
DICOM

Conformance Statement

Intera	R11.8
Intera	R1.8
Achieva	R1.8
Panorama 1.0.T	R1.8



Issued by:

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Document Number: 4522 132 73011

Date: 21 June 2007

1. DICOM CONFORMANCE STATEMENT OVERVIEW

This document is the DICOM Conformance Statement for the Intera R11.8, Intera R1.8, Achieva R1.8 and Panorama 1.0.T R1.8, later referred to as the MR System.

The MR System is an embedded modality system for DICOM MR images. It provides, amongst other things, the following features:

- DICOM Verification service (for both SCU and SCP).
- Storage of DICOM objects on a remote DICOM system.
- Commitment of stored DICOM objects on a remote DICOM system (Push Model).
- Querying for data on a remote DICOM system.
- Retrieval of DICOM objects from a remote DICOM system.
- Basic Worklist Management (BWLM).
- Implementation of Modality Performed Procedure Step (MPPS).
- Storage and retrieval of DICOM objects per DICOM media.
- Printing of hardcopies on a remote DICOM printer.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	UID		
Transfer			
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	Yes	Yes
Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	Yes	Yes
Query/Retrieve			
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	No
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Yes	No
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
Workflow Management			
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Yes	No
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	No
Print Management			
Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	Yes	No
Printer	1.2.840.10008.5.1.1.16	Yes	No

The following table lists the supported media storage Application Profiles (with roles).

Table 2: Media Services

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Magneto-Optical Disk		
CT/MR Studies on 2.3GB MOD	No	Yes
CT/MR Studies on 4.1GB MOD	No	Yes
DVD		
CT/MR Studies on DVD Media	Yes	Yes
USB		
General Purpose USB Media Interchange with JPEG*	Yes	Yes

*No JPEG support.

2. TABLE OF CONTENTS

1.	DICOM CONFORMANCE STATEMENT OVERVIEW	3
2.	TABLE OF CONTENTS	5
3.	INTRODUCTION	9
3.1.	REVISION HISTORY	9
3.2.	AUDIENCE	9
3.3.	REMARKS	9
3.4.	DEFINITIONS, TERMS AND ABBREVIATIONS	10
3.5.	REFERENCES	11
4.	NETWORKING	12
4.1.	IMPLEMENTATION MODEL	12
4.1.1.	Application Data Flow	12
4.1.2.	Functional Definition of AE's	13
4.1.2.1.	Functional Definition of the Network AE	13
4.1.2.1.1.	Verify	13
4.1.2.1.2.	Query Worklist	13
4.1.2.1.3.	Report MPPS	13
4.1.2.1.4.	Query Images	13
4.1.2.1.5.	Retrieve Images	13
4.1.2.1.6.	Import Images	13
4.1.2.1.7.	Export Images	13
4.1.2.1.8.	Archive Images	14
4.1.2.2.	Functional Definition of the Print AE	14
4.1.2.2.1.	Print Images	14
4.1.3.	Sequencing of Real World Activities	14
4.1.3.1.	Integrated Workflow	14
4.1.3.2.	Import Images per Query/Retrieve	16
4.2.	AE SPECIFICATIONS	17
4.2.1.	Network AE	17
4.2.1.1.	SOP Classes	17
4.2.1.2.	Association Policies	17
4.2.1.2.1.	General	17
4.2.1.2.2.	Number of Associations	17
4.2.1.2.3.	Asynchronous Nature	18
4.2.1.2.4.	Implementation Identifying Information	18
4.2.1.2.5.	Communication Failure Handling	18
4.2.1.3.	Association Initiation Policy	19
4.2.1.3.1.	Query Worklist	20
4.2.1.3.2.	Report MPPS	25
4.2.1.3.3.	Query Images	29
4.2.1.3.4.	Retrieve Images	32
4.2.1.3.5.	Export Images	35
4.2.1.3.6.	Archive Images	37
4.2.1.4.	Association Acceptance Policy	41
4.2.1.4.1.	Verify	43
4.2.1.4.2.	Import Images	44
4.2.1.4.3.	Archive Images	45
4.2.2.	Print AE	48
4.2.2.1.	SOP Classes	48
4.2.2.2.	Association Policies	48
4.2.2.2.1.	General	48
4.2.2.2.2.	Number of Associations	48
4.2.2.2.3.	Asynchronous Nature	48
4.2.2.2.4.	Implementation Identifying Information	48

