value:
00061     # if tag was not found, then it was simply not added to the internal std::map
00062     # Warning value can be None
00063     tag = pttv.GetCurrentTag()
00064     value = pttv.GetCurrentValue()
00065     print tag,"->",value
00066     # increment iterator
00067     pttv.Next()
00068
00069 sys.exit(0)

```

## 14.136 SortImage.py

```

00001
00014
00015 """
00016 Usage:
00017
00018 python SortImage.py dirname
00019 """
00020
00021 import gdcM
00022 import sys
00023
00024 def PrintProgress(object, event):
00025     assert event == "ProgressEvent"
00026     print "Progress:", object.GetProgress()
00027
00028 def MySort(ds1, ds2):
00029     # compare ds1
00030     return False
00031
00032 if __name__ == "__main__":
00033
00034     dirname = sys.argv[1]
00035     d = gdcM.Directory()
00036     d.Load( dirname )
00037
00038     print d
00039
00040     sorter = gdcM.Sorter()
00041     sorter.SetSortFunction( MySort )
00042     #sorter.AddObserver( "ProgressEvent", PrintProgress )
00043     sorter.Sort( d.GetFilenames() )
00044
00045     print "Sorter:"
00046     print sorter

```

## 14.137 WriteBuffer.py

```

00001
00014
00015 """
00016 Usage:
00017
00018 http://chuckhahm.com/Ischem/Zurich/XX_0134

```

```

00019
00020 (2005,1132) SQ (Sequence with undefined length #=8) # u/1, 1 Unknown Tag & Data
00021 (ffff,e000) na (Item with undefined length #=9) # u/1, 1 Item
00022 (2005,0011) LO [Philips MR Imaging DD 002] # 26, 1 PrivateCreator
00023 (2005,1137) PN [PDF_CONTROL_GEN_PARS] # 20, 1 Unknown Tag & Data
00024 (2005,1138) PN (no value available) # 0, 0 Unknown Tag & Data
00025 (2005,1139) PN [IEEE_PDF] # 8, 1 Unknown Tag & Data
00026 (2005,1140) PN (no value available) # 0, 0 Unknown Tag & Data
00027 (2005,1141) PN (no value available) # 0, 0 Unknown Tag & Data
00028 (2005,1143) SL 3103 # 4, 1 Unknown Tag & Data
00029 (2005,1144) OW 0566\0000\013b\0000\0a4a\0000\000e\0000\0a7a\0000\0195\0000\0008... # 3104, 1 Unknown
Tag & Data
00030 (2005,1147) CS [Y] # 2, 1 Unknown Tag & Data
00031 (ffff,e00d) na (ItemDelimitationItem) # 0, 0 ItemDelimitationItem
00032 (ffff,e000) na (Item with undefined length #=9) # u/1, 1 Item
00033 (2005,0011) LO [Philips MR Imaging DD 002] # 26, 1 PrivateCreator
00034 (2005,1137) PN [PDF_CONTROL_PREP_PARS] # 22, 1 Unknown Tag & Data
00035 (2005,1138) PN (no value available) # 0, 0 Unknown Tag & Data
00036 (2005,1139) PN [IEEE_PDF] # 8, 1 Unknown Tag & Data
00037 (2005,1140) PN (no value available) # 0, 0 Unknown Tag & Data
00038 (2005,1141) PN (no value available) # 0, 0 Unknown Tag & Data
00039 (2005,1143) SL 7934 # 4, 1 Unknown Tag & Data
00040 (2005,1144) OW 19b6\0000\005f\0000\1b2a\0000\00f3\0000\1eee\0000\0000\0000\0008... # 7934, 1 Unknown
Tag & Data
00041 (2005,1147) CS [Y] # 2, 1 Unknown Tag & Data
00042 (ffff,e00d) na (ItemDelimitationItem) # 0, 0 ItemDelimitationItem
00043 ...
00044 ""
00045
00046 import sys
00047 import gdcm
00048
00049 if __name__ == "__main__":
00050
00051     file1 = sys.argv[1]
00052     file2 = sys.argv[2]
00053
00054     r = gdcm.Reader()
00055     r.SetFileName( file1 )
00056     if not r.Read():
00057         sys.exit(1)
00058
00059     fg = gdcm.FileNameGenerator()
00060     f = r.GetFile()
00061     ds = f.GetDataSet()
00062     tsis = gdcm.Tag(0x2005,0x1132) #
00063     if ds.FindDataElement( tsis ):
00064         sis = ds.GetDataElement( tsis )
00065         #sqsis = sis.GetSequenceOfItems()
00066         # GetValueAsSQ handle more cases
00067         sqsis = sis.GetValueAsSQ()
00068         if sqsis.GetNumberOfItems():
00069             nitems = sqsis.GetNumberOfItems();
00070             fg.SetNumberOfFileNames( nitems )
00071             fg.SetPrefix( file2 )
00072             if not fg.Generate():
00073                 print "problem"
00074                 sys.exit(1)
00075             for i in range(0,nitems):
00076                 item1 = sqsis.GetItem(i+1) # Item start at 1
00077                 nestedds = item1.GetNestedDataSet()
00078                 tprcs = gdcm.Tag(0x2005,0x1144) #
00079                 if nestedds.FindDataElement( tprcs ):
00080                     prcs = nestedds.GetDataElement( tprcs )
00081                     bv = prcs.GetByteValue()
00082                     print bv
00083                     f = open( fg.GetFilename(i) , "w" )
00084                     f.write( bv.WriteBuffer() )

```

## 14.138 HelloActiviz.cs

```
/*=====
```

Program: GDCM (Grassroots DICOM) . A DICOM library

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PURPOSE. See the above copyright notice for more information.

```

=====*/
using vtkgdcm;
using Kitware.VTK;
using System;
using System.Runtime.InteropServices;

/*
 * This example shows how vtkgdcm can be connected to Kitware.VTK Activiz product.
 * Three (3) arguments are required:
 * 1. Input DICOM file (SWIG)
 * 2. Temporary PNG (intermediate) file (Activiz)
 * 3. Final DICOM file (SWIG)
 *
 * $ export MONO_PATH=/usr/lib/cli/Activiz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz.exe ~/Creatis/gdcmData/test.acr out.png toto.dcm
 *
 * Footnote:
 * this test originally used vtkBMPWriter / vtkBMPReader combination to store intermediate
 * image file, but BMP file are 24bits by default. Instead use PNG format which supports seems
 * to be closer to what was expected in this simple test.
 */
public class HelloActiviz
{
    // Does not work with Activiz.NET-5.4.0.455-Linux-x86_64-Personal
    /*
    static void ConnectSWIGToActiviz(Kitware.VTK.vtkImageExport imgin, Kitware.VTK.vtkImageImport imgout)
    {
        imgout.SetUpdateInformationCallback(imgin.GetUpdateInformationCallback());
        imgout.SetPipelineModifiedCallback(imgin.GetPipelineModifiedCallback());
        imgout.SetWholeExtentCallback(imgin.GetWholeExtentCallback());
        imgout.SetSpacingCallback(imgin.GetSpacingCallback());
        imgout.SetOriginCallback(imgin.GetOriginCallback());
        imgout.SetScalarTypeCallback(imgin.GetScalarTypeCallback());
        imgout.SetNumberOfComponentsCallback(imgin.GetNumberOfComponentsCallback());
        imgout.SetPropagateUpdateExtentCallback(imgin.GetPropagateUpdateExtentCallback());
        imgout.SetUpdateDataCallback(imgin.GetUpdateDataCallback());
        imgout.SetDataExtentCallback(imgin.GetDataExtentCallback());
        imgout.SetBufferPointerCallback(imgin.GetBufferPointerCallback());
        imgout.SetCallbackUserData(imgin.GetCallbackUserData());
    }
    */

    static Kitware.VTK.vtkImageData ConnectSWIGToActiviz(vtkgdcm.vtkImageData imgin)
    {
        HandleRef rawCppThis = imgin.GetCppThis();
        Kitware.VTK.vtkImageData imgout = new Kitware.VTK.vtkImageData( rawCppThis.Handle, false, false);
        return imgout;
    }

    static vtkgdcm.vtkImageData ConnectActivizToSWIG(Kitware.VTK.vtkImageData imgin)
    {
        HandleRef rawCppThis = imgin.GetCppThis();
        vtkgdcm.vtkImageData imgout = new vtkgdcm.vtkImageData( rawCppThis );
        return imgout;
    }

    public static int Main(string[] args)
    {
        string filename = args[0];
        string outfilename = args[1];

        // Step 1. Test SWIG -> Activiz
        vtkGDCMImageReader reader = vtkGDCMImageReader.New();
        reader.SetFileName( filename );
        //reader.Update(); // DO NOT call Update to check pipeline execution

        Kitware.VTK.vtkImageData imgout = ConnectSWIGToActiviz(reader.GetOutput());

        System.Console.WriteLine( imgout.ToString() ); // not initialized as expected

        vtkPNGWriter writer = new vtkPNGWriter();
        writer.SetInput( imgout );
        writer.SetFileName( outfilename );
    }
}

```

```

writer.Write();

// Step 2. Test Activiz -> SWIG
vtkPNGReader bmpreader = new vtkPNGReader();
bmpreader.SetFileName( outfilename );
//bmpreader.Update(); // DO NOT update to check pipeline execution

System.Console.WriteLine( bmpreader.GetOutput().ToString() ); // not initialized as expected

vtkgdcml.vtkImageData imgout2 = ConnectActivizToSWIG(bmpreader.GetOutput());

System.Console.WriteLine( imgout2.ToString() ); // not initialized as expected

Kitware.VTK.vtkMedicalImageProperties prop = new Kitware.VTK.vtkMedicalImageProperties();
prop.SetModality( "MR" );

string outfilename2 = args[2];
vtkGDCMImageWriter writer2 = vtkGDCMImageWriter.New();
writer2.SetMedicalImageProperties( prop.CastToActiviz() );
writer2.SetFileName( outfilename2 );
writer2.SetInput( imgout2 );
writer2.Write();

return 0;
}
}

```

## 14.139 HelloActiviz2.cs

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
PURPOSE. See the above copyright notice for more information.

=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;

/*
 * Usage:
 * $ export MONO_PATH=/usr/lib/cli/Activiz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz2.exe gdcmlData/test.acr bla.png bla2.dcm
 */

/*
 * From the outside view, no-one can detect that object pass to/from
 * vtkGDCMImageWriter/vtkGDCMImageReader are not Activiz object.
 *
 * TODO: Test Command/Observer
 */
public class HelloActiviz2
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        string outfilename = args[1];
        string outfilename2 = args[2];

        vtkGDCMImageReader reader = new Kitware.VTK.GDCM.vtkGDCMImageReader();
        reader.SetFileName( filename );

        // When calling multiple times creation of C# object from the same C++ object it triggers a:
        //error: potential refcounting error: Duplicate rawCppThis - weak reference that is still alive. Attempting to
        //    add '0x00b2dc10' again.
        //    Allowing new wrapped object to take over table key...
        //    Original object should *not* have been destroyed while we still had it in our table without notifying
        //    us...
        //reader.GetOutput();
    }
}

```



```

//reader.GetOutput();

System.Console.WriteLine( reader.ToString() ); // Test the ToString compat with Activiz

vtkGDCMImageWriter writer = new vtkGDCMImageWriter();
writer.SetInput( reader.GetOutput() );
writer.SetFileName( outfilename2 );
writer.Write();

System.Console.WriteLine( reader.GetOutput().ToString() ); // Test the ToString compat with Activiz

System.Console.WriteLine( writer.ToString() ); // Test the ToString compat with Activiz

vtkPNGWriter pngwriter = new vtkPNGWriter();
pngwriter.SetInput( reader.GetOutput() );
pngwriter.SetFileName( outfilename );
pngwriter.Write();

// at that point the .Write() should have triggered an Update() on the reader:
if( reader.GetImageFormat() == vtkgdc.VTK_LUMINANCE ) // MONOCHROME2
{
    System.Console.WriteLine( "Image is MONOCHROME2" ); //
}

vtkPNGReader bmpreader = new vtkPNGReader();
bmpreader.SetFileName( outfilename );

vtkMedicalImageProperties prop = new vtkMedicalImageProperties();
prop.SetModality( "MR" );

vtkMatrix4x4 dircos = reader.GetDirectionCosines();
dircos.Invert();

vtkGDCMImageWriter writer2 = new vtkGDCMImageWriter();
writer2.SetFileName( outfilename2 );
writer2.SetDirectionCosines( dircos );
writer2.SetMedicalImageProperties( prop );
writer2.SetInput( bmpreader.GetOutput() );
writer2.Write();

return 0;
}
}

```

## 14.140 HelloActiviz3.cs

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;

/*
 * $ export MONO_PATH=/usr/lib/cli/Activiz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz3.exe ~/Creatis/gdcmData/test.acr
 */
public class HelloActiviz3
{
    public static int Main(string[] args)
    {
        string filename = args[0];

        vtkGDCMImageReader reader = vtkGDCMImageReader.New();
        vtkStringArray array = vtkStringArray.New();
        array.InsertNextValue(filename);

        reader.SetFileNames(array);
    }
}

```

```

        reader.Update();

        //System.Console.WriteLine(reader.GetOutput());

        vtkRenderWindowInteractor iren = vtkRenderWindowInteractor.New();

        vtkImageViewer2 viewer = vtkImageViewer2.New();
        viewer.SetInput(reader.GetOutput());
        viewer.SetupInteractor(iren);
        viewer.SetSize(600, 600);
        viewer.Render();

        iren.Initialize();
        iren.Start();

        return 0;
    }
}

```

## 14.141 HelloActiviz4.cs

```

/*=====
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=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;

/*
 * $ export MONO_PATH=/usr/lib/cli/Activiz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz4.exe ~/Creatis/gdcmData/test.acr
 */
public class HelloActiviz4
{
    public static int Main(string[] args)
    {
        string filename = args[0];

        vtkGDCMImageReader reader = new vtkGDCMImageReader();
        vtkStringArray array = vtkStringArray.New();
        array.InsertNextValue(filename);

        reader.SetFileNames(array);
        reader.Update();

        //System.Console.WriteLine(reader.GetOutput());

        vtkRenderWindowInteractor iren = vtkRenderWindowInteractor.New();

        vtkImageViewer viewer = vtkImageViewer.New();
        viewer.SetInput(reader.GetOutput());
        viewer.SetupInteractor(iren);
        viewer.SetSize(600, 600);
        viewer.Render();

        iren.Initialize();
        iren.Start();

        return 0;
    }
}

```

## 14.142 HelloActiviz5.cs

```

/*=====

```

```

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=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;

// The command line arguments are:
// -I      => run in interactive mode; unless this is used, the program will
//          not allow interaction and exit
// -D <path> => path to the data; the data should be in <path>/Data/

/*
 * $ export MONO_PATH=/usr/lib/cli/Activiz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz5.exe -I
 */
public class HelloActiviz5
{
    public static int Main(string[] args)
    {
        vtkTesting testHelper = vtkTesting.New();
        for ( int cc = 0; cc < args.Length; cc++ )
        {
            //testHelper.AddArguments(argc,const_cast<const char **>(argv));
            //System.Console.Write( "args: " + args[cc] + "\n" );
            testHelper.AddArgument( args[cc] );
        }
        if ( testHelper.IsFlagSpecified("-D") != 0 )
        {
            string VTK_DATA_ROOT = vtkGDCMTesting.GetVTKDataRoot();
            if( VTK_DATA_ROOT != null )
            {
                //System.Console.Write( "VTK_DATA_ROOT: " + VTK_DATA_ROOT + "\n" );
                testHelper.SetDataRoot(VTK_DATA_ROOT);
                testHelper.AddArgument("-D");
                testHelper.AddArgument(VTK_DATA_ROOT);
            }
        }

        string dataRoot = testHelper.GetDataRoot();
        string filename = dataRoot;
        filename += "/Data/mr.001";

        vtkDirectory dir = vtkDirectory.New();
        if( dir.FileIsDirectory( dataRoot ) == 0 )
        {
            filename = vtkGDCMTesting.GetGDCMDataRoot() + "/test.acr";
        }
        //System.Console.Write( "dataRoot: " + dataRoot + "\n" );
        System.Console.Write( "filename being used is: " + filename + "\n" );

        vtkGDCMImageReader reader = vtkGDCMImageReader.New();
        vtkStringArray array = vtkStringArray.New();
        array.InsertNextValue(filename);
        reader.SetFileNames(array);
        reader.Update();

        System.Console.Write(reader.GetOutput());

        vtkRenderWindowInteractor iren = vtkRenderWindowInteractor.New();

        vtkRenderer ren1 = vtkRenderer.New();
        vtkRenderWindow renWin = vtkRenderWindow.New();
        renWin.AddRenderer(ren1);

        vtkImageActor actor = vtkImageActor.New();

        vtkImageMapToWindowLevelColors coronalColors = vtkImageMapToWindowLevelColors.New();
        coronalColors.SetInput(reader.GetOutput());

        actor.SetInput(coronalColors.GetOutput());

        ren1.AddActor(actor);
    }
}

```

```

    iren.SetRenderWindow(renWin);

    iren.Initialize();

    renWin.Render();

    int retVal = testHelper.IsInteractiveModeSpecified();

    if( retVal != 0 )
    {
        iren.Start();
    }

    return 0;
}

```

## 14.143 HelloVTKWorld.cs

```

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=====*/
using vtkgdcm;

/*
 * This test only test the SWIG/VTK part, you do not need Activiz
 */
public class HelloVTKWorld
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        vtkGDCMImageReader reader = vtkGDCMImageReader.New();
        reader.SetFileName( filename );
        reader.Update();

        vtkMedicalImageProperties prop = reader.GetMedicalImageProperties();
        System.Console.WriteLine( prop.GetPatientName() ); //

        if( reader.GetImageFormat() == vtkgdcm.vtkgdcm.VTK_LUMINANCE ) // MONOCHROME2
        {
            System.Console.WriteLine( "Image is MONOCHROME2" ); //
        }

        // Just for fun, invert the direction cosines, output should reflect that:
        vtkMatrix4x4 dircos = reader.GetDirectionCosines();
        dircos.Invert();

        string outfilename = args[1];
        vtkGDCMImageWriter writer = vtkGDCMImageWriter.New();
        writer.SetMedicalImageProperties( reader.GetMedicalImageProperties() );
        writer.SetDirectionCosines( dircos );
        writer.SetShift( reader.GetShift() );
        writer.SetScale( reader.GetScale() );
        writer.SetImageFormat( reader.GetImageFormat() );
        writer.SetFileName( outfilename );
        writer.SetInputConnection( reader.GetOutputPort() );
        writer.Write();

        return 0;
    }
}

```

## 14.144 HelloVTKWorld2.cs

```

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=====*/
using vtkgdcmm;

/*
 * This test only test the SWIG/VTK part, you do not need Activiz
 */
public class HelloVTKWorld2
{
    public static int Main(string[] args)
    {
        string VTK_DATA_ROOT = vtkGDCMTesting.GetVTKDataRoot();

        vtkVolume16Reader reader = vtkVolume16Reader.New();
        reader.SetDataDimensions(64, 64);
        reader.SetDataByteOrderToLittleEndian();
        reader.SetFilePrefix(VTK_DATA_ROOT + "/Data/headsq/quarter");
        reader.SetImageRange(1, 93);
        reader.SetDataSpacing(3.2, 3.2, 1.5);

        vtkImageCast cast = vtkImageCast.New();
        cast.SetInputConnection( reader.GetOutputPort() );
        cast.SetOutputScalarTypeToUnsignedChar();

        // By default this is creating a Multiframe Grayscale Word Secondary Capture Image Storage
        vtkGDCMImageWriter writer = vtkGDCMImageWriter.New();
        writer.SetFileName( "headsq.dcm" );
        writer.SetInputConnection( reader.GetOutputPort() );
        // cast -> Multiframe Grayscale Byte Secondary Capture Image Storage
        // writer.SetInputConnection( cast.GetOutputPort() );
        writer.SetFileDimensionality( 3 );
        writer.Write();

        return 0;
    }
}

```

## 14.145 MetaImageMD5Activiz.cs

```

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=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
using gdcm;

/*
 * $ export MONO_PATH=/usr/lib/cli/Activiz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/MetaImageMD5Activiz.exe gdcmData/012345.002.050.dcm
 */
public class MetaImageMD5Activiz
{
    public static int ProcessOneMHDMD5(string filename)

```

```

{
    vtkGDCMImageReader reader = vtkGDCMImageReader.New();
    reader.FileLowerLeftOn();
    reader.DebugOff();
    int canread = reader.CanReadFile( filename );
    if( canread == 0 )
    {
        string refms = gdcm.Testing.GetMediaStorageFromFile(filename);
        if( gdcm.MediaStorage.IsImage( gdcm.MediaStorage.GetMSType(refms) ) )
        {
            System.Console.Write( "Problem with file: " + filename + "\n" );
            return 1;
        }
        // not an image
        return 0;
    }

    reader.SetFileName( filename );
    reader.Update();

    // System.Console.Write(reader.GetOutput());

    vtkMetaImageWriter writer = vtkMetaImageWriter.New();
    writer.SetCompression( false );
    writer.SetInput( reader.GetOutput() );
    string subdir = "MetaImageMD5Activiz";
    string tmpdir = gdcm.Testing.GetTempDirectory( subdir );
    if( !gdcm.PosixEmulation.FileIsDirectory( tmpdir ) )
    {
        gdcm.PosixEmulation.MakeDirectory( tmpdir );
    }
    string mhdfile = gdcm.Testing.GetTempFilename( filename, subdir );

    string rawfile = mhdfile;
    mhdfile += ".mhd";
    rawfile += ".raw";
    writer.SetFileName( mhdfile );
    writer.Write();

    string digestmhd = gdcm.Testing.ComputeFileMD5( mhdfile );
    string digestraw = gdcm.Testing.ComputeFileMD5( rawfile );

    string mhdref = vtkGDCMTesting.GetMHDMD5FromFile(filename);
    string rawref = vtkGDCMTesting.GetRAWMD5FromFile(filename);

    if( mhdref != digestmhd )
    {
        System.Console.Write( "Problem with mhd file: " + filename + "\n" );
        System.Console.Write( digestmhd );
        System.Console.Write( "\n" );
        System.Console.Write( mhdref );
        System.Console.Write( "\n" );
        return 1;
    }
    if( rawref != digestraw )
    {
        System.Console.Write( "Problem with raw file: " + filename + "\n" );
        System.Console.Write( digestraw );
        System.Console.Write( "\n" );
        System.Console.Write( rawref );
        System.Console.Write( "\n" );
        return 1;
    }

    return 0;
}

public static int Main(string[] args)
{
    if ( args.Length == 1 )
    {
        string filename = args[0];
        return ProcessOneMHDMD5( filename );
    }

    // Loop over all gdcmData
    gdcm.Trace.DebugOff();
    gdcm.Trace.WarningOff();
    gdcm.Trace.ErrorOff();

    uint n = gdcm.Testing.GetNumberOfFileNames();
    int ret = 0;
    for( uint i = 0; i < n; ++i )

```

```

    {
        string filename = gdcm.Testing.GetFileName( i );
        ret += ProcessOneMHDMD5( filename );
    }
    return ret;
}

```

## 14.146 RefCounting.cs

```

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=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;

