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syngo Imaging
VB30A

IKM

DICOM Conformance Statement

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1 Introduction

1.1 Purpose

This DICOM Conformance Statement is written according to part PS 3.2 of the DICOM standard [1].

The applications described in this conformance statement are the *syngo* Imaging[1] based products of Table 1. The *syngo* Data Manager acts as SCU and SCP for the DICOM Storage, Query/Retrieve, MPPS and Storage Commitment services. The *syngo* Studio acts as a Query SCU, as a Print SCU and provides media support as a File Set Reader, File Set Creator and File Set Updater.

1.2 Scope

This DICOM Conformance Statement refers to *syngo* Imaging based applications listed in Table 1.

Table 1 *DICOM Products*

Application Name	Software Name	Product Name
syngo Data Manager	*syngo* Imaging	*syngo* suite
syngo Studio	*syngo* Imaging	*syngo* suite
syngo Workflow MLR	*syngo* Workflow	*syngo* suite
syngo Workflow SLR	*syngo* Workflow	*syngo* suite

This document describes the conformance of the following products

- *syngo* Data Manager
- *syngo* Studio

Please note that the DICOM Conformance of the following products is described in separate documents:

- *syngo* Workflow MLR VB25 [3]
- *syngo* Workflow SLR V28.0 [4]

1.3 Definitions, Acronyms and Abbreviations

1.3.1 Definitions

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1.3.2 Acronyms and Abbreviations

Table 2 *Acronyms and Abbreviations*

ACR	American College of Radiology
AE	DICOM Application Entity
ASCII	American Standard Code for Information Interchange
DB	Database
DCS	DICOM Conformance Statement
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DICOM Message Service Element with Composite information objects
FSC	File Set Creator
FSR	File Set Reader
FSU	File Set Updater
HC	Hardcopy
IHE	Integrating the Healthcare Enterprise
IOD	DICOM Information Object Definition
ISO	International Standard Organization
M	Mandatory Key Attribute
MOD	Magneto-optical Disk
MPPS	Modality Performed Procedure Step
NEMA	National Electrical Manufacturers Association
O	Optional Key Attribute
PDU	DICOM Protocol Data Unit
R	Required Key Attribute
RIS	Radiology Information System
RWA	Real-World Activity
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair

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Table 2 *Acronyms and Abbreviations*

U	Unique Key Attribute

1.4 References

[1] Digital Imaging and Communications in Medicine (DICOM) 3.0, NEMA PS 3.1-18, 2007.

[2] IHE Technical Framework, Rev 7.0, May 15, 2006, ACC/HIMSS/RSNA.

[3] Imaging Workflow Management VB23A, DICOM Conformance Statement, Rev. 1.0, 2005, SIEMENS AG Medical Solutions, Health Services.

[4] syngo Workflow SLR, DICOM Conformance Statement, Version 28.0, 2006, SIEMENS AG Medical Solutions, Health Services.

1.5 Connectivity and Interoperabilty

This Conformance Statement by itself does not guarantee successful interoperabilty of Siemens equipment with non-Siemens equipment. The user (user's agent) should be aware of the following issues:

- Interoperabilty

  Interoperabilty refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into a network environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperabilty of Siemens equipment with non-Siemens equipment. It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Siemens equipment with non-Siemens equipment.

- Validation

  Siemens equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
  Where Siemens equipment is linked to non-Siemens equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation test will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- New versions of the DICOM Standard

  the DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Siemens is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Siemens reserves the right to make changes to its products or to discontinue their delivery. The user should ensure that any non-Siemens provider linking to Siemens equipment,

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also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Siemens equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

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2 Conformance for *syngo* Data Manager

2.1 Implementation Model *syngo* Data Manager

The *syngo* Data Manager supports three DICOM Application Entities (AEs):

1. **Workflow filtered** Application Entity
2. **Workflow unfiltered** Application Entity
3. **Dicom Archive User** Application Entity

The **Workflow filtered** and **Workflow unfiltered** AEs receives associations for

- Verification,
- Storage,
- Storage Commitment,
- Query/Retrieve and
- Modality Performed Procedure Steps (MPPS).

The same AEs requests associations to remote AEs for

- Storage,
- MPPS,
- Storage Commitment,
- Query/Retrieve and
- Report Management.

The **Workflow filtered** and **Workflow unfiltered** AEs of *syngo* Data Manager differ in the way they handle Query/Retrieve requests. The **Workflow unfiltered** AE returns all matches (sends all objects) which has been stored in the system at some point. This means that objects marked as "deleted" and objects associated only with discontinued examinations are also returned. The **Workflow filtered** AE suppresses these matches (doesn’t send these objects).

The **Dicom Archive User AE** receives associations for

- Verification,
- Storage and

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- Storage Commitment.

It requests associations to remote AEs for

- Storage,
- Storage Commitment and
- Query/Retrieve.

The **Dicom Archive User** AE is needed if the *syngo* Data Manager is configured to archive its images to an external Dicom Archive. The archiving is done by using the Storage Service Class to send the Dicom objects and the Storage Commitment Service Class to insure that these objects have securely been stored. The dearchiving is done with the Query/Retrieve Service Class by sending a C-MOVE-RQ referencing a set of images to be dearchived. These images are then received with the use of the Storage Service Class.

Note: Structure of the AE Specification Chapters

In the proposed template for a DICOM Conformance Statement [1] each AE is described in a separate section. For *syngo* Data Manager this would duplicate most of the text effectively hiding the minor differences between the AEs. Therefore this document is grouped by function block and the differences between the two AEs are described within each function block.

2.1.1 Implementation Model Storage

The *syngo* Data Manager AEs open associations for Storage of images to Remote Application Entities and receive association requests for Storage from Remote Application Entities.

2.1.1.1 Application Data Flow Diagram

The *syngo* Data Manager DICOM network implementation acts as SCU and SCP for the C-STORE DICOM network service and as SCP for the C-ECHO DICOM network service.

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Figure 1: *Application Data Flow Diagram - Storage SCU*

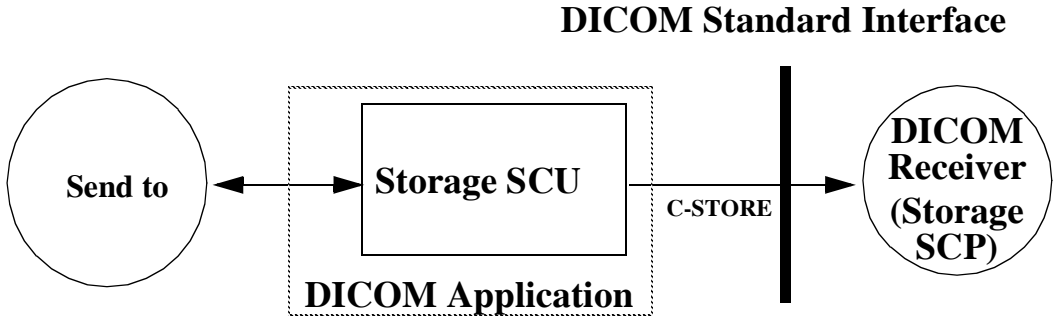
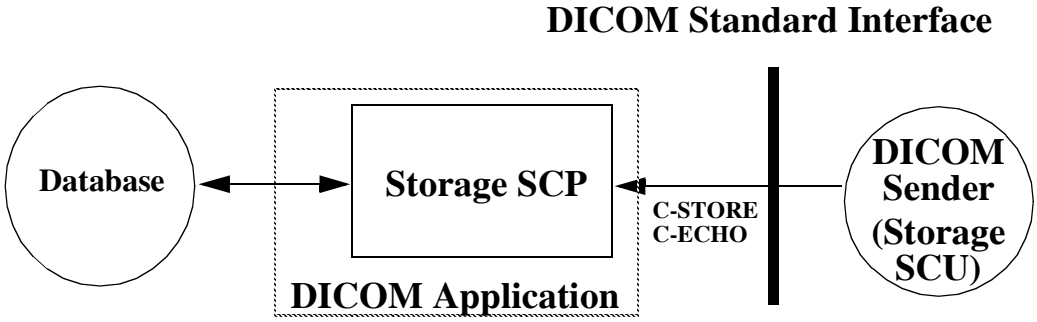


Figure 2: *Application Data Flow Diagram - Storage SCP*



2.1.1.2 Functional Definitions of Application Entities

2.1.1.2.1 Workflow filtered and unfiltered AEs

The Storage SCU is invoked either internally by the Query/Retrieve Application Entity that is responsible for processing retrieve requests or by a trigger of the internal communication system. The request consists of data describing the composite image objects selected for storage and the destination. An association is negotiated with the destination application entity and the image data is transferred using the C-STORE DIMSE-Service. The transfer status is reported to the Query/Retrieve User.

The Storage SCP component of the *syngo* Data Manager DICOM application is operating as a background server process. It exists as soon as the system is powered up and waits for Storage association requests. Upon accepting an association with a negotiated Presentation Context it starts to receive the Composite Image Objects and imports them to the database. Verification requests will be processed and responded to the Storage SCP component, too.

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2.1.1.2.2 Dicom Archive User AE

The Storage SCU is invoked if the *syngo* Data Manager is configured to archive its images to an external Dicom Archive and if the archiving is triggered by an internal event. If the images could successfully be stored to the Dicom Archive a subsequent Storage Commitment is neccessary to secure the storage of these images. Subsequent C-STORE-RQ may follow for the same object if it could not successfully be stored.

The Storage SCP component of the Dicom Archive User AE is used for the dearchiving of images which were archived at the external Dicom Archive. The images are requested by sending a C-MOVE after an internal dearchive event.

Images sent to the Dicom Archive User AE will only be stored if they have also been requested by a former C-MOVE-RQ. Only mages known to the *syngo* Data Manager will be stored permanently. However all other images will be accepted in the C-STORE-RQ but deleted at a later date. This means that the Dicom Archive User AE cannot be used for storage of new images!

2.1.1.3 Sequencing of real World Activities

not applicable.

2.1.2 Implementation Model MPPS

The MPPS service class defines an application-level class of services which facilitates the transfer of procedure information from the imaging modality to the information system, in this case to the PACS system.

Additionally the MPPS information can be forwarded to another system. In this case the *syngo* Data Manager DICOM application supports the MPPS services as SCU.

2.1.2.1 Application Data Flow Diagram

The *syngo* Data Manager DICOM network implementation acts as SCP and SCU for the MPPS network service.

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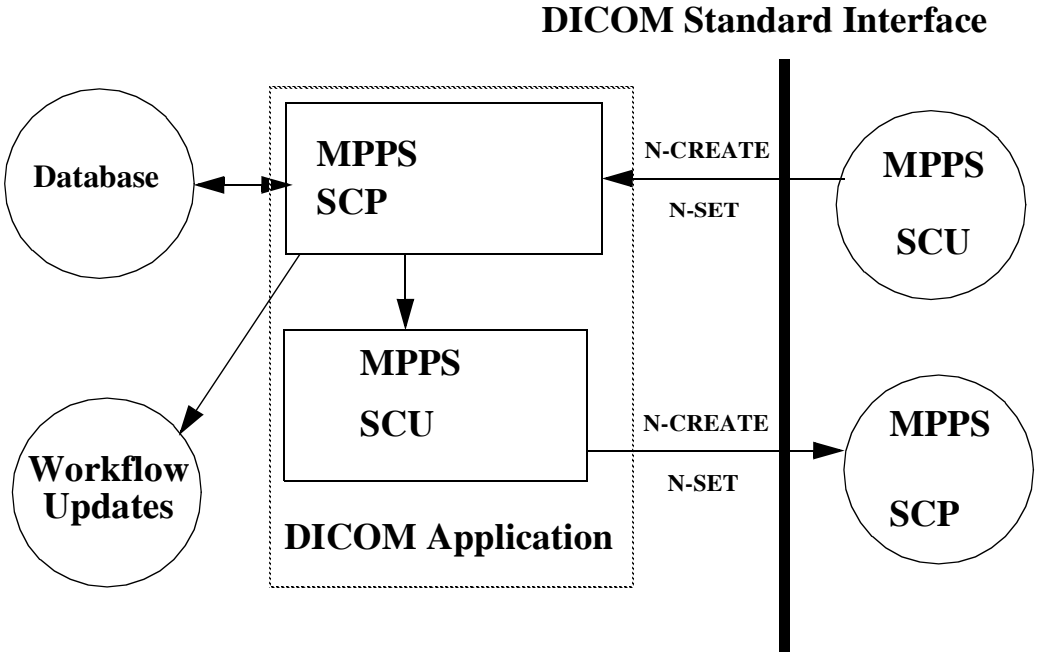
Figure 3: Application Data Flow Diagram - MPPS



2.1.2.2 Functional Definitions of Application Entities

2.1.2.2.1 Workflow filtered and unfiltered AEs

The *syngo* Data Manager MPPS SCP stores the MPPS instance and performs updates corresponding to the SCU requests. The state of the MPPS is used to update scheduled procedure information and to schedule further procedures like post-processing tasks.

All components of the MPPS SCP application are operating as background server processes. They are existing as soon as the system is powered up and then respond to creation and updates of MPPS objects and stores parts of this information in its database.

Both AEs (Workflow filtered and unfiltered) can receive MPPS requests. However only the workflow filtered AE will open associations to a remote MPPS SCP.

2.1.2.2.2 Dicom Archive User AE

The Dicom Archive User AE does not use the MPPS network services.

2.1.2.3 Sequencing of Real World Activities

not applicable.

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2.1.3 Implementation Model Storage Commitment

The Storage Commitment service class defines an application-level class of service which facilitates the commitment to storage. It performs an additional task of commitment of composite objects in addition to the network based storage of images as defined by the Storage Service class. The *syngo* Data Manager DICOM implementation supports the Storage Commitment Push Model as SCP and SCU.

2.1.3.1 Application Data Flow Diagram

The *syngo* Data Manager DICOM network implementation acts as SCU and SCP for the Storage Commitment Push Model Service using the Storage Commitment Service Class.

Figure 4: *Application Data Flow Diagram Storage Commitment SCP*

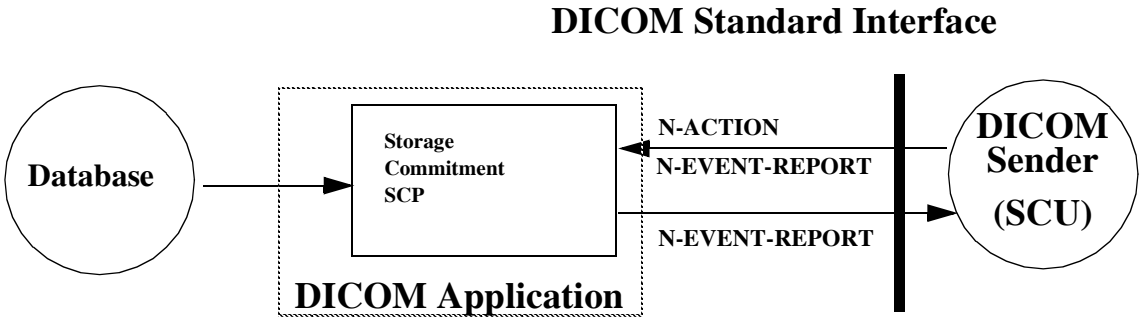
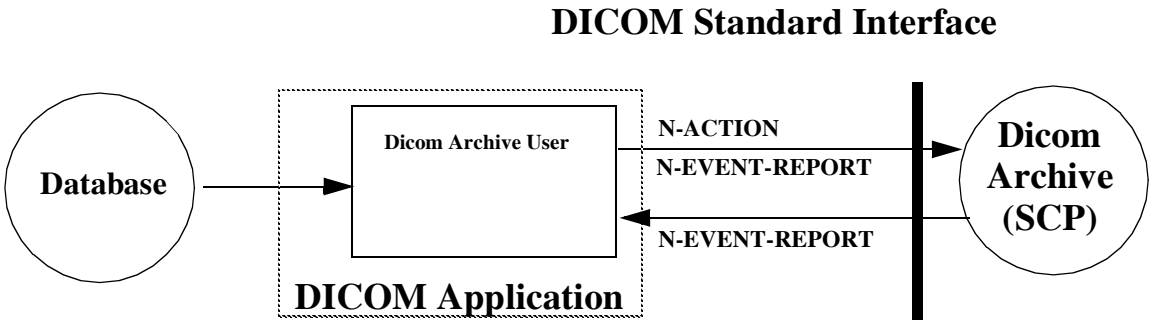


Figure 5: *Application Data Flow Diagram Storage Commitment SCU*



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2.1.3.2 Functional Definitions of Application Entities

2.1.3.2.1 Workflow filtered and unfiltered AE

Additional to each successfully completed send job modalities should trigger a Storage Commitment request for the safekeeping of the images sent to the *syngo* Data Manager. The Storage Commitment SCP is running in the background and is ready to receive requests when the system is started.

The Storage Commitment SCP will try to send the response on the same association or, if that fails, on a new association. The Workflow filtered and unfiltered AEs only support Storage Commitment as SCP.

2.1.3.2.2 Dicom Archive User AE

For the successful archiving of a set of images it is neccessary to get a successful storage response from the external Dicom Archive and also a successful storage commitment for these objects. The Dicom Archive User AE request a Storage Commitment for a set of images by opening an association and issuing an N-ACTION-RQ to the Dicom Archive where the objects were successfully stored before. The related N-EVENT-REPORT-RQ can be sent by the remote Dicom Archive the same association or through a new association. The Dicom Archive User AE only supports Storage Commitment as SCU.

2.1.3.3 Sequencing of real World Activities

2.1.3.3.1 Workflow filtered and unfiltered AE

The SCP requires that the images are stored before a Storage Commitment request is sent. The SCP will not queue Storage Commitment requests.

If the SOP instances and the Storage Commitment request are sent on different associations, it is possible that the store request has not yet been stored in the database. In order to clear the cache of store requests, at least one of the following things must be done:

- The store association must be closed before the Storage Commitment request is sent.
- A non-store request must be sent on the store association (e.g. a C-FIND).

Otherwise the storage commitment request might not be acknowledged.

2.1.3.3.2 Dicom Archive User AE

The Dicom Archive User AE will only send a Storage Commitment request for images which already have been successfully stored at the Dicom Archive. If no commitments for these objects will be sent back or an unsuccessful commitment will be sent back the Dicom Archive User will retry to send an N-ACTION-RQ for a configurable amount of times or until the commitment was successful.

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2.1.4 Implementation Model Query/Retrieve

The query/retrieve service class defines an application-level class of services which facilitates the management of images and patient data against the well defined information model of DICOM and allows a DICOM AE to retrieve images from a remote DICOM node or to request a remote DICOM AE to initiate a transfer of images to another DICOM AE. The *syngo* Data Manager DICOM Query/Retrieve application supports the Query/Retrieve service as SCP and Retrieve as SCU.

2.1.4.1 Application Data Flow Diagram

The *syngo* Data Manager DICOM network implementation acts as SCP for the query/retrieve network service and as SCU for the retrieve network service.

Figure 6: *Application Data Flow Diagram - Query/Retrieve SCP*

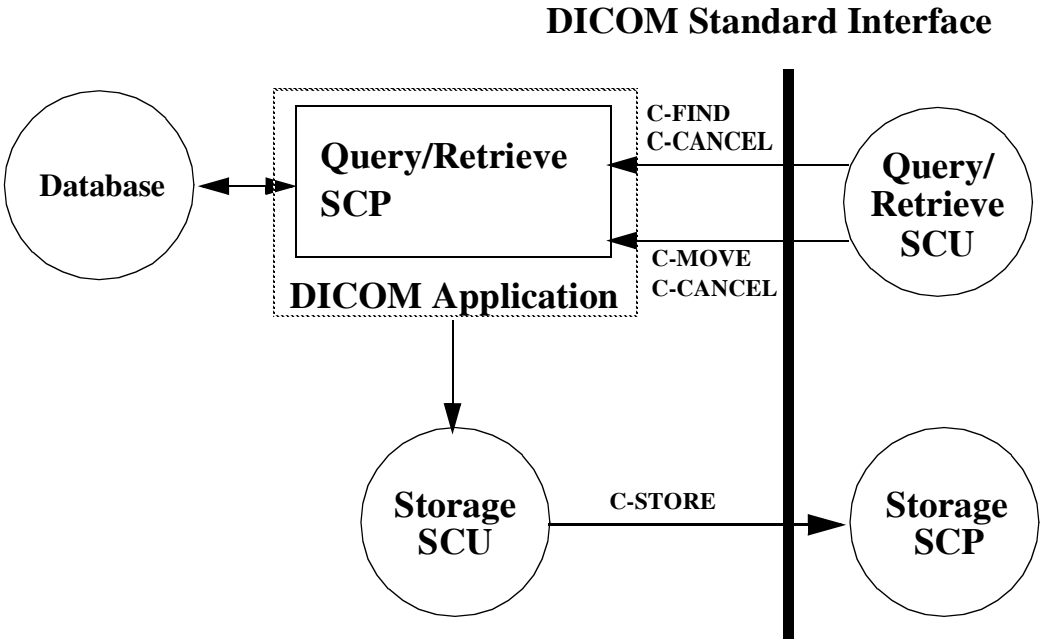

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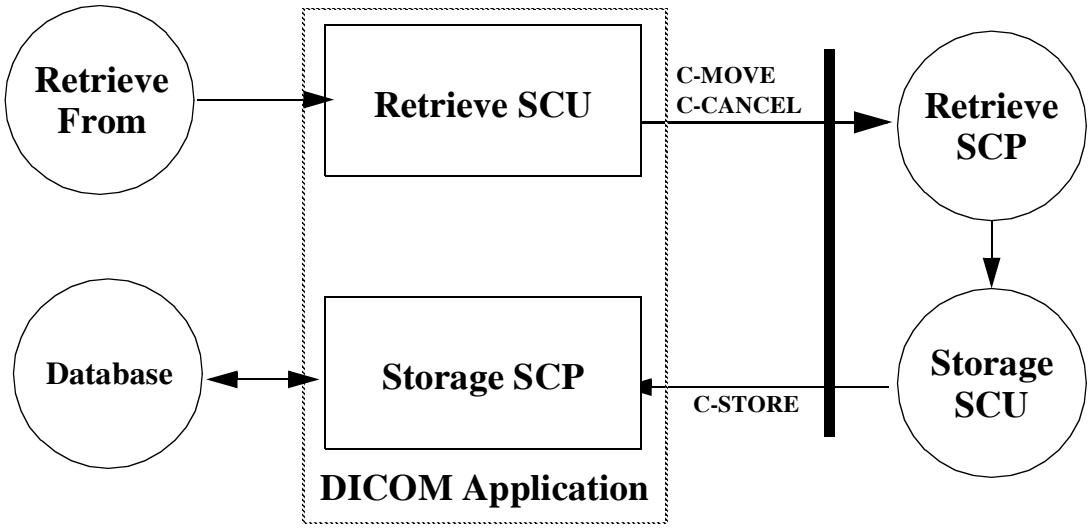
Figure 7: *Application Data Flow Diagram - Retrieve SCU*



2.1.4.2 Functional Definitions of Application Entities

2.1.4.2.1 Workflow filtered and unfiltered AE

The *syngo* Data Manager DICOM Retrieve SCU initiates a C-MOVE DIMSE request on the remote Retrieve SCP. The remote Retrieve SCP in turn starts C-STORE suboperations on the *syngo* Imaging Storage SCP. The *syngo* Data Manager DICOM Retrieve SCU is triggered and parameterized by an internal protocol. The *syngo* Data Manager is not a Query SCU.

The *syngo* Data Manager DICOM Query/Retrieve SCP responds to C-FIND DIMSE services from a remote SCU and depending on further remote request C-MOVE involves the *syngo* Data Manager DICOM Query/Retrieve SCP application to initiate a C-STORE sub-operation (by triggering and parametrizing the own Storage SCU) to send image objects to a remote Storage SCP.

All components of the Query/Retrieve SCP application are operating as background server processes. They are existing when the machine is powered on and then respond to queries based on the records stored in its database.

In a multiserver environment, different Storage SCU located on different servers might be executing one C-MOVE request.

For the difference between the Workflow filtered and unfiltered AEs for the handling of Query/Retrieve requests please refer to chapter 2.1.

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2.1.4.2.2 Dicom Archive User AE

The Dicom Archive User AE issues C-MOVE requests to dearchive a set of images from the external Dicom Archive where the objects were formerly archived (by using the Storage and Storage Commitment Service Classes). The remote Dicom Archive Retrieve SCP in turn starts C-STORE suboperations to the Dicom Archive User Storage SCP. The Retrieve SCU is triggered and parameterized by an internal protocol.

The Dicom Archive User AE is not a Query/Retrieve SCP and does not act as a Query SCU.

2.1.4.3 Sequencing of Real World Activities

not applicable.

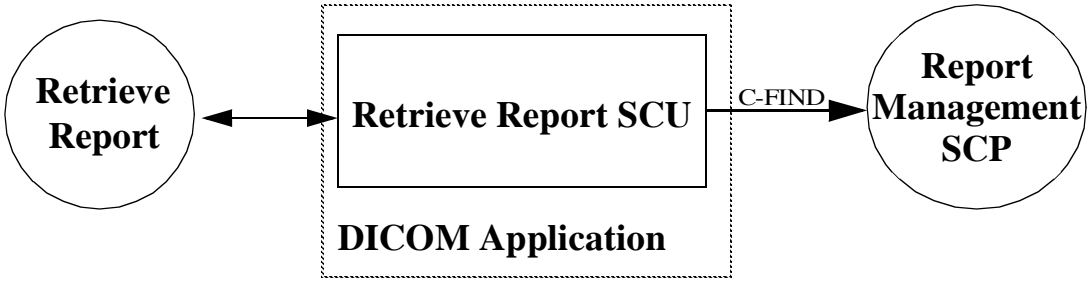
2.1.5 Implementation Model Report Management

The Report Management service class defines an application level class of services which facilitates the transfer of report informations. This is not a SOP class defined by DICOM but a private SOP class defined by MITRA.

2.1.5.1 Application Data Flow Diagram

The *syngo* Data Manager acts as an SCU for the Report Management network service.

Figure 8: *Application Data Flow Diagram - Retrieve Reports*



2.1.5.2 Functional Definitions of Application Entities

2.1.5.2.1 Workflow filtered and unfiltered AEs

The *syngo* Data Manager uses the Report Management service class to fetch reports from the RIS. It acts as an SCU.

The *syngo* Data Manager caches all reports. Reports are only fetched when **no** reports for the patient are found in the *syngo* Data Manager cache and

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1. when the SDM receives a schedule for the patient (ORM message), or
2. when the SDM receives an unsolicited report for the patient (ORU message), or
3. when the SDM receives a report query from the SWP

Then **all** reports for the patient are fetched.

Usually the *syngo* Data Manager is actively notified by the RIS about new or updated reports via HL7 messages. Fetching reports from RIS via the DICOM actively triggered by the *syngo* Data Manager is only applied if no appropriate reports are found in the *syngo* Data Manager report cache.

2.1.5.2.2 Dicom Archive User AE

The Dicom Archive User AE does not use the Report management network services.

2.1.5.3 Sequencing of Real World Activities

n/a

2.2 AE Specifications *syngo* Data Manager

The *syngo* Data Manager SCU/SCP applications use three AEs when initiating/receiving associations to/from remote DICOM nodes. Since all AEs provide a similiar set of services they are all descibed in this chapter.

2.2.1 Workflow filtered and Workflow unfiltered AEs

The *syngo* Data Manager Workflow filtered and Workflow unfiltered AEs provide Standard Conformance to the DICOM V3.0 SOP Classes as an SCP:

- Verification SOP Class defined in Table 3
- all Storage SOP Classes defined in Table 4
- all Query/Retrieve SOP Classes defined in Table 5
- MPPS SOP Class defined in Table 6
- Storage Commitment SOP Class defined in Table 7

The *syngo* Data Manager Workflow filtered and Workflow unfiltered AEs provide Standard Conformance to the DICOM V3.0 SOP Classes as an SCU:

- all Storage SOP Classes defined in Table 4
- all MPPS SOP Classes defined in Table 6
- all Query/Retrieve SOP Classes defined in Table 8

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- Report Management SOP class defined in Table 10

2.2.2 Dicom Archive User AE

The *syngo* Data Manager Dicom Archive User AE provides Standard Conformance to the DICOM V3.0 SOP Classes as an SCP:

- Verification SOP Class defined in Table 3
- all Storage SOP Classes defined in Table 4

The *syngo* Data Manager Dicom Archive User AE provides Standard Conformance to the DICOM V3.0 SOP Classes as an SCU:

- all Storage SOP Classes defined in Table 4
- all Storage Commitment SOP Classes defined in Table 7
- all Query/Retrieve SOP Classes defined in Table 9

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Table 3 *Verfication SOP Class*

SOP Class UID	SOP Class Name
1.2.840.10008.1.1	Verification

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Table 4 *Storage SOP Classes*

SOP Class UID	SOP Class Name
1.2.840.10008.5.1.4.1.1.1	CR Computed Radiography Object Storage
1.2.840.10008.5.1.4.1.1.4	MR Image Storage
1.2.840.10008.5.1.4.1.1.4.1	Enhanced MR Image Storage
1.2.840.10008.5.1.4.1.1.4.2	MR Spectroscopy Storage
1.2.840.10008.5.1.4.1.1.2	CT Image Storage
1.2.840.10008.5.1.4.1.1.3.1	US Multi-frame Object Storage
1.2.840.10008.5.1.4.1.1.3	US Multi-frame Object Storage (Retired)
1.2.840.10008.5.1.4.1.1.6.1	US Image Storage
1.2.840.10008.5.1.4.1.1.6	US Image Storage (Retired)
1.2.840.10008.5.1.4.1.1.7	SC Image Storage
1.2.840.10008.5.1.4.1.1.8	Stand-Alone Overlay Storage
1.2.840.10008.5.1.4.1.1.9	Stand-Alone Curve Storage
1.2.840.10008.5.1.4.1.1.10	Stand-Alone Modality LUT Storage
1.2.840.10008.5.1.4.1.1.11	Stand-Alone VOI LUT Storage
1.2.840.10008.5.1.4.1.1.11.1	Grayscale Softcopy Presentation State
1.2.840.10008.5.1.4.1.1.12.1	X-Ray Angiographic Image Storage
1.2.840.10008.5.1.4.1.1.12.2	X-Ray Radiofluoroscopic Image Storage
1.2.840.10008.5.1.4.1.1.12.3	X-Ray Angiographic Bi-Plane Image Storage (Retired)
1.2.840.10008.5.1.4.1.1.20	NM Image Storage
1.2.840.10008.5.1.4.1.1.5	NM Image Storage (Retired)
1.2.840.10008.5.1.1.27	Stored Print Storage
1.2.840.10008.5.1.1.29	Hardcopy Grayscale Image Storage
1.2.840.10008.5.1.1.30	Hardcopy Color Image Storage
1.2.840.10008.5.1.4.1.1.77.1.1	VL Endoscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.2	VL Microscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.3	VL Slide-Coordinates Microscopic Image Storage
1.2.840.10008.5.1.4.1.1.77.1.4	VL Photographic Image Storage

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Table 4 *Storage SOP Classes*

SOP Class UID	SOP Class Name
1.2.840.10008.5.1.4.1.1.128	Positron Emission Tomography Image Storage
1.2.840.10008.5.1.4.1.1.129	Stand-Alone PET Curve Storage
1.2.840.10008.5.1.4.1.1.481.1	RT Image Storage
1.2.840.10008.5.1.4.1.1.481.2	RT Dose Storage
1.2.840.10008.5.1.4.1.1.481.3	RT Structure Set Storage
1.2.840.10008.5.1.4.1.1.481.4	RT Beams Treatment Record Storage
1.2.840.10008.5.1.4.1.1.481.5	RT Plan Storage
1.2.840.10008.5.1.4.1.1.481.6	RT Brachy Treatment Record Storage
1.2.840.10008.5.1.4.1.1.481.7	RT Treatment Summary Record Storage
1.2.840.10008.5.1.4.1.1.481.8	RT Ion Plan Storage
1.2.840.10008.5.1.4.1.1.481.9	RT Ion Beams Treatement Record Storage
1.2.840.10008.5.1.4.1.1.88.11	Basic Text SR
1.2.840.10008.5.1.4.1.1.88.22	Enhanced SR
1.2.840.10008.5.1.4.1.1.88.33	Comprehensive SR
1.2.840.10008.5.1.4.1.1.88.50	Mammography CAD SR
1.2.840.10008.5.1.4.1.1.88.59	Key Object Selection
1.2.840.10008.5.1.4.1.1.88.65	Chest CAD SR
1.2.840.10008.5.1.4.1.1.1.1	Digital X-Ray Image Storage Presentation
1.2.840.10008.5.1.4.1.1.1.1.1	Digital X-Ray Image Storage Processing
1.2.840.10008.5.1.4.1.1.1.2	Digital Mammography X-Ray Image Storage Presentation
1.2.840.10008.5.1.4.1.1.1.2.1	Digital Mammography X-Ray Image Storage Processing
1.2.840.10008.5.1.4.1.1.1.3	Digital Intra-oral X-Ray Image Storage Presentation
1.2.840.10008.5.1.4.1.1.1.3.1	Digital Intra-oral X-Ray Image Storage Processing
1.2.840.10008.5.1.4.1.1.7.1	Multi-frame Single Bit Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.7.2	Multi-frame Grayscale Byte Secondary Capture Image Storage

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Table 4 *Storage SOP Classes*

SOP Class UID	SOP Class Name
1.2.840.10008.5.1.4.1.1.7.3	Multi-frame Grayscale Word Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.7.4	Multi-frame True Color Secondary Capture Image Storage
1.2.840.10008.5.1.4.1.1.9.1.1	12-lead ECG Waveform Storage
1.2.840.10008.5.1.4.1.1.9.1.2	General ECG Waveform Storage
1.2.840.10008.5.1.4.1.1.9.1.3	Ambulatory ECG Waveform Storage
1.2.840.10008.5.1.4.1.1.9.2.1	Hemodynamic Waveform Storage
1.2.840.10008.5.1.4.1.1.9.3.1	Cardiac Electrophysiology Waveform Storage
1.2.840.10008.5.1.4.1.1.9.4.1	Basic Voice Audio Waveform Storage
1.2.840.10008.5.1.4.1.1.66	Raw Data
1.3.12.2.1107.5.9.1	CSA Non- Image Storage
1.2.840.10008.5.1.4.1.1.88.3	Acuson KinetDX SR

Table 5 *Query/Retrieve SOP Classes (SCP) for the Workflow AEs*

SOP Class UID	SOP Class Name
1.2.840.10008.5.1.4.1.2.1.1	Patient Root Query/Retrieve Information Model - FIND
1.2.840.10008.5.1.4.1.2.1.2	Patient Root Query/Retrieve Information Model - MOVE
1.2.840.10008.5.1.4.1.2.2.1	Study Root Query/Retrieve Information Model - FIND
1.2.840.10008.5.1.4.1.2.2.2	Study Root Query/Retrieve Information Model - MOVE
1.2.840.10008.5.1.4.1.2.3.1	Patient/Study Only Query/Retrieve Information Model - FIND
1.2.840.10008.5.1.4.1.2.3.2	Patient/Study Only Query/Retrieve Information Model - MOVE

Table 6 *MPPS SOP Classes*

SOP Class UID	SOP Class Name
1.2.840.10008.3.1.2.3.3	Modality Performed Procedure Step

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Table 7 *Storage Commitment SOP Class*

SOP Class UID	SOP Class Name
1.2.840.10008.1.20.1	Storage Commitment Push Model

Table 8 *Query/Retrieve SOP Classes (SCU) for the Workflow AEs*

SOP Class UID	SOP Class Name
1.2.840.10008.5.1.4.1.2.1.2	Patient Root Query/Retrieve Information Model - MOVE
1.2.840.10008.5.1.4.1.2.2.2	Study Root Query/Retrieve Information Model - MOVE
1.2.840.10008.5.1.4.1.2.3.2	Patient/Study Only Query/Retrieve Information Model - MOVE

Table 9 *Query/Retrieve SOP Classes for the Dicom Archive User AE*

SOP Class UID	SOP Class Name
1.2.840.10008.5.1.4.1.2.2.2	Study Root Query/Retrieve Information Model - MOVE

Table 10 *Report Management SOP Class*

SOP Class UID	SOP Class Name
1.2.840.113532.3500.8	MITRA Report Management

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2.2.3 Association Establishment Policies

2.2.3.1 General

The default PDU size used will be 28 KB.

2.2.3.2 Number of Associations

The *syngo* Data Manager AEs accepts multiple associations at a time. The maximum number is configurable for each Application Entity (default: 50). If the number is reached, a newly required association will be rejected with *reason=local-limit-exceeded* until some associations are released. This transient rejection response might be delayed to avoid immediate retries.

The Storage SCU initiates a new association for each request (i.e. from a DICOM C_MOVE or an internal "SentTo") regardless of the number of already open associations.

The MPPS SCU initiates one association to the forwarding destination.

The Storage Commitment SCP initiates a new association to the SCU if the original association (over which the request has been sent) is already closed.

The Storage Commitment SCU initiates a new association to request commitments for the archiving of Dicom objects. The number of concurrent associations is configurable (default: 5).

The Query/Retrieve SCU initiates a new association for each internal "RetrieveFrom" request.

The Report Management SCU initiates a new association for each "RetrieveReport" request.

2.2.3.3 Asynchronous Nature

The *syngo* Data Manager DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

2.2.3.4 Implementation Identifying Information

The *syngo* Data Manager DICOM software provides a single Implementation Class UID of

- 1.3.12.2.1107.5.8.7

and an Implementation Version Name of

- VB30A

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2.2.4 Association Initiation Policy

syngo Data Manager initiates associations while processing the service operations and internal messages as shown in Table 11.

Table 11 *Operation or Real World Activity triggering associations*

Operation or Real World Activity	association for
DIMSE C-MOVE (as SCP)	C-STORE
DIMSE N-ACTION (Storage Commitment)	N-EVENT-REPORT
DIMSE N-CREATE, DIMSE N-SET (MPPS)	N-CREATE, N-SET
SendTo	C-STORE
RetrieveFrom	C-MOVE
RetrieveReport	C-FIND
DicomArchiveCommit	N-ACTION
DicomArchiveStore	C-STORE
DicomArchiveDearchive	C-MOVE

2.2.4.1 Real-World Activity "Send to"

2.2.4.1.1 Associated Real-World Activity

The associated Real-World activity is a trigger to send objects to another DICOM AE. This activity is triggered either by a C-MOVE request initiated by an external DICOM AE, an internal "SendTo" message or by the Dicom Archive User functionality to start the archiving of Dicom objects to an external Dicom Archive.

If the process successfully establishes an association to a remote Application Entity, it will transfer each image one after another via the open association.

2.2.4.1.1.1 Triggered by C-MOVE or internal "SendTo" message

No retry mechanisms are implemented.