/*
 * this is not so much an example but simply a test to make sure ctor / dctor work as expected
 * and call the ::New and ->Delete() of VTK style.
 */
public class RefCounting
{
    public static int Main(string[] args)
    {
        vtkGDCMTesting testing1 = vtkGDCMTesting.New();
        vtkGDCMTesting testing2 = new vtkGDCMTesting(); // just in case people do not read STYLE documentation

        vtkGDCMImageReader reader1 = vtkGDCMImageReader.New();
        vtkGDCMImageReader reader2 = new vtkGDCMImageReader();

        vtkGDCMImageWriter writer1 = vtkGDCMImageWriter.New();
        vtkGDCMImageWriter writer2 = new vtkGDCMImageWriter();

        using (vtkGDCMTesting testing3 = new vtkGDCMTesting())
        {
            System.Console.WriteLine( "GetReferenceCount: " + testing1.GetReferenceCount() + "\n");
            System.Console.WriteLine( "GetReferenceCount: " + testing2.GetReferenceCount() + "\n");
            System.Console.WriteLine( "GetReferenceCount: " + testing3.GetReferenceCount() + "\n");
        }

        using (vtkGDCMImageReader reader3 = new vtkGDCMImageReader())
        {
            System.Console.WriteLine( "GetReferenceCount: " + reader3.GetReferenceCount() + "\n");
        }

        using (vtkGDCMImageWriter writer3 = vtkGDCMImageWriter.New())
        {
            System.Console.WriteLine( "GetReferenceCount: " + writer3.GetReferenceCount() + "\n");
        }

        // C# destructor will call ->Delete on all C++ object as expected.
        return 0;
    }
}

```

## 14.147 Compute3DSpacing.cxx

```

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```

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```
=====*/
#include "vtkGDCMImageReader2.h"
#include "vtkImageChangeInformation.h"
#include "vtkStringArray.h"
#include "vtkVersion.h"
#include "gdcmIPPSorter.h"

#ifdef vtkFloatingPointType
#define vtkFloatingPointType double
#endif

/*
 * Simple example to check computation of spacing within vtkGDCMImageReader2
 * This is a direct implementation of:
 *
 *      http://gdcm.sourceforge.net/wiki/index.php/Using_GDCM_API#Automatic_ordering_of_slices_for_vtkGDCMImageReader.SetFileNames
 *
 * For more advanced information on how 3D spacing is being computed see:
 *
 * - http://gdcm.sourceforge.net/html/classgdcm_1_1IPPSorter.html
 *
 * Usage:
 *
 * $ Compute3DSpacing SIEMENS_MAGNETOM-12-MONO2-FileSeq0.dcm \
 *   SIEMENS_MAGNETOM-12-MONO2-FileSeq1.dcm \
 *   SIEMENS_MAGNETOM-12-MONO2-FileSeq2.dcm \
 *   SIEMENS_MAGNETOM-12-MONO2-FileSeq3.dcm
 */

int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;

    std::vector<std::string> filenames;
    for( int i = 1; i < argc; ++i )
    {
        filenames.push_back( argv[i] );
    }

    gdcm::IPPSorter s;
    s.SetComputeZSpacing( true );
    s.SetZSpacingTolerance( 1e-3 );
    bool b = s.Sort( filenames );
    if( !b )
    {
        std::cerr << "Failed to sort files" << std::endl;
        return 1;
    }
    std::cout << "Sorting succeeded:" << std::endl;
    //s.Print( std::cout );

    std::cout << "Found z-spacing:" << std::endl;
    std::cout << s.GetZSpacing() << std::endl;
    const double ipzspacing = s.GetZSpacing();

    const std::vector<std::string> & sorted = s.GetFileNames();
    vtkGDCMImageReader2 * reader = vtkGDCMImageReader2::New();
    vtkStringArray *files = vtkStringArray::New();
    std::vector< std::string >::const_iterator it = sorted.begin();
    for( ; it != sorted.end(); ++it )
    {
        const std::string &f = *it;
        files->InsertNextValue( f.c_str() );
    }
    reader->SetFileNames( files );
    reader->Update();

    const vtkFloatingPointType *spacing = reader->GetOutput()->GetSpacing();
    vtkImageChangeInformation *v16 = vtkImageChangeInformation::New();
    #if (VTK_MAJOR_VERSION >= 6)
    v16->SetInputConnection( reader->GetOutputPort() );
    #else
    v16->SetInput( reader->GetOutput() );
    #endif
}
```



```

#endif
v16->SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
v16->Update();

v16->GetOutput()->Print( std::cout );

return 0;
}

```

## 14.148 Convert16BitsTo8Bits.cxx

```

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=====*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageCast.h"
#include "vtkVersion.h"

#include "gdcmlTesting.h"
// The following file is 16/16/15 but the scalar range of the image is [0,192]
// it could be safely stored as 8bits instead:
// gdcmlData/012345.002.050.dcm

int main(int, char *[])
{
    const char *directory = gdcml::Testing::GetDataRoot();
    if(!directory) return 1;
    std::string file = std::string(directory) + "/012345.002.050.dcm";
    std::cout << file << std::endl;

    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( file.c_str() );
    reader->Update();
    //reader->GetOutput()->Print( std::cout );

    vtkImageCast *cast = vtkImageCast::New();
    #if (VTK_MAJOR_VERSION >= 6)
        cast->SetInputConnection( reader->GetOutputPort() );
    #else
        cast->SetInput( reader->GetOutput() );
    #endif
    cast->SetOutputScalarTypeToUnsignedChar();

    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileName( "/tmp/cast.dcm" );
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputConnection( cast->GetOutputPort() );
    #else
        writer->SetInput( cast->GetOutput() );
    #endif
    writer->SetImageFormat( reader->GetImageFormat() );
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    writer->SetDirectionCosines( reader->GetDirectionCosines() );
    writer->SetShift( reader->GetShift() );
    writer->SetScale( reader->GetScale() );
    writer->Write();

    reader->Delete();
    cast->Delete();
    writer->Delete();

    return 0;
}

```

## 14.149 ConvertMultiFrameToSingleFrame.cxx

```

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=====*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkStringArray.h"
#include "vtkVersion.h"

#include "gdcmTesting.h"
#include "gdcmFilenameGenerator.h"

int main(int argc, char *argv[])
{
    std::string filename;
    if( argc <= 1 )
    {
        const char *directory = gdcm::Testing::GetDataRoot();
        if(!directory) return 1;
        std::string file = std::string(directory) + "/US-PAL-8-10x-echo.dcm";
        filename = file;
    }
    else
    {
        filename = argv[1];
    }
    std::cout << "file: " << filename << std::endl;

    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( filename.c_str() );
    reader->Update();
    //reader->GetOutput()->Print( std::cout );

    int dims[3];
    reader->GetOutput()->GetDimensions( dims );

    std::ostream os;
    os << "singleframe";
    os << "%04d.dcm";
    gdcm::FilenameGenerator fg;
    fg.SetPattern( os.str().c_str() );
    unsigned int nfiles = dims[2];
    fg.SetNumberOfFiles( nfiles );
    bool b = fg.Generate();
    if( !b )
    {
        std::cerr << "FilenameGenerator::Generate() failed" << std::endl;
        return 1;
    }
    if( !fg.GetNumberOfFiles() )
    {
        std::cerr << "FilenameGenerator::Generate() failed somehow..." << std::endl;
        return 1;
    }

    // By default write them as Secondary Capture (for portability)
    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    vtkStringArray *filenames = vtkStringArray::New();
    for(unsigned int i = 0; i < fg.GetNumberOfFiles(); ++i)
    {
        filenames->InsertNextValue( fg.GetFilename(i) );
    }
    assert( filenames->GetNumberOfValues() == (int)fg.GetNumberOfFiles() );
    writer->SetFileNames( filenames );
    filenames->Delete();
    writer->SetFileDimensionality( 2 );
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputConnection( reader->GetOutputPort() );
    #endif
}

```

```

#else
    writer->SetInput( reader->GetOutput() );
#endif
    writer->SetImageFormat( reader->GetImageFormat() );
    writer->Write();

    reader->Delete();
    writer->Delete();

    return 0;
}

```

## 14.150 ConvertRGBToLuminance.cxx

```

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=====*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageLuminance.h"
#include "vtkVersion.h"

#include "gdcmlTesting.h"

// There is no such thing as MR Image Storage + Photometric Interpretation = RGB
// let's rewrite that into a proper single component image:
int main(int, char *[])
{
    const char *directory = gdcml::Testing::GetDataRoot();
    if(!directory) return 1;
    std::string file = std::string(directory) + "/SIEMENS-MR-RGB-16Bits.dcm";
    std::cout << file << std::endl;

    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( file.c_str() );
    reader->Update();
    //reader->GetOutput()->Print( std::cout );

    vtkImageLuminance *luminance = vtkImageLuminance::New();
    #if (VTK_MAJOR_VERSION >= 6)
        luminance->SetInputConnection( reader->GetOutputPort() );
    #else
        luminance->SetInput( reader->GetOutput() );
    #endif

    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileName( "/tmp/bla.dcm" );
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputConnection( luminance->GetOutputPort() );
    #else
        writer->SetInput( luminance->GetOutput() );
    #endif
    //writer->SetImageFormat( reader->GetImageFormat() ); // Do NOT pass image format
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    writer->SetDirectionCosines( reader->GetDirectionCosines() );
    writer->SetShift( reader->GetShift() );
    writer->SetScale( reader->GetScale() );
    writer->Write();

    // TODO:
    //vtkImageAppendComponents.h

    reader->Delete();
    luminance->Delete();
}

```

```

writer->Delete();

return 0;
}

```

## 14.151 ConvertSingleBitTo8Bits.cxx

```

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=====*/

#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageCast.h"
#include "vtkPointData.h"
#include "vtkBitArray.h"
#include "vtkUnsignedCharArray.h"
#include "vtkVersion.h"

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];

    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( filename );
    reader->Update();
    //reader->GetOutput()->Print( std::cout );

    vtkDataArray* array = reader->GetOutput()->GetPointData()->GetScalars();
    vtkBitArray *barray = vtkBitArray::SafeDownCast( array );
    if( !barray ) return false;
    vtkIdType nvalues = array->GetNumberOfTuples();
    vtkUnsignedCharArray *uarray = vtkUnsignedCharArray::New();
    uarray->SetNumberOfTuples( nvalues );
    for(vtkIdType i = 0; i < nvalues; ++i)
    {
        uarray->SetValue( i, (unsigned char)barray->GetValue(i) );
    }

    vtkImageData *copy = vtkImageData::New();
    // http://www.vtk.org/Wiki/VTK/VTK_6_Migration/Changes_to_Scalars_Manipulation_Functions#AllocateScalars.28.29
    copy->SetExtent( reader->GetOutput()->GetExtent() );
    #if (VTK_MAJOR_VERSION >= 6)
        copy->AllocateScalars(VTK_UNSIGNED_CHAR, 3);
    #else
        copy->SetScalarType( VTK_UNSIGNED_CHAR );
        copy->AllocateScalars();
    #endif

    //uarray->Print( std::cout );
    //copy->GetPointData()->GetScalars()->Print( std::cout );
    copy->GetPointData()->SetScalars( uarray );
    uarray->Delete();

    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileName( outfile );
    //writer->SetInput( cast->GetOutput() );
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputData( copy );
    #else
        writer->SetInput( copy );
    #endif
}

```

```

#endif
writer->SetImageFormat( reader->GetImageFormat() );
writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
writer->SetDirectionCosines( reader->GetDirectionCosines() );
writer->SetShift( reader->GetShift() );
writer->SetScale( reader->GetScale() );
writer->SetFileDimensionality( reader->GetFileDimensionality() );
writer->Write();

reader->Delete();
copy->Delete();
writer->Delete();

return 0;
}

```

## 14.152 CreateFakePET.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "vtkGDCMImageWriter.h"
#include "vtkImageReader.h"
#include "vtkImageCast.h"
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkDataArray.h"
#include "vtkMedicalImageProperties.h"
#include "vtkStringArray.h"
#include "vtkVersion.h"

#include "gdcmTrace.h"
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmFilenameGenerator.h"

/*
 * Minimal example to create a fake RTDOSE file. The data contains a sphere
 * just for testing.
 * The vtkMedicalImageProperties is not properly filled, but only contains a
 * single field which is required to set the proper SOP Class
 */
int main(int, char *[])
{
    gdcm::Trace::DebugOn();

    const vtkIdType xSize = 512;
    const vtkIdType ySize = 512;
    const vtkIdType zSize = 512;

    // Create the filenames in advance to supply to the vtkGDCMImageWriter
    std::ostream os;
    os << "PT";
    os << "%03d.dcm";
    gdcm::FilenameGenerator fg;
    fg.SetPattern( os.str().c_str() );
    unsigned int nfiles = zSize;
    fg.SetNumberOfFilenames( nfiles );
    bool b = fg.Generate();
    if( !b )
    {
        std::cerr << "FilenameGenerator::Generate() failed" << std::endl;
        return 1;
    }
    if( !fg.GetNumberOfFilenames() )

```

```

    {
        std::cerr << "FilenameGenerator::Generate() failed somehow..." << std::endl;
        return 1;
    }

    vtkStringArray *filenames = vtkStringArray::New();
    for(unsigned int i = 0; i < fg.GetNumberOfFileNames(); ++i)
    {
        filenames->InsertNextValue( fg.GetFilename(i) );
    }

    vtkImageData *image = vtkImageData::New();
    image->SetDimensions(xSize,ySize,zSize);
    image->SetOrigin(-350.684,350.0,890.76);
    image->SetSpacing(5.4688,-5.4688,-3.27);
    #if VTK_MAJOR_VERSION <= 5
        image->SetNumberOfScalarComponents(1);
        image->SetScalarTypeToDouble();
    #else
        image->AllocateScalars(VTK_DOUBLE,1);
    #endif

    double pt[3];
    for( int z = 0; z < zSize; ++z )
        for( int y = 0; y < ySize; ++y )
            for( int x = 0; x < xSize; ++x )
            {
                pt[0] = x;
                pt[1] = y;
                pt[2] = z;
                pt[0] -= xSize / 2;
                pt[1] -= ySize / 2;
                pt[2] -= zSize / 2;
                pt[0] /= xSize / 2;
                pt[1] /= ySize / 2;
                pt[2] /= zSize / 2;
                const double unit = pt[0] * pt[0] + pt[1] * pt[1] + pt[2] * pt[2];
                const double inval = unit <= 1. ? (3 * unit + 7) : 0.; // just for fun => max == 10.
                double* pixel= static_cast<double*>(image->GetScalarPointer(x,y,z));
                pixel[0] = inval;
            }

    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileDimensionality( 2 );
    writer->SetFileNames(filenames);
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputData( image );
    #else
        writer->SetInput( image );
    #endif
    writer->GetMedicalImageProperties()->SetSliceThickness("1.5");
    writer->GetMedicalImageProperties()->SetModality( "PT" );
    writer->SetScale( 0.0042 ); // why not
    writer->Write();

    image->Delete();
    writer->Delete();

    return 0;
}

```

## 14.153 CreateFakeRTDOSE.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====

```

```

===== */
#include "vtkGDCMImageWriter.h"
#include "vtkImageReader.h"
#include "vtkImageCast.h"
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkDataArray.h"
#include "vtkMedicalImageProperties.h"
#include "vtkVersion.h"

#include "gdcmTrace.h"
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"

/*
 * Minimal example to create a fake RTDOSE file. The data contains a sphere
 * just for testing.
 * The vtkMedicalImageProperties is not properly filled, but only contains a
 * single field which is required to set the proper SOP Class
 */
int main(int, char *[])
{
    //gdcm::Trace::DebugOn();

    const vtkIdType xSize = 512;
    const vtkIdType ySize = 512;
    const vtkIdType zSize = 512;

    vtkImageData *image = vtkImageData::New();
    image->SetDimensions(xSize,ySize,zSize);
    image->SetOrigin(-350.684,350.0,890.76);
    image->SetSpacing(5.4688,-5.4688,-3.27);
    #if VTK_MAJOR_VERSION <= 5
        image->SetNumberOfScalarComponents(1);
        image->SetScalarTypeToDouble();
    #else
        image->AllocateScalars(VTK_DOUBLE,1);
    #endif

    double pt[3];
    for( int z = 0; z < zSize; ++z )
        for( int y = 0; y < ySize; ++y )
            for( int x = 0; x < xSize; ++x )
            {
                pt[0] = x;
                pt[1] = y;
                pt[2] = z;
                pt[0] -= xSize / 2;
                pt[1] -= ySize / 2;
                pt[2] -= zSize / 2;
                pt[0] /= xSize / 2;
                pt[1] /= ySize / 2;
                pt[2] /= zSize / 2;
                const double unit = pt[0] * pt[0] + pt[1] * pt[1] + pt[2] * pt[2];
                const double inval = unit <= 1. ? (3 * unit + 7) : 0.; // just for fun => max == 10.
                double* pixel= static_cast<double*>(image->GetScalarPointer(x,y,z));
                pixel[0] = inval;
            }

    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileDimensionality( 3 );
    writer->SetFileName( "rtdose.dcm" );
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputData( image );
    #else
        writer->SetInput( image );
    #endif
    writer->GetMedicalImageProperties()->SetSliceThickness("1.5");
    writer->GetMedicalImageProperties()->AddUserDefinedValue( "Dose Units", "GY");
    writer->GetMedicalImageProperties()->AddUserDefinedValue( "Dose Summation Type", "PLAN");
    writer->GetMedicalImageProperties()->AddUserDefinedValue( "Dose Type", "PHYSICAL");
    writer->GetMedicalImageProperties()->AddUserDefinedValue( "Frame of Reference UID",
        "1.3.12.2.1107.5.6.1.68100.30270111041215391275000000001");
    writer->GetMedicalImageProperties()->SetModality( "RTDOSE" );
    //writer->GetMedicalImageProperties()->SetModality( "PT" ); // debug
    writer->SetScale( 0.0042 ); // why not
    writer->Write();

    image->Delete();
}

```

```

writer->Delete();

// BEGIN HACK
// In GDCM version 2.4.3 and before, the following tag was missing which caused issue with some RTDose
// software:

// Open the DICOM file that was temporarily created. This will allows me to used
// GDCM to append specific tags that allows the RTDOSE to be associated with the
// relevant CT images.
gdcmm::Reader reader2;
reader2.SetFileName("rtdose.dcm" );
reader2.Read();
gdcmm::File &file = reader2.GetFile();
gdcmm::DataSet &ds = file.GetDataSet();

// Required by some software and not automagically added by GDCM in old version
gdcmm::Attribute<0x0028,0x0009> framePointer;
framePointer.SetNumberOfValues(1);
framePointer.SetValue( gdcmm::Tag(0x3004,0x000C) );
ds.Replace( framePointer.GetAsDataElement() );

gdcmm::Writer writer2;
writer2.CheckFileMetaInformationOff();
writer2.SetFileName("rtdose2.dcm");
writer2.SetFile( file );
writer2.Write();
// END HACK

return 0;
}

```

## 14.154 GenerateRTSTRUCT.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
PURPOSE. See the above copyright notice for more information.

=====*/
#include "vtkGDCMPolyDataWriter.h"
#include "vtkGDCMPolyDataReader.h"
#include "vtkPolyData.h"
#include "vtkPolyDataReader.h"
#include "vtkMedicalImageProperties.h"
#include "vtkRTStructSetProperties.h"
#include "vtkStringArray.h"
#include "vtkAppendPolyData.h"
#include "vtkPolyDataWriter.h"
#include "vtkPolyDataMapper.h"
#include "vtkPolyDataMapper2D.h"
#include "vtkActor2D.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkMedicalImageProperties.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkCamera.h"
#include "vtkProperty.h"
#include "vtkProperty2D.h"
#include "vtkImageData.h"
#include "vtkVersion.h"

#include <algorithm> //for std::find

#include "gdcmmDirectoryHelper.h"

using namespace gdcmm;

//view each organ independently of the others, to make sure that

```



```

//organ names correspond to actual segmentations.
void ShowOrgan(vtkPolyData* inData)
{
    // Now we'll look at it.
    vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
    #if (VTK_MAJOR_VERSION >= 6)
        cubeMapper->SetInputData( inData );
    #else
        cubeMapper->SetInput( inData );
    #endif
    cubeMapper->SetScalarRange(0,7);
    vtkActor *cubeActor = vtkActor::New();
    cubeActor->SetMapper(cubeMapper);
    vtkProperty *property = cubeActor->GetProperty();
    property->SetRepresentationToWireframe();

    vtkRenderer *renderer = vtkRenderer::New();
    vtkRenderWindow *renWin = vtkRenderWindow::New();
    renWin->AddRenderer(renderer);

    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renWin);

    renderer->AddActor(cubeActor);
    renderer->ResetCamera();
    renderer->SetBackground(1,1,1);

    renWin->SetSize(300,300);

    renWin->Render();
    iren->Start();

    cubeMapper->Delete();
    cubeActor->Delete();
    renderer->Delete();
    renWin->Delete();
    iren->Delete();
}

/*
 * Full application which ... RTSTRUCT
 */
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " directory-with-rtstruct-and-ct-images\n";
        return 1;
    }
    std::string theDirName(argv[1]);
    Directory::FileNamesType theRTSeries =
        DirectoryHelper::GetRTStructSeriesUIDs(theDirName);

    gdcm::Directory theDir;
    theDir.Load(argv[1]);

    if (theRTSeries.empty())
    {
        std::cerr << "No RTStructs found for the test, ending." << std::endl;
        return 1;
    }

    for (size_t q = 0; q < theRTSeries.size(); q++)
    {
        Directory::FileNamesType theRTNames =
            DirectoryHelper::GetFileNamesFromSeriesUIDs(theDirName, theRTSeries[q]);

        if (theRTNames.empty()){
            std::cerr << "Unable to load RT Series " << theRTSeries[q] << ", continuing. " << std::endl;
            continue;
        }

        vtkGDCMPolyDataReader * reader = vtkGDCMPolyDataReader::New();
        reader->SetFileName( theRTNames[0].c_str() );
        reader->Update();

        //std::cout << reader->GetMedicalImageProperties()->GetStudyDate() << std::endl;

        vtkGDCMPolyDataWriter * writer = vtkGDCMPolyDataWriter::New();
        int numMasks = reader->GetNumberOfOutputPorts() + 1; //add a blank one in
        writer->SetNumberOfInputPorts( numMasks );
    }
}

```

```

std::string thePotentialName = theDirName + "/" + "GDCMTestRTStruct." + theRTSeries[q] + ".dcm";
gdcm::Directory::FileNamesType theFileNames = theDir.GetFilesNames();
//keep renaming the output until we get something that doesn't overwrite what was there already
int count = 0;
while (std::find(theFileNames.begin(), theFileNames.end(), thePotentialName) != theFileNames.end())
{
    char buff[255];
    snprintf(buff, sizeof(buff), "%d", count);
    thePotentialName = theDirName + "/" + "GDCMTestRTStruct." + buff + "." + theRTSeries[q] + ".dcm";
}
writer->SetFileName( thePotentialName.c_str());
writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
//this line is cheating, we won't have the same stuff, and may not have a struct
//to start with.
//have to go back to the original data to reconstruct the RTStructureSetProperties
//writer->SetRTStructSetProperties( reader->GetRTStructSetProperties() );
//writer->Write();

//loop through the outputs in order to write them out as if they had been created and appended
vtkStringArray* roiNames = vtkStringArray::New();
vtkStringArray* roiAlgorithms = vtkStringArray::New();
vtkStringArray* roiTypes = vtkStringArray::New();
roiNames->SetNumberOfValues(numMasks);
roiAlgorithms->SetNumberOfValues(numMasks);
roiTypes->SetNumberOfValues(numMasks);
vtkAppendPolyData* append = vtkAppendPolyData::New();

//ok, now we'll add a blank organ
//the blank organ is to test to ensure that blank organs work; there have been crash reports
//this code is added at the beginning to ensure that the blank organs are read
//and preserved as individual organs.
vtkPolyData* blank = vtkPolyData::New();
#if (VTK_MAJOR_VERSION >= 6)
writer->SetInputData(0, blank);
#else
writer->SetInput(0, blank);
#endif
roiNames->InsertValue(0, "blank");
roiAlgorithms->InsertValue(0, "blank");
roiTypes->InsertValue(0, "ORGAN");

//note the offsets used to place the blank rtstruct at the beginning of the newly generated RT.
//the idea is to run the program twice; first to generate an rtstruct with a blank mask (making
//sure that that functionality works), and then a second time to make sure that everything is
//being read properly. Multiple organs with the same name could cause some strangenesses.
for (int i = 1; i < numMasks; ++i)
{
    if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputConnection(i, reader->GetOutputPort(i-1));
    else
        writer->SetInput(i, reader->GetOutput(i-1));
    append->AddInputConnection(reader->GetOutputPort(i-1));
    else
        writer->SetInput(i, reader->GetOutput(i-1));
    append->AddInput(reader->GetOutput(i-1));
    #endif
    std::string theString = reader->GetRTStructSetProperties()->GetStructureSetROIName(i-1);
    roiNames->InsertValue(i, theString);
    theString = reader->GetRTStructSetProperties()->GetStructureSetROIGenerationAlgorithm(i-1);
    roiAlgorithms->InsertValue(i, theString);
    theString = reader->GetRTStructSetProperties()->GetStructureSetRTROIInterpretedType(i-1);
    roiTypes->InsertValue(i, theString);

    ShowOrgan(reader->GetOutput(i-1));
}

vtkRTStructSetProperties* theProperties = vtkRTStructSetProperties::New();
writer->SetRTStructSetProperties(theProperties);
writer->InitializeRTStructSet(theDirName,
    reader->GetRTStructSetProperties()->GetStructureSetLabel(),
    reader->GetRTStructSetProperties()->GetStructureSetName(),
    roiNames, roiAlgorithms, roiTypes);

writer->SetRTStructSetProperties(theProperties);
writer->Write();

// print reader output:
reader->Print( std::cout );
// print first output:
reader->GetOutput()->Print( std::cout );

reader->Delete();
append->Delete();