2.2.4.1.1.2 Triggered by Dicom Archive User

If the Dicom objects could not be successfully sent to the remote Dicom Archive (Association could not be opened, C-STORE failed, ...) these objects are sent again until the C-STORE-RSP has the status SUCCESS. This is done for a configurable amount of times. The sending is also repeated if the subsequent Storage Commitment for this image is not successful.

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2.2.4.1.2 Proposed Presentation Contexts

The *syngo* Data Manager DICOM applications will propose Presentation Contexts as shown in the following table *(cf. to Table 12)*. Only needed contexts (SOP classes to be sent) will be negotiated

Table 12 *Initiation Presentation Context - Storage*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
CR Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Digital X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Digital X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Digital Mammography X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None

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Table 12 *Initiation Presentation Context - Storage*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
US Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Lossless JPEG 2000 Lossless Only JPEG 2000 RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCU	None
US Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Lossless JPEG 2000 Lossless Only JPEG 2000 RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Lossless JPEG 2000 Lossless Only JPEG 2000 RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCU	None
US Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Lossless JPEG 2000 Lossless Only JPEG 2000 RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCU	None

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Table 12 *Initiation Presentation Context - Storage*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None

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Table 12 *Initiation Presentation Context - Storage*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Stored Print Storage	1.2.840.10008.5.1.1.27	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None

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Table 12 *Initiation Presentation Context - Storage*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotia-tion
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
VL Endo-scopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
VL Micro-scopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
VL Slide-Co-ordinates Mi-croscopic Image Stor-age	1.2.840.10008.5.1.4.1.1.77.1.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
VL Photo-graphic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None

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Table 12 *Initiation Presentation Context - Storage*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Digital Mammography X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Digital Intraoral X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
Digital Intraoral X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCU	None
MR Spectroscopy	1.2.840.10008.5.1.4.1.1.4.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Stand-alone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Stand-alone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Stand-alone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Stand-alone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None

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Table 12 *Initiation Presentation Context - Storage*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotia-tion
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Grayscale Softcopy Pre-sentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Comprehen-sive SR	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Mammogra-phy CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Stand-alone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
RT Beams Treatment Record Stor-age	1.2.840.10008.5.1.4.1.1.481.4	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
RT Plan Stor-age	1.2.840.10008.5.1.4.1.1.481.5	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None

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Table 12 *Initiation Presentation Context - Storage*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
RT Ion Beams Treatment Storage	1.2.840.10008.5.1.4.1.1.481.9	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
CSA NON Image	1.3.12.2.1107.5.9.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Acuson Kinet-DX SR	1.2.840.10008.5.1.4.1.1.88.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

2.2.4.1.3 SOP Specific Conformance to Storage SOP Classes

The *syngo* Data Manager will not change private attributes as long as no modification is done.

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2.2.4.1.4 Specialized Information Object Definitions

The images created by *syngo* Data Manager DICOM application conform to the DICOM IOD definitions (Standard extended IODs). But they will contain additional private elements.

2.2.4.2 Real World Activity "Forward MPPS"

2.2.4.2.1 Associated Real-World Activity

The associated Real-World activity is receiving a MPPS message from a modality. IHE [2] requires that the MPPS provider is able to forward this message to another system.

2.2.4.2.2 Proposed Presentation Contexts

The *syngo* Data Manager application will propose Presentation Contexts as shown in Table 13.

Table 13 *Proposed Presentation Contexts - Forward MPPS*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

2.2.4.2.3 SOP Specific Conformance - MPPS

All attributes received by *syngo* Data Manager will be sent without any changes, interpretation or validation. Therefore no list of supported attributes is given.

please refer to 2.2.5.2 (pg. 64)

If the destination is not reachable, the *syngo* Data Manager will neither try sending the message again, nor is the status returned from the destination evaluated.

The message will always be forwarded, even if the *syngo* Data Manager application returns an error to the SCU.

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2.2.4.3 Real World Activity "Request Commitment"

2.2.4.3.1 Associated Real-World Activity

This activity is used by the Dicom Archive User to continue the archiving of Dicom objects formerly stored to an external Dicom Archive. If the Storage Commitment request for the Dicom objects could not be sent to the remote Dicom Archive or the objects are not committed within a configurable amount of time the Storage Commitment request is sent again until the Commitment was successfully.

2.2.4.3.2 Proposed Presentation Contexts - Request Commitment

The *syngo* Data Manager DICOM application will propose Presentation Contexts as shown in Table 14.

Table 14 *Proposed Presentation Contexts - Send Storage Commitment Request*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

2.2.4.4 Real World Activity "Send Commitment"

2.2.4.4.1 Associated Real-World Activity

The *syngo* Data Manager AEs will initiate an association to send the N-EVENT-REPORT-RQ to the SCU if they received an N-ACTION-RQ and are ready to send back the response, but the association is not open anymore.

2.2.4.4.2 Proposed Presentation Contexts - Send Commitment

The *syngo* Data Manager DICOM application will propose Presentation Contexts as shown in the following table:

Table 15 *Proposed Presentation Contexts - Send Storage Commitment Response*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

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2.2.4.5 Real World Activity "Retrieve From"

2.2.4.5.1 Associated Real-World Activity

2.2.4.5.1.1 Triggered by internal "Retrieve From" message

The associated "Real World Activity" is to receive a "Retrieve From" request on the internal communication framework of the *syngo* Data Manager. The DICOM application will then open a new, dedicated association, issue a C-MOVE request with the query parameters of the "Retrieve From call". "Pending Responses" are propagated back to the initiator. After the C-MOVE request has been completed, the association is closed.

2.2.4.5.1.2 Triggered by Dicom Archiv User

The Dicom Archive User will open a new association to issue a C-MOVE request to the remote Dicom Archive if a set of Dicom objects should be dearchived. If the requested Dicom objects could not be sent back, the Dicom Archive User retries to open the association and issues the C-MOVE request again for a configurable number of times.

2.2.4.5.2 Proposed Presentation Contexts - Move SCU

2.2.4.5.2.1 Triggered by internal "Retrieve From" message

The *syngo* Data Manager Workflow filtered and Workflow unfiltered AEs will propose Presentation Contexts as shown in the following table. Only needed contexts will be negotiated.

Table 16 *Initiation Presentation Context - Retrieve after "RetrieveFrom" message*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Patient/Study Only Query/ Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

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2.2.4.5.2.2 Triggered by Dicom Archive User

The *syngo* Data Manager Dicom Archive User AE will propose Presentation Contexts as shown in the following table.

Table 17 *Initiation Presentation Context - Retrieve for Dicom Archive User Dearchiving*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

2.2.4.5.3 SOP Specific Conformance Statement - Move SCU

The MOVE SCU interprets the following status codes in a special way. If other codes are received they are considered to be failures of some kind. These failures are given back to the initiator of the "Retrieve From" function if the C-MOVE was triggered by a "Retrieve From" message. In the case of a Dicom Archive User triggered C-MOVE request the error codes are ignored.

Table 18 *C-MOVE SCU status codes*

Service Status	Meaning	Protocol Codes	Related Fields
Success	Suboperations complete - No failures or Warning	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Canceled	Suboperations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Suboperations Complete - One or more failures	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Pending	Suboperations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

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2.2.4.6 Real World Activity "Retrieve Reports"

2.2.4.6.1 Associated Real-World Activity

The *syngo* Data Manager has a cache for textual reports. This cache holds all reports for a given patient. The cache is filled with information obtained from configured RIS when

1. a schedule for the patient (ORM message) is received, or
2. an unsolicited report for the patient (ORU message) is received, or
3. a report query is received via internal communication channels from the workplace.

No reports are fetched if there are already any report for the patient known. This means that the cache either contains all or no reports for a given patient.

2.2.4.6.2 Proposed Presentation Contexts

The following presentation contexts are proposed during the association negotiation:

Table 19 *Proposed Presentation Contexts - Retrieve Reports*

Name	UID	Name List	UID List	Role	Nego-tiation
MITRA Report Management	1.2.840.113532.3500.8	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

2.2.4.6.3 SOP Specific Conformance Statement - Retrieve Reports

The issued C-FIND request only contains values for the attributes "Patient's Name" and "Patient ID". Other attributes are **not** requested (i.e. no universal matching). However it is expected that **all** of the attributes listed in table 20 are returned. This contrasts to the usual behaviour of DICOM query handling but conforms to the description of this SOP class in [3].

Table 20 *Attributes for Report Query*

Attribute Name	**Attribute Tag**	**Usage SCU**
Patient's Name	(0010,0010)	supplied value
Patient ID	(0010,0020)	supplied value
Accession Number	(0008,0050)	
Requested Procedure ID	(0040,1001)	
Study Instance UID	(0020,000D)	
Requested Procedure Description	(0032,1060)	
Requested Procedure Code Sequence	(0032,1064)	

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Table 20 *Attributes for Report Query*

Attribute Name	Attribute Tag	Usage SCU
>Code Value	(0008,0100)	
>Coding Scheme Designator	(0008,0102)	
>Code Meaning	(0008,0104)	
Requesting Physician Name	(0032,1032)	
Referring Physician Name	(0008,0090)	
Reason for Study	(0032,1030)	
Patient Birth Date	(0010,0030)	
Patient Sex	(0010,0040)	
Patient Weight	(0010,1030)	
Confidentiality Constraint on Patient Data Description	(0040,3001)	
Pregnancy Status	(0010,21C0)	
Medical Alerts	(0010,2000)	
Contrast Allergies	(0010,2110)	
Study Description	(0008,1030)	
Study Date	(0008,0020)	
Study Time	(0008,0030)	
Record Date	(4008,0100)	
Record Time	(4008,0101)	
Interpretation Recorder	(4008,0102)	
Transcription Date	(4008,0108)	
Transcription Time	(4008,0109)	
Interpretation Transcriber	(4008,010A)	
Interpretation Author	(4008,010C)	
Approver Sequence	(4008,0111)	
> Approval Date	(4008,0112)	
> Approval Time	(4008,0113)	
> Physicians Appr.	(4008,0114)	

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Table 20 *Attributes for Report Query*

Attribute Name	Attribute Tag	Usage SCU
Interpretation Text	(4008,0115)	
Interpretation ID	(4008,0200)	
Interpretation Type	(4008,0210)	
Interpretation Status ID	(4008,0212)	

2.2.5 Association Acceptance Policy

The *syngo* Data Manager application attempts to accept a new association for

- DIMSE C-ECHO
- DIMSE C-STORE
- DIMSE C-MOVE
- DIMSE C-FIND
- DIMSE C-CANCEL-FIND
- DIMSE C-CANCEL-MOVE
- DIMSE N-CREATE/N-SET (MPPS)
- DIMSE N-ACTION (Storage Commitment)
- DIMSE N-EVENT-REPORT (Storage Commitment)

service operations.

Generally associations are accepted if all of the following conditions are true:

- The "called AET" matches the one of the configured AETs of the *syngo* Data Manager DICOM application. (This check can be disabled.)
- The "calling AET" is allowed to connect to *syngo* Data Manager. (This check can be configured and/or disabled).
- The maximum number of incoming associations is not reached *(cf. to section 2.2.3.2)*.
- At least one Presentation Context has been proposed with at least one suitable transfer syntax as defined by the "Presentation Context Tables" in the following subsections.

Note

Versions before VB30A also required a successfull "reverse hostname lookup" which resolved the IP address of the peer into a human readable hostname. This check is disabled by default in version VB30A and following.

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Generally all presentation contexts are accepted as long as it contains at least one suitable transfer syntax. All other presentation contexts are rejected.

If a Proposed Presentation Context contains more than one Transfer Syntax, the one in the following priority list is chosen (if applicable for the SOP class):

1. Explicit VR Little Endian
2. Implicit VR Little Endian
3. Explicit VR Big Endian
4. JPEG Lossless (Process 14)
5. JPEG 2000 Lossless Only
6. JPEG 2000
7. RLE
8. JPEG Baseline
9. JPEG Extended Process 2 & 4

2.2.5.1 Real-World Activity "Receive Objects"

2.2.5.1.1 Associated Real-World Activity

The *syngo* Data Manager receiving process will accept an association, receive any images transmitted on that association and store the images on disk. It will store some header attributes in the database in order to allow clients to query these attributes and in order to trigger workflow related actions.

2.2.5.1.2 Presentation Context Table

The *syngo* Data Manager DICOM application will accept Presentation Contexts as shown in the following table *(cf. to Table 21)*:

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Table 21 *Acceptable Presentation Contexts - Storage*

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extend-ed**
Name	**UID**	**Name List**	**UID List**		**Negotia-tion**
CR Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Digital X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Digital X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Digital Mammography X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Digital Mammography X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.2.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None

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Table 21 *Acceptable Presentation Contexts - Storage*

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extend-ed**
Name	**UID**	**Name List**	**UID List**		**Negotia-tion**
Digital Intra-oral X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Digital Intra-oral X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
US Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Lossless JPEG 2000 Lossless Only JPEG 2000 RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
US Multi-frame Image Storage (Re-tired)	1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Lossless JPEG 2000 Lossless Only JPEG 2000 RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None

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Table 21 *Acceptable Presentation Contexts - Storage*

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extend-ed Negotia-tion**
Name	**UID**	**Name List**	**UID List**		
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Lossless JPEG 2000 Lossless Only JPEG 2000 RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
US Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Lossless JPEG 2000 Lossless Only JPEG 2000 RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91 1.2.840.10008.1.2.5	SCP	None
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None

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Table 21 *Acceptable Presentation Contexts - Storage*

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extend-ed**
Name	**UID**	**Name List**	**UID List**		**Negotia-tion**
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
NM Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None

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Table 21 *Acceptable Presentation Contexts - Storage*

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extend-ed Negotia-tion**
Name	**UID**	**Name List**	**UID List**		
NM Image Storage (Re-tired)	1.2.840.10008.5.1.4.1.1.5	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Stored Print Storage	1.2.840.10008.5.1.1.27	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Hardcopy Grayscale Im-age Storage	1.2.840.10008.5.1.1.29	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
VL Endo-scopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None

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Table 21 *Acceptable Presentation Contexts - Storage*

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extend-ed**
Name	**UID**	**Name List**	**UID List**		**Negotia-tion**
VL Micro-scopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
VL Slide-Co-ordinates Mi-croscopic Image Stor-age	1.2.840.10008.5.1.4.1.1.77.1.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
VL Photo-graphic Mi-croscopic Image Stor-age	1.2.840.10008.5.1.4.1.1.77.1.4	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended 24 JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
Positron Emission To-mography Im-age Storage	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Lossless JPEG 2000 Lossless Only JPEG 2000	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.90 1.2.840.10008.1.2.4.91	SCP	None
MR Spectros-copy	1.2.840.10008.5.1.4.1.1.4.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Stand-alone Overlay Stor-age	1.2.840.10008.5.1.4.1.1.8	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Stand-alone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None

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Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extend-ed Negotia-tion**
Name	**UID**	**Name List**	**UID List**		
Ambulatory ECG Wave-form Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Hemodynam-ic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Cardiac Elec-trophysiolo-gy Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Basic Voice Audio Wave-form Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Stand-alone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Stand-alone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Grayscale Softcopy Pre-sentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Comprehen-sive SR	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Mammogra-phy CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None

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Table 21 *Acceptable Presentation Contexts - Storage*

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extend-ed Negotia-tion**
Name	**UID**	**Name List**	**UID List**		
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Stand-alone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
RT Ion Beams Treatment Storage	1.2.840.10008.5.1.4.1.1.481.9	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
CSA Non-Image Storage	1.3.12.2.1107.5.9.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Acuson Kinet-DX SR	1.2.840.10008.5.1.4.1.1.88.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None

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2.2.5.1.3 SOP Specific Conformance Statement

The *syngo* Data Manager DICOM application conforms to the Full Storage Class at Level 2. In case of a successful C-STORE operation, the image has successfully been written on disc either in Explicit Little Endian format or in the compression format received. Please refer to Table 22 for an explanation of the status codes returned for the C-STORE operation.

Table 22 *C-STORE SCP Return Status*

Service Status	Meaning	Protocol Codes	Related Fields
Error	missing, empty or invalid attribute(s) Missing attribute is stored in (0000,0901)	A900	(0000,0901) (0000,0902)
Error	Refused: Out of resources due to internal reconfiguration	A700	(0000,0902)
Processing Failure	could not write to file system could not write to database could not translate metadata	0110	(0000,0902)
In the cases mentioned above the image is not stored, neither on file system nor in the database. The association will not be aborted.			
Success	image is successfully stored on file system	0000	None

2.2.5.1.3.1 Return Status "Success" for Workflow AEs

The *syngo* Data Manager DICOM receiver returns the status Success upon successful operation. Successful operation does **not** guarantee a successful storage of the metadata in the database. It does mean that the images are successfully stored on the file system and a minimal image header validation was successful. The received image header contains a syntactically valid and not empty Patient Name, Study Instance UID, Series Instance UID and SOP Instance UID.

2.2.5.1.3.2 Return Status "Success" for Dicom Archive User AE

The *syngo* Data Manager DICOM receiver returns the status Success for an image if it could successfully be stored on the file system and a minimal image header validation was successful. The received image header contains a syntactically valid and not empty Patient Name, Study Instance UID, Series Instance UID and SOP Instance UID. If the image was not requested to be retrieved by the Dicom Archiv User before it will be deleted even if a successful response was sent.

2.2.5.1.3.3 Other SOP specific behaviour

- Due to the IHE Patient Information and Reconciliation profile (PIR) patient and study information might be updated after successful storage.
- If an image is received that is already stored in the database - identified by the SOP Instance UID - the new image will be ignored. The existing instance is not superseded.

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- The Patient ID is specified as a "type 2" attribute by DICOM. Therefore the attribute must be in the message but it may be empty. The *syngo* Data Manager needs the Patient ID for internal processing. If the Patient ID is missing a new one will be inserted.
- If the insertion of the image information to the database fails a message will be generated and a system administrator has the possibility to correct these images or whatever might be useful. It is strongly recommended that modalities use the Storage commitment service before deleting the images from their local databases. It is possible to configure sending the status Success **after** inserting the metadata to the database. This however has an impact on performance.
- Currently the Multi-frame Single Bit Secondary Capture Image Storage SOP class has the following restrictions: The image must contain only one frame or the each frame must end on exact byte boundaries. Otherwise the image is rejected.

2.2.5.2 Real World Activity "Receive MPPS"

2.2.5.2.1 Associated Real-World Activity

The associated Real-World activity is to accept a newly performed procedure from an SCU.

Multiple N-CREATE, N-SET requests over the same association are supported.

2.2.5.2.2 Accepted Presentation Contexts

The *syngo* Data Manager DICOM application will accept Presentation Contexts as shown in Table 23.

Table 23 *Acceptable Presentation Contexts - MPPS*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotia-tion
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

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2.2.5.2.3 SOP Specific Conformance Statement

The following tables describe the supported attributes, which are stored in the database. Although DICOM does not allow to set some attributes in the N-SET Request - like performed procedure step relationship attributes or modality and study id - the SCP would change new values for these attributes, if they are present in the message.