```

```

        roiNames->Delete();
        roiTypes->Delete();
        theProperties->Delete();
        roiAlgorithms->Delete();
        blank->Delete();

        writer->Delete();
    }
    return 0;
}

```

## 14.155 MagnifyFile.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====*/

#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageMagnify.h"
#include "vtkImageCast.h"
#include "vtkVersion.h"

#include "gdcmTesting.h"
#include "gdcmSystem.h"

// This is a simple test to magnify an image that is known to give excellent
// compression ratio. This will be our test for those large image
int main(int, char *[])
{
    const char *directory = gdcm::Testing::GetDataRoot();
    if(!directory) return 1;
    std::string file = std::string(directory) + "/test.acr";
    std::cout << file << std::endl;
    if( !gdcm::System::FileExists( file.c_str() ) ) return 1;

    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( file.c_str() );
    reader->Update();
    //reader->GetOutput()->Print( std::cout );

    vtkImageCast *cast = vtkImageCast::New();
    if (VTK_MAJOR_VERSION >= 6)
        cast->SetInputConnection( reader->GetOutputPort() );
    #else
        cast->SetInput( reader->GetOutput() );
    #endif
    cast->SetOutputScalarTypeToUnsignedShort();

    vtkImageMagnify *magnify = vtkImageMagnify::New();
    if (VTK_MAJOR_VERSION >= 6)
        magnify->SetInputConnection( cast->GetOutputPort() );
    #else
        magnify->SetInput( cast->GetOutput() );
    #endif
    magnify->SetInterpolate( 1 );
    magnify->SetInterpolate( 0 );
    int factor = 100;
    magnify->SetMagnificationFactors (factor, factor, 1);

    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileName( "/tmp/bla.dcm" );
    if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputConnection( magnify->GetOutputPort() );
    #else
        writer->SetInput( magnify->GetOutput() );

```

```

#endif
writer->SetImageFormat( reader->GetImageFormat() );
writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
writer->SetDirectionCosines( reader->GetDirectionCosines() );
writer->SetShift( reader->GetShift() );
writer->SetScale( reader->GetScale() );
writer->Write();

// TODO:
//vtkImageAppendComponents.h

reader->Delete();
magnify->Delete();
writer->Delete();

return 0;
}

```

## 14.156 gdcmmorthoplanes.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/

#include "vtkActor.h"
#include "vtkCamera.h"
#include "vtkMatrix4x4.h"
#include "vtkTransform.h"
#include "vtkAssembly.h"
#include "vtkCellPicker.h"
#include "vtkCommand.h"
#include "vtkImageActor.h"
#include "vtkImageMapToColors.h"
#include "vtkImageOrthoPlanes.h"
#include "vtkImagePlaneWidget.h"
#include "vtkImageReader.h"
#include "vtkInteractorEventRecorder.h"
#include "vtkLookupTable.h"
#include "vtkOutlineFilter.h"
#include "vtkPolyDataMapper.h"
#include "vtkProperty.h"
#include "vtkRenderWindow.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkRenderer.h"
#include "vtkVolume16Reader.h"
#include "vtkImageData.h"
#include "vtkImageChangeInformation.h"
#include "vtkOrientationMarkerWidget.h"
#include "vtkAnnotatedCubeActor.h"
#include "vtkAxesActor.h"
#include "vtkCaptionActor2D.h"
#include "vtkTextProperty.h"
#include "vtkPropAssembly.h"

#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkStringArray.h"
#include "vtkVersion.h"

#include "gdcmmSystem.h"
#include "gdcmmDirectory.h"
#include "gdcmmIPPSorter.h"

#ifdef vtkFloatingPointType
#define vtkFloatingPointType double

```

```

#endif

//-----
class vtkOrthoPlanesCallback : public vtkCommand
{
public:
    static vtkOrthoPlanesCallback *New()
    { return new vtkOrthoPlanesCallback; }

    void Execute( vtkObject *caller, unsigned long vtkNotUsed( event ),
                  void *callData )
    {
        vtkImagePlaneWidget* self =
            reinterpret_cast< vtkImagePlaneWidget* >( caller );
        if(!self) return;

        double* wl = static_cast<double*>( callData );

        if ( self == this->WidgetX )
        {
            this->WidgetY->SetWindowLevel(wl[0],wl[1],1);
            this->WidgetZ->SetWindowLevel(wl[0],wl[1],1);
        }
        else if( self == this->WidgetY )
        {
            this->WidgetX->SetWindowLevel(wl[0],wl[1],1);
            this->WidgetZ->SetWindowLevel(wl[0],wl[1],1);
        }
        else if (self == this->WidgetZ)
        {
            this->WidgetX->SetWindowLevel(wl[0],wl[1],1);
            this->WidgetY->SetWindowLevel(wl[0],wl[1],1);
        }
    }

    vtkOrthoPlanesCallback():WidgetX( 0 ), WidgetY( 0 ), WidgetZ ( 0 ) {}

    vtkImagePlaneWidget* WidgetX;
    vtkImagePlaneWidget* WidgetY;
    vtkImagePlaneWidget* WidgetZ;
};

int main( int argc, char *argv[] )
{
    //char* fname = vtkTestUtilities::ExpandDataFileName(argc, argv, "Data/headsq/quarter");

    //vtkVolume16Reader* v16 = vtkVolume16Reader::New();
    // v16->SetDataDimensions( 64, 64);
    // v16->SetDataByteOrderToLittleEndian();
    // v16->SetImageRange( 1, 93);
    // v16->SetDataSpacing( 3.2, 3.2, 1.5);
    // v16->SetFilePrefix( fname );
    // v16->SetDataMask( 0x7fff);
    // v16->Update();
    std::vector<std::string> filenames;
    if( argc < 2 )
    {
        std::cerr << argv[0] << " filename1.dcm [filename2.dcm ...]\n";
        return 1;
    }
    else
    {
        // Is it a single directory ? If so loop over all files contained in it:
        const char *filename = argv[1];
        if( argc == 2 && gdcm::System::FileIsDirectory( filename ) )
        {
            std::cout << "Loading directory: " << filename << std::endl;
            bool recursive = false;
            gdcm::Directory d;
            d.Load(filename, recursive);
            gdcm::Directory::FileNamesType const &files = d.GetFileNames();
            for( gdcm::Directory::FileNamesType::const_iterator it = files.begin(); it != files.end(); ++it )
            {
                filenames.push_back( it->c_str() );
            }
        }
        else // list of files passed directly on the cmd line:
            // discard non-existing or directory
        {
            for(int i=1; i < argc; ++i)
            {

```

```

        filename = argv[i];
        if( gdcm::System::FileExists( filename ) )
        {
            if( gdcm::System::FileIsDirectory( filename ) )
            {
                std::cerr << "Discarding directory: " << filename << std::endl;
            }
            else
            {
                filenames.push_back( filename );
            }
        }
        else
        {
            std::cerr << "Discarding non existing file: " << filename << std::endl;
        }
    }
    //names->Print( std::cout );
}

vtkGDCMImageReader * reader = vtkGDCMImageReader::New();
double ippzspacing;
if( filenames.size() > 1 )
{
    //gdcm::Trace::DebugOn();
    //gdcm::Trace::WarningOn();
    gdcm::IPPSorter s;
    s.SetComputeZSpacing( true );
    s.SetZSpacingTolerance( 1e-3 );
    bool b = s.Sort( filenames );
    if( !b )
    {
        std::cerr << "Failed to sort files" << std::endl;
        return 1;
    }
    std::cout << "Sorting succeeded:" << std::endl;
    s.Print( std::cout );

    std::cout << "Found z-spacing:" << std::endl;
    std::cout << s.GetZSpacing() << std::endl;
    ippzspacing = s.GetZSpacing();

    const std::vector<std::string> & sorted = s.GetFilenames();
    vtkStringArray *files = vtkStringArray::New();
    std::vector< std::string >::const_iterator it = sorted.begin();
    for( ; it != sorted.end(); ++it )
    {
        const std::string &f = *it;
        files->InsertNextValue( f.c_str() );
    }
    reader->SetFileNames( files );
    //reader->SetFileLowerLeft( 1 );
    reader->Update(); // important
    files->Delete();
}
else
{
    reader->SetFileName( argv[1] );
    reader->Update(); // important
    ippzspacing = reader->GetOutput()->GetSpacing()[2];
    ippzspacing = 4;
}

//reader->GetOutput()->Print( std::cout );
//vtkFloatingPointType range[2];
//reader->GetOutput()->GetScalarRange(range);
//std::cout << "Range: " << range[0] << " " << range[1] << std::endl;

const vtkFloatingPointType *spacing = reader->GetOutput()->GetSpacing();

    vtkImageChangeInformation *v16 = vtkImageChangeInformation::New();
    #if (VTK_MAJOR_VERSION >= 6)
    v16->SetInputConnection( reader->GetOutputPort() );
    #else
    v16->SetInput( reader->GetOutput() );
    #endif
    v16->SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
    v16->Update();

    #if 0

```

```

    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetInput( v16->GetOutput() );
    writer->SetFileLowerLeft( reader->GetFileLowerLeft() );
    writer->SetDirectionCosines( reader->GetDirectionCosines() );
    writer->SetImageFormat( reader->GetImageFormat() );
    writer->SetFileDimensionality( 3 ); //reader->GetFileDimensionality();
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    writer->SetShift( reader->GetShift() );
    writer->SetScale( reader->GetScale() );
    writer->SetFileName( "out.dcm" );
    writer->Write();
#endif

    vtkOutlineFilter* outline = vtkOutlineFilter::New();
    outline->SetInputConnection(v16->GetOutputPort());

    vtkPolyDataMapper* outlineMapper = vtkPolyDataMapper::New();
    outlineMapper->SetInputConnection(outline->GetOutputPort());

    vtkActor* outlineActor = vtkActor::New();
    outlineActor->SetMapper( outlineMapper);

    vtkRenderer* ren1 = vtkRenderer::New();
    vtkRenderer* ren2 = vtkRenderer::New();

    vtkRenderWindow* renWin = vtkRenderWindow::New();
    renWin->AddRenderer(ren2);
    renWin->AddRenderer(ren1);

    vtkRenderWindowInteractor* iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renWin);

    vtkCellPicker* picker = vtkCellPicker::New();
    picker->SetTolerance(0.005);

    vtkProperty* ipwProp = vtkProperty::New();
    //assign default props to the ipw's texture plane actor

    vtkImagePlaneWidget* planeWidgetX = vtkImagePlaneWidget::New();
    planeWidgetX->SetInteractor( iren);
    planeWidgetX->SetKeyPressActivationValue('x');
    planeWidgetX->SetPicker(picker);
    planeWidgetX->RestrictPlaneToVolumeOn();
    planeWidgetX->GetPlaneProperty()->SetColor(1,0,0);
    planeWidgetX->SetTexturePlaneProperty(ipwProp);
    planeWidgetX->TextureInterpolateOff();
    planeWidgetX->SetResliceInterpolateToNearestNeighbour();
    if (VTK_MAJOR_VERSION >= 6)
        planeWidgetX->SetInputConnection(v16->GetOutputPort());
    else
        planeWidgetX->SetInput(v16->GetOutput());
    endif
    planeWidgetX->SetPlaneOrientationToXAxes();
    //planeWidgetX->SetSliceIndex(32);
    planeWidgetX->DisplayTextOn();
    planeWidgetX->On();
    planeWidgetX->InteractionOff();
    planeWidgetX->InteractionOn();

    vtkImagePlaneWidget* planeWidgetY = vtkImagePlaneWidget::New();
    planeWidgetY->SetInteractor( iren);
    planeWidgetY->SetKeyPressActivationValue('y');
    planeWidgetY->SetPicker(picker);
    planeWidgetY->GetPlaneProperty()->SetColor(1,1,0);
    planeWidgetY->SetTexturePlaneProperty(ipwProp);
    planeWidgetY->TextureInterpolateOn();
    planeWidgetY->SetResliceInterpolateToLinear();
    if (VTK_MAJOR_VERSION >= 6)
        planeWidgetY->SetInputConnection(v16->GetOutputPort());
    else
        planeWidgetY->SetInput(v16->GetOutput());
    endif
    planeWidgetY->SetPlaneOrientationToYAxes();
    //planeWidgetY->SetSlicePosition(102.4);
    planeWidgetY->SetLookupTable( planeWidgetX->GetLookupTable());
    planeWidgetY->DisplayTextOn();
    planeWidgetY->UpdatePlacement();
    planeWidgetY->On();

    vtkImagePlaneWidget* planeWidgetZ = vtkImagePlaneWidget::New();

```

```

planeWidgetZ->SetInteractor( iren);
planeWidgetZ->SetKeyPressActivationValue('z');
planeWidgetZ->SetPicker(picker);
planeWidgetZ->GetPlaneProperty()->SetColor(0,0,1);
planeWidgetZ->SetTexturePlaneProperty(ipwProp);
planeWidgetZ->TextureInterpolateOn();
planeWidgetZ->SetResliceInterpolateToCubic();
#if (VTK_MAJOR_VERSION >= 6)
planeWidgetZ->SetInputConnection(vl6->GetOutputPort());
#else
planeWidgetZ->SetInput(vl6->GetOutput());
#endif
planeWidgetZ->SetPlaneOrientationToZAxes();
//planeWidgetZ->SetSliceIndex(25);
planeWidgetZ->SetLookupTable( planeWidgetX->GetLookupTable());
planeWidgetZ->DisplayTextOn();
planeWidgetZ->On();

vtkImageOrthoPlanes *orthoPlanes = vtkImageOrthoPlanes::New();
orthoPlanes->SetPlane(0, planeWidgetX);
orthoPlanes->SetPlane(1, planeWidgetY);
orthoPlanes->SetPlane(2, planeWidgetZ);
orthoPlanes->ResetPlanes();

vtkOrthoPlanesCallback* cbk = vtkOrthoPlanesCallback::New();
cbk->WidgetX = planeWidgetX;
cbk->WidgetY = planeWidgetY;
cbk->WidgetZ = planeWidgetZ;
planeWidgetX->AddObserver( vtkCommand::EndWindowLevelEvent, cbk );
planeWidgetY->AddObserver( vtkCommand::EndWindowLevelEvent, cbk );
planeWidgetZ->AddObserver( vtkCommand::EndWindowLevelEvent, cbk );
cbk->Delete();

double wl[2];
planeWidgetZ->GetWindowLevel(wl);

// Add a 2D image to test the GetReslice method
//
vtkImageMapToColors* colorMap = vtkImageMapToColors::New();
colorMap->PassAlphaToOutputOff();
colorMap->SetActiveComponent(0);
colorMap->SetOutputFormatToLuminance();
#if (VTK_MAJOR_VERSION >= 6)
colorMap->SetInputData(planeWidgetZ->GetResliceOutput());
#else
colorMap->SetInput(planeWidgetZ->GetResliceOutput());
#endif
colorMap->SetLookupTable(planeWidgetX->GetLookupTable());

vtkImageActor* imageActor = vtkImageActor::New();
imageActor->PickableOff();
#if (VTK_MAJOR_VERSION >= 6)
imageActor->SetInputData(colorMap->GetOutput());
#else
imageActor->SetInput(colorMap->GetOutput());
#endif

// Add the actors
//
ren1->AddActor( outlineActor);
ren2->AddActor( imageActor);

ren1->SetBackground( 0.1, 0.1, 0.2);
ren2->SetBackground( 0.2, 0.1, 0.2);

renWin->SetSize( 600, 350);

ren1->SetViewport(0,0,0.58333,1);
ren2->SetViewport(0.58333,0,1,1);

// Set the actors' positions
//
renWin->Render();
//iren->SetEventPosition( 175,175);
//iren->SetKeyCode('r');
//iren->InvokeEvent(vtkCommand::CharEvent,NULL);
//iren->SetEventPosition( 475,175);
//iren->SetKeyCode('r');
//iren->InvokeEvent(vtkCommand::CharEvent,NULL);

```



```

//renWin->Render();

//ren1->GetActiveCamera()->Elevation(110);
//ren1->GetActiveCamera()->SetViewUp(0, 0, -1);
//ren1->GetActiveCamera()->Azimuth(45);
//ren1->GetActiveCamera()->Dolly(1.15);
ren1->ResetCameraClippingRange();

vtkAnnotatedCubeActor* cube = vtkAnnotatedCubeActor::New();
cube->SetXPlusFaceText ( "R" );
cube->SetXMinusFaceText ( "L" );
cube->SetYPlusFaceText ( "A" );
cube->SetYMinusFaceText ( "P" );
cube->SetZPlusFaceText ( "H" );
cube->SetZMinusFaceText ( "F" );
cube->SetFaceTextScale( 0.666667 );

vtkAxesActor* axes2 = vtkAxesActor::New();

vtkMatrix4x4 *invert = vtkMatrix4x4::New();
invert->DeepCopy( reader->GetDirectionCosines() );
invert->Invert();

// simulate a left-handed coordinate system
//
vtkTransform *transform = vtkTransform::New();
transform->Identity();
//transform->RotateY(90);
transform->Concatenate(invert);
axes2->SetShaftTypeToCylinder();
axes2->SetUserTransform( transform );
cube->GetAssembly()->SetUserTransform( transform );

axes2->SetTotalLength( 1.5, 1.5, 1.5 );
axes2->SetCylinderRadius( 0.500 * axes2->GetCylinderRadius() );
axes2->SetConeRadius ( 1.025 * axes2->GetConeRadius() );
axes2->SetSphereRadius ( 1.500 * axes2->GetSphereRadius() );

vtkTextProperty* tprop = axes2->GetXAxisCaptionActor2D()->
    GetCaptionTextProperty();
tprop->ItalicOn();
tprop->ShadowOn();
tprop->SetFontFamilyToTimes();

axes2->GetYAxisCaptionActor2D()->GetCaptionTextProperty()->ShallowCopy( tprop );
axes2->GetZAxisCaptionActor2D()->GetCaptionTextProperty()->ShallowCopy( tprop );

vtkPropAssembly* assembly = vtkPropAssembly::New();
assembly->AddPart( axes2 );
assembly->AddPart( cube );

vtkOrientationMarkerWidget* widget = vtkOrientationMarkerWidget::New();
widget->SetOutlineColor( 0.9300, 0.5700, 0.1300 );
widget->SetOrientationMarker( assembly );
widget->SetInteractor( iren );
widget->SetViewport( 0.0, 0.0, 0.4, 0.4 );
widget->SetEnabled( 1 );
widget->InteractiveOff();
widget->InteractiveOn();

// Playback recorded events
//
//vtkInteractorEventRecorder *recorder = vtkInteractorEventRecorder::New();
//recorder->SetInteractor(iren);
//recorder->ReadFromInputStringOn();
//recorder->SetInputString(IOEventLog);

// Interact with data
// Render the image
//
iren->Initialize();
renWin->Render();

// Test SetKeyPressActivationValue for one of the widgets
//
//iren->SetKeyCode('z');
//iren->InvokeEvent(vtkCommand::CharEvent,NULL);
//iren->SetKeyCode('z');
//iren->InvokeEvent(vtkCommand::CharEvent,NULL);

//int retVal = vtkRegressionTestImage( renWin );

```

```
//
//if ( retVal == vtkRegressionTester::DO_INTERACTOR)
//{
//    iren->Start();
//}

// Clean up
//
//recorder->Off();
//recorder->Delete();

ipwProp->Delete();
orthoPlanes->Delete();
planeWidgetX->Delete();
planeWidgetY->Delete();
planeWidgetZ->Delete();
colorMap->Delete();
imageActor->Delete();
picker->Delete();
outlineActor->Delete();
outlineMapper->Delete();
outline->Delete();
iren->Delete();
renWin->Delete();
ren1->Delete();
ren2->Delete();
v16->Delete();
reader->Delete();

return 0;
}
```

## 14.157 gdcmreslice.cxx

```
/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "vtkGDCMImageReader.h"

#include "vtkRenderer.h"
#include "vtkAssembly.h"
#include "vtkImageFlip.h"
#include "vtkImageReslice.h"
#include "vtkRenderWindow.h"
#include "vtkAnnotatedCubeActor.h"
#include "vtkTransform.h"
#include "vtkAxesActor.h"
#include "vtkTextProperty.h"
#include "vtkCaptionActor2D.h"
#include "vtkPropAssembly.h"
#include "vtkOrientationMarkerWidget.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkImageData.h"
#include "vtkLookupTable.h"
#include "vtkTexture.h"
#include "vtkPlaneSource.h"
#include "vtkVersion.h"

int main( int argc, char *argv[] )
{
    if( argc < 2 ) return 1;
    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( argv[1] );
    //reader->FileLowerLeftOn();
}
```

```

reader->Update();

vtkImageFlip *flip = vtkImageFlip::New();
#if (VTK_MAJOR_VERSION >= 6)
    flip->SetInputConnection(reader->GetOutputPort());
#else
    flip->SetInput(reader->GetOutput());
#endif
flip->SetFilteredAxis(0);
flip->Update();

vtkImageReslice *reslice = vtkImageReslice::New();
//reslice->SetInput(reader->GetOutput());
#if (VTK_MAJOR_VERSION >= 6)
    reslice->SetInputConnection(flip->GetOutputPort());
#else
    reslice->SetInput(flip->GetOutput());
#endif
//reslice->SetResliceAxesDirectionCosines()
reader->GetDirectionCosines()->Print(std::cout);
vtkMatrix4x4 *invert = vtkMatrix4x4::New();
invert->DeepCopy( reader->GetDirectionCosines() );
invert->Invert();

//reslice->SetResliceAxes( reader->GetDirectionCosines() );
reslice->SetResliceAxes( invert );
reslice->Update();
vtkImageData* ima = reslice->GetOutput();

vtkLookupTable* table = vtkLookupTable::New();
table->SetNumberOfColors(1000);
table->SetTableRange(0,1000);
table->SetSaturationRange(0,0);
table->SetHueRange(0,1);
table->SetValueRange(0,1);
table->SetAlphaRange(1,1);
table->Build();

// Texture
vtkTexture* texture = vtkTexture::New();
#if (VTK_MAJOR_VERSION >= 6)
    texture->SetInputData(ima);
#else
    texture->SetInput(ima);
#endif
texture->InterpolateOn();
texture->SetLookupTable(table);

// PlaneSource
vtkPlaneSource* plane = vtkPlaneSource::New();

// PolyDataMapper
vtkPolyDataMapper *planeMapper = vtkPolyDataMapper::New();
#if (VTK_MAJOR_VERSION >= 6)
    planeMapper->SetInputConnection(plane->GetOutputPort());
#else
    planeMapper->SetInput(plane->GetOutput());
#endif

// Actor
vtkActor* planeActor = vtkActor::New();
planeActor->SetTexture(texture);
planeActor->SetMapper(planeMapper);
planeActor->PickableOn();

// Final rendering with simple interactor:
vtkRenderer *ren = vtkRenderer::New();
vtkRenderWindow *renwin = vtkRenderWindow::New();
renwin->AddRenderer(ren);
vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
iren->SetRenderWindow(renwin);
ren->AddActor(planeActor);
ren->SetBackground(0,0,0.5);

// DICOM is RAH:
vtkAnnotatedCubeActor* cube = vtkAnnotatedCubeActor::New();
cube->SetXPlusFaceText( "R" );
cube->SetXMinusFaceText( "L" );
cube->SetYPlusFaceText( "A" );
cube->SetYMinusFaceText( "P" );
cube->SetZPlusFaceText( "H" );