Table 24 *Performed Procedure Step N-CREATE Attributes*

Attribute name	Tag	Value
Performed Procedure Step Relationship		
Scheduled Step Attribute Sequence	(0040,0270)	
>Study Instance UID	(0020,000D)	
>Referenced Study Sequence	(0008,1110)	
>>Referenced SOP Class UID	(0008,1150)	
>>Referenced SOP Instance UID	(0008,1155)	
>Accession Number	(0008,0050)	
>Requested Procedure ID	(0040,1001)	
>Requested Procedure Description	(0032,1060)	
>Scheduled Procedure Step ID	(0040,0009)	
>Scheduled Procedure Step Description	(0040,0007)	
>Scheduled Action Item Sequence	(0040,0008)	
>>Code Value	(0008,0100)	
>>Coding Scheme Designator	(0008,0102)	
>>Coding Scheme Version	(0008,0103)	
>>Code Meaning	(0008,0104)	
Patient’s Name	(0010,0010)	
Patient ID	(0010,0020)	
Patient’s Birth Date	(0010,0030)	
Patient’s Sex	(0010,0040)	
Performed Procedure Step Informations		
Performed Station AE Title	(0040,0241)	
Performed Station Name	(0040,0242)	
Performed Location	(0040,0243)	
Performed Procedure Step Start Date	(0040,0244)	
Performed Procedure Step Start Time	(0040,0245)	
Performed Procedure Step Status	(0040,0252)	"IN PROGRESS"
Performed Procedure Step ID	(0040,0253)	

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Attribute name	Tag	Value
Performed Procedure Step Description	(0040,0254)	
Performed Procedure Type Description	(0040,0255)	
Procedure Code Sequence	(0008,1032)	
>Code Value	(0008,0100)	
>Coding Scheme Designator	(0008,0102)	
>Coding Scheme Version	(0008,0103)	
>Code Meaning	(0008,0104)	
Performed Procedure Step End Date	(0040,0250)	
Performed Procedure Step End Time	(0040,0251)	
Image Acquisition Results		
Modality	(0008,0060)	
Study ID	(0020,0010)	
Performed Action Item Code Sequence	(0040,0260)	
>Code Value	(0008,0100)	
>Coding Scheme Designator	(0008,0102)	
>Coding Scheme Version	(0008,0103)	
>Code Meaning	(0008,0104)	
Performed Series Sequence	(0040,0340)	
>Performing Physicians's Name	(0008,1050)	
>Operator's Name	(0008,1070)	
>Series Instance UID	(0020,000E)	
>Series Description	(0008,103E)	
>Retrieve AE Title	(0008,0054)	
>Referenced Image Sequence	(0008,1140)	
>Referenced Standalone SOP Instance Sequence	(0040,0220)	

The MPPS provider expects a complete set of attributes in the N-SET Request message. If an attribute is missing or filled with a different value, the old values will be overwritten.

Table 25 *Performed Procedure Step N-SET Attributes*

Attribute name	Tag	Value
Performed Procedure Step Informations		
Performed Procedure Step Status	(0040,0252)	"COMPLETED" or "DIS-CONTINUED"

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Attribute name	**Tag**	**Value**
Performed Procedure Step Description	(0040,0254)	
Performed Procedure Type Description	(0040,0255)	
Procedure Code Sequence	(0008,1032)	
>Code Value	(0008,0100)	
>Coding Scheme Designator	(0008,0102)	
>Coding Scheme Version	(0008,0103)	
>Code Meaning	(0008,0104)	
Performed Procedure Step End Date	(0040,0250)	
Performed Procedure Step End Time	(0040,0251)	
Image Acquisition Results		
Performed Action Item Code Sequence	(0040,0260)	
>Code Value	(0008,0100)	
>Coding Scheme Designator	(0008,0102)	
>Coding Scheme Version	(0008,0103)	
>Code Meaning	(0008,0104)	
Performed Series Sequence	(0040,0340)	
>Performing Physicians's Name	(0008,1050)	
>Protocol Name	(0018,1030)	
>Operator's Name	(0008,1070)	
>Series Instance UID	(0020,000E)	
>Series Description	(0008,103E)	
>Retrieve AE Title	(0008,0054)	
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Class UID	(0008,1150)	
>>Referenced SOP Instance UID	(0008,1155)	
>Referenced Standalone SOP Instance Sequence	(0040,0220)	

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2.2.5.2.4 Return Codes

The SCP returns the status codes listed in Table 26.

Table 26 *N-SET/N-CREATE Return Status*

Service Status	Status Code	Meaning	Related Fields
Processing failure	0110H	Application processing failure	(0000,0902)
Processing failure	0110H	MPPS already completed	(0000,0902)= Performed Procedure Step Object may no longer be updated (0000,0903) = 0xA710
Duplicate SOP instance	0111H	The optional field contains the SOP Instance UID which was already allocated to another SOP Instance	(0000,1000)
Missing attribute	0120H		Attribute List
Invalid attribute value	0106H		Attribute List
Missing attribute value	0121H		Attribute List
Success	0000H	Matching is complete - No final Identifier is supplied	None

2.2.5.3 Real World Activity "Receive Commitment Request"

2.2.5.3.1 Associated Real-World Activity

When receiving a Storage Commitment request the *syngo* Data Manager DICOM application will perform the necessary steps to check the received list of instances against the database.

2.2.5.3.2 Accepted Presentation Contexts - Receive Commit Request

The *syngo* Data Manager DICOM application will accept Presentation Contexts as shown in the following table:

Table 27 *Accepted Presentation Contexts - Receive Storage Commitment Request*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

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2.2.5.3.3 SOP-Specific Conformance Statement - Receive Commit Request

There are only 2 different return status codes for the commitment request itself. They indicate only whether the request was successfully received or not. The real response is sent via N-EVENT-REPORT-RQ either on the same or on a different association (see 2.2.4.4).

The client application is responsible for creating a unique transaction UID. The provider will not check, whether the UID is already in use or not.

Table 28 *Return Codes*

Service Status	Meaning	Protocol Codes	Related Fields
Processing failure	processing failure without comment	0110	(0000,0902)
Success	The request was successfully received	0000	none

Success or failure of storage commitment will be signalled via the N-EVENT-REPORT primitive.

2.2.5.4 Real World Activity "Receive Commitment Notification"

2.2.5.4.1 Associated Real-World Activity

When receiving a Storage Commitment notification the *syngo* Data Manager Dicom Archive User AE will update the archiving state for each image referenced in the notification.

2.2.5.4.2 Accepted Presentation Contexts - Receive Commit Notification

The *syngo* Data Manager DICOM application will accept Presentation Contexts as shown in the following table:

Table 29 *Accepted Presentation Contexts - Receive Storage Commitment Request*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

2.2.5.4.3 SOP-Specific Conformance Statement - Receive Commit

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Notification

There are only 2 different return status codes for the N-EVENT-REPORT request itself as specified in Table 30. A status of "Processing failure" is sent back if the N-EVENT-REPORT request was not correctly formed, the Transaction UID is unknown or an internal error processing the request occured.

Table 30 *Return Codes*

Service Status	Meaning	Protocol Codes	Related Fields
Processing failure	processing failure without comment	0110	(0000,0902)
Success	The request was successfully received	0000	none

2.2.5.5 Real World Activity "Receive C-FIND request"

2.2.5.5.1 Associated Real-World Activity

The associated Real-World activity is to respond to requests issued by an SCU with the query model Patient Root, Study Root and Patient/Study Only. Relational retrieve operations are supported. With a C-FIND-CANCEL request the running query can be canceled at any time.

2.2.5.5.2 Accepted Presentation Contexts - Find SCP

The *syngo* Data Manager DICOM application will accept Presentation Contexts as shown in the following table:

Table 31 *Accepted Presentation Contexts - Receive C-FIND request*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Patient Root Query/ Retrieve Information Model - FIND	1.2.840.10008. 5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Study Root Query/ Retrieve Information Model FIND	1.2.840.10008. 5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/Retrieve Information Model FIND	1.2.840.10008. 5.1.4.1.2.3.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

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2.2.5.5.3 SOP Specific Conformance Statement - Find SCP

The *syngo* Data Manager DICOM Query/Retrieve SCP supports hierarchical queries with all mandatory and optional search keys. The following four tables describe the search keys for the four levels of query that the SCP supports.

Table 32 *C-FIND SCP: Patient Level Attributes*

Attribute name	Tag	Usage SCU	Matching
Patient Name	(0010,0010)	O	single value, wildcard, universal
Patient ID	(0010,0020)	U (Patient Root, Patient/ Study only) R (Study Root)	single value, wildcard, universal
Patient's Birth Date	(0010,0030)	O	single value, range, universal
Patient's Sex	(0010,0040)	O	single value, wildcard, universal
Other Patient IDs	(0010,1000)	O	single value, wildcard, universal, multiple values
Other Patient Names	(0010,1001)	O	multiple values
Ethnic Group	(0010,2160)	O	single value, wildcard, universal
Patient Comments	(0010,4000)	O	universal
Number of Patient Related Studies	(0020,1200)	return key only	no matching
Number of Patient Related Series	(0020,1202)	return key only	no matching
Number of Patient Related Instances	(0020,1204)	return key only	no matching

Table 33 *C-FIND SCP: Study Level Attributes*

Attribute name	Tag	Usage SCU	Matching
Study Instance UID	(0020,000D)	U	single value, list of UID
Study ID	(0020,0010)	O	single value, wildcard, universal
Study Date	(0008,0020)	O	single value, range, universal
Study Time	(0008,0030)	O	single value, range, universal
Accession Number	(0008,0050)	O	single value, wildcard, universal
Modalities in Study	(0008,0061)	O	universal, single value, multiple value

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Table 33 *C-FIND SCP: Study Level Attributes*

Attribute name	Tag	Usage SCU	Matching
Referring Physician's Name	(0008,0090)	O	single value, wildcard, universal
Study Description	(0008,1030)	O	single value, wildcard, universal
Procedure Code Sequence	(0008,1032)	O	sequence matching
Number of Study Related Series	(0020,1206)	return key only	no matching
Number of Study Related Instances	(0020,1208)	return key only	no matching

Table 34 *C-FIND SCP: Series Level Attributes*

Attribute name	Tag	Usage SCU	Matching
Series Instance UID	(0020,000E)	U	single value, list of UID
Series Number	(0020,0011)	O	single value, wildcard, universal
Modality	(0008,0060)	O	single value, wildcard, universal
Body Part Examined	(0018,0015)	O	single value, wildcard, universal
Series Date	(0008,0021)	O	single value, range, universal
Series Time	(0008,0031)	O	single value, range, universal
Series description	(0008,103E)	O	single value, wildcard, universal
Number of Series Related Instances	(0020,1209)	return key only	no matching
Referenced Performed Procedure Sequence	(0008,1111)	O	sequence matching
>Referenced SOP Class UID	(0008,1150)	O	single value, list of UID
>Referenced SOP Instance UID	(0008,1155)	O	single value, list of UID
Performed Procedure Step Start Date	(0040,0244)	O	single value, range, universal
Performed Procedure Step Start Time	(0040,0245)	O	single value, range, universal
Performed Procedure Step ID	(0040,0253)	O	single value, wildcard, universal
Performed Procedure Step Description	(0040,0254)	O	single value, wildcard, universal
Request Attribute Sequence	(0040,0275)	O	sequence matching
>Requested Procedure ID	(0040,1001)	O	single value, wildcard, universal

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Table 34 *C-FIND SCP: Series Level Attributes*

Attribute name	Tag	Usage SCU	Matching
>Scheduled Procedure Step ID	(0040,0009)	O	single value, wildcard, universal

The following table is valid for different types of content documents (Images, SRs, GSPS, Key Image Notes). Some attributes are valid only for special instances - the usage is described in the Usage SCU column.

Table 35 *C-FIND SCP: Instance Level Attributes*

Attribute name	Tag	Usage SCU	Matching
SOP Instance UID	(0008,0018)	U	single value, list of UID
SOP Class UID	(0008,0016)	O	single value, list of UID
Content Date	(0008,0023)	O	single value, range, universal
Content Time	(0008,0033)	O	single value, range, universal
Acquisition Number	(0020,0012)	O	single value, universal
Instance Number	(0020,0013)	O	single value, universal
Patient Orientation	(0020,0020)	O	single value, universal
Samples per Pixel	(0028,0002)	O	single value, universal
Photometric Interpretation	(0028,0004)	O	single value, universal
Number of Frames	(0028,0008)	O	single value, universal
Rows	(0028,0010)	O	single value, universal
Columns	(0028,0011)	O	single value, universal
Bits Allocated	(0028,0100)	O	single value, universal
Bits Stored	(0028,0101	O	single value, universal
Operators' Name	(0008,1070)	query RT ION Plan	single value, universal
RT Plan Label	(300A,0002)	query RT ION Plan	single value, universal
RT Plan Name	(300A,0003)	query RT ION Plan	single value, universal
RT Plan Description	(300A,0004)	query RT ION Plan	single value, universal
RT Plan Date	(300A,0006)	query RT ION Plan	single value, range, universal
RT Plan Time	(300A,0007)	query RT ION Plan	single value, range, universal
Plan Intent	(300A,000A)	query RT ION Plan	single value, universal
Prescription Description	(300A,000E)	query RT ION Plan	single value, universal
Approval Status	(300E,0002)	query RT ION Plan	single value, universal

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Table 35 *C-FIND SCP: Instance Level Attributes*

Attribute name	Tag	Usage SCU	Matching
Completion Flag	(0040,A491)	query SR	single value, universal
Concept Name Code Sequence	(0040,A043)	query SR	sequence
> Code Value	(0008,0100)	query SR	single value, universal
> Code Scheme Designator	(0008,0102)	query SR	single value, universal
> Code Scheme Version	(0008,0103)	query SR	single value, universal
> Code Meaning	(0008,0104)	query SR	single value, universal
Observation Date Time	(0040,A032)	query SR	single value, range, universal
Verifying Observer Sequence	(0040,A073)	query SR	sequence
> Verifying Organization	(0040,A027)	query SR	single value, universal
> Verifying Date Time	(0040,A030)	query SR	single value, universal
> Verifying Observer Name	(0040,A075)	query SR	single value, universal
> Verifying Observer Identification Code Sequence	(0040,A088)	query SR	single value, universal
Referenced Request Sequence	(0040,A370)	query SR	sequence
> Study Instance UID	(0020,000D)	query SR	single value, universal
> Accession Number	(0008,0050)	query SR	single value, universal
> Requested Procedure ID	(0040,1001)	query SR	single value, universal
> Requested Procedure Code Sequence	(0032,1064)	query SR	single value, universal
> Code Value	(0008,0100)	query SR	single value, universal
> Code Scheme Designator	(0008,0102)	query SR	single value, universal
> Code Scheme Version	(0008,0103)	query SR	single value, universal
> Code Meaning	(0008,0104)	query SR	single value, universal
Verification Flag	(0040,A493)	query SR	single value, universal
Content Template Sequence	(0040,A504)	query SR	sequence
>Template Identifier	(0040,DB00)	query SR	single value, universal
Presentation Label	(0070,0080)	query GSPS	single value, universal
Presentation Description	(0070,0081)	query GSPS	single value, universal
Presentation Creation Date	(0070,0082)	query GSPS	single value, range, universal
Presentation Creator’s Name	(0070,0084)	query GSPS	single value, universal
Referenced Series Sequence	(0008,1115)	query GSPS	sequence
> Series Instance UID	(0020,000E)	query GSPS	single value, universal, list

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Table 35 *C-FIND SCP: Instance Level Attributes*

Attribute name	Tag	Usage SCU	Matching
> Referenced Image Sequence	(0008,1140)	query GSPS	single value, universal, list
>> Referenced SOP Class UID	(0008,1150)	query GSPS	single value, universal, list
>> Referenced SOP Instance UID	(0008,1155)	query GSPS	single value, universal, list

The query attribute contents will be treated case-sensitive except all PN attributes which will always be treated case-insensitive.

The Find SCP does not return any Media File-Set IDs or UIDs, it always returns the Retrieve AET (0008,0054).

The Find SCP always returns "Instance Availability" (0008,0056).

Starting with VB20D *syngo* Imaging provides two AEs supporting Query/Retrieve as SCP. The **Workflow filtered** AE suppresses all matches (i.e. SOP Instances) which are not referenced by the last procedure step of a non-discontinued examination. The **Workflow unfiltered** AE will always return matches for each SOP Instance stored on the system. Please refer to section 2.1 on page 20 for more information about the actual AETs.

2.2.5.5.4 Hierarchical and Relational Queries

With and without extended negotiation for relational queries, each C-FIND request is treated as if it was a relational query. The SCP allows any combination of keys at any level in the hierarchy.

2.2.5.5.5 Return Codes

The Find SCP returns the following status codes:

Table 36 *C-FIND SCP Return Status*

Service Status	Meaning	Protocol Codes	Related Fields
Processing failure	Parsing or translation of the DICOM request failed (new) A response could not be generated.(new) The response could not be sent to the client The query of the database failed.	C001	(0000,0902)
Cancel	Matching terminated due to a Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied	0000	None

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Table 36 *C-FIND SCP Return Status*

Service Status	Meaning	Protocol Codes	Related Fields
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier

The maximum number of matches returned can be configured. The status of the final response will always be SUCCESS whether the clipping occured or not.

2.2.5.6 Real World Activity "Move SCP"

2.2.5.6.1 Associated Real-World Activity

The associated Real-World activity is to respond to retrieve requests to an SCU. The SCP supports the query models Patient Root, Study Root and Patient/Study Only. The Storage Service Class Conformance Statement describes the C-STORE service which is generated by the C-MOVE service.

2.2.5.6.2 Accepted Presentation Contexts - Move SCP

The *syngo* Imaging DICOM application will accept Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Move	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/ Retrieve Move	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

2.2.5.6.3 SOP Specific Conformance Statement - Move SCP

At association establishment time the C-MOVE presentation context shall be negotiated. The C-STORE sub-operations is done on a different association, specified in the C-MOVE request, to transfer images to a remote SCP of the Storage Service Class.

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In previous versions of the *syngo* Data Manager the Q/R-Level was silently ignored and a relational query was performed. Starting with VA15A the QR Level is mandatory. Keys below the QR-Level will be rejected with code "0106".

Starting with VB20D *syngo* Imaging provides two AEs supporting Query/Retrieve as SCP. The "workflow filtered" AE suppresses to move all matches (i.e. SOP Instances) which are not referenced by the last procedure step of a non-discontinued examination. The "unfiltered" AE will always move all matches stored on the system. Please refer to section 2.1 on page 20 for more information about the actual AETs.

2.2.5.6.4 Hierarchical and Relational Queries

With and without extended negotiation for relational queries each move request is treated as a relational request by ignoring attributes above the Query/Retrieve Level. Attributes below the Query/Retrieve Level are not supported.

2.2.5.6.5 Implicit dearchiving

If objects are requested which are not online, the following steps are executed one by one:

1. An implicit dearchive task is initiated,
2. all "ONLINE" objects are transferred,
3. the completion of the dearchive task is awaited. In the meantime pending messages are sent every two seconds to the initiator.
4. Then the dearchived objects are transferred.

If some objects are not dearchived, then the return code is "B000" and the missing instances are listed in the "Failed SOP Instance UID List" (0008,0058).

Please note that the transfer of the dearchived objects is done in a second C-STORE association.

2.2.5.6.6 Return Codes

The Move SCP returns following status codes:

Table 37 *C-MOVE Return Status*

Service Status	Meaning	Protocol Codes	Related Fields
Missing Attribute	The Query Retrieve Level attribute is missing	0120	(0000,1005)
Invalid Attribute Value	Attributes below the Q/R level have been found.	0106	n/a
Processing Failure	unexpected error The complete Image Move Command had been aborted	C001	(0000,0901)
Refused	Move Destination unknown (next increment)	A801	(0000,0902)

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Table 37 *C-MOVE Return Status*

Service Status	Meaning	Protocol Codes	Related Fields
Cancel	Sub-operations terminated due to Cancel Indication (next increment)	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures or Warnings	B000	(0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warning	0000	(0000,1021) (0000,1022) (0000,1023)

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2.3 Configuration

2.3.1 AE Title / Presentation Address Mapping

To ensure unique identification within the network the hostname should be used as part of the AE Titles (see examples below). The string can be up to 16 characters and must not contain any extended characters. Only 7-bit ASCII characters (excluding Control Characters) are allowed according to DICOM Standard.