```

```

cube->SetZMinusFaceText( "F" );

vtkAxesActor* axes2 = vtkAxesActor::New();

vtkTransform *transform = vtkTransform::New();
transform->Identity();
//reader->GetDirectionCosines()->Print(std::cout);
transform->Concatenate(invert);
//axes2->SetShaftTypeToCylinder();
axes2->SetUserTransform( transform );
cube->GetAssembly()->SetUserTransform( transform ); // can't get it to work

vtkPropAssembly* assembly = vtkPropAssembly::New();
assembly->AddPart( axes2 );
assembly->AddPart( cube );

vtkOrientationMarkerWidget* widget = vtkOrientationMarkerWidget::New();
widget->SetOrientationMarker( assembly );
widget->SetInteractor( iren );
widget->SetEnabled( 1 );
widget->InteractiveOff();
widget->InteractiveOn();

renwin->Render();
iren->Start();

// Clean up:
reader->Delete();
table->Delete();
texture->Delete();
plane->Delete();
planeMapper->Delete();
planeActor->Delete();
ren->Delete();
renwin->Delete();
iren->Delete();

return 0;
}

```

## 14.158 gdcmrtnionplan.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkPolyData.h"
#include "vtkProperty.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkRenderer.h"
#include "vtkCellArray.h"
#include "vtkPoints.h"
#include "vtkDoubleArray.h"
#include <vtkXMLImageDataWriter.h>
#include <vtkXMLPolyDataWriter.h>
#include <vtkRenderWindowInteractor.h>
#include <vtkImageColorViewer.h>
#include "vtkVersion.h"

#include "gdcmReader.h"
#include "gdcmAttribute.h"

/*
This example is just for fun. We found a RT Ion Plan Storage and simply extracted the viz stuff for VTK

```

```

    RTIonPlanStorage, // 1.2.840.10008.5.1.4.1.1.481.8
*/
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " filename.dcm outfile.vti\n";
        return 1;
    }
    const char * filename = argv[1];
    const char * outfilename = argv[2];
    const char * outfilename2 = argv[3];

    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }

    gdcm::MediaStorage ms;
    ms.SetFromFile( reader.GetFile() );
    if( ms != gdcm::MediaStorage::RTIonPlanStorage )
    {
        return 1;
    }

    /*
(300a,03a2) SQ                                     # u/l,1 Ion Beam Sequence
(fffe,e000) na (Item with undefined length)
(0008,1040) LO [Test]                               # 4,1 Institutional Department Name
(300a,00b2) SH (no value)                           # 0,1 Treatment Machine Name
(300a,00b3) CS [MU]                                  # 2,1 Primary Dosimeter Unit
(300a,00c0) IS [1 ]                                # 2,1 Beam Number
(300a,00c2) LO [1 ]                                # 2,1 Beam Name
(300a,00c4) CS [STATIC]                             # 6,1 Beam Type
(300a,00c6) CS [PROTON]                             # 6,1 Radiation Type
(300a,00ce) CS [TREATMENT ]                         # 10,1 Treatment Delivery Type
(300a,00d0) IS [0 ]                                # 2,1 Number of Wedges
(300a,00e0) IS [1 ]                                # 2,1 Number of Compensators
(300a,00ed) IS [0 ]                                # 2,1 Number of Boli
(300a,00f0) IS [1 ]                                # 2,1 Number of Blocks
(300a,0110) IS [2 ]                                # 2,1 Number of Control Points
(300a,02ea) SQ                                     # u/l,1 Ion Range Compensator Sequence
(fffe,e000) na (Item with undefined length)
(300a,00e1) SH [lucite]                             # 6,1 Material ID
(300a,00e4) IS [1 ]                                # 2,1 Compensator Number
(300a,00e5) SH [75hdhe5 ]                          # 8,1 Compensator ID
(300a,00e7) IS [35]                                # 2,1 Compensator Rows
(300a,00e8) IS [37]                                # 2,1 Compensator Columns
(300a,00e9) DS [3.679991\4.249288 ]                # 18,2 Compensator Pixel Spacing
(300a,00ea) DS [-76.00\62.50]                       # 12,2 Compensator Position
(300a,00ec) DS
[52.13\52.13\52.13\53.18\54.04\54.04\47.11\40.06\40.06\38.79\34.87\33.28\33.28\33.28\33.28\35.43\35.43\34.54\34.54\34.71\36.
# 7618,1-n Compensator Thickness Data
(300a,02e0) CS [ABSENT]                             # 6,1 Compensator Divergence
(300a,02e1) CS [SOURCE_SIDE ]                       # 12,1 Compensator Mounting Position
(300a,02e4) FL 39.2                                # 4,1 Isocenter to Compensator Tray Distance
(300a,02e5) FL 2.12                                # 4,1 Compensator Column Offset
(300a,02e8) FL 4.76                                # 4,1 Compensator Milling Tool Diameter
(fffe,e00d)

*/
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
    gdcm::Tag tbeamsq(0x300a,0x03a2);
    if( !ds.FindDataElement( tbeamsq ) )
    {
        return 1;
    }
    const gdcm::DataElement &tbeamsq = ds.GetDataElement( tbeamsq );
    //std::cout << beamsq << std::endl;
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = beamsq.GetValueAsSQ();
    if( !sqi || !sqi->GetNumberOfItems() )
    {
        return 1;
    }

    //for(unsigned int pd = 0; pd < sqi->GetNumberOfItems(); ++pd)
    // {
    //     //const gdcm::Item &item = sqi->GetItem(1); // Item start at #1
    //     const gdcm::Item &item = sqi->GetItem(1); // Item start at #1
    
```

```

const gdcm::DataSet& nestedds = item.GetNestedDataSet();
//std::cout << nestedds << std::endl;
gdcm::Tag tcompensatorsq(0x300a,0x02ea);
if( !nestedds.FindDataElement( tcompensatorsq ) )
{
    return 1;
}
const gdcm::DataElement &compensatorsq = nestedds.GetDataElement( tcompensatorsq );
//std::cout << compensatorsq << std::endl;
gdcm::SmartPointer<gdcm::SequenceOfItems> ssqi = compensatorsq.GetValueAsSQ();
const gdcm::Item & item2 = ssqi->GetItem(1); // Item start at #1
const gdcm::DataSet& nestedds2 = item2.GetNestedDataSet();
//std::cout << nestedds2 << std::endl;
gdcm::Tag tcompensatorthicknessdata(0x300a,0x00ec);
if( !nestedds2.FindDataElement( tcompensatorthicknessdata ) )
{
    return 1;
}
const gdcm::DataElement &compensatorthicknessdata = nestedds2.GetDataElement( tcompensatorthicknessdata );
// std::cout << compensatorthicknessdata << std::endl;
gdcm::Attribute<0x300a,0x00ec> at;
at.SetFromDataElement( compensatorthicknessdata );
const double* pts = at.GetValues();
// (300a,00e7) IS [35] # 2,1 Compensator Rows
gdcm::Attribute<0x300a,0x00e7> at1;
const gdcm::DataElement &compensatorrows = nestedds2.GetDataElement( at1.GetTag() );
at1.SetFromDataElement( compensatorrows );
std::cout << at1.GetValue() << std::endl;
// (300a,00e8) IS [37] # 2,1 Compensator Columns
gdcm::Attribute<0x300a,0x00e8> at2;
const gdcm::DataElement &compensatorcols = nestedds2.GetDataElement( at2.GetTag() );
at2.SetFromDataElement( compensatorcols );
std::cout << at2.GetValue() << std::endl;

// (300a,00e9) DS [3.679991\4.249288 ] # 18,2 Compensator Pixel Spacing
gdcm::Attribute<0x300a,0x00e9> at3;
const gdcm::DataElement &compensatorpixelspacing = nestedds2.GetDataElement( at3.GetTag() );
at3.SetFromDataElement( compensatorpixelspacing );
std::cout << at3.GetValue(0) << std::endl;
// (300a,00ea) DS [-76.00\62.50] # 12,2 Compensator Position
gdcm::Attribute<0x300a,0x00ea> at4;
const gdcm::DataElement &compensatorposition = nestedds2.GetDataElement( at4.GetTag() );
at4.SetFromDataElement( compensatorposition );
std::cout << at4.GetValue(0) << std::endl;

vtkDoubleArray *d = vtkDoubleArray::New();
d->SetArray( const_cast<double*>(pts) , at1.GetValue() * at2.GetValue() , 0 );

vtkImageData *img = vtkImageData::New();
img->Initialize();
img->SetDimensions( at2.GetValue(), at1.GetValue(), 1 );
//imgb->SetExtent(1, xdim, 1, ydim, 1, zdim);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetScalarTypeToDouble();
#endif
img->SetSpacing( at3.GetValue(1), at3.GetValue(0), 1); // FIXME image is upside down
img->SetOrigin( at4.GetValue(0), at4.GetValue(1), 1);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetNumberOfScalarComponents(1);
#endif
img->GetPointData()->SetScalars(d);

#if (VTK_MAJOR_VERSION >= 6)
#else
    img->Update();
#endif
img->Print(std::cout);

vtkXMLImageDataWriter *writeb= vtkXMLImageDataWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
    writeb->SetInputData( img );
#else
    writeb->SetInput( img );
#endif
writeb->SetFileName( outfilename );
writeb->Write();
/*

```

```

(300a,03a6) SQ # u/1,1 Ion Block Sequence
(fffe,e000) na (Item with undefined length)
(300a,00e1) SH [brass ] # 6,1 Material ID
(300a,00f7) FL 95.03 # 4,1 Isocenter to Block Tray Distance
(300a,00f8) CS [APERTURE] # 8,1 Block Type
(300a,00fa) CS [ABSENT] # 6,1 Block Divergence
(300a,00fb) CS [SOURCE_SIDE ] # 12,1 Block Mounting Position
(300a,00fc) IS [1 ] # 2,1 Block Number
(300a,0100) DS [50.00 ] # 6,1 Block Thickness
(300a,0104) IS [179 ] # 4,1 Block Number of Points
(300a,0106) DS
[1.7\50.0\14.3\50.0\16.7\49.4\18.7\48.2\19.4\47.7\20.1\47.1\21.0\47.0\22.3\47.0\23.7\46.8\25.7\46.2\27.0\45.6\27.2\45.4\28.2
2\37.4\43.0\37.1\44.7\36] # 1934,2-2n Block Data
(fffe,e00d)
(fffe,e0dd)

*/
gdcmm::Tag tblocksq(0x300a,0x03a6);
if( !nestedds.FindDataElement( tblocksq ) )
{
    return 1;
}
const gdcmm::DataElement &tblocksq = nestedds.GetDataElement( tblocksq );
//std::cout << tblocksq << std::endl;
gdcmm::SmartPointer<gdcmm::SequenceOfItems> sssqi = tblocksq.GetValueAssSQ();
const gdcmm::Item & item3 = sssqi->GetItem(1); // Item start at #1
const gdcmm::DataSet& nestedds3 = item3.GetNestedDataSet();

gdcmm::Tag tblockdata(0x300a,0x0106);
if( !nestedds3.FindDataElement( tblockdata ) )
{
    return 1;
}
const gdcmm::DataElement &tblockdata = nestedds3.GetDataElement( tblockdata );
// std::cout << tblockdata << std::endl;
gdcmm::Attribute<0x300a,0x0106> at_;
at_.SetFromDataElement( tblockdata );

vtkDoubleArray *scalars = vtkDoubleArray::New();
scalars->SetNumberOfComponents(3);

gdcmm::Attribute<0x300a,0x0104> bnpts; // IS [179 ] # 4,1 Block Number
of Points
if( !nestedds3.FindDataElement( bnpts.GetTag() ) )
{
    return 1;
}
const gdcmm::DataElement &tbnpts = nestedds3.GetDataElement( bnpts.GetTag() );
bnpts.SetFromDataElement( tbnpts );
//std::cout << bnpts.GetValue() << std::endl;

vtkPolyData *output = vtkPolyData::New();
vtkPoints *newPts = vtkPoints::New();
vtkCellArray *polys = vtkCellArray::New();
const double *ptr = at_.GetValues();
//unsigned int npts = bnpts.GetNumberOfValues() / 2;
unsigned int npts = bnpts.GetValue();
vtkIdType *ptIds = new vtkIdType[npts];
for(unsigned int i = 0; i < npts; ++i)
{
    float x[3] = {};
    x[0] = (float)ptr[2*i+0];
    x[1] = (float)ptr[2*i+1];
    //x[2] = ptr[i+2];
    vtkIdType ptId = newPts->InsertNextPoint( x );
    //std::cout << x[0] << " " << x[1] << " " << x[2] << std::endl;
    ptIds[i] = ptId;
}
vtkIdType cellId = polys->InsertNextCell(npts, ptIds);
(void)cellId;
delete[] ptIds;

output->SetPoints(newPts);
newPts->Delete();
output->SetPolys(polys);
polys->Delete();
//output->GetCellData()->SetScalars(scalars);
//scalars->Delete();
#if (VTK_MAJOR_VERSION >= 6)
#else
    output->Update();
#endif

```

```

#endif
    output->Print( std::cout );

    // }

    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();

    vtkImageColorViewer *viewer = vtkImageColorViewer::New();
    #if (VTK_MAJOR_VERSION >= 6)
        viewer->SetInputData(img);
    #else
        viewer->SetInput(img);
    #endif
    viewer->SetupInteractor(iren);
    viewer->SetSize(600, 600);
    viewer->GetRenderer()->ResetCameraClippingRange();
    viewer->Render();
    viewer->GetRenderer()->ResetCameraClippingRange();

    vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
    //vtkPolyDataMapper2D* cubeMapper = vtkPolyDataMapper2D::New();
    #if (VTK_MAJOR_VERSION >= 6)
        cubeMapper->SetInputData( output );
    #else
        cubeMapper->SetInput( output );
    #endif
    cubeMapper->SetScalarRange(0,7);
    vtkActor *cubeActor = vtkActor::New();
    //vtkActor2D* cubeActor = vtkActor2D::New();
    cubeActor->SetMapper(cubeMapper);
    vtkProperty * property = cubeActor->GetProperty();
    property->SetRepresentationToWireframe();

    viewer->GetRenderer()->AddActor( cubeActor );

    vtkXMLPolyDataWriter *writec= vtkXMLPolyDataWriter::New();
    #if (VTK_MAJOR_VERSION >= 6)
        writec->SetInputData( output );
    #else
        writec->SetInput( output );
    #endif
    writec->SetFileName( outfilename2 );
    writec->Write();

    iren->Initialize();
    iren->Start();

    return 0;
}

```

## 14.159 gdcmrtpplan.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
PURPOSE. See the above copyright notice for more information.

=====*/
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkPolyData.h"
#include "vtkProperty.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkRenderer.h"

```



```

#include "vtkCellArray.h"
#include "vtkPoints.h"
#include "vtkDoubleArray.h"
#include <vtkXMLImageDataWriter.h>
#include <vtkRenderWindowInteractor.h>
#include <vtkImageColorViewer.h>
#include "vtkVersion.h"

#include "gdcmReader.h"
#include "gdcmAttribute.h"

/*
This example is just for fun. We found a fake RT Ion Plan Storage and simply extracted the viz stuff for VTK
but this is rather a RT Plan storage
*/
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " filename.dcm outfile.vti\n";
        return 1;
    }
    const char * filename = argv[1];
    const char * outfilename = argv[2];

    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }

    gdcm::MediaStorage ms;
    ms.SetFromFile( reader.GetFile() );
    if( ms != gdcm::MediaStorage::RTIonPlanStorage )
    {
        return 1;
    }

    /*
(300a,00b0) SQ                                     # u/1,1 Beam Sequence
  (fffe,e000) na (Item with undefined length)
    (300a,00b2) SH (no value)                       # 0,1 Treatment Machine Name
    (300a,00c0) IS [1 ]                             # 2,1 Beam Number
    (300a,00c2) LO [1 ]                             # 2,1 Beam Name
    (300a,00c4) CS [STATIC]                         # 6,1 Beam Type
    (300a,00c6) CS [PROTON]                         # 6,1 Radiation Type
    (300a,00ce) CS [TREATMENT ]                    # 10,1 Treatment Delivery Type
    (300a,00e0) IS [1 ]                             # 2,1 Number of Compensators
    (300a,00e3) SQ                                   # u/1,1 Compensator Sequence
      (fffe,e000) na (Item with undefined length)
        (300a,00e1) SH [lucite]                     # 6,1 Material ID
        (300a,00e4) IS [1 ]                         # 2,1 Compensator Number
        (300a,00e5) SH [75hdhe5 ]                  # 8,1 Compensator ID
        (300a,00e7) IS [35]                         # 2,1 Compensator Rows
        (300a,00e8) IS [37]                         # 2,1 Compensator Columns
        (300a,00e9) DS [3.679991\4.249288 ]         # 18,2 Compensator Pixel Spacing
        (300a,00ea) DS [-76.00\62.50]               # 12,2 Compensator Position
        (300a,00ec) DS
          [52.13\52.13\52.13\53.18\54.04\54.04\47.11\40.06\40.06\38.79\34.87\33.28\33.28\33.28\33.28\35.43\35.43\34.54\34.54\34.71\36.
          # 7618,1-n Compensator Thickness Data
          (300a,02e0) CS [ABSENT]                   # 6,1 Compensator Divergence
          (300a,02e1) CS [SOURCE_SIDE ]             # 12,1 Compensator Mounting Position
        (fffe,e00d)
        (fffe,e000) na (Item with undefined length)
        (fffe,e00d)
        (fffe,e0dd)
      */
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
    gdcm::Tag tbeamsq(0x300a,0x00b0);
    if( !ds.FindDataElement( tbeamsq ) )
    {
        return 1;
    }
    const gdcm::DataElement &tbeamsq = ds.GetDataElement( tbeamsq );
    //std::cout << tbeamsq << std::endl;
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = tbeamsq.GetValueAsSQ();
    if( !sqi || !sqi->GetNumberOfItems() )
    {
        return 1;
    }
}

```

```

    }

//for(unsigned int pd = 0; pd < sqi->GetNumberOfItems(); ++pd)
// {
//const gdcm::Item & item = sqi->GetItem(1); // Item start at #1
const gdcm::Item & item = sqi->GetItem(2); // Item start at #1
const gdcm::DataSet& nestedds = item.GetNestedDataSet();
//std::cout << nestedds << std::endl;
gdcm::Tag tcompensatorsq(0x300a,0x00e3);
if( !nestedds.FindDataElement( tcompensatorsq ) )
{
    return 1;
}
const gdcm::DataElement &compensatorsq = nestedds.GetDataElement( tcompensatorsq );
//std::cout << compensatorsq << std::endl;
gdcm::SmartPointer<gdcm::SequenceOfItems> ssqi = compensatorsq.GetValueAsSQ();
const gdcm::Item & item2 = ssqi->GetItem(1); // Item start at #1
const gdcm::DataSet& nestedds2 = item2.GetNestedDataSet();
//std::cout << nestedds2 << std::endl;
gdcm::Tag tcompensatorthicknessdata(0x300a,0x00ec);
if( !nestedds2.FindDataElement( tcompensatorthicknessdata ) )
{
    return 1;
}
const gdcm::DataElement &compensatorthicknessdata = nestedds2.GetDataElement( tcompensatorthicknessdata );
// std::cout << compensatorthicknessdata << std::endl;
gdcm::Attribute<0x300a,0x00ec> at;
at.SetFromDataElement( compensatorthicknessdata );
const double* pts = at.GetValues();
// (300a,00e7) IS [35] # 2,1 Compensator Rows
gdcm::Attribute<0x300a,0x00e7> at1;
const gdcm::DataElement &compensatorrows = nestedds2.GetDataElement( at1.GetTag() );
at1.SetFromDataElement( compensatorrows );
std::cout << at1.GetValue() << std::endl;
// (300a,00e8) IS [37] # 2,1 Compensator Columns
gdcm::Attribute<0x300a,0x00e8> at2;
const gdcm::DataElement &compensatorcols = nestedds2.GetDataElement( at2.GetTag() );
at2.SetFromDataElement( compensatorcols );
std::cout << at2.GetValue() << std::endl;

// (300a,00e9) DS [3.679991\4.249288 ] # 18,2 Compensator Pixel Spacing
gdcm::Attribute<0x300a,0x00e9> at3;
const gdcm::DataElement &compensatorpixelspacing = nestedds2.GetDataElement( at3.GetTag() );
at3.SetFromDataElement( compensatorpixelspacing );
std::cout << at3.GetValue(0) << std::endl;
// (300a,00ea) DS [-76.00\62.50] # 12,2 Compensator Position
gdcm::Attribute<0x300a,0x00ea> at4;
const gdcm::DataElement &compensatorposition = nestedds2.GetDataElement( at4.GetTag() );
at4.SetFromDataElement( compensatorposition );
std::cout << at4.GetValue(0) << std::endl;

vtkDoubleArray *d = vtkDoubleArray::New();
d->SetArray( const_cast<double*>(pts) , at1.GetValue() * at2.GetValue() , 0 );

vtkImageData *img = vtkImageData::New();
img->Initialize();
img->SetDimensions( at2.GetValue(), at1.GetValue(), 1 );
//img->SetExtent(1, xdim, 1, ydim, 1, zdim);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetScalarTypeToDouble();
#endif
img->SetSpacing( at3.GetValue(1), at3.GetValue(0), 1); // FIXME image is upside down
img->SetOrigin( at4.GetValue(0), at4.GetValue(1), 1);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetNumberOfScalarComponents(1);
#endif
img->GetPointData()->SetScalars(d);

vtkXMLImageDataWriter *writeb= vtkXMLImageDataWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
    writeb->SetInputData( img );
#else
    writeb->SetInput( img );
#endif
writeb->SetFileName( outfilename );
writeb->Write();
/*

```

```

(300a,00f4) SQ                                     # u/1,1 Block Sequence
(fffe,e000) na (Item with undefined length)
    (300a,00e1) SH [brass ]                        # 6,1 Material ID
    (300a,00f8) CS [APERTURE]                      # 8,1 Block Type
    (300a,00fa) CS [ABSENT]                        # 6,1 Block Divergence
    (300a,00fb) CS [SOURCE_SIDE ]                 # 12,1 Block Mounting Position
    (300a,00fc) IS [1 ]                           # 2,1 Block Number
    (300a,0100) DS [50.00 ]                        # 6,1 Block Thickness
    (300a,0104) IS [179 ]                         # 4,1 Block Number of Points
    (300a,0106) DS
[1.7\50.0\14.3\50.0\16.7\49.4\18.7\48.2\19.4\47.7\20.1\47.1\21.0\47.0\22.3\47.0\23.7\46.8\25.7\46.2\27.0\45.6\27.2\45.4\28.2]
# 1934,2-2n Block Data
(fffe,e00d)
(fffe,e000) na (Item with undefined length)
(fffe,e00d)
(fffe,e0dd)
*/
gdcmm::Tag tblocksq(0x300a,0x00f4);
if( !nestedds.FindDataElement( tblocksq ) )
{
    return 1;
}
const gdcmm::DataElement &blocksq = nestedds.GetDataElement( tblocksq );
//std::cout << blocksq << std::endl;
gdcmm::SmartPointer<gdcmm::SequenceOfItems> sssqi = blocksq.GetValueAssSQ();
const gdcmm::Item & item3 = sssqi->GetItem(1); // Item start at #1
const gdcmm::DataSet& nestedds3 = item3.GetNestedDataSet();

gdcmm::Tag tblockdata(0x300a,0x0106);
if( !nestedds3.FindDataElement( tblockdata ) )
{
    return 1;
}
const gdcmm::DataElement &blockdata = nestedds3.GetDataElement( tblockdata );
// std::cout << blockdata << std::endl;
gdcmm::Attribute<0x300a,0x0106> at_;
at_.SetFromDataElement( blockdata );

vtkDoubleArray *scalars = vtkDoubleArray::New();
scalars->SetNumberOfComponents(3);

gdcmm::Attribute<0x300a,0x0104> bnpts; // IS [179 ] # 4,1 Block Number of Points
if( !nestedds3.FindDataElement( bnpts.GetTag() ) )
{
    return 1;
}
const gdcmm::DataElement &blocknpts = nestedds3.GetDataElement( bnpts.GetTag() );
bnpts.SetFromDataElement( blocknpts );
std::cout << bnpts.GetValue() << std::endl;

vtkPolyData *output = vtkPolyData::New();
vtkPoints *newPts = vtkPoints::New();
vtkCellArray *polys = vtkCellArray::New();
const double *ptr = at_.GetValues();
//unsigned int npts = bnpts.GetNumberOfValues() / 2;
unsigned int npts = bnpts.GetValue();
vtkIdType *ptIds = new vtkIdType[npts];
for(unsigned int i = 0; i < npts; ++i)
{
    float x[3] = {};
    x[0] = (float)ptr[2*i+0];
    x[1] = (float)ptr[2*i+1];
    //x[2] = ptr[i+2];
    vtkIdType ptId = newPts->InsertNextPoint( x );
    //std::cout << x[0] << "," << x[1] << "," << x[2] << std::endl;
    ptIds[i] = ptId;
}
vtkIdType cellId = polys->InsertNextCell(npts , ptIds);
(void)cellId;
delete[] ptIds;

output->SetPoints(newPts);
newPts->Delete();
output->SetPolys(polys);
polys->Delete();
//output->GetCellData()->SetScalars(scalars);
//scalars->Delete();
#if (VTK_MAJOR_VERSION >= 6)
#else
    output->Update();
#endif
#endif

```

```

    output->Print( std::cout );

    // }

    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();

    vtkImageColorViewer *viewer = vtkImageColorViewer::New();
    #if (VTK_MAJOR_VERSION >= 6)
        viewer->SetInputData(img);
    #else
        viewer->SetInput(img);
    #endif
    viewer->SetupInteractor(iren);
    viewer->SetSize(600, 600);
    viewer->Render();

    vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
    //vtkPolyDataMapper2D* cubeMapper = vtkPolyDataMapper2D::New();
    #if (VTK_MAJOR_VERSION >= 6)
        cubeMapper->SetInputData( output );
    #else
        cubeMapper->SetInput( output );
    #endif
    cubeMapper->SetScalarRange(0,7);
    vtkActor *cubeActor = vtkActor::New();
    //vtkActor2D* cubeActor = vtkActor2D::New();
    cubeActor->SetMapper(cubeMapper);
    vtkProperty *property = cubeActor->GetProperty();
    property->SetRepresentationToWireframe();

    viewer->GetRenderer()->AddActor( cubeActor );

    iren->Initialize();
    iren->Start();

    return 0;
}

```

## 14.160 gdcmscene.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
PURPOSE. See the above copyright notice for more information.

=====*/
#include "vtkGDCMPolyDataReader.h"
// #include "vtkGDCMPolyDataWriter.h"

#include "vtkAppendPolyData.h"
#include "vtkPolyDataWriter.h"
#include "vtkPolyDataMapper.h"
#include "vtkPolyDataMapper2D.h"
#include "vtkActor2D.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkCamera.h"
#include "vtkProperty.h"
#include "vtkProperty2D.h"
#include "vtkVersion.h"

// gdcmDataExtra/gdcmNonImageData/exRT_Structure_Set_Storage.dcm
// gdcmDataExtra/gdcmNonImageData/RTSTRUCT_1.3.6.1.4.1.22213.1.1396.2.dcm

```

```

// gdcmDataExtra/gdcmNonImageData/RT/RTStruct.dcm

int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " filename1.dcm\n";
        return 1;
    }
    const char * filename = argv[1];

    vtkGDCMPolyDataReader * reader = vtkGDCMPolyDataReader::New();
    reader->SetFileName( filename );
    reader->Update();

    // vtkGDCMPolyDataWriter * writer2 = vtkGDCMPolyDataWriter::New();
    // for(int num = 0; num < reader->GetNumberOfOutputPorts(); ++num )
    //     writer2->SetInput( num, reader->GetOutput(num) );
    // writer2->SetFileName( "rtstruct.dcm" );
    // writer2->Write();

    // print reader output:
    reader->Print( std::cout );
    // print first output:
    reader->GetOutput()->Print( std::cout );

    vtkAppendPolyData *append = vtkAppendPolyData::New();
    int n = reader->GetNumberOfOutputPorts();
    for(int i = 0; i < n; ++i)
    {
#ifdef VTK_MAJOR_VERSION >= 6
        append->AddInputConnection( reader->GetOutputPort(i) );
#else
        append->AddInput( reader->GetOutput(i) );
#endif
    }

    vtkPolyDataWriter * writer = vtkPolyDataWriter::New();
#ifdef VTK_MAJOR_VERSION >= 6
    writer->SetInputConnection( reader->GetOutputPort() );
#else
    writer->SetInput( reader->GetOutput() );
#endif
    writer->SetFileName( "rtstruct.vtk" );
    //writer->Write();

    // Now we'll look at it.
    vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
    //vtkPolyDataMapper2D* cubeMapper = vtkPolyDataMapper2D::New();
    //cubeMapper->SetInput( reader->GetOutput() );
#ifdef VTK_MAJOR_VERSION >= 6
    cubeMapper->SetInputConnection( append->GetOutputPort() );
#else
    cubeMapper->SetInput( append->GetOutput() );
#endif
    cubeMapper->SetScalarRange(0,7);
    vtkActor *cubeActor = vtkActor::New();
    //vtkActor2D* cubeActor = vtkActor2D::New();
    cubeActor->SetMapper(cubeMapper);
    vtkProperty * property = cubeActor->GetProperty();
    property->SetRepresentationToWireframe();
    //cubeActor->GetProperty()->SetColor(1, 0, 0);

    // The usual rendering stuff.
    // vtkCamera *camera = vtkCamera::New();
    //     camera->SetPosition(1,1,1);
    //     camera->SetFocalPoint(0,0,0);

    vtkRenderer *renderer = vtkRenderer::New();
    vtkRenderWindow *renWin = vtkRenderWindow::New();
    renWin->AddRenderer(renderer);

    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renWin);

    renderer->AddActor(cubeActor);
    //renderer->AddActor2D(cubeActor);
    //renderer->SetActiveCamera(camera);
    renderer->ResetCamera();

```

```

        renderer->SetBackground(1,1,1);

renWin->SetSize(300,300);

// interact with data
renWin->Render();
iren->Start();

reader->Delete();
append->Delete();
cubeMapper->Delete();
cubeActor->Delete();
// camera->Delete();
renderer->Delete();
renWin->Delete();
iren->Delete();

writer->Delete();

return 0;
}

```

## 14.161 gdcmttexture.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "vtkGDCMImageReader.h"

#include "vtkRenderer.h"
#include "vtkAssembly.h"
#include "vtkRenderWindow.h"
#include "vtkAnnotatedCubeActor.h"
#include "vtkTransform.h"
#include "vtkAxesActor.h"
#include "vtkTextProperty.h"
#include "vtkCaptionActor2D.h"
#include "vtkPropAssembly.h"
#include "vtkOrientationMarkerWidget.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkImageData.h"
#include "vtkLookupTable.h"
#include "vtkTexture.h"
#include "vtkPlaneSource.h"
#include "vtkVersion.h"

int main( int argc, char *argv[] )
{
    if( argc < 2 ) return 1;
    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( argv[1] );

    reader->Update();
    vtkImageData* ima = reader->GetOutput();

    vtkLookupTable* table = vtkLookupTable::New();
    table->SetNumberOfColors(1000);
    table->SetTableRange(0,1000);
    table->SetSaturationRange(0,0);
    table->SetHueRange(0,1);
    table->SetValueRange(0,1);
    table->SetAlphaRange(1,1);

```

```

table->Build();

// Texture
vtkTexture* texture = vtkTexture::New();
#if (VTK_MAJOR_VERSION >= 6)
    texture->SetInputData(ima);
#else
    texture->SetInput(ima);
#endif
texture->InterpolateOn();
texture->SetLookupTable(table);

// PlaneSource
vtkPlaneSource* plane = vtkPlaneSource::New();
plane->SetOrigin( -0.5, -0.5, 0.0);
plane->SetPoint1( 0.5, -0.5, 0.0);
plane->SetPoint2( -0.5, 0.5, 0.0);

// PolyDataMapper
vtkPolyDataMapper *planeMapper = vtkPolyDataMapper::New();
#if (VTK_MAJOR_VERSION >= 6)
    planeMapper->SetInputConnection(plane->GetOutputPort());
#else
    planeMapper->SetInput(plane->GetOutput());
#endif

// Actor
vtkActor* planeActor = vtkActor::New();
planeActor->SetTexture(texture);
planeActor->SetMapper(planeMapper);
planeActor->PickableOn();

// Final rendering with simple interactor:
vtkRenderer *ren = vtkRenderer::New();
vtkRenderWindow *renwin = vtkRenderWindow::New();
renwin->AddRenderer(ren);
vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
iren->SetRenderWindow(renwin);
ren->AddActor(planeActor);
ren->SetBackground(0,0,0.5);

vtkAnnotatedCubeActor* cube = vtkAnnotatedCubeActor::New();
cube->SetXPlusFaceText ( "L" );
cube->SetXMinusFaceText ( "R" );
cube->SetYPlusFaceText ( "A" );
cube->SetYMinusFaceText ( "P" );
cube->SetZPlusFaceText ( "H" );
cube->SetZMinusFaceText ( "F" );

vtkAxesActor* axes2 = vtkAxesActor::New();
// simulate a left-handed coordinate system
//
vtkTransform *transform = vtkTransform::New();
transform->Identity();
//transform->RotateY(180);
reader->GetDirectionCosines()->Print(std::cout);
transform->Concatenate(reader->GetDirectionCosines());
//axes2->SetShaftTypeToCylinder();
axes2->SetUserTransform( transform );
//cube->SetUserTransform( transform ); // can't get it to work
cube->GetAssembly()->SetUserTransform( transform ); // can't get it to work

vtkPropAssembly* assembly = vtkPropAssembly::New();
assembly->AddPart( axes2 );
assembly->AddPart( cube );

vtkOrientationMarkerWidget* widget = vtkOrientationMarkerWidget::New();
//widget->SetOutlineColor( 0.9300, 0.5700, 0.1300 );
widget->SetOrientationMarker( assembly );
widget->SetInteractor( iren );
//widget->SetViewport( 0.0, 0.0, 0.4, 0.4 );
widget->SetEnabled( 1 );
widget->InteractiveOff();
widget->InteractiveOn();

renwin->Render();
iren->Start();

// Clean up:
reader->Delete();
table->Delete();

```

```

texture->Delete();
plane->Delete();
planeMapper->Delete();
planeActor->Delete();
ren->Delete();
renwin->Delete();
iren->Delete();

return 0;
}

```

## 14.162 gdcmvolume.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "vtkVersion.h"
#include "vtkGDCMImageReader.h"
#include "vtkPiecewiseFunction.h"
#include "vtkColorTransferFunction.h"
#include "vtkVolume.h"
#include "vtkVolumeProperty.h"
#if VTK_MAJOR_VERSION < 7
#include "vtkVolumeTextureMapper3D.h"
#endif
#include "vtkFixedPointVolumeRayCastMapper.h"
#include "vtkInteractorStyleTrackballCamera.h"
#include "vtkRenderer.h"
#include "vtkRenderWindow.h"
#include "vtkImageClip.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkVersion.h"

// gdcmvolume gdcmData/GE_DLX-8-MONO2-Multiframe-Jpeg_Lossless.dcm
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( argv[1] );
    reader->Update();

    // Create the renderers, render window, and interactor
    vtkRenderWindow *renWin = vtkRenderWindow::New();
    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renWin);
    vtkRenderer *ren = vtkRenderer::New();
    renWin->AddRenderer(ren);

    // Create a transfer function mapping scalar value to opacity
    vtkPiecewiseFunction *oTFun = vtkPiecewiseFunction::New();
    //oTFun->AddSegment(0, 1.0, 256, 0.1);
    oTFun->AddSegment(0, 1.0, 240, 0.1);

    vtkColorTransferFunction *cTFun = vtkColorTransferFunction::New();
    cTFun->AddRGBPoint( 0, 1.0, 1.0, 1.0 );
    //cTFun->AddRGBPoint( 255, 1.0, 1.0, 1.0 );
    cTFun->AddRGBPoint( 240, 1.0, 1.0, 1.0 );

    // Need to crop to actually see minimum intensity
    vtkImageClip *clip = vtkImageClip::New();
    clip->SetInputConnection( reader->GetOutputPort() );
    clip->SetOutputWholeExtent(0,66,0,66,30,37);
    clip->ClipDataOn();

    vtkVolumeProperty *property = vtkVolumeProperty::New();

```



```

property->SetScalarOpacity(oTFun);
property->SetColor(cTFun);
property->SetInterpolationTypeToLinear();

vtkFixedPointVolumeRayCastMapper *mapper = vtkFixedPointVolumeRayCastMapper::New();
mapper->SetBlendModeToMinimumIntensity();
mapper->SetInputConnection( reader->GetOutputPort() );

vtkVolume *volume = vtkVolume::New();
volume->SetMapper(mapper);
volume->SetProperty(property);

ren->AddViewProp(volume);

renWin->Render();
{
    iren->Start();
}

volume->Delete();
mapper->Delete();
property->Delete();
clip->Delete();
cTFun->Delete();
oTFun->Delete();
reader->Delete();
renWin->Delete();
iren->Delete();
ren->Delete();

return 0;
}

```

## 14.163 offscreenimage.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "vtkGDCMImageReader.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkImageMapToWindowLevelColors.h"
#include "vtkImageActor.h"
#include "vtkPNGWriter.h"
#include "vtkWindowToImageFilter.h"
#include "vtkMedicalImageProperties.h"
#include "vtkVersion.h"

int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        return 1;
    }
    const char *filename = argv[1];

    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( filename );
    reader->Update(); // important to read the window/level info

    vtkMedicalImageProperties *prop = reader->GetMedicalImageProperties();

    vtkRenderWindow *renWin = vtkRenderWindow::New();

```

```

renWin->OffScreenRenderingOn();

vtkRenderer *renderer = vtkRenderer::New();
renWin->AddRenderer(renderer);

vtkImageMapToWindowLevelColors *windowlevel = vtkImageMapToWindowLevelColors::New();
#if (VTK_MAJOR_VERSION >= 6)
windowlevel->SetInputConnection( reader->GetOutputPort() );
#else
windowlevel->SetInput( reader->GetOutput() );
#endif
unsigned int n = prop->GetNumberOfWindowLevelPresets();
if( n )
{
    // Take the first one by default:
    const double *wl = prop->GetNthWindowLevelPreset(0);
    windowlevel->SetWindow( wl[0] );
    windowlevel->SetLevel( wl[1] );
}

vtkImageActor *actor = vtkImageActor::New();
#if (VTK_MAJOR_VERSION >= 6)
actor->SetInputData( windowlevel->GetOutput() );
#else
actor->SetInput( windowlevel->GetOutput() );
#endif

renderer->AddActor( actor );

renWin->Render();

vtkWindowToImageFilter *w2if = vtkWindowToImageFilter::New();
w2if->SetInput( renWin );

vtkPNGWriter *wr = vtkPNGWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
wr->SetInputConnection( w2if->GetOutputPort() );
#else
wr->SetInput( w2if->GetOutput() );
#endif
wr->SetFileName( "offscreenimage.png" );
wr->Write();

reader->Delete();
renWin->Delete();
renderer->Delete();
windowlevel->Delete();
actor->Delete();
w2if->Delete();
wr->Delete();

return 0;
}

```

## 14.164 reslicesphere.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
//
// Load a DICOM series.
// Position a sphere within the volume.
// Allow the user to change between Axial, Sagittal, Coronal, and
// Oblique view of the images and move through the slices.
// The display should show the resliced image and the cross section
// of the sphere intersecting that plane.

```

```
//

/*
from Scott Johnson /Scott Johnson neuwave com/
to VTK /vtkusers vtk.org/
date Tue, May 11, 2010 at 7:01 PM
*/
#include <string>

#include <vtkDICOMImageReader.h>
#include <vtkStringArray.h>
#include <vtkDirectory.h>
#include <vtkImageThreshold.h>
#include <vtkImageShiftScale.h>
#include <vtkImageReslice.h>
#include <vtkRenderWindowInteractor.h>
#include <vtkImageViewer2.h>
#include <vtkSphereSource.h>
#include <vtkPolyDataMapper.h>
#include <vtkPlane.h>
#include <vtkCutter.h>
#include <vtkActor.h>
#include <vtkCommand.h>
#include <vtkSmartPointer.h>
#include <vtkMatrix4x4.h>
#include <vtkInteractorObserver.h>
#include <vtkProperty.h>
#include <vtkRenderer.h>
#include <vtkImageData.h>
#include <vtkImageActor.h>
#include "vtkTransformPolyDataFilter.h"
#include <vtkCamera.h>
#include <vtkMath.h>
#include <vtkTransform.h>
#include <vtkTextActor.h>
#include <vtkActor2D.h>
#include <vtkPolyDataMapper2D.h>
#include <vtkProperty2D.h>
#include <vtkGDCMImageReader.h>
#include <vtkImageChangeInformation.h>
#include <vtkVersion.h>

#include "gdcmdirctory.h"
#include "gdcmtesting.h"
#include "gdcmppsorter.h"

// Change to match the path to find Raw_0.vti or provide
// the parameter when starting ResliceSphere.

const double sphereCenter[3]={74, 219, 70};

// Angles (0, 0, 0)
const double AxialMatrix[] = { 1.0, 0.0, 0.0, 0.0,
                               0.0, 1.0, 0.0, 0.0,
                               0.0, 0.0, 1.0, 0.0,
                               0.0, 0.0, 0.0, 1.0 };

// Angles (0, 90, 0)
const double SagittalMatrix[] = { 0.0, 0.0, 1.0, 0.0,
                                   0.0, 1.0, 0.0, 0.0,
                                   -1.0, 0.0, 0.0, 0.0,
                                   0.0, 0.0, 0.0, 1.0 };

// Angles (-90, 0, 0)
const double CoronalMatrix[] = { 1.0, 0.0, 0.0, 0.0,
                                  0.0, 0.0, 1.0, 0.0,
                                  0.0, -1.0, 0.0, 0.0,
                                  0.0, 0.0, 0.0, 1.0 };

// Angles (0, 90, 31)
const double ObliqueMatrix[] = { 0.0, -0.515038, 0.857167, 0.0,
                                  0.0, 0.857167, 0.515038, 0.0,
                                  -1.0, 0.0, 0.0, 0.0,
                                  0.0, 0.0, 0.0, 1.0 };

class ResliceRender;

// Class to handle key press events.
class KeyCallback : public vtkCommand
{
public:
    static KeyCallback* New()
    {

```

```

        return new KeyCallback();
    }

    void Execute(vtkObject* caller, unsigned long eventId, void *calldata);
    void SetCallbackData(ResliceRender* reslice);

protected:
    ResliceRender* _reslice;
};

class ResliceRender
{
public:
    typedef enum _ORIENTATION
    {
        AXIAL = 0,
        SAGITTAL = 1,
        CORONAL = 2,
        OBLIQUE = 3
    } ORIENTATION;

    ResliceRender()
    {
        _orientation=AXIAL;
    }

    ~ResliceRender()
    {
        _transform->Delete();
        _reader->Delete();
        _reslice->Delete();
        _interactor->Delete();
        _imageViewer->Delete();

        _sphere->Delete();
        _sphereMapper->Delete();
        _sphereActor->Delete();

        _plane->Delete();
        _cutter->Delete();
        _polyTransform->Delete();
        _ROIMapper->Delete();
        _ROIActor->Delete();

        _annotation->Delete();
    }

    void CreatePipeline(const char* fileName)
    {
        vtkProperty2D* props;

        //_reader=vtkXMLImageDataReader::New();
        //_reader->SetFileName(fileName);
        //_reader->Update();

        //_reader=qzDICOMImageReader::New();
        _reader=vtkGDCMImageReader::New();

        //vtkDirectory *d = vtkDirectory::New();
        //d->Open(fileName);
        //d->Print( std::cout );
        gdcm::Directory d;
        d.Load(fileName);
        gdcm::Directory::FileNamesType const &files = d.GetFilesNames();

        gdcm::IPPSorter s;
        s.SetComputeZSpacing( true );
        s.SetZSpacingTolerance( 1e-3 );
        bool b = s.Sort( files );
        if( !b )
        {
            std::cerr << "Failed to sort:" << fileName << std::endl;
            //return ;
        }
        //std::cout << "Sorting succeeded:" << std::endl;
        //s.Print( std::cout );

        //std::cout << "Found z-spacing:" << std::endl;
        //std::cout << s.GetZSpacing() << std::endl;
    }
};

```

```

double ippzspacing = s.GetZSpacing();

const std::vector<std::string> & sorted = s.GetFileNames();
vtkStringArray *vtkfiles = vtkStringArray::New();
std::vector< std::string >::const_iterator it = sorted.begin();
for( ; it != sorted.end(); ++it)
{
    const std::string &f = *it;
    vtkfiles->InsertNextValue( f.c_str() );
}

    //_reader->SetDirectoryName(fileName);
    //_reader->SetFileNames( d->GetFiles() );
    _reader->SetFileNames( vtkfiles );
    _reader->Update();

#ifdef vtkFloatingPointType
#define vtkFloatingPointType double
#endif
    const vtkFloatingPointType *spacing = _reader->GetOutput()->GetSpacing();

    vtkImageChangeInformation *v16 = vtkImageChangeInformation::New();
    #if (VTK_MAJOR_VERSION >= 6)
        v16->SetInputConnection( _reader->GetOutputPort() );
    #else
        v16->SetInput( _reader->GetOutput() );
    #endif
    v16->SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
    v16->Update();

    _threshold=vtkImageThreshold::New();
    _threshold->ThresholdByUpper(-3024.0);
    _threshold->ReplaceOutOn();
    _threshold->SetOutValue(0.0);
    _threshold->SetInputConnection(v16->GetOutputPort());

    _shift=vtkImageShiftScale::New();
    _shift->SetShift(0);
    _shift->SetScale(1);
    _shift->SetInputConnection(_threshold->GetOutputPort());

    // Initialize the reslice with an axial orientation.
    vtkSmartPointer<vtkMatrix4x4> matrix =
        vtkSmartPointer<vtkMatrix4x4>::New();
    matrix->Identity();

    _transform = vtkTransform::New();
    _transform->SetMatrix(matrix);

    _reslice = vtkImageReslice::New();
    _reslice->SetOutputDimensionality(3);

    // PROBLEM:
    // The original intent was to connect the same transform
    // to the vtkImageReslice and vtkTransformPolyDataFilter,
    // but the resulting reslices appear different using the
    // vtkTransform as opposed to explicitly setting the
    // reslice axes via SetResliceAxes. Also, if the vtkTransform
    // is connected and orientated other than axial, the extents
    // don't seem to update resulting in VTK believing the slice
    // is out of range.