2.3.1.1 AE Title

The *syngo* Data Manager DICOM application provides three Application Entities. The title for all Application Entities can be configured in the *syngo* Imaging Service software. The default for the Workflow filtered AET is the first part of the hostname in upper case. The default for the Workflow unfiltered AET is the AET of the workflow filtered AET with the suffix `_ALL`. The default for the Dicom Archive User AET is the AET of the Workflow filtered AET with the suffix `_DAU`. If the hostname is longer than 12 characters the default for the Workflow filtered AET is to take only the last 12 characters of the hostname. This is necessary because the AET may not exceed 16 characters.

For example:

Hostname	`sdm.healthcare-site.org`
workflow filtered AET	`SDM`
unfiltered AET	`SDM_ALL`
Dicom Archive Uset AET	`SDM_DAU`

The port number for all Application Entities is configurable in the *syngo* Imaging Service. The default port number for all Application Entities is 2002.

2.3.2 Configurable Parameters

The Application Entity Titles, host names and port numbers of remote nodes are configured using the *syngo* Imaging Service software.

The current implementation uses aet-nameservice.xml to configure remote DICOM nodes. New AETs can be inserted without restarting the process.

2.3.3 Default Parameters

Table 38 lists some default configuration parameters.

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Table 38 *Default Parameters*

Parameter	Value
max PDU size	28672 Bytes
time-out for accepting/rejecting an association request	60 s
time-out for responding to an association open/close request	60 s
time-out for accepting a message over network	60 s
time-out for waiting for data between TCP/IP-packets	60 s
time-outs for waiting for a Service Request/Response message from the remote node (Storage SCP/SCU)	600 s
time-outs for waiting for a Service Request/Response message from the remote node (Query/Retrieve SCP/SCU)	600 s
number of image collection before saving to database	maximage-counter=20
activate MPPS Simulation	dis-ablemppssimu-late=true
max matches querylimit	unlimited
max number of parallel associations	50

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3 Conformance for *syngo* Studio

3.1 Networking

3.1.1 Implementation Model *syngo* Studio

The *syngo* Studio Workplace contains two DICOM AEs:

- A **Query SCU** for retrieving informations from other DICOM nodes.
- A **Print SCU** for sending images to a DICOM printer.

Both AEs are described in the following sections.

3.1.1.1 Application Data Flow Diagram

The *syngo* Studio Workplace DICOM network implementation acts as SCU for the print management network service. The product target Operating System is Windows XP / 2000.

Figure 9: *Application Data Flow Diagram - Print SCU*

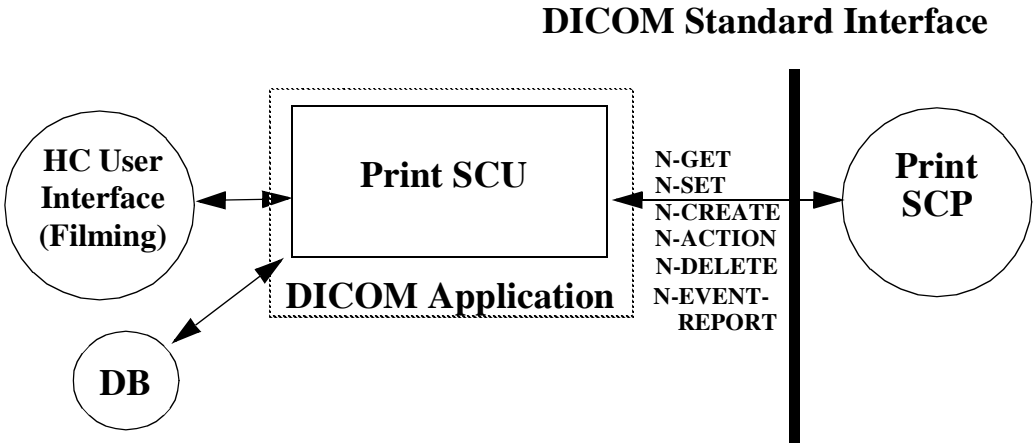
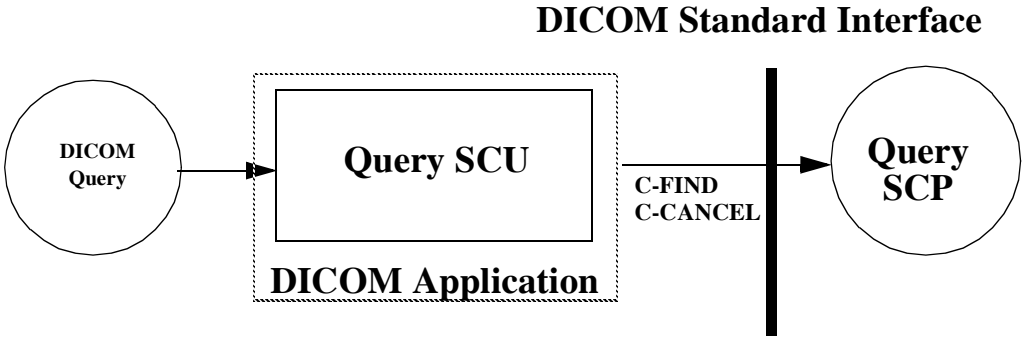


Figure 10: *Application Data Flow Diagram - Query SCU*



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3.1.1.2 Functional Definitions of Application Entities

3.1.1.2.1 Application Entity "Query"

The Query Service Classes define an application-level class of services, which facilitate the querying of Studies or Series on different DICOM nodes.

The *syngo* Studio Workplace DICOM query SCU initiates a C-FIND DIMSE request to the remote query SCP. The Query SCP returns a list of responses with defined Data, which are displayed to the user.The user can decide to start a retrieve or do another query. The Query SCU support the Patient Root Query Model.

3.1.1.2.2 Application Entity "Print"

The Print Management Service Classes define an application-level class of services, which facilitate the printing of images on a hardcopy medium. The print management SCU and print management SCP are peer DICOM print management application entities. The *syngo* Studio Workplace DICOM print application supports the print management DIMSE services to act as SCU.

The Print SCU is invoked by the user interface to setup film-sheet layout and whenever an image is ready to be printed on film. The Print SCU will hold and maintain all data needed to compile a complete film-sheet from the data (images, layout, configuration) received. Whenever a film-sheet is ready to print the related data is used to supply the Information to the SOP Classes of the Print Management Service Class. A queue is maintained, in order to intermediately store several film-sheets in case of resource problems on printer. The SCU will only supply and require the mandatory SOP Classes of the Print Management Service Class.

Note

The "Print" Application Entity is optional depending on licensing and configuration.

3.1.1.3 Sequencing of Real World Activities

not applicable.

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3.1.2 AE Specifications *syngo* Studio

3.1.2.1 Query Service AEs Specification

syngo Studio Workplace provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU:

Table 39 *Query SOP Classes as an SCU*

SOP Class Name	SOP Class UID
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1

3.1.2.1.1 Association Establishment Policies

3.1.2.1.1.1 General

The default PDU size used will be 512 KB.

3.1.2.1.1.2 Number of Associations

The *syngo* Studio Workplace does not open more than 1 concurrent association.

3.1.2.1.1.3 Asynchronous Nature

The *syngo* Studio Workplace DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

3.1.2.1.1.4 Implementation Identifying Information

The *syngo* Studio Workplace DICOM software provides a single Implementation Class UID of

- 1.3.12.2.1107.5.9.20000101

and an Implementation Version Name of

- SIEMENS_SWP

3.1.2.1.2 Association Initiation Policy

The *syngo* Studio Workplace DICOM application will initiate new associations for the following DIMSE-C operations as SCU:

- C-FIND
- C-FIND-CANCEL

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3.1.2.1.2.1 Real World Activity - Query a Remote Node

3.1.2.1.2.1.1 Associated Real World Activity

The associated Real-World activity is a C-Find request initiated by the user of the Reporting station. The user specifies some attributes the remote Application should use to query the database. If the query user successfully establishes an association to the remote Application Entity, it will send a C-Find request (according to the query model) and will then return the results to the application.

3.1.2.1.2.1.2 Proposed Presentation Contexts

The *syngo* Studio Workplace will propose Presentation Contexts as shown in the following table.

Table 40 *Presentation Context - Query/Retrieve*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Patient Root Query/ Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	Yes

3.1.2.1.2.1.3 SOP Specific Conformance Statement

The *syngo* Studio Workplace uses hierarchical queries. It checks for the following status codes in the Query/Retrieve provider's response to the C-Find request:

- SUCCESS (0000): Matching is complete
- PENDING (FF00): Matches are continuing
- PENDING (FF01): Matches are continuing, no optional key support
- REFUSED (A700): Out of Resources
- CANCEL (FE00)

The Query/Retrieve levels supported are

- Patient
- Study
- Series

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The following tables list the attributes at Patient, Study, and Series levels, which can be used for queries as well as return values for display.

Table 41 *Attributes at Patient Level*

Attribute	Tag	Type	Matching	User Input/Display
Patient Name	(0010,0010)	R	Wildcard	Yes/Yes
Patient ID	(0010,0020)	U	Wildcard	Yes/Yes
Patient DOB	(0010,0032)	O	Universal	No/Yes

Table 42 *Attributes at Study Level*

Attribute	Tag	Type	Matching	User Input/Display
Patient Name	(0010,0010)	R	Wildcard	Yes/Yes
Patient ID	(0010,0020)	U	Wildcard	Yes/Yes
Study Instance UID	(0020,000D)	U	Single value	No/No
Study Date	(0008,0020)	R	Universal/Range	Yes/Yes
Accession number	(0008,0050)	R	Universal	No/Yes
Referring Physician's Name	(0008,0090)	O	Universal	No/Yes
Study Description	(0008,1030)	O	Universal	No/Yes

Table 43 *Attributes at Series Level*

Attribute	Tag	Type	Matching	User Input/Display
Patient Name	(0010,0010)	R	Wildcard	Yes/Yes
Patient ID	(0010,0020)	U	Wildcard	Yes/Yes
Study Date	(0008,0020)	R	Universal	Yes/Yes
Referring Physician's Name	(0008,0090)	O	Universal	No/Yes
Series Instance UID	(0020,000E)	U	Single Value	No/No
Modality	(0008,0060)	R	Universal	Yes/Yes
Organ	(0018,0015)	O	Universal	Yes/Yes
Number of series related instances	(0020,1209)	O	Universal	No/Yes

The maximum number of query responses is configurable to limit the query time.

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3.1.2.2 Print Management AE Specification

The *syngo* Studio Workplace Print Management SCU invokes print management DIMSE services to print images with a defined layout on a selected network-based DICOM hardcopy printer. This is done in a “full-page” print mode.

The *syngo* Studio Workplace provides Standard Conformance to the DICOM V3.0 Print Management Meta SOP Classes listed in Table 44 and Table 45 as an SCU:

Table 44 *Grayscale Print Management Meta SOP Classes as an SCU*

SOP Class Name	SOP Class UID
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
- Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
- Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
- Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
- Printer SOP Class	1.2.840.10008.5.1.1.16
Print Job SOP Class	1.2.840.10008.5.1.1.14
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23

Table 45 *Color Print Management Meta SOP Classes as an SCU*

SOP Class Name	SOP Class UID
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
- Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
- Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
- Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
- Printer SOP Class	1.2.840.10008.5.1.1.16
Print Job SOP Class	1.2.840.10008.5.1.1.14

3.1.2.2.1 Association Establishment Policies

3.1.2.2.1.1 General

Whenever a film is completely set up and printed by command or automatism, the job is prepared for processing. As soon as the queue is ready to process the job is activated and worked according the processing data. The related Print application will initiate an association to the print destination and process the printing of the related information.

The default PDU size used will be 28 KB.

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3.1.2.2.1.2 Number of Associations

The *syngo* Studio Workplace Print application initiates one association in parallel for each different print device configured.

3.1.2.2.1.3 Asynchronous Nature

The *syngo* Studio Workplace DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

3.1.2.2.1.4 Implementation Identifying Information

The *syngo* Studio Workplace DICOM software provides a single Implementation Class UID listed in Table 46.

Table 46 *Implementation Class UID and Version Name*

Implementation Class UID	1.3.12.2.1107.5.9.20000101
Implementation Version Name	SIEMENS_SWP

3.1.2.2.2 Association Initiation Policy

Triggered by the Print job queue the Print Management SCU establishes an association by using the DICOM association services. With the help of the N-GET request for the Printer SOP Class the statusof the printer is determined before printing.

With no problem encountered with the N-CREATE/N-SET Services for the related Basic Print SOP Classes the film sheet is set up for printing and the image(s) is(are) transferred to the printer device.

After the last film is printed from queue, the Print application will leave the association open for another 60 seconds. If a new film job is ready for printing within this time-limit, the job will be immediately processed over the still open association. If there is no new job, the association is closed if the time-out elapsed. This is done to optimize automated printing.

During the “idle-time” (no open association to printer) the Print application will issue a cyclic camera status request (using N-GET of Printer SOP Class) every 5 minutes.

3.1.2.2.2.1 Real World Activity - Print

3.1.2.2.2.1.1 Associated Real-World Activity - Printing a Printer Job Queue Entry

Whenever a film-sheet is prepared by the user, it is forwarded to the Printer Job queue. As soon as the associated Printer device is available the job is activated and association is set up.

The film sheet is internally processed, converted to a Standard/1-1 page and then the page image is sent. Status is controlled by awaiting any N-EVENT message all through the transfer until the last image or film-sheet is sent.

If the response from the remote application contains a status other than Success or Warning the association is aborted.

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3.1.2.2.2.1.2 Proposed Presentation Contexts

The *syngo* Studio Workplace DICOM application will propose Presentation Contexts as shown in Table 47.

Table 47 *Presentation Contexts - Printing*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotia-tion
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Printer SOP Class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Print Job SOP Class	1.2.840.10008.5.1.1.14	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

3.1.2.2.2.1.3 SOP Specific Conformance Statement - Meta SOP Classes

The *syngo* Studio Workplace DICOM Print Management SCU conforms to the DICOM Basic Grayscale Print Management Meta SOP Class and the Basic Color Print Management Meta SOP Class.

The application uses a setting platform to define the properties of the connected DICOM SCP, e.g.:

- maximum number of print jobs in the queue
- maximum number of print copies

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- supported film sizes of the connected DICOM SCP
- supported film formats of the DICOM SCP
- lookup table definition.

The printing is only suspended in the case of a failure return status of the SCP.

3.1.2.2.2.1.3.1 Basic Film Session SOP Class

The Basic Film Session information object definition describes all the user-defined parameters, which are common for all the films of a film session. The Basic Film Session refers to one or more Basic Film Boxes and that are printed on one hardcopy printer.

The *syngo* Studio Workplace Print Management SCU supports the following DIMSE Service elements for the Basic Film Session SOP Class as SCU:

- N-CREATE
- N-DELETE

The Basic Film Session SOP Class N-CREATE-RQ (SCU) uses the attributes listed in Table 48.

Table 48 *Attributes N-CREATE-RQ of Basic Film Session*

Attribute Name	Tag	Usage SCU	Supported Values
Number of Copies	(2000,0010)	U	1
Medium Type	(2000,0030)	U	BLUE FILM CLEAR FILM PAPER
Film Destination	(2000,0040)	U	MAGAZINE PROCESSOR

The number of Copies sent to the DICOM Printer is always 1, the job is sent n times for n copies.

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requests (e.g. N-DELETE-RQ) on the Basic Film Session – see Table 49.

Table 49 *Requested SOP Instance UID for Basic Film Session*

Attribute Name	Tag	Source of Information
Requested SOP Instance UID	(0000,1000) => (0000,1001)	Affected SOP Instance UID of N-CREATE-RSP on Basic Film Session

The N-DELETE-RQ on the Basic Film Session SOP Class is used to remove the complete Basic Film Session SOP Instance hierarchy.

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The Basic Film Session SOP class interprets the status codes (from N-CREATE-RSP, N-DELETE-RSP messages) listed in Table 50.

Table 50 *Status codes for Basic Film Session messages*

Service Status	Meaning	Error Codes
Failed	Film session SOP instances hierarchy does not contain film box SOP instances	C600
	Unable to create print job, print queue is full	C601
	Image size is larger than images box size	C603
Warning	Memory allocation not supported	B600
	Film session printing is not supported	B601
	Film box does not contain image box (empty page)	B602
Success	Film belonging to the film session are accepted for printing	0000

3.1.2.2.2.1.3.2 Basic Film Box SOP class

The Basic Film Box information object definition describes all the user-defined parameter of one film of the film session. The Basic Film Box information description defines the presentation parameters, which are common for all images on a given sheet of film.

The Basic Film Box refers to one or more Image Boxes.

Supported Service Elements as SCU are:

- N-CREATE
- N-ACTION
- N-DELETE

The Basic Film Box SOP Class N-CREATE-RQ message uses the attributes (the actual values for each attribute depend on DICOM printer configuration within the *syngo* Studio Workplace DICOM Print Management SCU) listed in Table 51.

Table 51 *Attributes for N-CREATE-RQ of Basic Film Box*

Attribute Name	Tag	Usage SCU	Supported Values
Image Display Format	(2010,0010)	M	STANDARD\C,R
Referenced Film Session Sequence	(2010,0500)	M	
> Referenced SOP Class UID	(0008,1150)	M	1.2.840.10008.5.1.1.1
> Referenced SOP Instance UID	(0008,1155)	M	
Film Orientation	(2010,0040)	M	PORTRAIT LANDSCAPE

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Film Size ID	(2010,0050)	M	8INX10IN, 10INX12IN, 10INX14IN, 11INX14IN,, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM
Magnification Type	(2010,0060)	M	BILINEAR, CUBIC, NONE, REPLICATE
Border Density	(2010,0100)	U	BLACK, WHITE
Max Density	(2010,0130)	U	0 < Value
Min Density	(2010,0120)	U	0 < Value < 50
Illumination	(2010,015E)	U	0 < Value Required if Presentation LUT is present.
Reflective Ambient Light	(2010,0160)	U	0 < Value Required if Presentation LUT is present.
Referenced Presentation LUT Sequence	(2050,0500)	U	

For Page Mode printing, the Image Display format used is Standard\1,1. For Image Mode Printing, the Image Display format used is Standard\C,R where C is the number of Columns and R is the number of Rows as specified in the Hardcopy Layout.

The N-CREATE-RSP message from the Print SCP includes the Referenced Image Box Sequence with SOP Class/Instance UID pairs which will be kept internally to be further used for the subsequent Basic Image Box SOP Class N-SET-RQ messages.

When all Image Boxes (including parameters) for the film-sheet have been set, the *syngo* DICOM print manager will issue a N-ACTION-RQ message with the SOP Instance UID of the Basic Film Box and the Action Type ID of 1.

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requests (e.g. N-DELETE-RQ) on the Basic Film Box - see Table 52.

Table 52 *Requested SOP Instance UID for Basic Film Box*

Attribute Name	Tag	Source of Information
Requested SOP Instance UID	(0000,1000) => (0000,1001)	Affected SOP Instance UID of N-CREATE-RSP on Basic Film Box

The Basic Film Box SOP class interprets the status codes listed in Table 53.

Table 53 *Status codes for Basic Film Box messages*

Service Status	Meaning	Error Codes
Failure	Unable to create print job, print queue is full	C602
	Image size is larger than images box size	C603

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Warning	Film box does not contain image box (empty page)	B603
	Requested MinDensity or MaxDensity outside of Printer's operating range	B605
Success	Film accepted for printing	0000

3.1.2.2.2.1.3.3 Basic Grayscale Image Box SOP Class

The Basic Grayscale Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information describes the presentation parameters and image pixel data, which apply to a single image of a sheet of film.

The Grayscale Image Box SOP Class uses only the N-SET-RQ with the attributes listed in Table 54.