    //_reslice->SetResliceTransform(_transform);
    _reslice->SetResliceAxes(matrix);
    //_reslice->SetInputConnection(_reader->GetOutputPort());
    _reslice->SetInputConnection(_shift->GetOutputPort());

    // Create the sphere target shape.
    _sphere=vtkSphereSource::New();
    _sphere->SetRadius(7.0);
    _sphere->SetThetaResolution(16);
    _sphere->SetPhiResolution(16);
    _sphere->SetCenter(sphereCenter[0], sphereCenter[1], sphereCenter[2]);

    _sphereMapper=vtkPolyDataMapper::New();
    _sphereMapper->SetInputConnection(_sphere->GetOutputPort());

    _sphereActor=vtkActor::New();
    _sphereActor->SetMapper(_sphereMapper);
    _sphereActor->PickableOff();

```

```

_sphereActor->GetProperty()->SetColor(1.0, 0.0, 0.0);
_sphereActor->GetProperty()->SetEdgeColor(1.0, 0.0, 0.0);
_sphereActor->GetProperty()->SetDiffuseColor(1.0, 0.0, 0.0);
_sphereActor->SetVisibility(true);

// Create the cutting pipeline.
// This plane will be positioned in the original image coordinate system.
_plane = vtkPlane::New();
_plane->SetNormal(0.0, 0.0, 1.0);

_cutter = vtkCutter::New();
_cutter->SetInputConnection(_sphere->GetOutputPort());
_cutter->SetCutFunction(_plane);
_cutter->GenerateCutScalarsOn();
_cutter->SetValue(0, 0.5);

// The transform attached to _polyTransform should move the cut
// ROI into the resliced coordinate system, which should be the
// same as the coordinate system of the resliced images.
// PROBLEM: It doesn't.
_polyTransform = vtkTransformPolyDataFilter::New();
_polyTransform->SetTransform(_transform);
_polyTransform->SetInputConnection(_cutter->GetOutputPort());

_ROIMapper = vtkPolyDataMapper2D::New();
_ROIMapper->SetInputConnection(_polyTransform->GetOutputPort());

vtkCoordinate* coordinate = vtkCoordinate::New();
coordinate->SetCoordinateSystemToWorld();
_ROIMapper->SetTransformCoordinate(coordinate);

_ROIActor = vtkActor2D::New();
_ROIActor->SetMapper(_ROIMapper);

// Make sure the cut can be seen, especially the edges.
props=_ROIActor->GetProperty();
props->SetLineWidth(2);
props->SetOpacity(1.0);
// props->EdgeVisibilityOn();
// props->SetDiffuse(0.8);
// props->SetSpecular(0.3);
// props->SetSpecularPower(20);
// props->SetRepresentationToSurface();
// props->SetDiffuseColor(1.0, 0.0, 0.0);
// props->SetEdgeColor(1.0, 0.0, 0.0);
props->SetColor(1.0, 0.0, 0.0);

_interactor = vtkRenderWindowInteractor::New();

// Create the image viewer and add the actor with the cut ROI.
_imageViewer = vtkImageViewer2::New();
_imageViewer->SetupInteractor(_interactor);
_imageViewer->SetSize(400, 400);
_imageViewer->SetColorWindow(1024);
_imageViewer->SetColorLevel(800);
_imageViewer->SetInputConnection(_reslice->GetOutputPort());
_imageViewer->GetImageActor()->SetOpacity(0.5);

_annotation = vtkTextActor::New();
_annotation->SetTextScaleModeToViewport();
_imageViewer->GetRenderer()->AddActor(_annotation);

// Add the cut shape actor to the renderer.
_imageViewer->GetRenderer()->AddActor(_ROIActor);

// Set up the key handler.
vtkSmartPointer<KeyCallback> callback = vtkSmartPointer<KeyCallback>::New();
callback->SetCallbackData(this);
_interactor->AddObserver(vtkCommand::KeyPressEvent, callback);

_interactor->Initialize();
}

void Start()
{
    _interactor->Start();
}

void ResetOrientation()
{
    vtkSmartPointer<vtkMatrix4x4> matrix =

```

```

        vtkSmartPointer<vtkMatrix4x4>::New();
        matrix->Identity();

        SetOrientation(matrix);
    }

    // Make sure the orientation of the vtkImageReslice and
    // vtkTransform are in sync.
    void SetOrientation(vtkMatrix4x4* matrix)
    {
        _reslice->SetResliceAxes(matrix);
        _reslice->Update();

        vtkMatrix4x4* inverse = vtkMatrix4x4::New();
        vtkMatrix4x4::Invert(matrix, inverse);

        _transform->SetMatrix(inverse);
        _transform->Update();
    }

    // Set the current slice of the current view.
    void SetSlice(int slice)
    {
        std::stringstream posString;

        double    center[3];
        double    spacing[3];
        double    origin[3];
        double    point[4];
        double    newPoint[4];

        vtkImageData* imageData;
        int newSlice;

        // Try to make sure the extents of the reslice are updated.
        // PROBLEM: It doesn't seem to work when changing the orientation.
        imageData=vtkImageData::SafeDownCast(_reslice->GetOutput());
#ifdef (VTK_MAJOR_VERSION >= 6)
        assert(0);
#else
        imageData->UpdateInformation();
#endif

        // Let vtkImageViewer2 handle the slice limits.
        _imageView->SetSlice(slice);
        newSlice=GetSlice();

        imageData->GetCenter(center);
        imageData->GetSpacing(spacing);
        imageData->GetOrigin(origin);

        // Compute the position of the center of the slice based on the
        // spacing of the slices. The resliced axis will always
        // be the "Z" axis.
        point[0]=center[0];
        point[1]=center[1];
        point[2]=(newSlice * spacing[2]) + origin[2];
        point[3]=1.0;

        // Convert the coordinate from the reslice coordinate system to the
        // original image coordinate system.
        // PROBLEM: Logically this seems like it should have been multiplied
        // by the inverse to translate from the resliced coordinate system to
        // the original coordinate system. However, multiplying by the inverse
        // sticks the plane in the wrong place completely. Using the original
        // matrix at least gets the Z coordinate right.
        vtkMatrix4x4* matrix=_reslice->GetResliceAxes();
        vtkSmartPointer<vtkMatrix4x4> inverse =
            vtkSmartPointer<vtkMatrix4x4>::New();
        vtkMatrix4x4::Invert(matrix, inverse);

        matrix->MultiplyPoint(point, newPoint);
        _plane->SetOrigin(newPoint[0], newPoint[1], newPoint[2]);

        // Annotate the image.
        posString << "Position: (" << newPoint[0] << ", " << newPoint[1]
            << ", " << newPoint[2] << ") Slice: " << newSlice;
        _annotation->SetInput(posString.str().c_str());

        _imageView->Render();
    }

```

```

    }

    int GetSlice()
    {
        return _imageView->GetSlice();
    }

    // Set the orientation of the view.
    void SetOrientation(ResliceRender::ORIENTATION orientation)
    {
        vtkCamera* camera=_imageView->GetRenderer()->GetActiveCamera();

        double spacing[3];
        double origin[3];
        double point[4];
        double newPoint[4];
        double initialPosition;
        double xDirCosine[3];
        double yDirCosine[3];
        double zDirCosine[3];
        double normal[3];

        vtkImageData* imageData;

        vtkSmartPointer<vtkMatrix4x4> matrix =
            vtkSmartPointer<vtkMatrix4x4>::New();

        _orientation=orientation;

        // Reset ViewUp
        camera->SetViewUp(0.0, 1.0, 0.0);

        // Compute the cut plane position to the input coordinate system.
        imageData=vtkImageData::SafeDownCast(_reslice->GetInput());
#ifdef (VTK_MAJOR_VERSION >= 6)
        assert(0);
#else
        imageData->UpdateInformation();
#endif
        imageData->GetSpacing(spacing);
        imageData->GetOrigin(origin);

        point[0]=origin[0];
        point[1]=origin[1];
        point[2]=origin[2];
        point[3]=1.0;

        switch (_orientation)
        {
            case AXIAL:
                matrix->DeepCopy(AxialMatrix);
                initialPosition=sphereCenter[2];
                break;

            case CORONAL:
                matrix->DeepCopy(CoronalMatrix);
                initialPosition=sphereCenter[1];
                break;

            case SAGITTAL:
                matrix->DeepCopy(SagittalMatrix);
                initialPosition=sphereCenter[0];
                break;

            case OBLIQUE:
                matrix->DeepCopy(ObliqueMatrix);
                initialPosition=sphereCenter[2];
                break;
        }

        // Move the origin from the original image coordinate system to the
        // resliced image coordinate system.
        matrix->MultiplyPoint(point, newPoint);
        matrix->SetElement(0, 3, newPoint[0]);
        matrix->SetElement(1, 3, newPoint[1]);
        matrix->SetElement(2, 3, newPoint[2]);

        ResetOrientation();
        SetOrientation(matrix);

        // Compute the cutting plane normal and set it.

```



```

        // PROBLEM: If the transformation is connected rather than
        // using SetResliceAxes, the Direction Cosines do not reflect
        // the orientation of the vtkImageReslice.
        _reslice->GetResliceAxesDirectionCosines(xDirCosine, yDirCosine,
                                                zDirCosine);
        vtkMath::Cross(xDirCosine, yDirCosine, normal);
        _plane->SetNormal(normal);

        // Set the extents and spacing of the reslice to account for
        // all of the data.
        _reslice->SetOutputExtentToDefault();
        _reslice->SetOutputSpacing(spacing[0], spacing[0], spacing[0]);

        // Force the vtkImageViewer2 to update.
        // PROBLEM: The whole extent does not seem to be set in time
        // for the first render. This results in an error because the
        // slice is positioned outside the old bounds.
#if (VTK_MAJOR_VERSION >= 6)
        _imageView->SetInputData(NULL);
#else
        _imageView->SetInput(NULL);
#endif
        _imageView->SetInputConnection(_reslice->GetOutputPort());

        _imageView->GetRenderer()->ResetCameraClippingRange();
        _imageView->GetRenderer()->ResetCamera();

        // Set the initial slice to be at the center of the sphere.
        // Divide by the spacing because this will be undone in SetSlice.
        SetSlice( (int)(initialPosition / spacing[0]));
    }

    vtkRenderWindowInteractor* GetInteractor()
    {
        return _interactor;
    }

protected:
    ORIENTATION          _orientation;

    //qzDICOMImageReader*    _reader;
    vtkGDCMImageReader*    _reader;
    vtkImageThreshold*      _threshold;
    vtkImageShiftScale*     _shift;
    vtkImageReslice*        _reslice;
    vtkRenderWindowInteractor* _interactor;
    vtkImageViewer2*        _imageView;

    vtkSphereSource*        _sphere;
    vtkPolyDataMapper*      _sphereMapper;
    vtkActor*               _sphereActor;

    vtkPlane*               _plane;
    vtkCutter*              _cutter;
    vtkTransform*           _transform;
    vtkTransformPolyDataFilter* _polyTransform;
    vtkPolyDataMapper2D*    _ROIMapper;
    vtkActor2D*             _ROIActor;

    vtkTextActor*           _annotation;
};

// Catch KeyPress events.
// Up Arrow - increases the slice
// Down Arrow - decreases the slice
// 'A' - sets the view to Axial
// 'S' - sets the view to Sagittal
// 'C' - sets the view to Coronal
// 'O' - set the view to Oblique

void KeyCallback::Execute(vtkObject* caller, unsigned long eventId, void *calldata)
{
    (void)caller;
    (void)eventId;
    (void)calldata;
    std::string sym=_reslice->GetInteractor()->GetKeySym();

    if (!sym.compare("Up"))
    {
        _reslice->SetSlice(_reslice->GetSlice() + 1);
    }

```

```

    }
    else if (!sym.compare("Down"))
    {
        _reslice->SetSlice(_reslice->GetSlice() - 1);
    }
    else if ((!sym.compare("A")) || (!sym.compare("a")))
    {
        _reslice->SetOrientation(ResliceRender::AXIAL);
    }
    else if ((!sym.compare("C")) || (!sym.compare("c")))
    {
        _reslice->SetOrientation(ResliceRender::CORONAL);
    }
    else if ((!sym.compare("S")) || (!sym.compare("s")))
    {
        _reslice->SetOrientation(ResliceRender::SAGITTAL);
    }
    else if ((!sym.compare("O")) || (!sym.compare("o")))
    {
        _reslice->SetOrientation(ResliceRender::OBLIQUE);
    }
}

void KeyCallback::SetCallbackData(ResliceRender* reslice)
{
    _reslice=reslice;
}

// Usage: ResliceSphere [fileName]
int main(int argc, char *argv[])
{
    ResliceRender render;

    if (argc == 1)
    {
        const char *root = gdcm::Testing::GetDataExtraRoot();
        std::string dir3 = root;
        dir3 += "/gdcmSampleData/ForSeriesTesting/Dentist/images/";
        render.CreatePipeline(dir3.c_str());
    }
    else
    {
        render.CreatePipeline(argv[1]);
    }

    render.SetOrientation(ResliceRender::AXIAL);
    render.Start();

    return EXIT_SUCCESS;
}

```

## 14.165 rtstructapp.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "vtkGDCMPolyDataReader.h"
#include "vtkGDCMPolyDataWriter.h"

#include "vtkPolyDataWriter.h"
#include "vtkPolyDataMapper.h"
#include "vtkPolyDataMapper2D.h"
#include "vtkActor2D.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkMedicalImageProperties.h"
#include "vtkRenderWindow.h"

```

```

#include "vtkRenderer.h"
#include "vtkCamera.h"
#include "vtkProperty.h"
#include "vtkProperty2D.h"
#include "vtkAppendPolyData.h"
#include "vtkImageData.h"
#include "vtkVersion.h"

/*
 * Small example to read in a RTSTRUCT and write it out (displays it too).
 */

// gdcmDataExtra/gdcmNonImageData/exRT_Structure_Set_Storage.dcm
// gdcmDataExtra/gdcmNonImageData/RTSTRUCT_1.3.6.1.4.1.22213.1.1396.2.dcm
// gdcmDataExtra/gdcmNonImageData/RT/RTStruct.dcm

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm\n";
        return 1;
    }
    const char * filename = argv[1];
    const char * outfilename = argv[2];
    vtkGDCMPolyDataReader * reader = vtkGDCMPolyDataReader::New();
    reader->SetFileName( filename );
    reader->Update();

    //std::cout << reader->GetMedicalImageProperties()->GetStudyDate() << std::endl;

    vtkGDCMPolyDataWriter * writer = vtkGDCMPolyDataWriter::New();
    writer->SetNumberOfInputPorts( reader->GetNumberOfOutputPorts() );
    writer->SetFileName( outfilename );
    for(int num = 0; num < reader->GetNumberOfOutputPorts(); ++num )
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputConnection( num, reader->GetOutputPort( num ) );
    #else
        writer->SetInput( num, reader->GetOutput( num ) );
    #endif
    //doesn't look like the medical properties are actually written out
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    writer->SetRTStructSetProperties( reader->GetRTStructSetProperties() );
    writer->Write();

    // print reader output:
    reader->Print( std::cout );
    // print first output:
    reader->GetOutput()->Print( std::cout );

    vtkAppendPolyData *append = vtkAppendPolyData::New();

    int n = reader->GetNumberOfOutputPorts();
    for(int i = 0; i < n; ++i)
    {
    #if (VTK_MAJOR_VERSION >= 6)
        append->AddInputConnection( reader->GetOutputPort(i) );
    #else
        append->AddInput( reader->GetOutput(i) );
    #endif
    }

    // Now we'll look at it.
    vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
    #if (VTK_MAJOR_VERSION >= 6)
        cubeMapper->SetInputConnection( append->GetOutputPort() );
    #else
        cubeMapper->SetInput( append->GetOutput() );
    #endif
    cubeMapper->SetScalarRange(0,7);
    vtkActor *cubeActor = vtkActor::New();
    cubeActor->SetMapper( cubeMapper );
    vtkProperty * property = cubeActor->GetProperty();
    property->SetRepresentationToWireframe();

    vtkRenderer *renderer = vtkRenderer::New();
    vtkRenderWindow *renWin = vtkRenderWindow::New();
    renWin->AddRenderer( renderer );

    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();

```

```

    iren->SetRenderWindow(renWin);

    renderer->AddActor(cubeActor);
    renderer->ResetCamera();
    renderer->SetBackground(1,1,1);

    renWin->SetSize(300,300);

    renWin->Render();
    iren->Start();

    reader->Delete();
    append->Delete();
    cubeMapper->Delete();
    cubeActor->Delete();
    renderer->Delete();
    renWin->Delete();
    iren->Delete();
    writer->Delete();

    return 0;
}

```

## 14.166 threadgdcmm.cxx

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====*/

#include "gdcmmReader.h"
#include "gdcmmImageReader.h"
#include "gdcmmDirectory.h"
#include "gdcmmSystem.h"

#include "vtkImageData.h"
#include "vtkStructuredPointsWriter.h"
#include "vtkVersion.h"

#include <pthread.h>

struct threadparams
{
    const char **filenames;
    size_t nfiles;
    char *scalarpointer;
// TODO I should also pass in the dim of the reference image just in case
};

void *ReadFilesThread(void *voidparams)
{
    const threadparams *params = static_cast<const threadparams *> (voidparams);

    const size_t nfiles = params->nfiles;
    for(unsigned int file = 0; file < nfiles; ++file)
    {
        /*
        // TODO: update progress
        pthread_mutex_lock(&params->lock);
        //section critique
        ReadingProgress+=params->stepProgress;
        pthread_mutex_unlock(&params->lock);
        */
        const char *filename = params->filenames[file];
        //std::cerr << filename << std::endl;

        gdcmm::ImageReader reader;
        reader.SetFileName( filename );
    }
}

```

```

    try
    {
        if( !reader.Read() )
        {
            std::cerr << "Failed to read: " << filename << std::endl;
            break;
        }
    }
    catch( ... )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        break;
    }

    const gdcm::Image &image = reader.GetImage();
    unsigned long len = image.GetBufferLength();
    char * pointer = params->scalarpointer;

#ifdef 0
    char *tempimage = new char[len];
    image.GetBuffer(tempimage);

    memcpy(pointer + file*len, tempimage, len);
    delete[] tempimage;
#else
    char *tempimage = pointer + file * len;
    image.GetBuffer(tempimage);
#endif
    }

    return voidparams;
}

void ShowFileNames(const threadparams &params)
{
    std::cout << "start" << std::endl;
    for(unsigned int i = 0; i < params.nfiles; ++i)
    {
        const char *filename = params filenames[i];
        std::cout << filename << std::endl;
    }
    std::cout << "end" << std::endl;
}

void ReadFiles(size_t nfiles, const char *filenames[])
{
    // \precondition: nfiles > 0
    assert( nfiles > 0 );
    const char *reference= filenames[0]; // take the first image as reference

    gdcm::ImageReader reader;
    reader.SetFileName( reference );
    if( !reader.Read() )
    {
        // That would be very bad...
        assert(0);
    }

    const gdcm::Image &image = reader.GetImage();
    gdcm::PixelFormat pixeltype = image.GetPixelFormat();
    unsigned long len = image.GetBufferLength();
    const unsigned int *dims = image.GetDimensions();
    unsigned short pixelsize = pixeltype.GetPixelSize();
    (void)pixelsize;
    assert( image.GetNumberOfDimensions() == 2 );

    vtkImageData *output = vtkImageData::New();
    output->SetDimensions(dims[0], dims[1], (int)nfiles);

#ifdef (VTK_MAJOR_VERSION >= 6)
    int numscal = pixeltype.GetSamplesPerPixel();
    switch( pixeltype )
    {
        case gdcm::PixelFormat::INT8:
            output->AllocateScalars( VTK_SIGNED_CHAR, numscal );
            break;
        case gdcm::PixelFormat::UINT8:
            output->AllocateScalars( VTK_UNSIGNED_CHAR, numscal );
            break;
        case gdcm::PixelFormat::INT16:
            output->AllocateScalars( VTK_SHORT, numscal );
            break;
    }
#endif
}

```

```

case gdcm::PixelFormat::UINT16:
    output->AllocateScalars( VTK_UNSIGNED_SHORT, numscal );
    break;
case gdcm::PixelFormat::INT32:
    output->AllocateScalars( VTK_INT, numscal );
    break;
case gdcm::PixelFormat::UINT32:
    output->AllocateScalars( VTK_UNSIGNED_INT, numscal );
    break;
default:
    assert(0);
}
#else
switch( pixeltype )
{
case gdcm::PixelFormat::INT8:
    #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
        output->SetScalarType ( VTK_SIGNED_CHAR );
    #else
        output->SetScalarType ( VTK_CHAR );
    #endif
    break;
case gdcm::PixelFormat::UINT8:
    output->SetScalarType ( VTK_UNSIGNED_CHAR );
    break;
case gdcm::PixelFormat::INT16:
    output->SetScalarType ( VTK_SHORT );
    break;
case gdcm::PixelFormat::UINT16:
    output->SetScalarType ( VTK_UNSIGNED_SHORT );
    break;
case gdcm::PixelFormat::INT32:
    output->SetScalarType ( VTK_INT );
    break;
case gdcm::PixelFormat::UINT32:
    output->SetScalarType ( VTK_UNSIGNED_INT );
    break;
default:
    assert(0);
}
output->SetNumberOfScalarComponents ( pixeltype.GetSamplesPerPixel() );
output->AllocateScalars();
#endif
char * scalarpointer = static_cast<char*>(output->GetScalarPointer());

const unsigned int nthreads = 4;
threadparams params[nthreads];

//pthread_mutex_t lock;
//pthread_mutex_init(&lock, NULL);

pthread_t *pthread = new pthread_t[nthreads];

// There is nfiles, and nThreads
assert( nfiles > nthreads );
const size_t partition = nfiles / nthreads;
for (unsigned int thread=0; thread < nthreads; ++thread)
{
    params[thread].filenames = filenames + thread * partition;
    params[thread].nfiles = partition;
    if( thread == nthreads - 1 )
    {
        // There is slightly more files to process in this thread:
        params[thread].nfiles += nfiles % nthreads;
    }
    assert( thread * partition < nfiles );
    params[thread].scalarpointer = scalarpointer + thread * partition * len;
    //assert( params[thread].scalarpointer < scalarpointer + 2 * dims[0] * dims[1] * dims[2] );
    // start thread:
    int res = pthread_create( &pthread[thread], NULL, ReadFilesThread, &params[thread]);
    if( res )
    {
        std::cerr << "Unable to start a new thread, pthread returned: " << res << std::endl;
        assert(0);
    }
    //ShowFilenames(params[thread]);
}
// DEBUG
size_t total = 0;
for (unsigned int thread=0; thread < nthreads; ++thread)
{

```

```

        total += params[thread].nfiles;
    }
    assert( total == nfiles );
// END DEBUG

    for (unsigned int thread=0;thread<nthreads;thread++)
    {
        pthread_join( pthread[thread], NULL);
    }
    delete[] pthread;

    //pthread_mutex_destroy(&lock);

    // For some reason writing down the file is painfully slow...
    vtkStructuredPointsWriter *writer = vtkStructuredPointsWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
    writer->SetInputData( output );
#else
    writer->SetInput( output );
#endif
    writer->SetFileName( "/tmp/threadgdcmm.vtk" );
    writer->SetFileTypeToBinary();
    //writer->Write();
    writer->Delete();

    //output->Print( std::cout );
    output->Delete();
}

int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " [directory|list of filenames]\n";
        return 1;
    }