Table 54 *Attributes for N-SET-RQ of Basic Grayscale Image Box*

Attribute Name	Tag	Usage SCU	Supported Values
Image Position	(2020,0010)	M	1
BASIC Grayscale Image Sequence	(2020,0110)	M	
> Samples per Pixel	(0028,0002)	M	1
> Photometric Interpretation	(0028,0004)	M	MONOCHROME2
> Rows	(0028,0010)	M	
> Columns	(0028,0011)	M	
> Pixel Aspect Ratio	(0028,0034)	M	
> Bits Allocated	(0028,0100)	M	8,16
> Bits Stored	(0028,0101)	M	8,12
> High Bit	(0028,0102)	M	7,11
> Pixel Representation	(0028,0103)	M	0
> Pixel Data	(7FE0,0010)	M	

The Grayscale Image Box SOP class interpret the status codes listed in Table 55.

Table 55 *Status codes for Basic Grayscale Image Box messages*

Service Status	Meaning	Error Codes
Failure	Image contains more pixel than printer can print in Image Box	C603
	Insufficient memory in printer to store the image	C605
Warning	Requested MinDensity or MaxDensity outside of Printer's operating range	B605

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Success		0000

3.1.2.2.2.1.3.4 Basic Color Image Box SOP Class

The Basic Color Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information describes the presentation parameters and image pixel data, which apply to a single image of a sheet of film.

The Color Image Box SOP Class uses only the N-SET-RQ with the attributes listed in Table 56.

Table 56 *Attributes for N-SET-RQ of Basic Color Image Box*

Attribute Name	Tag	Usage SCU	Supported Values
Image Position	(2020,0010)	M	1
BASIC Color Image Sequence	(2020,0111)	M	
> Samples per Pixel	(0028,0002)	M	3
> Photometric Interpretation	(0028,0004)	M	RGB
> Planar Configuration	(0028,0006)	M	0
> Rows	(0028,0010)	M	
> Columns	(0028,0011)	M	
> Pixel Aspect Ratio	(0028,0034)	M	
> Bits Allocated	(0028,0100)	M	8
> Bits Stored	(0028,0101)	M	8
> High Bit	(0028,0102)	M	7
> Pixel Representation	(0028,0103)	M	0
> Pixel Data	(7FE0,0010)	M	

The Color Image Box SOP class interpret the status codes listed in Table 57.

Table 57 *Status codes for Basic Color Image Box messages*

Service Status	Meaning	Error Codes
Failure	Image contains more pixel than printer can print in Image Box	C603
	Insufficient memory in printer to store the image	C605
Warning	Image size larger than image box size	B604
Success		0000

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3.1.2.2.2.1.3.5 Presentation LUT SOP Class

The objective of the Presentation LUT is to realize image hardcopy printing tailored for specific modalities, applications and user preferences.

The output of the Presentation LUT is Presentation Values (P-Values). P-Values are approximately related to human perceptual response. They are intended to facilitate common input for hardcopy. P-Values are intended to be independent of the specific class or characteristics of the hardcopy device.

The Presentation LUT SOP Class uses only the N-CREATE-RQ with the attributes listed in Table 58.

Table 58 *Attributes for N-CREATE-RQ of Presentation LUT SOP Class*

Attribute Name	Tag	Usage SCU	Supported Values
Presentation LUT Shape	(2050,0020)	U	IDENTITY

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and is used for later requests on the Basic Film Box (N-CREATE-RQ) and on the Presentation LUT (N-DELETE-RQ) - see Table 59.

Table 59 *Requested SOP Instance UID for Presentation LUT SOP Class*

Attribute Name	Tag	Source of Information
Requested SOP Instance UID	(0000,1000) => (0000,1001)	Affected SOP Instance UID of N-CREATE-RSP on Presentation LUT

The Presentation LUT SOP class interprets the status codes listed in Table 60.

Table 60 *Status codes for Presentation LUT SOP Class messages*

Service Status	Meaning	Error Codes
Warning	Requested MinDensity or MaxDensity outside of HCD's operating range. HCD will use its respective minimum or maximum density value instead.	B605
Success	Presentation LUT successfully created	0000

3.1.2.2.2.1.3.6 Printer SOP Class

The Printer SOP Class is the possibility to monitor the status of the hardcopy printer in a synchronous and in an asynchronous way.

The SCU uses the mandatory N-EVENT Report DIMSE service to monitor the changes of the printer status in an asynchronous way.

It can directly ask the Printer (SCP) for its status or receive Events from the Printer asynchronously:

- N-GET as SCU
- N-EVENT-REPORT as SCU

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In both cases the information listed in Table 61 and Table 62 is supported.

Table 61 *Used Printer N-EVENT Report attributes*

Event-type Name	Event	Attributes	Tag	Usage SCU
Normal	1			
Warning	2	Printer Status Info	(2110,0020)	U
Failure	3	Printer Status Info	(2110,0020)	U

Table 62 *Mandatory Printer N-GET-RSP, N-EVENT-REPORT-RQ attributes*

Attribute Name	Tag	Usage SCP	Supported Values
Printer Status	(2110,0010)	M	NORMAL, FAILURE, WARNING
Printer Status Info	(2110,0020)	M	See tables in Annex for details.

Note: For a detailed description on how *syngo* Studio Workplace reacts on different printer status messages, please refer to the Annex section "DICOM Print SCU – detailed status displays".

3.1.2.2.2.1.3.7 Print Job SOP Class

The Print Job SOP Class is the possibility to monitor the execution of the print process.

The *syngo* DICOM Print Management application supports the optional N-EVENT-REPORT DICMSE Service to receive the changes of the Print Job Status in an asynchronous way. It can receive Events from the Print SCP asynchronously.

Note: The *syngo* DICOM Print Management application does not support receiving N-EVENT-REPORT requests from the camera during print sessions. Normally this is configurable in the camera. Refer to Table 63 for the N-EVENT-REPORT attributes the *syngo* DICOM Print Management application can handle.

Table 63 *Used Print Job N-EVENT Report attributes*

Event-type Name	Event	Attributes	Tag	Usage SCU
Pending	1	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Printing	2	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U

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		Printer Name	(2110,0030)	U
Done	3	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Failure	4	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	-- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U

Note: For a detailed description on how *syngo* Studio Workplace reacts on different printer status messages, please refer to the Annex section "DICOM Print SCU – detailed status displays".

3.1.2.2.3 Association Acceptance Policy

The *syngo* Studio Workplace does not accepts any DICOM association.

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3.1.3 Configuration of *syngo* Studio Workplace

The following configuration depends on the type of *syngo* Studio Workplace and acquired software licenses.

3.1.3.1 AE Title/Presentation Address Mapping

To ensure unique identification within the network the hostname should be used as part of the AE Titles. The string can be up to 16 characters long and must not contain any extended characters, only 7-bit ASCII characters (excluding Control Characters) are allowed according to DICOM Standard.

Note: the current implementation of syngo does not support the full DICOM Standard. Spaces and special characters (like &<> ") in the AE title string are not supported.

3.1.3.1.1 DICOM Query SCU AE Title

The DICOM Query/Retrieve application uses a fixed AE Title:

SIRIUS_WORKPLACE

3.1.3.1.2 DICOM Print AE Title

The DICOM Print application provides the application entity title:

e.g. PRI_NAME1 (No input of AETs starting with a numeric character is possible)

3.1.3.2 Configurable Parameters

The Application Entity Titles, host names and port numbers for remote AE are configured using the *syngo* Studio Workplace Service Software. For each AET the list of services supported can be configured.

3.1.3.3 Print

- The *syngo* Studio Workplace Service Software can be used to configure the SCP (DICOM-Printer).

These parameters are mandatory to set:

- AET,
- host-name,
- IP-address and
- Port-number.

These parameters have defaults as per configuration file and can be changed:

- default camera (yes/no),
- pixel size,

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- additional or changed film sheet formats (e.g. inch 14x14, inch 14x17, ...),
- list with mapping pixel size to each film sheet format,
- minimal density,
- stored printed film jobs,
- media type,
- film destination.

3.1.3.4 Default Parameters

- This installation tool also uses some default parameters:
- max PDU size set to 262144 Bytes (256 kB)
- time-out for accepting/rejecting an association request: 60 s
- time-out for responding to an association open/close request: 60 s
- time-out for accepting a message over network: 60 s
- time-out for waiting for data between TCP/IP-packets: 60 s
- The time-outs for waiting for a Service Request/Response message from the remote node are as follows:
- for Storage SCU: 600 s
- time-out for Response to N-ACTION: 600 s
- for Query SCU: 600 s
- for Print Management SCU:
- time-out for Response to N-SET-RQ: 240 s
- time-out for Response to other Requests: 60 s

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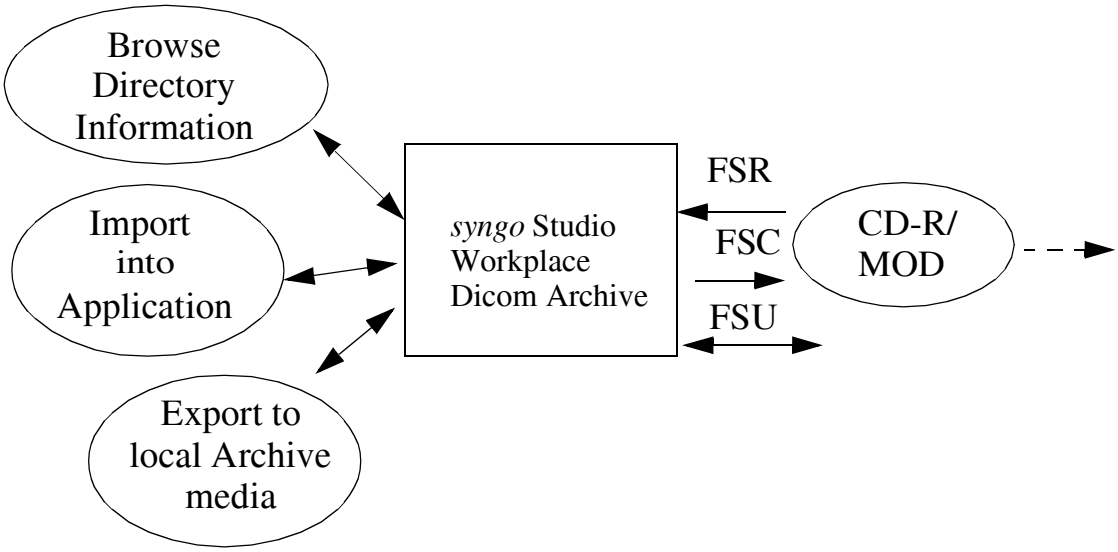
3.2 Media Interchange

3.2.1 Implementation Model

3.2.1.1 Application Data Flow Diagram

Figure 11: *Application Data Flow Diagram - Media*



The *syngo* Studio Workplace Dicom Archive application will serve as an interface to the offline medium device. It serves interfaces to include the offline media directory into the browser and to copy SOP instances to a medium or retrieve SOP Instances from medium to the Viewing Application.

The *syngo* Studio Workplace Dicom Archive application will support the 120mm CD-R and DVD medium, the 130mm 2.3 GB R/W MOD and the 130mm 4.1 GB R/W MOD.

3.2.1.2 Functional Definitions of AEs

The *syngo* Studio Workplace Dicom Archive application is capable of

1. creating a new File-set onto an unwritten medium (Export to ...),
2. updating an existing File-set by writing new SOP Instances onto the medium (Export to...),
3. importing SOP Instances from the medium onto local storage and
4. reading the File-sets DICOMDIR information into temporary database and pass it to the Viewing Application.

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3.2.1.3 Sequencing of Real-World Activities

The *syngo* Studio Workplace Dicom Archive application will not perform updates before the Directory information of the DICOMDIR is completely read.

When performing updates, the SOP instances are checked for existence before updating. Duplicate instances will be avoided.

3.2.1.4 File Meta Information Options

Table 64 *Implementation Class/Version Name - Media*

Implementation Class UID	1.3.12.2.1107.5.9.20000101
Implementation Version Name	SIEMENS_SWP

3.2.2 AE Specifications

3.2.2.1 *syngo* Studio Workplace DICOM Archive Specification

The *syngo* Studio Workplace Dicom Archive provides Standard conformance to Media Storage Service Class (Interchange Option). In addition Augmented conformance is provided to store extra data attributes important for the full feature support of the *syngo* Studio Workplace product SW. Details are listed in Table 65.

Table 65 *Media - Application Profiles and Real-World Activities*

Application Profiles Supported	Real-World Activity	Role	SC Option
PRI-SYNGO-CD PRI-SYNGO-MOD23 (option)	Browse Directory Information	FSR	Interchange
PRI-SYNGO-MOD41 (option) PRI-SYNGO-FD	Import into Application	FSR	Interchange
AUG-GEN-CD AUG-CTMR-MOD650[a] AUG-CTMR-MOD12[a] AUG-CTMR-MOD23[a] AUG-CTMR-CD[a] AUG-XA1K-CD[a]	Export to local Archive Media	FSC,FSU	Interchange
STD-GEN-CD STD-CTMR-MOD650	Browse Directory Information	FSR	Interchange
STD-CTMR-MOD12 STD-CTMR-MOD23 STD-CTMR-CD STD-XABC-CD STD-XA1K-CD STD-US-zz-yF-xxxxxx[b] STD-WVFM-GEN-FD	Import into Application	FSR	Interchange

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a. With no Private SOP Class used, the PRI-SYNGO-CD/DVD profile definitions are appropriate to describe the augmentation of the related -STD Profiles.

b. All combinations of the following values for xx, yF and xxxxxx are supported: yF={SF|MF}, xx={ID|SC|CC}, xxxxxx={MOD128| MOD230|MOD540|MOD650|MOD12|MOD23|DVD|CDR}

The Private Extended *syngo* Profile (PRI-SYNGO-CD) will be preferably used by the system. The General Purpose Interchange Profile (STD-GEN-CD), Ultrasound Profile (STD-US-xxx), CT and MR Image Profile (STD-CTMR-xxx), Waveform Interchange (STD-WVFM-xxx), Basic Cardiac Profile (STD-XABC-CD) and 1024 X-Ray Angiographic Profile (STD-XA1K-CD) will be supported with read capability of the related media.

3.2.2.1.1 File Meta Information for the Application Entity

The Source Application Entity Title is set by configuration. See Chapter “Configuration” for details.

3.2.2.1.2 Real-World Activities for this Application Entity

3.2.2.1.2.1 Real-World Activity: Browse Directory Information

The *syngo* Studio Workplace Dicom Archive application acts as FSR using the interchange option when requested to read the media directory.

The *syngo* Studio Workplace Dicom Archive application will read the DICOMDIR and insert those directory entries, that are valid for the application profiles supported, into a local database. The database can the then be used for browsing media contents.

Note

IconImageSQ is also supported in DICOMDIR. But only those Icon Images with BitsAllocated (0028,0100) equal to 8 and size of 64x64 or 128x128 pixels are imported into database and are visible in the Browser.

3.2.2.1.2.1.1 Application Profiles for the RWA: Browse Directory Information

See Table in section 3.1 for the Application Profiles listed that invoke this Application Entity for the Browse Directory Information RWA.

3.2.2.1.2.2 Real-World Activity: Import into Application

The *syngo* Studio Workplace Dicom Archive application acts as FSR using the interchange option when requested to read SOP Instances from the medium into the application.

The SOP Instance selected from the media directory will be copied into the running Application. Only SOP Instances, that are valid for the application profile supported and are listed as supported by the Storage SCP Conformance section (see Table 4), can be retrieved from media storage.

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During operation no "Attribute Value Precedence" is applied to the SOP Instances. Detached Patient Management is not supported (please refer to DICOM Part 11, Media Storage Application Profiles).

For media conforming to the STD-GEN-CD Profile the SOP classes listed in Table 66 will be supported as an FSR

Table 66 *Media FSR - Supported SOP Classes*

Information Object Definition	SOP Class UID	Transfer Syntax UID
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
CT image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
DX Image-For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
DX Image-For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
IOX Image-For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
IOX Image-For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
MG Image-For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
MG Image-For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

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Table 66 *Media FSR - Supported SOP Classes*

RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Ion Plan	1.2.840.10008.5.1.4.1.1.481.8	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
RT Ion Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.9	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Ultrasound Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
CSA Non-Image	1.3.12.2.1107.5.9.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

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Table 66 *Media FSR - Supported SOP Classes*

Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

3.2.2.1.2.2.1 Application Profiles for the RWA: Import into local Storage

See Table in section 3.1 for the Application Profiles listed that invoke this Application Entity for the Import into local Storage RWA.

3.2.2.1.2.3 Real-World Activity: Export to local Archive Media

The *syngo* Studio Workplace Dicom Archive application acts as FSU (for media with existing DICOM file-set) or FSC (media not initialized) using the interchange option when requested to copy SOP Instances from the local storage to local Archive Medium.

The *syngo* Studio Workplace Dicom Archive application will receive a list of SOP Instances to be copied to the local archive medium. According to the state of the medium inserted (new medium, Medium with DICOM file-set) the validity of the SOP Instances according to the applicable profile is checked. Only valid SOP Instances are accepted.

When the *syngo* Studio Workplace Dicom archive application is requested to copy SOP Instances the preferred application profile according configuration will be used to validate and copy the referred SOP Instances. When creating a new file-set no Descriptor File will be allocated and the related ID is not used.

The *syngo* Studio Workplace Dicom archive application will not close the medium.

3.2.2.1.2.3.1 Application Profiles for the RWA: Export to local Archive Media

See Table in section 3.1 for the Application Profiles listed that invoke this Application Entity for the local Archive Media RWA.

3.2.3 Augmented and Private Profiles

3.2.3.1 Augmented Application Profiles

3.2.3.1.1 AUG-GEN-CD

With no private Siemens Non-Images stored onto Medium, the definitions of the PRI-SYNGO-CD Profile are applicable to denote the augmentations for the STD-GEN-CD Standard Profile.

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Storage of Private Information Objects will only be supported with reference to a Private Application Profile (see next section).

The Siemens non-image is typically used for raw data and 3D private data.

3.2.3.1.2 AUG-CTMR-xxxxx

With no private Siemens Non-Images stored onto Medium, the definitions of the PRI-SYNGO-CD Profile are applicable to denote the augmentations for the STD-CTMR-MOD650, STD-CTMR-MOD12, STD-CTMR-MOD23 and STD-CTMR-CDR Standard Profiles.

Storage of Private Information Objects will only be supported with reference to a Private Application Profile (see next section).

3.2.3.1.3 AUG-XA1K-CD

With no private Siemens Non-Images stored onto Medium, the definitions of the PRI-SYNGO-CD Profile are applicable to denote the augmentations for the STD-XA1K-CD Standard Profile.

Storage of Private Information Objects will only be supported with reference to a Private Application Profile (see other section).

3.2.4 *syngo* private offline Media Application Profile

The structure of this Application Profile is defined in Part 11 of the 2000 DICOM Standard.

It is needed to describe the requirements for Offline Media Storage of the private IOD (Non-Image IOD).

3.2.4.1 Class and Profile Identification

This document defines an Application Profile Class for "*syngo* speaking" modalities or applications.

The identifier for this class shall be PRI-SYNGO. This class is intended to be used for interchange of extended and private Information Objects via CD-R or re-writable magneto-optical disk (MOD) offline media between dedicated acquisition or workstation modalities build from a common *syngo* architecture.

The specific application profiles in this class are shown in Table below:

Table 67 *PRI-SYNGO - Application Profiles*

Application Profile	Identifier	Description
"*syngo* speaking" System on CD-R	PRI-SYNGO-CD	Handles interchange of Composite SOP Instances and privately defined SOP Instances (Siemens Non-Image IOD).

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Table 67 *PRI-SYNGO - Application Profiles*

"*syngo* speaking" System on 2.3 GB MOD	PRI-SYNGO-MOD23	Handles interchange of Composite SOP Instances and privately defined SOP Instances (Siemens Non-Image IOD).
"*syngo* speaking" System on 4.1 GB MOD[a]	PRI-SYNGO-MOD41	Handles interchange of Composite SOP Instances and privately defined SOP Instances (Siemens Non-Image IOD).
"*syngo* speaking" System on DVD R	PRI-SYNGO-DVD	Handles interchange of Composite SOP Instances and privately defined SOP Instances (Siemens Non-Image IOD).

a. Definition of this profile is done due to approval of DICOM Supplement 62.

Equipment claiming conformance for this *syngo* Application Profile Class shall make a clear statement on handling of the private defined SOP Instances.

3.2.4.2 Clinical Context

This application profile facilitates the interchange of original acquired and derived images and private data related to them. Typical media interchange would be from in-lab acquisition equipment to dedicated workstations and archive systems with specific extensions to handle the private data objects (in both directions).

Additionally, images (from MR,CT,US,NM,DX,RF) used to prepare procedures, multi-modality images (e.g. integrated US) and images derived from primary diagnostic images, such as annotations, quantitative analysis images, reference images, screen capture images may be interchanged via this profile.

3.2.4.2.1 Roles and Service Class Options

This Application Profile uses the Media Storage Service Class defined in PS 3.4 with the Interchange Option.

The Application Entity shall support one or more of the roles of File Set Creator (FSC), File Set Reader (FSR), and File Set Updater (FSU), defined in PS 3.10

3.2.4.2.1.1 File Set Creator

The Application Entity acting as a File-Set Creator generates a File Set under the PRI-SYNGO Application Profiles.

File Set Creators shall be able to generate the Basic Directory SOP Class in the DICOMDIR file with all the subsidiary Directory Records related to the Image SOP Classes and Private SOP Classes stored in the File Set.

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In case of the PRI-SYNGO-CD profile, the FSC shall offer the ability to either finalize the disc at the completion of the most recent write session (no additional information can be subsequently added to the disc) or to allow multi-session (additional information may be subsequently added to the disc). In case of the PRI-SYNGO-DVD profile only multi-session is supported. For both profile a multi-session media can be finalized.

Note

A multiple volume (a logical volume that can cross multiple physical media) is not supported by this Application Profile Class. If a set of Files, e.g., a Study, cannot be written entirely on one CD-R, the FSC will create multiple independent DICOM File-Set such that each File-Set can reside on a single CD-R medium controlled by its individual DICOMDIR file. The user of the FSC can opt to use written labels on the discs to reflect that there is more than one disc for this set of files (e.g., a Study).

3.2.4.2.1.2 File Set Reader

The role of the File Set Reader shall be used by Application Entities which receive the transferred File Set.

File Set Readers shall be able to read all the defined SOP Instances files defined for the specific Application Profiles to which a conformance claim is made, using all the defined Transfer Syntaxes.

3.2.4.2.1.3 File Set Updater

The role of the File Set Updater shall be used by Application Entities, which receive a transferred File Set and update it by the addition of processed information.

File Set Updaters shall be able to read and update the DICOMDIR file. File-Set Updaters do not have to read the image/private information objects. File-Set Updaters shall be able to generate any of the SOP Instances files defined for the specific Application Profiles to which a conformance claim is made, and to read and update the DICOMDIR file.

In case of the PRI-SYNGO-CD profile, the FSU shall offer the ability to either finalize a disc at the completion of the most recent write session (no additional information can be subsequently added to the disc) or to allow multi-session (additional information may be subsequently added to the disc). In case of the PRI-SYNGO-DVD profile only multi-session is supported. For both profile a multi-session media can be finalized.

Note (for CD-R and DVD-R)

If the disc has not been finalized, the File-Set Updater will be able to update information assuming there is enough space on the disc to write a new DICOMDIR file, the information, and the fundamental CD-R/DVD-R control structures. CD-R/DVD-R control structures are the structures that inherent to the CD-R/DVD-R standards; see PS 3.12

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3.2.4.3 PRI-SYNGO Profiles

3.2.4.3.1 SOP Classes and Transfer Syntaxes

These Application Profiles are based on the Media Storage Service Class with the Interchange Option. In the table below Transfer Syntax UID “RLE Lossless“ applies only for decompression.

Table 68 *PRI-SYNGO - Supported SOP Classes*

Information Object Definition	SOP Class UID	Transfer Syntax UID	FSC	FSR	FSU
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	M
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
CR Image	1.2.840.10008.5.1.4.1.1.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	O	O
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	O	O
CT image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
CT Image	1.2.840.10008.5.1.4.1.1.2	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	O	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	O	O

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Table 68 *PRI-SYNGO - Supported SOP Classes*

DX Image – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
DX Image – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
DX Image – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
DX Image – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
DX Image – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	O	O
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	O	O
MG Image – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
MG Image – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
MG Image – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
MG Image – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
MG Image – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
MG Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
MG Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O

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Table 68 *PRI-SYNGO - Supported SOP Classes*

MG Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
MG Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
MG Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
MG Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	O	O
MG Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	O	O
IOX Image – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
IOX Image – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
IOX Image – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
IOX Image – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
IOX Image – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
IOX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
IOX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
IOX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
IOX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
IOX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
IOX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	O	O
IOX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	O	O
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O

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Table 68 *PRI-SYNGO - Supported SOP Classes*

MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
MR Image	1.2.840.10008.5.1.4.1.1.4	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	O	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	O	O
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	;M	O
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	;M	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
NM Image	1.2.840.10008.5.1.4.1.1.20	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	O	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	O	O
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	;M	O
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	;M	O
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
PET Image	1.2.840.10008.5.1.4.1.1.128	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	O	O
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	O	O

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Table 68 *PRI-SYNGO - Supported SOP Classes*

RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	O	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	O	O
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O

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Table 68 *PRI-SYNGO - Supported SOP Classes*

RT Ion Plan	1.2.840.10008.5.1.4.1.1.481.8	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Ion Plan	1.2.840.10008.5.1.4.1.1.481.8	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Ion Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.9	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Ion Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.9	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	O	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	O	O
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	-	M	-
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	-	M	-
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	-	M	-
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	-	M	-
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	RLE Lossless 1.2.840.10008.1.2.5	-	M	-
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	-	M	-
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	-	M	-
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O

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Table 68 *PRI-SYNGO - Supported SOP Classes*

Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	M	O
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	M	O
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	M	O
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	-	M	-
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	-	M	-
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	-	M	-
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	-	M	-
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	RLE Lossless 1.2.840.10008.1.2.5	-	M	-
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	-	M	-
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	-	M	-
Ultrasound Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Ultrasound Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
Ultrasound Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Ultrasound Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	M	O
Ultrasound Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	M	M	O

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Table 68 *PRI-SYNGO - Supported SOP Classes*

X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	M	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	M	M	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	O	M	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG 2000 Lossless 1.2.840.10008.1.2.4.90	O	M	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG 2000 Lossy 1.2.840.10008.1.2.4.91	O	M	O
Waveform Storage SOP Classes	1.2.840.10008.5.1.4.1.1.9.1.1 1.2.840.10008.5.1.4.1.1.9.1.2 1.2.840.10008.5.1.4.1.1.9.1.3 1.2.840.10008.5.1.4.1.1.9.2.1 1.2.840.10008.5.1.4.1.1.9.3.1 1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O

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Table 68 *PRI-SYNGO - Supported SOP Classes*

Waveform Storage SOP Classes	1.2.840.10008.5.1.4.1.1.9.1.1 1.2.840.10008.5.1.4.1.1.9.1.2 1.2.840.10008.5.1.4.1.1.9.1.3 1.2.840.10008.5.1.4.1.1.9.2.1 1.2.840.10008.5.1.4.1.1.9.3.1 1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.5	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.51.2 .840.10008.5.1.4.1.1.88.5	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.6	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.6	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
CSA Non-Image	1.3.12.2.1107.5.9.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	O	M	O

FSC, FSR, FSU – denote the requirements for those roles

O – Optional

M - Mandatory

3.2.4.3.2 Physical Media and Formats

The PRI-SYNGO-CD Profile requires the 120mm CD-R physical media with the ISO/IEC 9660 Media Format, as defined in PS3.12.

The PRI-SYNGO-DVD Profile requires the 120mm DVD physical media with the UDF 2.01 Media Format, as defined in PS3.12.

The PRI-SYNGO-MOD23 Profile requires the 130mm 2.3 GB R/W MOD physical medium with the PCDOS Media Format, as defined in PS3.12.

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The PRI-SYNGO-MOD41 Profile requires the 130mm 4.1 GB R/W MOD physical medium with the PCDOS Media Format, as defined in PS 3.12.

3.2.4.3.3 Directory Information in DICOMDIR

Conforming Application Entities shall include in the DICOMDIR File the Basic Directory IOD containing Directory Records at the Patient and subsidiary levels appropriate to the SOP Classes in the File-set. All DICOM files in the File-set incorporating SOP Instances defined for the specific Application profile, shall be referenced by Directory Records.

Note

DICOMDIRs with no directory information are not allowed by this Application Profile. Privately defined IODs will be referenced by “PRIVATE” Directory Records.

3.2.4.3.3.1 Basic Directory IOD Specialization

This Application Profile makes use of optional attributes of the Basic Directory IOD to support recognition of Patient’s Storage Service request results in spanning multiple volumes (file sets). Therefore the File Set Descriptor File can be used and is then referenced by optional Basic Directory IOD attributes. If existent, the specified Descriptor File may be used by FSR applications. Any FSU, FSC shall make a clear Statement if the Descriptor File mechanism is used according to the specialization defined in this Application Profile.

The Descriptor Files shall have the following contents:

One single Line without any control-characters and according to the Basic Character-Set having the following defined text:

“MULTIVOLUME: xx of yy”

xx, yy are replaced by the actual Number of the volume (xx) and the Total Number of Volumes in the set (yy).

If used, the Descriptor File shall have the File ID “README” and reside in same directory level as the DICOMDIR. It is referenced by the attribute [0004,1141] File-set Descriptor File ID having the defined content of “README”.

3.2.4.3.3.2 Additional Keys

File-set Creators and Updaters are required to generate the mandatory elements specified in PS 3.3, Annex F of the DICOM Standard. Table below: PRI-SYNGO-CD Additional DICOMDIR Keys specifies the additional associated keys. At each directory record level other additional data elements can be added, but it is not required that File Set Readers be able to use them as keys. Refer to the Basic Directory IOD in PS 3.3.

Table 69 *PRI-SYNGO-CD Additional DICOMDIR Keys*

Key Attribute	Tag	Directory Record Level	Type	Notes
Date of Birth	(0010,0030)	PATIENT	2C	required, if present in SOP Instance

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Table 69 *PRI-SYNGO-CD Additional DICOMDIR Keys*

Patient's Sex	(0010,0040)	PATIENT	2C	required, if present in SOP Instance
Series Date	(0008,0021)	SERIES	3	
Series Time	(0008,0031)	SERIES	3	
Institute Name	(0008,0080)	SERIES	2C	required, if present in SOP Instance
Institution Address	(0008,0081)	SERIES	2C	required, if present in SOP Instance
Series Description	(0008,103E)	SERIES	3	
Performing Physician's Name	(0008,1050)	SERIES	2C	required, if present in SOP Instance
Image Type	(0008,0008)	IMAGE	1C	required, if present in SOP Instance
SOP Class UID	(0008,0016)	IMAGE	3	
SOP Instance UID	(0008,0018)	IMAGE	3	
Image Date	(0008,0023)	IMAGE	3	
Image Time	(0008,0033)	IMAGE	3	
Referenced Image Sequence	(0008,1140)	IMAGE	1C	required, if present in SOP Instance
> Referenced SOP Class UID	(0008,1150)			
> Referenced SOP Instance UID	(0008,1155)			
Image Position (Patient)	(0020,0032)	IMAGE	2C	required, if present in SOP Instance
Image Orientation (Patient)	(0020,0037)	IMAGE	2C	required, if present in SOP Instance
Frame of Reference UID	(0020,0052)	IMAGE	2C	required, if present in SOP Instance
Rows	(0028,0010)	IMAGE	3	
Columns	(0028,0011)	IMAGE	3	
Pixel Spacing	(0028,0030)	IMAGE	1C	required, if present in SOP Instance
Calibration Image	(0050,0004)	IMAGE	2C	required, if present in SOP Instance
Icon Image Sequence	(0088,0200)	IMAGE	3	required for Image SOP Classes
> Samples per Pixel	(0028,0002)			1
> Photometric Interpretation	(0028,0004)			MONOCHROME2
> Rows	(0028,0010)			128 for XA, 64 for others
> Columns	(0028,0011)			128 for XA, 64 for others
> Bits Allocated	(0028,0100)			8
> Bits Stored	(0028,0101)			8
> High Bit	(0028,0102)			7
> Pixel Representation	(0028,0103)			0

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Table 69 *PRI-SYNGO-CD Additional DICOMDIR Keys*

> Pixel Data	(7FE0,0010)			Icon Image
Curve Number	(0020,0024)	CURVE	1C	required, if present in SOP Instance

3.2.4.3.3.3 Private Directory Record Keys

Private Directory Records are supported by this Application Profile Class at the following Level - IMAGE. The PRIVATE Directory Records will have required elements in addition to the mandatory elements specified in PS 3.3.

The following table will list the additional required keys for PRIVATE Directory Records:

Table 70 *PRI-SYNGO-CD additional keys for Private Directory Records*

Key Attribute	Tag	Directory Record Level	Type	Notes
Private Record UID	(0004,1432)	PRIVATE	1	See Conformance Statement
SOP Class UID	(0008,0016)	PRIVATE	1C	required, if present in SOP Instance
SOP Instance UID	(0008,0018)	PRIVATE	1C	required, if present in SOP Instance
Image Type	(0008,0008)	PRIVATE	3	
Acquisition Date	(0008,0022)	PRIVATE	3	
Acquisition Time	(0008,0032)	PRIVATE	3	
Acquisition Number	(0020,0012)	PRIVATE	3	
CSA Data Type	(0029,xx08)	PRIVATE	1	private owner code = SIEMENS CSA NON-IMAGE
CSA Data Version	(0029,xx09)	PRIVATE	3	private owner code = SIEMENS CSA NON-IMAGE

3.2.4.3.3.4 Icon Images

Directory Records of type SERIES or IMAGE may include Icon Images. The Icon Image pixel data shall be as specified in PS 3.3 “Icon Image Key Definition”, and restricted such, that Bits Allocated (0028,0100) and Bits Stored (0028,0101) shall be equal 8, and Rows (0028,0010) and Columns (0028,0011) shall be equal to 128 for XA Images and 64 for all other Images. The Photometric Interpretation (0028,0004) shall always be restricted to “MONOCHROME2”.

PRIVATE Directory Records will not contain Icon Image information.

3.2.4.3.4 Other Parameters

This section defines other parameters common to all specific Application Profiles in the PRI-SYNGO class which need to be specified in order to ensure interoperable media interchange.

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3.2.4.3.4.1 Multi-Frame JPEG Format

The JPEG encoding of pixel data shall use Interchange Format (with table specification) for all frames.

3.2.4.3.4.2 Attribute Value Precedence

The values of attributes contained in a Detached Patient Management SOP Instance referenced by a DICOMDIR PATIENT Directory Record shall take precedence over the values of those attributes contained in the SOP Instance referenced by a subsidiary Directory Record. The DICOMDIR Directory Records shall have key attribute values in accordance with this precedence.

Note

This allows patient identification and demographic information to be updated without changing the composite Image IOD files. The DICOMDIR file thus is critical in establishing the link between the updated information and the image. As an example, at the time an Image file was written, the patient's name therein was incorrect, or inconsistent with the Hospital Information System records. Subsequently, a Detached Patient Management file with the corrected name is added to the file-set. The FSR should use the name from the Patient File rather than in the Image File.

3.2.5 Configuration

3.2.5.1 AE Title Mapping

3.2.5.1.1 DICOM Media Storage AE Title

The DICOM Storage application provides the application entity title:

CsaImageManager

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4 Communication Profiles

4.1 Supported Communication Stacks

The *syngo* Imaging DICOM applications (*syngo* Data Manager and *syngo* Studio Workplace) provide DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.1.1 OSI Stack

not supported.

4.1.2 TCP/IP Stack

The *syngo* Imaging DICOM applications use the TCP/IP stack from the OS system upon which it executes. They use the MergeCOM-3 subroutine library from Merge Technologies Inc.

4.1.2.1 API

The *syngo* Imaging DICOM applications use the MergeCOM library that is based on a TCP/IP socket interface.

4.1.2.2 Physical Media Support

The *syngo* Imaging DICOM applications are indifferent to the physical medium over which TCP/IP executes; they inherit this from the OS system upon which it executes.

4.1.3 Point-to-Point Stack

not supported.

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5 Support of Extended Character Sets

5.1 Character Sets for *syngo* Data Manager

The *syngo* Data Manager DICOM application supports the ISO 8859 Latin 1 (ISO-IR 100) character set.

5.2 Character Sets for *syngo* Studio Workplace

The *syngo* Studio Workplace DICOM application supports the ISO 8859 Latin 1 (ISO-IR 100) character set. When there is a mismatch between the Specific Character Set tag (0008,0005) and the characters in an IOD received by the system, then the following measures are taken to make the characters DICOM conform:

Try to import with ISO_IR 100. If ISO_IR 100 fails, convert each illegal character to a '?'.

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6 Extensions/Specializations/ Privatization

6.1 Standard Extended/Specialized/Private SOPs

Not applicable.

6.2 Private Transfer Syntaxes

Not applicable.

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A Annex

A.1 DICOM Print SCU – detailed status displays

The following tables document the behavior of the *syngo* Studio Workplace DICOM Print AE in response to messages received for the Printer SOP Class and the Print Job SOP Class.

Definitions of camera symbols:

- Idle: Camera is installed and ready; idle icon is displayed.
- Interact: The user has to react in near future, but not immediately. Example: A camera was low in 8x10 clear sheets: LOW 8x10 CLR was sent by n-event-report.
- Queue Stopped: The user has to react immediately. Either the camera needs immediate interaction or a job has been aborted. Example: A camera is out of 8x10 clear sheets, or camera is down, or a film job is aborted.

Note: different camera symbols are displayed according to the Printer Status Info.