    // Check if user pass in a single directory
    if( argc == 2 && gdcmm::System::FileIsDirectory( argv[1] ) )
    {
        gdcmm::Directory d;
        d.Load( argv[1] );
        gdcmm::Directory::FileNamesType l = d.GetFilesNames();
        const size_t nfiles = l.size();
        const char **filenames = new const char* [ nfiles ];
        for(unsigned int i = 0; i < nfiles; ++i)
        {
            filenames[i] = l[i].c_str();
        }
        ReadFiles(nfiles, filenames);
        delete[] filenames;
    }
    else
    {
        // Simply copy all filenames into the vector:
        const char **filenames = const_cast<const char**>(argv+1);
        const size_t nfiles = argc - 1;
        ReadFiles(nfiles, filenames);
    }

    return 0;
}

```

## 14.167 AWTMedical3.java

```

/*=====

Program: GDCM (Grassroots DICOM). A DICOM library

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```

```

    PURPOSE. See the above copyright notice for more information.

=====*/
package examples;

import vtk.*;
//import gdcm.*;

import vtk.util.VtkPanelContainer;
import vtk.util.VtkPanelUtil;
import vtk.util.VtkUtil;

import java.util.ArrayList;

import javax.swing.*;
import java.awt.*;
import java.io.File;

public class AWTMedical3 extends JComponent implements VtkPanelContainer {

    private vtkPanel renWin;

    vtkImageData ReadDataFile(File inSelectedFile){

        vtkImageData outImageData = null;
        Directory theDir = new Directory();

        String theInputDirectory = inSelectedFile.getPath();
        theDir.Load(theInputDirectory);

        Scanner theScanner = new Scanner();
        Tag theStudyTag = new Tag(0x0020,0x000d);
        Tag theSeriesTag = new Tag(0x0020,0x000e);
        theScanner.AddTag(theStudyTag); //get studies,
        theScanner.AddTag(theSeriesTag); //get studies,
        theScanner.Scan(theDir.GetFilesNames());

        FilenamesType theStudyValues = theScanner.GetOrderedValues(theStudyTag);
        long theNumStudies = theStudyValues.size();
        //for now, take the first study, and nothing else.
        //and the return is actually not FilenamesType, just a
        //vector of strings
        if (theNumStudies != 1)
            return outImageData;
        String theStudyVal = theStudyValues.get(0);
        //now, get all the values from the scanner that are in that
        //study, then from that get their different series
        FilenamesType theFileNames =
            theScanner.GetAllFileNamesFromTagToValue(theStudyTag, theStudyVal);

        //from that set of filenames, isolate individual series
        //conclude that singleton series = RT struct (can do further
        //checking for things like MIPs and the like)
        //and multiple series entries = volumetric data
        theScanner.Scan(theFileNames);
        FilenamesType theSeriesValues = theScanner.GetOrderedValues(theSeriesTag);
        String studyUID = theScanner.GetValue(theScanner.GetFilesNames().get(0), theStudyTag);
        long theNumSeries = theSeriesValues.size();
        for (int i = 0; i < theNumSeries; i++) {
            FilenamesType theSeriesFiles =
                theScanner.GetAllFileNamesFromTagToValue(theSeriesTag, theSeriesValues.get(i));
            long theNumFilesInSeries = theSeriesFiles.size();
            if (theNumFilesInSeries > 1) { //assume it's CT or volumetric data
                //for now, assume a single volume
                //could have multiples, like PET and CT

                IPPSorter sorter = new IPPSorter();
                sorter.SetComputeZSpacing(true);
                sorter.SetZSpacingTolerance(0.001);
                Boolean sorted = sorter.Sort(theSeriesFiles);
                if (!sorted){
                    //need some better way to handle failures here
                    return outImageData;
                }

                FilenamesType sortedFT = sorter.GetFilesNames();
                long theSize = sortedFT.size();
                vtkStringArray sa = new vtkStringArray();

```



```

        ArrayList<String> theStrings = new ArrayList<String>();

        vtkGDCMImageReader gdcmReader = new vtkGDCMImageReader();
        for (int j = 0; j < theSize; j++) {
            String theFileName = sortedFT.get(j);
            if (gdcmReader.CanReadFile(theFileName) > 0){
                theStrings.add(theFileName);
                sa.InsertNextValue(theFileName);
            } else {
                //this is a busted series
                //need some more appropriate error here
                return outImageData;
            }
        }

        gdcmReader.SetFileNames(sa);

        gdcmReader.Update();

        outImageData = gdcmReader.GetOutput(); //the zeroth output should be the image
    }
}

String theImageInfo = "";
if (outImageData != null){
    theImageInfo = outImageData.Print();
}
return outImageData;
}

//this function is a rewrite of Medical3 to see if data can
//be loaded via gdcm easily
public AWTMedical3(File inFile) {
    // Create the buttons.
    renWin = new vtkPanel();

    vtkImageData theImageData = ReadDataFile(inFile);

    // An isosurface, or contour value of 500 is known to correspond to the
    // skin of the patient. Once generated, a vtkPolyDataNormals filter is
    // is used to create normals for smooth surface shading during rendering.
    // The triangle stripper is used to create triangle strips from the
    // isosurface these render much faster on some systems.
    vtkContourFilter skinExtractor = new vtkContourFilter();
    skinExtractor.SetInput(theImageData);
    skinExtractor.SetValue(0, 500);
    vtkPolyDataNormals skinNormals = new vtkPolyDataNormals();
    skinNormals.SetInput(skinExtractor.GetOutput());
    skinNormals.SetFeatureAngle(60.0);
    //      vtkStripper skinStripper = new vtkStripper();
    //      skinStripper.SetInput(skinNormals.GetOutput());
    vtkPolyDataMapper skinMapper = new vtkPolyDataMapper();
    skinMapper.SetInput(skinNormals.GetOutput());
    skinMapper.ScalarVisibilityOff();
    vtkActor skin = new vtkActor();
    skin.SetMapper(skinMapper);
    skin.GetProperty().SetDiffuseColor(1, .49, .25);
    skin.GetProperty().SetSpecular(.3);
    skin.GetProperty().SetSpecularPower(20);

    // An isosurface, or contour value of 1150 is known to correspond to the
    // skin of the patient. Once generated, a vtkPolyDataNormals filter is
    // is used to create normals for smooth surface shading during rendering.
    // The triangle stripper is used to create triangle strips from the
    // isosurface these render much faster on some systems.
    vtkContourFilter boneExtractor = new vtkContourFilter();
    boneExtractor.SetInput(theImageData);
    boneExtractor.SetValue(0, 1150);
    vtkPolyDataNormals boneNormals = new vtkPolyDataNormals();
    boneNormals.SetInput(boneExtractor.GetOutput());
    boneNormals.SetFeatureAngle(60.0);
    vtkStripper boneStripper = new vtkStripper();
    boneStripper.SetInput(boneNormals.GetOutput());
    vtkPolyDataMapper boneMapper = new vtkPolyDataMapper();
    boneMapper.SetInput(boneStripper.GetOutput());
    boneMapper.ScalarVisibilityOff();
    vtkActor bone = new vtkActor();
    bone.SetMapper(boneMapper);
    bone.GetProperty().SetDiffuseColor(1, 1, .9412);

    // An outline provides context around the data.
    vtkOutlineFilter outlineData = new vtkOutlineFilter();

```

```

outlineData.SetInput(theImageData);
vtkPolyDataMapper mapOutline = new vtkPolyDataMapper();
mapOutline.SetInput(outlineData.GetOutput());
vtkActor outline = new vtkActor();
outline.SetMapper(mapOutline);
outline.GetProperty().SetColor(0, 0, 0);

// Now we are creating three orthogonal planes passing through the
// volume. Each plane uses a different texture map and therefore has
// different coloration.

// Start by creating a black/white lookup table.
vtkLookupTable bwLut = new vtkLookupTable();
bwLut.SetTableRange(0, 2000);
bwLut.SetSaturationRange(0, 0);
bwLut.SetHueRange(0, 0);
bwLut.SetValueRange(0, 1);
bwLut.Build();

// Now create a lookup table that consists of the full hue circle (from
// HSV);.
vtkLookupTable hueLut = new vtkLookupTable();
hueLut.SetTableRange(0, 2000);
hueLut.SetHueRange(0, 1);
hueLut.SetSaturationRange(1, 1);
hueLut.SetValueRange(1, 1);
hueLut.Build();

// Finally, create a lookup table with a single hue but having a range
// in the saturation of the hue.
vtkLookupTable satLut = new vtkLookupTable();
satLut.SetTableRange(0, 2000);
satLut.SetHueRange(.6, .6);
satLut.SetSaturationRange(0, 1);
satLut.SetValueRange(1, 1);
satLut.Build();

// Create the first of the three planes. The filter vtkImageMapToColors
// maps the data through the corresponding lookup table created above.
// The vtkImageActor is a type of vtkProp and conveniently displays an
// image on a single quadrilateral plane. It does this using texture
// mapping and as a result is quite fast. (Note: the input image has to
// be unsigned char values, which the vtkImageMapToColors produces.);
// Note also that by specifying the DisplayExtent, the pipeline
// requests data of this extent and the vtkImageMapToColors only
// processes a slice of data.
vtkImageMapToColors sagittalColors = new vtkImageMapToColors();
sagittalColors.SetInput(theImageData);
sagittalColors.SetLookupTable(bwLut);
vtkImageActor sagittal = new vtkImageActor();
sagittal.SetInput(sagittalColors.GetOutput());
sagittal.SetDisplayExtent(32, 32, 0, 63, 0, 92);

// Create the second (axial); plane of the three planes. We use the same
// approach as before except that the extent differs.
vtkImageMapToColors axialColors = new vtkImageMapToColors();
axialColors.SetInput(theImageData);
axialColors.SetLookupTable(hueLut);
vtkImageActor axial = new vtkImageActor();
axial.SetInput(axialColors.GetOutput());
axial.SetDisplayExtent(0, 63, 0, 63, 46, 46);

// Create the third (coronal); plane of the three planes. We use the same
// approach as before except that the extent differs.
vtkImageMapToColors coronalColors = new vtkImageMapToColors();
coronalColors.SetInput(theImageData);
coronalColors.SetLookupTable(satLut);
vtkImageActor coronal = new vtkImageActor();
coronal.SetInput(coronalColors.GetOutput());
coronal.SetDisplayExtent(0, 63, 32, 32, 0, 92);

// It is convenient to create an initial view of the data. The FocalPoint
// and Position form a vector direction. Later on (ResetCamera() method)
// this vector is used to position the camera to look at the data in
// this direction.
vtkCamera aCamera = new vtkCamera();
aCamera.SetViewUp(0, 0, -1);
aCamera.SetPosition(0, 1, 0);
aCamera.SetFocalPoint(0, 0, 0);

```

```

aCamera.ComputeViewPlaneNormal();

// Actors are added to the renderer. An initial camera view is created.
// The Dolly() method moves the camera towards the FocalPoint,
// thereby enlarging the image.
renWin.GetRenderer().AddActor(sagittal);
renWin.GetRenderer().AddActor(axial);
renWin.GetRenderer().AddActor(coronal);
renWin.GetRenderer().AddActor(outline);
renWin.GetRenderer().AddActor(skin);
renWin.GetRenderer().AddActor(bone);

// Turn off bone for this example.
bone.VisibilityOff();

// Set skin to semi-transparent.
skin.GetProperty().SetOpacity(0.5);

// An initial camera view is created. The Dolly() method moves
// the camera towards the FocalPoint, thereby enlarging the image.
renWin.GetRenderer().SetActiveCamera(aCamera);
renWin.GetRenderer().ResetCamera();
aCamera.Dolly(1.5);

// Set a background color for the renderer and set the size of the
// render window (expressed in pixels).
renWin.GetRenderer().SetBackground(1, 1, 1);
VtkPanelUtil.setSize(renWin, 640, 480);

// Note that when camera movement occurs (as it does in the Dolly()
// method), the clipping planes often need adjusting. Clipping planes
// consist of two planes: near and far along the view direction. The
// near plane clips out objects in front of the plane the far plane
// clips out objects behind the plane. This way only what is drawn
// between the planes is actually rendered.
renWin.GetRenderer().ResetCameraClippingRange();

// Setup panel
setLayout(new BorderLayout());
add(renWin, BorderLayout.CENTER);
}

public vtkPanel getRenWin() {
    return renWin;
}

public static void main(String s[]) {
    if (s.length == 0){
        return; //need a filename here
    }
    File theFile = new File(s[0]);
    //File theFile = new
    File("/Users/mmroden/Documents/MVSDownloadDirectory/Documents/1.2.840.113704.1.111.3384.1271766367.5/");
    AWTMedical3 panel = new AWTMedical3(theFile);

    JFrame frame = new JFrame("AWTMedical3");
    frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    frame.getContentPane().add("Center", panel);
    frame.pack();
    frame.setVisible(true);
}
}

```

## 14.168 HelloVTKWorld.java

```

/*=====

Program: GDCM (Grassroots DICOM). A DICOM library

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```

```

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=====*/
// We are required to call the package 'vtk' even though I (MM) would have preferred
// an import statement along the line of:
// import vtkgdcmm.*;
import vtk.*;

/*
 * Compilation:
 * CLASSPATH=vtkgdcmm.jar:/usr/share/java/vtk.jar javac HelloVTKWorld.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
 * CLASSPATH=/usr/share/java/vtk.jar:vtkgdcmm.jar:gdcmm.jar:. java HelloVTKWorld gdcmmData/012345.002.050.dcm
 * bla.dcm
 */
public class HelloVTKWorld
{
    static {
        System.loadLibrary("vtkCommonJava");
        System.loadLibrary("vtkFilteringJava");
        System.loadLibrary("vtkIOJava");
        System.loadLibrary("vtkImagingJava");
        System.loadLibrary("vtkGraphicsJava");
        System.loadLibrary("vtkgdcmmJava");
        try {
            System.loadLibrary("vtkRenderingJava");
        } catch (Throwable e) {
            System.out.println("cannot load vtkHybrid, skipping...");
        }
        try {
            System.loadLibrary("vtkHybridJava");
        } catch (Throwable e) {
            System.out.println("cannot load vtkHybrid, skipping...");
        }
        try {
            System.loadLibrary("vtkVolumeRenderingJava");
        } catch (Throwable e) {
            System.out.println("cannot load vtkVolumeRendering, skipping...");
        }
    }

    public static void main(String[] args)
    {
        String filename = args[0];
        vtkGDCMImageReader reader = new vtkGDCMImageReader();
        reader.SetFileName( filename );
        reader.Update();

        vtkMedicalImageProperties prop = reader.GetMedicalImageProperties();
        System.out.println( prop.GetPatientName() ); //

        // if( reader.GetImageFormat() == vtkgdcmm.vtkgdcmm.VTK_LUMINANCE ) // MONOCHROME2
        // {
        //     System.out.println( "Image is MONOCHROME2" ); //
        // }

        // Just for fun, invert the direction cosines, output should reflect that:
        vtkMatrix4x4 dircos = reader.GetDirectionCosines();
        dircos.Invert();

        // We need to maintain in sync information stored in vtkMedicalImageProperties:
        double[] cosines = new double[6];
        cosines[0] = dircos.GetElement(0,0);
        cosines[1] = dircos.GetElement(1,0);
        cosines[2] = dircos.GetElement(2,0);
        cosines[3] = dircos.GetElement(0,1);
        cosines[4] = dircos.GetElement(1,1);
        cosines[5] = dircos.GetElement(2,1);
        reader.GetMedicalImageProperties().SetDirectionCosine( cosines );

        String outfilename = args[1];
        vtkGDCMImageWriter writer = new vtkGDCMImageWriter();
        writer.SetMedicalImageProperties( reader.GetMedicalImageProperties() );
        writer.SetDirectionCosines( dircos );
        writer.SetShift( reader.GetShift() );
    }
}

```

```

        writer.SetScale( reader.GetScale() );
        writer.SetImageFormat( reader.GetImageFormat() );
        writer.SetFileName( outfilename );
        writer.SetInputConnection( reader.GetOutputPort() ); // new
        //writer.SetInput( reader.GetOutput() ); // old
        writer.Write();

        System.out.println("Success reading: " + filename );
    }
}

```

## 14.169 MIPViewer.java

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====*/

import vtk.*;
import gdcm.*;
import java.io.File;
import java.awt.Canvas;

/*
 * Compilation:
 * CLASSPATH=vtkgdc.jar:/usr/share/java/vtk.jar javac MIPViewer.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
 * CLASSPATH=/usr/share/java/vtk.jar:vtkgdc.jar:gdcm.jar:. java MIPViewer BRAINX
 */
public class MIPViewer extends Canvas
{
    static {
        // VTK
        System.loadLibrary("vtkCommonJava");
        System.loadLibrary("vtkFilteringJava");
        System.loadLibrary("vtkIOJava");
        System.loadLibrary("vtkImagingJava");
        System.loadLibrary("vtkGraphicsJava");
        System.loadLibrary("vtkRenderingJava");
        System.loadLibrary("vtkVolumeRenderingJava"); // vtkSmartVolumeMapper
        System.loadLibrary("vtkWidgetsJava"); // vtkBoxWidget
        // VTK-GDCM
        System.loadLibrary("vtkgdcJava");
    }

    static FilenamesType fns = new FilenamesType();

    protected native int Lock();

    protected native int Unlock();

    public static void process(String path)
    {
        fns.add( path );
    }

    // Process only files under dir
    public static void visitAllFiles(File dir)
    {
        if (dir.isDirectory())
        {
            String[] children = dir.list();
            for (int i=0; i<children.length; i++)
            {
                visitAllFiles(new File(dir, children[i]));
            }
        }
    }
}

```

```

    }
}
else
{
    process(dir.getPath());
}
}

public static void main(String[] args) throws Exception
{
    String dirname = args[0];
    if( !PosixEmulation.FileIsDirectory( dirname ) )
    {
        return;
    }

    File dir = new File(dirname);
    visitAllFiles(dir);

    IPPSorter ipp = new IPPSorter();
    ipp.SetComputeZSpacing( true );
    ipp.SetZSpacingTolerance( 1e-3 );
    boolean b = ipp.Sort( fns );
    if(!b)
    {
        throw new Exception("Could not scan");
    }
    double ippzspacing = ipp.GetZSpacing();

    FilenamesType sorted = ipp.GetFilenames();
    vtkStringArray files = new vtkStringArray();
    long nfiles = sorted.size();
    //for( String f : sorted )
    for (int i = 0; i < nfiles; i++) {
        String f = sorted.get(i);
        files.InsertNextValue( f );
    }
    vtkGDCMImageReader reader = new vtkGDCMImageReader();
    reader.SetFileNames( files );
    reader.Update(); // get spacing value

    double[] spacing = reader.GetOutput().GetSpacing();

    vtkImageChangeInformation change = new vtkImageChangeInformation();
    change.SetInputConnection( reader.GetOutputPort() );
    change.SetOutputSpacing( spacing[0], spacing[1], ippzspacing );

    // Create our volume and mapper
    vtkVolume volume = new vtkVolume();
    vtkSmartVolumeMapper mapper = new vtkSmartVolumeMapper();

    vtkRenderWindowInteractor iren = new vtkRenderWindowInteractor();

    // Add a box widget if the clip option was selected
    vtkBoxWidget box = new vtkBoxWidget();
    box.SetInteractor(iren);
    box.SetPlaceFactor(1.01);
    box.SetInputConnection(change.GetOutputPort());

    //box.SetDefaultRenderer(renderer);
    box.InsideOutOn();
    box.PlaceWidget();
    //vtkBoxWidgetCallback callback = vtkBoxWidgetCallback::New();
    //callback.SetMapper(mapper);
    //box.AddObserver(vtkCommand::InteractionEvent, callback);
    //callback.Delete();
    // Lock();
    // box.EnabledOn();
    // Unlock();
    box.GetSelectedFaceProperty().SetOpacity(0.0);

    mapper.SetInputConnection( change.GetOutputPort() );

    // Create our transfer function
    vtkColorTransferFunction colorFun = new vtkColorTransferFunction();
    vtkPiecewiseFunction opacityFun = new vtkPiecewiseFunction();

    // Create the property and attach the transfer functions
    vtkVolumeProperty property = new vtkVolumeProperty();
    property.IndependentComponentsOn();
    property.SetColor( colorFun );

```

```

property.SetScalarOpacity( opacityFun );
property.SetInterpolationTypeToLinear();

// connect up the volume to the property and the mapper
volume.SetProperty( property );
volume.SetMapper( mapper );

vtkMedicalImageProperties medprop = reader.GetMedicalImageProperties();
int n = medprop.GetNumberOfWindowLevelPresets();
double opacityWindow = 4096;
double opacityLevel = 2048;

// Override default with value from DICOM files:
for( int i = 0; i < n; ++i )
{
    double wl[] = medprop.GetNthWindowLevelPreset(i);
    //System.out.println( "W/L: " + wl[0] + " " + wl[1] );
    opacityWindow = wl[0];
    opacityLevel = wl[1];
}

colorFun.AddRGBSegment(0.0, 1.0, 1.0, 1.0, 255.0, 1.0, 1.0, 1.0 );
opacityFun.AddSegment( opacityLevel - 0.5*opacityWindow, 0.0,
    opacityLevel + 0.5*opacityWindow, 1.0 );
mapper.SetBlendModeToMaximumIntensity();

// Create the RenderWindow, Renderer
vtkRenderer ren1 = new vtkRenderer();
vtkRenderWindow renWin = new vtkRenderWindow();
renWin.AddRenderer(ren1);

// Set the default window size
renWin.SetSize(600,600);

// Add the volume to the scene
ren1.AddVolume( volume );
ren1.ResetCamera();

iren.SetRenderWindow( renWin );

// interact with data
renWin.Render();

iren.Start();
}
}

```

## 14.170 MPRViewer.java

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
import vtk.*;
import gdcm.*;
import java.io.File;

/*
 * Compilation:
 * CLASSPATH=vtkgdcm.jar:/usr/share/java/vtk.jar javac MPRViewer.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
 * CLASSPATH=/usr/share/java/vtk.jar:vtkgdcm.jar:gdcm.jar:. java MPRViewer BRAINX
 *
 */
public class MPRViewer

```

```

{
    static {
        // VTK
        System.loadLibrary("vtkCommonJava");
        System.loadLibrary("vtkFilteringJava");
        System.loadLibrary("vtkIOJava");
        System.loadLibrary("vtkImagingJava");
        System.loadLibrary("vtkGraphicsJava");
        System.loadLibrary("vtkRenderingJava");
        // VTK-GDCM
        System.loadLibrary("vtkgdcmlJava");
    }

    static FilenamesType fns = new FilenamesType();

    public static void process(String path)
    {
        fns.add( path );
    }

    // Process only files under dir
    public static void visitAllFiles(File dir)
    {
        if (dir.isDirectory())
        {
            String[] children = dir.list();
            for (int i=0; i<children.length; i++)
            {
                visitAllFiles(new File(dir, children[i]));
            }
        }
        else
        {
            process(dir.getPath());
        }
    }

    public static void main(String[] args) throws Exception
    {
        String dirname = args[0];
        if( !PosixEmulation.FileIsDirectory( dirname ) )
        {
            return;
        }

        File dir = new File(dirname);
        visitAllFiles(dir);

        IPPSorter ipp = new IPPSorter();
        ipp.SetComputeZSpacing( true );
        ipp.SetZSpacingTolerance( 1e-3 );
        boolean b = ipp.Sort( fns );
        if(!b)
        {
            throw new Exception("Could not scan");
        }
        double ippzspacing = ipp.GetZSpacing();

        FilenamesType sorted = ipp.GetFilenames();
        vtkStringArray files = new vtkStringArray();
        long nfiles = sorted.size();
        //for( String f : sorted )
        for (int i = 0; i < nfiles; i++) {
            String f = sorted.get(i);
            files.InsertNextValue( f );
        }
        vtkGDCMImageReader reader = new vtkGDCMImageReader();
        reader.SetFileNames( files );
        reader.Update(); // get spacing value

        double[] spacing = reader.GetOutput().GetSpacing();

        vtkImageChangeInformation change = new vtkImageChangeInformation();
        change.SetInputConnection( reader.GetOutputPort() );
        change.SetOutputSpacing( spacing[0], spacing[1], ippzspacing );

        // A simple vtkInteractorStyleImage example for
        // 3D image viewing with the vtkImageResliceMapper.
        //
        // Drag Left mouse button to window/level
        // Shift-Left drag to rotate (oblique slice)
    }
}

```



```

// Shift-Middle drag to slice through image
// OR Ctrl-Right drag to slice through image

// Create the RenderWindow, Renderer
vtkRenderer ren1 = new vtkRenderer();
vtkRenderWindow renWin = new vtkRenderWindow();
renWin.AddRenderer(ren1);

vtkImageResliceMapper im = new vtkImageResliceMapper();
im.SetInputConnection(change.GetOutputPort());
im.SliceFacesCameraOn();
im.SliceAtFocalPointOn();
im.BorderOff();

vtkImageProperty ip = new vtkImageProperty();
ip.SetColorWindow(2000);
ip.SetColorLevel(1000);
ip.SetAmbient(0.0);
ip.SetDiffuse(1.0);
ip.SetOpacity(1.0);
ip.SetInterpolationTypeToLinear();

vtkImageSlice ia = new vtkImageSlice();
ia.SetMapper(im);
ia.SetProperty(ip);

ren1.AddViewProp(ia);
ren1.SetBackground(0.1, 0.2, 0.4);
renWin.SetSize(300, 300);

vtkRenderWindowInteractor iren = new vtkRenderWindowInteractor();
vtkInteractorStyleImage style = new vtkInteractorStyleImage();
style.SetInteractionModeToImage3D();
iren.SetInteractorStyle(style);
renWin.SetInteractor(iren);

// render the image
renWin.Render();
vtkCamera cam1 = ren1.GetActiveCamera();
cam1.ParallelProjectionOn();
ren1.ResetCameraClippingRange();
renWin.Render();

iren.Start();
}
}

```

## 14.171 MPRViewer2.java

```

/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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=====*/
import vtk.*;
import gdcm.*;
import java.io.File;

/*
 * Compilation:
 * CLASSPATH=vtkgdcm.jar:/usr/share/java/vtk.jar javac MPRViewer2.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
 * CLASSPATH=/usr/share/java/vtk.jar:vtkgdcm.jar:gdcm.jar:. java MPRViewer2 BRAINX
 *
 */
public class MPRViewer2

```

```

{
    static {
        // VTK
        System.loadLibrary("vtkCommonJava");
        System.loadLibrary("vtkFilteringJava");
        System.loadLibrary("vtkIOJava");
        System.loadLibrary("vtkImagingJava");
        System.loadLibrary("vtkGraphicsJava");
        System.loadLibrary("vtkRenderingJava");
        System.loadLibrary("vtkHybridJava");
        System.loadLibrary("vtkWidgetsJava");
        // VTK-GDCM
        System.loadLibrary("vtkgdcmlib");
    }

    static FilenamesType fns = new FilenamesType();

    public static void process(String path)
    {
        fns.add( path );
    }

    // Process only files under dir
    public static void visitAllFiles(File dir)
    {
        if (dir.isDirectory())
        {
            String[] children = dir.list();
            for (int i=0; i<children.length; i++)
            {
                visitAllFiles(new File(dir, children[i]));
            }
        }
        else
        {
            process(dir.getPath());
        }
    }

    public void dointer(vtkImagePlaneWidget current_widget)
    {
        int cstat = current_widget.GetCursorDataStatus();
        double[] v = current_widget.GetCurrentCursorPosition();
        //System.out.println( cstat );
        //System.out.println( v[0] );
        //System.out.println( v[1] );
        //System.out.println( v[2] );
        planeWidgetX.SetSliceIndex( (int)v[0] );
        planeWidgetY.SetSliceIndex( (int)v[1] );
        planeWidgetZ.SetSliceIndex( (int)v[2] );
        planeWidgetX.GetCurrentRenderer().ResetCameraClippingRange();
        planeWidgetY.GetCurrentRenderer().ResetCameraClippingRange();
        planeWidgetZ.GetCurrentRenderer().ResetCameraClippingRange();
    }

    public void startinterX()
    {
        dointer( planeWidgetX );
    }

    public void interX()
    {
        dointer( planeWidgetX );
    }

    public void endinterX()
    {
    }

    public void startinterY()
    {
        dointer( planeWidgetY );
    }

    public void interY()
    {
        dointer( planeWidgetY );
    }

    public void endinterY()
    {
    }

    public void startinterZ()
    {
        dointer( planeWidgetZ );
    }

    public void interZ()

```

```

    {
        dointer( planeWidgetZ );
    }
public void endinterZ()
{
    //System.out.println( "endinter" );
}

public static void AlignCamera(int slice_number, vtkImagePlaneWidget current_widget)
{
    vtkImageData image = (vtkImageData)current_widget.GetInput();
    vtkRenderer ren = current_widget.GetCurrentRenderer();
    double[] origin = image.GetOrigin();
    double ox = origin[0];
    double oy = origin[1];
    double oz = origin[2];

    int dims[] = image.GetDimensions();
    int xmin = 0;
    int xmax = 1;
    int ymin = 2;
    int ymax = dims[0]-1;
    int zmin = dims[1]-1;
    int zmax = dims[2]-1;

    double[] spacing = image.GetSpacing();
    double sx = spacing[0];
    double sy = spacing[1];
    double sz = spacing[2];

    double cx = ox+(0.5*(xmax-xmin))*sx;
    double cy = oy+(0.5*(ymax-ymin))*sy;
    double cz = oy+(0.5*(zmax-zmin))*sz;
    double vx = 0, vy = 0, vz = 0;
    double nx = 0, ny = 0, nz = 0;
    int iaxis = current_widget.GetPlaneOrientation();
    if ( iaxis == 0 ) {
        vz = -1;
        nx = ox + xmax*sx;
        cx = ox + slice_number*sx;
    }
    else if ( iaxis == 1 ) {
        vz = -1;
        ny = oy+ymax*sy;
        cy = oy+slice_number*sy;
    }
    else {
        vy = 1;
        nz = oz+zmax*sz;
        cz = oz+slice_number*sz;
    }
    double px = cx+nx*2;
    double py = cy+ny*2;
    double pz = cz+nz*3;

    vtkCamera camera = ren.GetActiveCamera();
    camera.SetViewUp(vx, vy, vz);
    camera.SetFocalPoint(cx, cy, cz);
    camera.SetPosition(px, py, pz);
    camera.OrthogonalizeViewUp();
    ren.ResetCameraClippingRange();
}

private vtkImagePlaneWidget planeWidgetX = new vtkImagePlaneWidget();
private vtkImagePlaneWidget planeWidgetY = new vtkImagePlaneWidget();
private vtkImagePlaneWidget planeWidgetZ = new vtkImagePlaneWidget();

public void config()
{
    //System.out.println( "config" );
    planeWidgetX.GetCurrentRenderer().ResetCamera();
    planeWidgetY.GetCurrentRenderer().ResetCamera();
    planeWidgetZ.GetCurrentRenderer().ResetCamera();
}

public void Run(String dirname)
{
    File dir = new File(dirname);
    visitAllFiles(dir);

    IPPSorter ipp = new IPPSorter();

```

```

ipp.SetComputeZSpacing( true );
ipp.SetZSpacingTolerance( 1e-3 );
boolean b = ipp.Sort( fns );
if(!b)
{
    //throw new Exception("Could not scan");
}
double ippzspacing = ipp.GetZSpacing();

FileNamesType sorted = ipp.GetFileNames();
vtkStringArray files = new vtkStringArray();
long nfiles = sorted.size();
//for( String f : sorted )
for (int i = 0; i < nfiles; i++) {
    String f = sorted.get(i);
    files.InsertNextValue( f );
}
vtkGDCMImageReader reader = new vtkGDCMImageReader();
reader.SetFileNames( files );
reader.Update(); // get spacing value

double[] spacing = reader.GetOutput().GetSpacing();

vtkImageChangeInformation change = new vtkImageChangeInformation();
change.SetInputConnection( reader.GetOutputPort() );
change.SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
change.Update();

System.out.println( change.GetOutput().toString() );

vtkRenderer ren1 = new vtkRenderer();
ren1.SetViewport(0., 0., 0.333, 1);
ren1.SetBackground(0.1,0.2,0.4);
vtkRenderer ren2 = new vtkRenderer();
ren2.SetViewport(0.333, 0., 0.667, 1);
ren2.SetBackground(0.1,0.2,0.4);
vtkRenderer ren3 = new vtkRenderer();
ren3.SetViewport(0.667, 0., 1., 1.);
ren3.SetBackground(0.1,0.2,0.4);

vtkRenderWindow renWin = new vtkRenderWindow();
renWin.AddRenderer(ren1);
renWin.AddRenderer(ren2);
renWin.AddRenderer(ren3);

vtkRenderWindowInteractor iren = new vtkRenderWindowInteractor();
iren.SetRenderWindow(renWin);

vtkInteractorStyleImage style = new vtkInteractorStyleImage();
iren.SetInteractorStyle( style );

vtkCellPicker picker = new vtkCellPicker();
picker.SetTolerance(0.005);

vtkProperty ipwProp = new vtkProperty();

//vtkImagePlaneWidget planeWidgetX = new vtkImagePlaneWidget();
planeWidgetX.SetInteractor(iren);
planeWidgetX.SetCurrentRenderer(ren1);
planeWidgetX.SetDefaultRenderer(ren1);
planeWidgetX.RestrictPlaneToVolumeOn();
planeWidgetX.SetTexturePlaneProperty(ipwProp);
//planeWidgetX.GetPlaneProperty().SetColor(1,0,0);
//planeWidgetX.TextureInterpolateOff();
//planeWidgetX.SetResliceInterpolateToNearestNeighbour();
planeWidgetX.SetInputConnection(change.GetOutputPort());
planeWidgetX.SetPlaneOrientationToXAxes();
planeWidgetX.SetSliceIndex(62);
planeWidgetX.SetPicker(picker);
planeWidgetX.SetKeyPressActivationValue('x');
planeWidgetX.On();
planeWidgetX.InteractionOn();

//vtkImagePlaneWidget planeWidgetY = new vtkImagePlaneWidget();
planeWidgetY.SetInteractor(iren);
planeWidgetY.SetCurrentRenderer(ren2);
planeWidgetY.SetDefaultRenderer(ren2);
planeWidgetY.RestrictPlaneToVolumeOn();
planeWidgetY.SetTexturePlaneProperty(ipwProp);
//planeWidgetY.GetPlaneProperty().SetColor(1,0,0);
//planeWidgetY.TextureInterpolateOff();

```

```

//planeWidgetY.SetResliceInterpolateToNearestNeighbour();
planeWidgetY.SetInputConnection(change.GetOutputPort());
planeWidgetY.SetLookupTable( planeWidgetX.GetLookupTable() );
planeWidgetY.SetPlaneOrientationToYAxes();
planeWidgetY.SetSliceIndex(32);
planeWidgetY.SetPicker(picker);
planeWidgetY.SetKeyPressActivationValue('y');
planeWidgetY.On();

//vtkImagePlaneWidget planeWidgetZ = new vtkImagePlaneWidget();
planeWidgetZ.SetInteractor(iren);
planeWidgetZ.SetCurrentRenderer(ren3);
planeWidgetZ.SetDefaultRenderer(ren3);
planeWidgetZ.RestrictPlaneToVolumeOn();
planeWidgetZ.SetTexturePlaneProperty(ipwProp);
//planeWidgetZ.GetPlaneProperty().SetColor(1,0,0);
//planeWidgetZ.TextureInterpolateOff();
//planeWidgetZ.SetResliceInterpolateToNearestNeighbour();
planeWidgetZ.SetInputConnection(change.GetOutputPort());
planeWidgetZ.SetLookupTable( planeWidgetX.GetLookupTable() );
planeWidgetZ.SetPlaneOrientationToZAxes();
planeWidgetZ.SetSliceIndex(32);
planeWidgetZ.SetPicker(picker);
planeWidgetZ.SetKeyPressActivationValue('z');
planeWidgetZ.On();

iren.Initialize();

renWin.Render();
AlignCamera(52, planeWidgetX);
AlignCamera(32, planeWidgetY);
AlignCamera(32, planeWidgetZ);

planeWidgetX.GetCurrentRenderer().ResetCamera();
planeWidgetY.GetCurrentRenderer().ResetCamera();
planeWidgetZ.GetCurrentRenderer().ResetCamera();

renWin.Render();

planeWidgetX.AddObserver("StartInteractionEvent", this,"startinterX");
planeWidgetX.AddObserver("InteractionEvent", this,"interX");
planeWidgetX.AddObserver("EndInteractionEvent", this,"endinterX");
planeWidgetY.AddObserver("StartInteractionEvent", this,"startinterY");
planeWidgetY.AddObserver("InteractionEvent", this,"interY");
planeWidgetY.AddObserver("EndInteractionEvent", this,"endinterY");
planeWidgetZ.AddObserver("StartInteractionEvent", this,"startinterZ");
planeWidgetZ.AddObserver("InteractionEvent", this,"interZ");
planeWidgetZ.AddObserver("EndInteractionEvent", this,"endinterZ");

iren.AddObserver("ConfigureEvent", this,"config");

iren.Start();
}

public static void main(String[] args) throws Exception
{
    String dirname = args[0];
    if( !PosixEmulation.FileIsDirectory( dirname ) )
    {
        return;
    }

    MPRViewer2 me = new MPRViewer2();
    me.Run( dirname );
}
}

```

## 14.172 ReadSeriesIntoVTK.java

```

/*=====

Program: GDCM (Grassroots DICOM). A DICOM library

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```

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```

=====*/
// We are required to call the package 'vtk' even though I (MM) would have preferred
// an import statement along the line of:
// import vtkgdcm.*;
import vtk.*;

/*
 * Usage:
 * export LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:.
 * java -classpath `pwd`/vtkgdcm.jar:/usr/share/java/vtk.jar:. ReadSeriesIntoVTK
 */
public class ReadSeriesIntoVTK
{
    static {
        System.loadLibrary("vtkCommonJava");
        System.loadLibrary("vtkFilteringJava");
        System.loadLibrary("vtkIOJava");
        System.loadLibrary("vtkImagingJava");
        System.loadLibrary("vtkGraphicsJava");
        System.loadLibrary("vtkgdcmJava");
        try {
            System.loadLibrary("vtkRenderingJava");
        } catch (Throwable e) {
            System.out.println("cannot load vtkHybrid, skipping...");
        }
        try {
            System.loadLibrary("vtkHybridJava");
        } catch (Throwable e) {
            System.out.println("cannot load vtkHybrid, skipping...");
        }
        try {
            System.loadLibrary("vtkVolumeRenderingJava");
        } catch (Throwable e) {
            System.out.println("cannot load vtkVolumeRendering, skipping...");
        }
    }

    public static void main(String[] args)
    {
        vtkFileOutputWindow outWin = new vtkFileOutputWindow();
        outWin.SetInstance(outWin);
        outWin.SetFileName("MVSVTKViewer.log");

        // See: http://review.source.kitware.com/#change,888
        // vtkWrapJava does not handle static keyword
        // String directory = vtkGDCMTesting.GetGDCMDataRoot();
        vtkGDCMTesting t = new vtkGDCMTesting();
        String directory = t.GetGDCMDataRoot();
        String file0 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq0.dcm";
        String file1 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq1.dcm";
        String file2 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq2.dcm";
        String file3 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq3.dcm";

        vtkStringArray s = new vtkStringArray();
        System.out.println("adding : " + file0 );
        s.InsertNextValue( file0 );
        s.InsertNextValue( file1 );
        s.InsertNextValue( file2 );
        s.InsertNextValue( file3 );

        vtkGDCMImageReader reader = new vtkGDCMImageReader();
        reader.SetFileNames( s );
        reader.Update();

        System.out.println("Success reading: " + file0 );

        vtkMetaImageWriter writer = new vtkMetaImageWriter();
        writer.DebugOn();
        writer.SetCompression( false );
        writer.SetInputConnection( reader.GetOutputPort() );
        writer.SetFileName( "ReadSeriesIntoVTK.mhd" );
        writer.Write();

        System.out.println("Success writing: " + writer.GetFileName() );
    }
}

```

```
}

```

## 14.173 CastConvertPhilips.py

```
00001
00014
00015 """
00016 Usage:
00017
00018 python --public /path/to/directory/
00019 or
00020 python --private /path/to/directory/
00021
00022 python --public --extension bak /path/to/directory/
00023
00024 rename -f 's/\.bak$//' *.bak
00025
00026 TODO:
00027 http://docs.python.org/library/optparse.html#module-optparse
00028 """
00029
00030 import vtkgdc
00031 import vtk
00032 import sys
00033 import gdc
00034
00035 def ProcessOneFilePublic(filename, outfilename, tmpfile):
00036     gdc.ImageHelper.SetForceRescaleInterceptSlope(True)
00037     vtkreader = vtkgdc.vtkGDCMImageReader()
00038     vtkreader.SetFileName( filename )
00039     vtkreader.Update()
00040
00041     cast = vtk.vtkImageCast()
00042     cast.SetInput( vtkreader.GetOutput() )
00043     cast.SetOutputScalarTypeToUnsignedShort()
00044
00045     # vtkGDCMImageWriter does not support Sequence, so let's write a tmp file first:
00046     # Some operation will actually be discarded (we simply need a temp storage)
00047     vtkwriter = vtkgdc.vtkGDCMImageWriter()
00048     vtkwriter.SetFileName( tmpfile )
00049     vtkwriter.SetMedicalImageProperties( vtkreader.GetMedicalImageProperties() )
00050     vtkwriter.SetDirectionCosines( vtkreader.GetDirectionCosines() )
00051     print "Format:", vtkreader.GetImageFormat()
00052     vtkwriter.SetImageFormat( vtkreader.GetImageFormat() )
00053     vtkwriter.SetInput( cast.GetOutput() )
00054     #vtkwriter.Update()
00055     vtkwriter.Write()
00056
00057     # ok now rewrite the exact same file as the original (keep all info)
00058     # but use the Pixel Data Element from the written file
00059     tmpreader = gdc.ImageReader()
00060     tmpreader.SetFileName( tmpfile )
00061     if not tmpreader.Read():
00062         sys.exit(1)
00063
00064     reader = gdc.Reader()
00065     reader.SetFileName( filename )
00066     if not reader.Read():
00067         sys.exit(1)
00068
00069     # Make sure to remove Slope/Rescale to avoid re-execution
00070     ds = reader.GetFile().GetDataSet()
00071     tags = [
00072         gdc.Tag(0x0028,0x1052),
00073         gdc.Tag(0x0028,0x1053),
00074         gdc.Tag(0x0028,0x1053),
00075     ]
00076     for tag in tags:
00077         ds.Remove( tag )
00078
00079     writer = gdc.ImageWriter()
00080     writer.SetFileName( outfilename )
00081     # Pass image from vtk written file
00082     writer.SetImage( tmpreader.GetImage() )
00083     # pass dataset from initial 'reader'
00084     writer.SetFile( reader.GetFile() )
```

```

00085     if not writer.Write():
00086         sys.exit(1)
00087
00088 def ProcessOneFilePrivate(filename, outfilename, tmpfile):
00089     vtkreader = vtkgdcmm.vtkGDCMImageReader()
00090     vtkreader.SetFileName( filename )
00091     vtkreader.Update()
00092
00093
00094     # (2005,1409)      DS      4      0.0
00095     # (2005,140a)      DS      16     1.52283272283272
00096
00097     # (2005,0014)      LO      26     Philips MR Imaging DD 005
00098     tag1 = gdcmm.PrivateTag(0x2005,0x09,"Philips MR Imaging DD 005")
00099     tag2 = gdcmm.PrivateTag(0x2005,0x0a,"Philips MR Imaging DD 005")
00100
00101
00102
00103     # Need to access some private tags, reread the file (for now):
00104     reader = gdcmm.Reader()
00105     reader.SetFileName( filename )
00106     if not reader.Read():
00107         sys.exit(1)
00108
00109     ds = reader.GetFile().GetDataSet()
00110
00111     e11 = ds.GetDataElement( tag1 )
00112     e12 = ds.GetDataElement( tag2 )
00113
00114
00115     #pf = gdcmm.PythonFilter()
00116     #pf.SetFile( reader.GetFile() )
00117     #print e11.GetTag()
00118
00119     print e11.GetByteValue()
00120     v1 = eval(e11.GetByteValue().GetBuffer())
00121     print e12.GetByteValue()
00122     v2 = eval(e12.GetByteValue().GetBuffer())
00123
00124     print v1
00125     shift = v1
00126     print v2
00127     scale = v2
00128
00129     ss = vtk.vtkImageShiftScale()
00130     ss.SetInput( vtkreader.GetOutput() )
00131     # because VTK image shift / scale convention is inverted from DICOM make sure shift is 0
00132     assert shift == 0
00133     ss.SetShift( shift )
00134     ss.SetScale( scale )
00135     ss.SetOutputScalarTypeToUnsignedShort()
00136     ss.Update()
00137
00138     # vtkGDCMImageWriter does not support Sequence, so let's write a tmp file first:
00139     # Some operation will actually be discarded (we simply need a temp storage)
00140     vtkwriter = vtkgdcmm.vtkGDCMImageWriter()
00141     vtkwriter.SetFileName( tmpfile )
00142     vtkwriter.SetMedicalImageProperties( vtkreader.GetMedicalImageProperties() )
00143     vtkwriter.SetDirectionCosines( vtkreader.GetDirectionCosines() )
00144     vtkwriter.SetImageFormat( reader.GetImageFormat() )
00145     # do not pass shift/scale again
00146     vtkwriter.SetInput( ss.GetOutput() )
00147     #vtkwriter.Update()
00148     vtkwriter.Write()
00149
00150     # ok now rewrite the exact same file as the original (keep all info)
00151     # but use the Pixel Data Element from the written file
00152     tmpreader = gdcmm.ImageReader()
00153     tmpreader.SetFileName( tmpfile )
00154     if not tmpreader.Read():
00155         sys.exit(1)
00156
00157     writer = gdcmm.ImageWriter()
00158     writer.SetFileName( outfilename )
00159     # Pass image from vtk written file
00160     writer.SetImage( tmpreader.GetImage() )
00161     # pass dataset from initial 'reader'
00162     writer.SetFile( reader.GetFile() )
00163     if not writer.Write():
00164         sys.exit(1)
00165

```



```

00166 if __name__ == "__main__":
00167
00168     gdcm.Trace.DebugOff()
00169     gdcm.Trace.WarningOff()
00170     #filename = sys.argv[1]
00171     #outfilename = sys.argv[2]
00172     tmpfile = "/tmp/philips_rescaled.dcm"
00173     #ProcessOneFile( filename, outfilename, tmpfile )
00174     rescaletype = sys.argv[1]
00175     assert rescaletype == "--public" or rescaletype == "--private"
00176     dirname = sys.argv[2]
00177     d = gdcm.Directory()
00178     d.Load( dirname )
00179
00180     for f in d.GetFilesNames():
00181         #print f
00182         ProcessOneFilePublic( f, f + ".bak", tmpfile )
00183
00184
00185 print "success"

```

## 14.174 headsq2dcm.py

```

00001
00014
00015 """
00016 Usage:
00017 python headsq2dcm.py -D /path/to/VTKData
00018 """
00019
00020 import vtk
00021 import vtkgdc
00022 from vtk.util.misc import vtkGetDataRoot
00023 VTK_DATA_ROOT = vtkGetDataRoot()
00024
00025 reader = vtk.vtkVolume16Reader()
00026 reader.SetDataDimensions(64, 64)
00027 reader.SetDataByteOrderToLittleEndian()
00028 reader.SetFilePrefix(VTK_DATA_ROOT + "/Data/headsq/quarter")
00029 reader.SetImageRange(1, 93)
00030 reader.SetDataSpacing(3.2, 3.2, 1.5)
00031
00032 cast = vtk.vtkImageCast()
00033 cast.SetInput( reader.GetOutput() )
00034 cast.SetOutputScalarTypeToUnsignedChar()
00035
00036 # By default this is creating a Multiframe Grayscale Word Secondary Capture Image Storage
00037 writer = vtkgdc.vtkGDCMImageWriter()
00038 writer.SetFileName( "headsq.dcm" )
00039 writer.SetInput( reader.GetOutput() )
00040 # cast -> Multiframe Grayscale Byte Secondary Capture Image Storage
00041 #writer.SetInput( cast.GetOutput() )
00042 writer.SetFileDimensionality( 3 )
00043 writer.Write()

```



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