A.1.1 Common Status Information

Table 71 Common Status Information

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
NORMAL	Camera is ready.	Camera is ready.	<None>/idle
BAD RECEIVE MGZ	There is a problem with the film receive magazine. Films from the printer cannot be transported into the magazine.	Problem with receive magazine.	<None>/interact
BAD SUPPLY MGZ	There is a problem with the film supply magazine. Films from this magazine cannot be transported into the printer.	Problem with supply magazine.	<None>/interact
CALIBRATING	Printer is performing self calibration, it is expected to be available for normal operation shortly.	Self calibration. Please wait.	<None>/idle
CALIBRATION ERR	An error in the printer calibration has been detected, quality of processed films may not be optimal.	Problem in calibration. Film quality may not be optimal.	<None>/interact

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Printer Status Info/ Execution Status Info	**Description**	**Message string visible in 'Status Bar'**	**Other action for UI/'camera symbol'**
CHECK CHEMISTRY	A problem with the processor chemicals has been detected, quality of processed films may not be optimal.	Problem with chemistry. Film quality may not be optimal.	<None>/interact
CHECK SORTER	There is an error in the film sorter.	Error in film sorter.	<None>/interact
CHEMICALS EMPTY	There are no processing chemicals in the processor, films will not be printed and processed until the processor is back to normal.	Camera chemistry empty. Please check.	<None>/interact
CHEMICALS LOW	The chemical level in the processor is low, if not corrected, it will probably shut down soon.	Camera chemistry low. Please check.	<None>/interact
COVER OPEN	One or more printer or processor covers, drawers, doors are open.	Camera cover, drawer or door open.	<None>/interact
ELEC CONFIG ERR	Printer configured improperly for this job.	Camera configured improperly for this job. Queue stopped.	Queue for this camera will be STOPPED/ Queue stopped
ELEC DOWN	Printer is not operating due to some unspecified electrical hardware problem.	Camera electrical hardware Problem.	<None>/interact
ELEC SW ERROR	Printer not operating for some unspecified software error.	Camera software problem. Queue stopped.	Queue for this camera will be STOPPED/ Queue stopped
EMPTY 8X10	The 8x10 inch film supply magazine is empty.	8x10 film supply empty.	<None>/interact
EMPTY 8X10 BLUE	The 8x10 inch blue film supply magazine is empty.	8x10 blue film supply empty.	<None>/interact
EMPTY 8X10 CLR	The 8x10 inch clear film supply magazine is empty.	8x10 clear film supply empty.	<None>/interact
EMPTY 8X10 PAPR	The 8x10 inch paper supply magazine is empty.	8x10 paper supply empty.	<None>/interact
EMPTY 10X12	The 10x12 inch film supply magazine is empty.	10x12 film supply empty.	<None>/interact

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Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
EMPTY 10X12 BLUE	The 10x12 inch blue film supply magazine is empty.	10x12 blue film supply empty.	<None>/interact
EMPTY 10X12 CLR	The 10x12 inch clear film supply magazine is empty.	10x12 clear film supply empty.	<None>/interact
EMPTY 10X12 PAPR	The 10x12 inch paper supply magazine is empty.	10x12 paper supply empty.	<None>/interact
EMPTY 10X14	The 10x14 inch film supply magazine is empty.	10x14 film supply empty.	<None>/interact
EMPTY 10X14 BLUE	The 10x14 inch blue film supply magazine is empty.	10x14 blue film supply empty.	<None>/interact
EMPTY 10X14 CLR	The 10x14 inch clear film supply magazine is empty.	10x14 clear film supply empty.	<None>/interact
EMPTY 10X14 PAPR	The 10x14 inch paper supply magazine is empty.	10x14 paper supply empty.	<None>/interact
EMPTY 11X14	The 11x14 inch film supply magazine is empty.	11x14 film supply empty.	<None>/interact
EMPTY 11X14 BLUE	The 11x14 inch blue film supply magazine is empty.	11x14 blue film supply empty.	<None>/interact
EMPTY 11X14 CLR	The 11x14 inch clear film supply magazine is empty.	11x14 clear film supply empty.	<None>/interact
EMPTY 11X14 PAPR	The 11x14 inch paper supply magazine is empty.	11x14 paper supply empty.	<None>/interact
EMPTY 14X14	The 14x14 inch film supply magazine is empty.	14x14 film supply empty.	<None>/interact
EMPTY 14X14 BLUE	The 14x14 inch blue film supply magazine is empty.	14x14 blue film supply empty.	<None>/interact
EMPTY 14X14 CLR	The 14x14 inch clear film supply magazine is empty.	14x14 clear film supply empty.	<None>/interact
EMPTY 14X14 PAPR	The 14x14 inch paper supply magazine is empty.	14x14 paper supply empty.	<None>/interact
EMPTY 14X17	The 14x17 inch film supply magazine is empty.	14x17 film supply empty.	<None>/interact
EMPTY 14X17 BLUE	The 14x17 inch blue film supply magazine is empty.	14x17 blue film supply empty.	<None>/interact
EMPTY 14X17 CLR	The 14x17 inch clear film supply magazine is empty.	14x17 clear film supply empty.	<None>/interact

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Printer Status Info/ Execution Status Info	**Description**	**Message string visible in 'Status Bar'**	**Other action for UI/'camera symbol'**
EMPTY 14X17 PAPR	The 14x17 inch paper supply magazine is empty.	14x17 paper supply empty.	<None>/interact
EMPTY 24X24	The 24x24 inch film supply magazine is empty.	24x24 film supply empty.	<None>/interact
EMPTY 24X24 BLUE	The 24x24 inch blue film supply magazine is empty.	24x24 blue film supply empty.	<None>/interact
EMPTY 24X24 CLR	The 24x24 inch clear film supply magazine is empty.	24x24 clear film supply empty.	<None>/interact
EMPTY 24X24 PAPR	The 24x24 inch paper supply magazine is empty.	24x24 paper supply empty.	<None>/interact
EMPTY 24X30	The 24x30 inch film supply magazine is empty.	24x30 film supply empty.	<None>/interact
EMPTY 24X30 BLUE	The 24x30 inch blue film supply magazine is empty.	24x30 blue film supply empty.	<None>/interact
EMPTY 24X30 CLR	The 24x30 inch clear film supply magazine is empty.	24x30 clear film supply empty.	<None>/interact
EMPTY 24X30 PAPR	The 24x30 inch paper supply magazine is empty.	24x30 paper supply empty.	<None>/interact
EMPTY A4 PAPR	The A4 paper supply magazine is empty.	A4 paper supply empty.	<None>/interact
EMPTY A4 TRANS	The A4 transparency supply magazine is empty.	A4 transparency supply empty.	<None>/interact
EXPOSURE FAILURE	The exposure device has failed due to some unspecified reason.	Exposure device has failed.	<None>/interact
FILM JAM	A film transport error has occurred and a film is jammed in the printer or processor.	Film jam.	<None>/interact
FILM TRANSP ERR	There is a malfunction with the film transport, there may or may not be a film jam.	Film transport problem.	<None>/interact
FINISHER EMPTY	The finisher is empty.	Finisher is empty.	<None>/interact
FINISHER ERROR	The finisher is not operating due to some unspecified reason.	Finisher problem.	<None>/interact
FINISHER LOW	The finisher is low on supplies.	Finisher low.	<None>/interact

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Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
LOW 8X10	The 8x10 inch film supply magazine is low.	8x10 film supply low.	<None>/interact
LOW 8X10 BLUE	The 8x10 inch blue film supply magazine is low.	8x10 blue film supply low.	<None>/interact
LOW 8X10 CLR	The 8x10 inch clear film supply magazine is low.	8x10 clear film supply low.	<None>/interact
LOW 8X10 PAPR	The 8x10 inch paper supply magazine is low.	8x10 paper supply low.	<None>/interact
LOW 10X12	The 10x12 inch film supply magazine is low.	10x12 film supply low.	<None>/interact
LOW 10X12 BLUE	The 10x12 inch blue film supply magazine is low.	10x12 blue film supply low.	<None>/interact
LOW 10X12 CLR	The 10x12 inch clear film supply magazine is low.	10x12 clear film supply low.	<None>/interact
LOW 10X12 PAPR	The 10x12 inch paper supply magazine is low.	10x12 paper supply low.	<None>/interact
LOW 10X14	The 10x14 inch film supply magazine is low.	10x14 film supply low.	<None>/interact
LOW 10X14 BLUE	The 10x14 inch blue film supply magazine is low.	10x14 blue film supply low.	<None>/interact
LOW 10X14 CLR	The 10x14 inch clear film supply magazine is low.	10x14 clear film supply low.	<None>/interact
LOW 10X14 PAPR	The 10x14 inch paper supply magazine is low.	10x14 paper supply low.	<None>/interact
LOW 11X14	The 11x14 inch film supply magazine is low.	11x14 film supply low.	<None>/interact
LOW 11X14 BLUE	The 11x14 inch blue film supply magazine is low.	11x14 blue film supply low.	<None>/interact
LOW 11X14 CLR	The 11x14 inch clear film supply magazine is low.	11x14 clear film supply low.	<None>/interact
LOW 11X14 PAPR	The 11x14 inch paper supply magazine is low.	11x14 paper supply low.	<None>/interact
LOW 14X14	The 14x14 inch film supply magazine is low.	14x14 film supply low.	<None>/interact
LOW 14X14 BLUE	The 14x14 inch blue film supply magazine is low.	14x14 blue film supply low.	<None>/interact

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Printer Status Info/ Execution Status Info	**Description**	**Message string visible in 'Status Bar'**	**Other action for UI/'camera symbol'**
LOW 14X14 CLR	The 14x14 inch clear film supply magazine is low.	14x14 clear film supply low.	<None>/interact
LOW 14X14 PAPR	The 14x14 inch paper supply magazine is low.	14x14 paper supply low.	<None>/interact
LOW 14X17	The 14x17 inch film supply magazine is low.	14x17 film supply low.	<None>/interact
LOW 14X17 BLUE	The 14x17 inch blue film supply magazine is low.	14x17 blue film supply low.	<None>/interact
LOW 14X17 CLR	The 14x17 inch clear film supply magazine is low.	14x17 clear film supply low.	<None>/interact
LOW 14X17 PAPR	The 14x17 inch paper supply magazine is low.	14x17 paper supply low.	<None>/interact
LOW 24X24	The 24x24 inch film supply magazine is low.	24x24 film supply low.	<None>/interact
LOW 24X24 BLUE	The 24x24 inch blue film supply magazine is low.	24x24 blue film supply low.	<None>/interact
LOW 24X24 CLR	The 24x24 inch clear film supply magazine is low.	24x24 clear film supply low.	<None>/interact
LOW 24X24 PAPR	The 24x24 inch paper supply magazine is low.	24x24 paper supply low.	<None>/interact
LOW 24X30	The 24x30 inch film supply magazine is low.	24x30 film supply low.	<None>/interact
LOW 24X30 BLUE	The 24x30 inch blue film supply magazine is low.	24x30 blue film supply low.	<None>/interact
LOW 24X30 CLR	The 24x30 inch clear film supply magazine is low.	24x30 clear film supply low.	<None>/interact
LOW 24X30 PAPR	The 24x30 inch paper supply magazine is low.	24x30 paper supply low.	<None>/interact
LOW A4 PAPR	The A4 paper supply magazine is low.	A4 paper supply low.	<None>/interact
LOW A4 TRANS	The A4 transparency supply magazine is low.	A4 transparency supply low.	<None>/interact
NO RECEIVE MGZ	The film receive magazine is not available.	Film receiver not available.	<None>/interact
NO RIBBON	The ribbon cartridge needs to be replaced.	Replace ribbon cartridge.	<None>/interact

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Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
NO SUPPLY MGZ	The film supply magazine is not available.	Film supply not available.	<None>/interact
CHECK PRINTER	The printer is not ready at this time, operator intervention is required to make the printer available.	Check camera.	<None>/interact
CHECK PROC	The processor is not ready at this time, operator intervention is required to make the printer available.	Check processor.	<None>/interact
PRINTER DOWN	The printer is not operating due to some unspecified reason.	Camera down.	<None>/interact
PRINTER INIT	The printer is not ready at this time, it is expected to become available without intervention. For example, it may be in a normal warm-up state.	Camera initializing.	<None>/Idle
PRINTER OFFLINE	The printer has been disabled by an operator or service person.	Camera off-line.	<None>/interact
PROC DOWN	The processor is not operating due to some unspecified reason.	Processor down.	<None>/interact
PROC INIT	The processor is not ready at this time, it is expected to become available without intervention. For example, it may be in a normal warm-up state.	Processor initializing.	<None>/Idle
PROC OVERFLOW FL	Processor chemicals are approaching the overflow full mark.	Processor chemicals near overflow.	<None>/interact
PROC OVERFLOW HI	Processor chemicals have reached the overflow full mark.	Processor chemicals overflow.	<None>/interact
QUEUED	Print job in Queue	--	<None>/Idle
RECEIVER FULL	The film receive magazine is full.	Receiver full.	<None>/interact

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Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
REQ MED NOT INST	The requested film, paper, or other media supply magazine is installed in the printer, but may be available with operator intervention.	Install media supply.	<None>/interact
REQ MED NOT AVAI	The requested film, paper, or other media requested is not available on this printer.	Media supply not available on this camera. Queue stopped. Change camera.	Queue for this camera will be STOPPED/ Queue stopped
RIBBON ERROR	There is an unspecified problem with the print ribbon.	Error with print ribbon.	<None>/interact
SUPPLY EMPTY	The printer is out of film.	Camera out of film.	<None>/interact
SUPPLY LOW	The film supply is low.	Film supply low.	<None>/interact
UNKNOWN	There is an unspecified problem.	Unspecified problem with camera.	<None>/interact

A.1.2 Additional Status Information – AGFA printers

Table 72 Additional Agfa printer Status Info evaluation

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
WARMING UP	Printer is in the warm-up stage. Spooling of print jobs to disk is still possible.	Camera is warming up.	<None>/idle
OFFLINE	OFFLINE Printer is switched off-line. Spooling of print jobs to disk is still possible.	Camera is switched off-line.	<None>/interact
NONE	General printer warning, no specific information is available. Spooling of print jobs to disk is still possible.	--	<None>/idle

A.1.3 Additional Status Information – Kodak PACS Link

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(formerly Imation)

Table 73 Additional Kodak PACS Link (Imation) printer Status Info evaluation

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
SUPPLY MGZ ERR	The supply magazine has an error.	Film supply has an error.	<None>/interact

A.1.4 Additional Status Information – Kodak 1901

Table 74 Additional Kodak 190 printer Status Info evaluation

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
PRINTER STOPPED	The printer has stopped.	Camera has stopped.	<None>/interact
FATAL ERROR	Fatal Error.	Fatal Error.	Queue stopped.Queue for this camera will be STOPPED/ Queue stopped

A.1.5 Additional Status Information – Kodak 2180/1120

Table 75 Additional Kodak 2180/1120 printer Status Info evaluation

Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
PRINTER NOT RDY	Printer not ready.	Camera not ready.	<None>/interact
CHECK PRO-CESSOR	Check processor.	Check processor.	<None>/interact
NO TONER	No toner.	No toner.	<None>/interact
FATAL	Fatal Error.	Fatal Error.	Queue stopped. Queue for this camera will be STOPPED/ Queue stopped

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A.1.6 Additional Status Information – Codonics

Table 76 Additional Codonics printer Status Info evaluation

Printer Status Info/ Execution Status Info	**Description**	**Message string visible in 'Status Bar'**	**Other action for UI/'camera symbol'**
STANDARD	Printer is ready.	Camera is ready.	<None>/Normal
LOAD A-SIZE	Load A-Size media.	Load A-Size media.	<None>/interact
LOAD A-DVPAPER	Load A-Size black and white paper.	Load A-Size black and white paper.	<None>/interact
LOAD A-CVPAPER	Load A-Size color paper.	Load A-Size color paper.	<None>/interact
LOAD A-CVTRANS	Load A-Size transparencies.	Load A-Size trans-parencies.	<None>/interact
LOAD A4-SIZE	Load A4-Size media.	Load A4-Size media.	<None>/interact
LOAD A4-DVPAPER	Load A4-Size black and white paper.	Load A4-Size black and white paper.	<None>/interact
LOAD A4-CVPAPER	Load A4-Size color paper.	Load A4-Size color paper.	<None>/interact
LOAD A4-CVTRANS	Load A4-Size transparencies.	Load A4-Size trans-parencies.	<None>/interact
LOAD LA-SIZE	Load LA-Size media.	Load LA-Size media.	<None>/interact
LOAD LA-DVPAPER	Load LA-Size black and white paper.	Load LA-Size black and white paper.	<None>/interact
LOAD LA-CVPAPER	Load LA-Size color paper.	Load LA-Size color paper.	<None>/interact
LOAD LA-CVTRANS	Load LA-Size transparencies.	Load LA-Size trans-parencies.	<None>/interact
LOAD LA4-SIZE	Load LA4-Size media.	Load LA4-Size media.	<None>/interact
LOAD LA4-DVPAPER	Load LA4-Size black and white paper.	Load LA4-Size black and white paper.	<None>/interact
LOAD LA4-CVPAPER	Load LA4-Size color paper.	Load LA4-Size color paper.	<None>/interact
LOAD LA4-CVTRANS	Load LA4-Size transparencies.	Load LA4-Size transparencies.	<None>/interact

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Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
LOAD XLA-SIZE	Load XLA-Size media.	Load XLA-Size media.	<None>/interact
LOAD XLA-DVPAPER	Load XLA-Size black and white paper.	Load XLA-Size black and white paper.	<None>/interact
LOAD XLA-CVPAPER	Load XLA-Size color paper.	Load XLA-Size color paper.	<None>/interact
LOAD XLA-CVTRANS	Load XLA-Size transparencies.	Load XLA-Size transparencies.	<None>/interact
LOAD XLA4-SIZE	Load XLA4-Size media.	Load XLA4-Size media.	<None>/interact
LOAD XLA4-DVPAPER	Load XLA4-Size black and white paper.	Load XLA4-Size black and white paper.	<None>/interact
LOAD XLA4-CVPAPER	Load XLA4-Size color paper.	Load XLA4-Size color paper.	<None>/interact
LOAD XLA4-CVTRANS	Load XLA4-Size transparen-cies.	Load XLA4-Size transparencies.	<None>/interact
LOAD XLW-SIZE	Load XLW-Size media.	Load XLW-Size media.	<None>/interact
LOAD XLW-DVPAPER	Load XLW-Size black and white paper.	Load XLW-Size black and white paper.	<None>/interact
LOAD XLW-CVPAPER	Load XLW-Size color paper.	Load XLW-Size color paper.	<None>/interact
LOAD 8X10-SIZE	Load 8x10 media.	Load 8x10 media.	<None>/interact
LOAD 8X10-DVFILM	Load XLW-Size black and white film.	Load XLW-Size black and white film.	<None>/interact
SUPPLY MISS-ING	The film supply magazine specified for this job is not available.	Film supply not available.	<None>/interact
RIBBON MISS-ING	Ribbon is missing.	Ribbon is missing.	<None>/interact
RIBBON EMPTY	Ribbon is empty.	Ribbon is empty.	<None>/interact

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Printer Status Info/ Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
TOP COVER OPEN	Top cover of printer is open.	Top cover of camera is open.	<None>/interact

A.1.7 Additional DICOM Execution Status Information

Table 77 Additional DICOM Execution Status Info evaluation

Printer Status Info/Execution Status Info	Description	Message string visible in 'Status Bar'	Other action for UI/'camera symbol'
INVALID PAGE DES	The specified page layout cannot be printed or other page description errors have been detected.	Film Job cannot be printed on this camera. Queue stopped. Please redirect film job.	Queue for this camera will be STOPPED/ Queue stopped
INSUFFICIENT MEMORY	There is not enough memory available to complete this job.	Not enough memory available in camera. Queue stopped. Please continue queue or change camera.	Queue for this camera will be STOPPED/ Queue stopped
NONE	General printer warning, no specific information is available. Spooling of print jobs to disk is still possible.	--	<None>/Idle

A.1.8 Additional DICOM Execution Status Information

Printer Status Info and Execution Status Info are defined terms and can therefore be extended or reduced by camera manufacturers. Therefore syngo shall be flexible.

If any other printer status info or execution status info is received, syngo will react as shown in Table 78.

Table 78 Additional DICOM Execution Status Info

Printer Status / Execution	Printer / Execution Status Info	Description	Message string visible in the HCD status bar	Other action for syngo / camera symbol
WARNING	<any other>	<not defined status info>	Camera info:<status info>	<None>/Interact

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Printer Status / Execution	Printer / Execution Status Info	Description	Message string visible in the HCD status bar	Other action for syngo / camera symbol
FAILURE	<any other>	<not defined status info>	Camera info: <status info>	Queue stopped. Queue for this camera will be STOPPED/ Queue stopped

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