4.2.2.2.5.	Communication Failure Handling	48
4.2.2.3.	Association Initiation Policy.....	49
4.2.2.3.1.	Print Images.....	50
4.2.2.4.	Association Acceptance Policy	53
4.3.	NETWORK INTERFACES.....	54
4.3.1.	Physical Network Interface	54
4.3.2.	Additional Protocols	54
4.4.	CONFIGURATION	55
4.4.1.	AE Title/Presentation Address Mapping	55
4.4.1.1.	Local AE Titles	55
4.4.1.2.	Remote AE Title/Presentation Address Mapping	55
4.4.1.2.1.	Remote SCP Configuration	55
4.4.1.2.2.	Remote SCU Configuration	55
4.4.2.	Parameters.....	55
4.4.2.1.	Configuration of the Local System	56
4.4.2.2.	Configuration per Remote System.....	56
4.4.2.3.	Print Configuration	57
5.	MEDIA INTERCHANGE.....	59
5.1.	IMPLEMENTATION MODEL	59
5.1.1.	Application Data Flow Diagram.....	59
5.1.2.	Functional Definitions of AE's	59
5.1.2.1.	Functional Definition of the Media AE.....	59
5.1.3.	Sequencing of Real World Activities.....	59
5.1.4.	File Meta Information for Implementation Class and Version.....	60
5.2.	AE SPECIFICATIONS	60
5.2.1.	Media AE.....	60
5.2.1.1.	File Meta Information for the Media AE	61
5.2.1.2.	Real-World Activities	61
5.2.1.2.1.	Display Directory.....	61
5.2.1.2.2.	Read Images.....	61
5.2.1.2.3.	Write Images.....	61
5.3.	AUGMENTED AND PRIVATE APPLICATION PROFILES	62
5.3.1.	Augmented Application Profiles	62
5.3.1.1.	Augmented Application Profile AUG-CTMR-MOD23.....	62
5.3.1.1.1.	SOP Class Augmentations	62
5.3.1.1.2.	Directory Augmentations	62
5.3.1.1.3.	Other Augmentations.....	62
5.3.1.2.	Augmented Application Profile AUG-CTMR-MOD41.....	62
5.3.1.2.1.	SOP Class Augmentations	62
5.3.1.2.2.	Directory Augmentations	62
5.3.1.2.3.	Other Augmentations.....	63
5.3.1.3.	Augmented Application Profile AUG-CTMR-DVD	63
5.3.1.3.1.	SOP Class Augmentations	63
5.3.1.3.2.	Directory Augmentations	63
5.3.1.3.3.	Other Augmentations.....	63
5.3.2.	Private Application Profiles	63
5.4.	MEDIA CONFIGURATION	63
6.	SUPPORT OF CHARACTER SETS	64
7.	SECURITY	65
7.1.	TRANSPORT LAYER SECURITY (TLS)	65
7.2.	ASSOCIATION LEVEL SECURITY.....	65
7.3.	APPLICATION LEVEL SECURITY	65
7.4.	HIPAA.....	65
8.	ANNEXES.....	66
8.1.	IOD CONTENTS	66
8.1.1.	Created SOP Instances	66

8.1.1.1.	MR Image Storage SOP Class	67
8.1.1.2.	Secondary Capture Image Storage SOP Class.....	78
8.1.1.3.	Grayscale Softcopy Presentation State Storage SOP Class.....	83
8.1.1.4.	Patient Root Query/Retrieve Information Model – FIND SOP Class.....	90
8.1.1.5.	Patient Root Query/Retrieve Information Model – MOVE SOP Class.....	91
8.1.1.6.	Study Root Query/Retrieve Information Model – FIND SOP Class.....	92
8.1.1.7.	Study Root Query/Retrieve Information Model – MOVE SOP Class.....	93
8.1.1.8.	Storage Commitment Push Model SOP Class	94
8.1.1.9.	Modality Performed Procedure Step SOP Class	95
8.1.1.10.	Modality Worklist Information Model – FIND SOP Class	98
8.1.1.11.	Basic Film Session SOP Class.....	101
8.1.1.12.	Basic Film Box SOP Class	102
8.1.1.13.	Basic Grayscale Image Box SOP Class.....	104
8.1.1.14.	Printer SOP Class.....	105
8.1.1.15.	Media Storage Directory Storage SOP Class	106
8.1.2.	Usage of Attributes from Received IOD's	109
8.1.3.	Attribute Mapping	109
8.1.4.	Coerced/Modified fields.....	109
8.2.	DATA DICTIONARY OF PRIVATE ATTRIBUTES	109
8.3.	CODED TERMINOLOGY AND TEMPLATES.....	110
8.4.	GRAYSCALE IMAGE CONSISTENCY	110
8.5.	STANDARD EXTENDED/SPECIALIZED/PRIVATE SOPS.....	110
8.5.1.	Standard Extended MR Image SOP Class.....	110
8.5.2.	Private SOP Classes.....	110
8.6.	PRIVATE TRANSFER SYNTAXES.....	110

3. INTRODUCTION

3.1. Revision History

The revision history provides dates and differences of the different releases.

Table 3: Revision History

Document Version	Date of Issue	Author	Description
1.0	21 June 2007	PMS/ CTO/ C&S/IC2	Initial release version of the DICOM Conformance Statement for Intera R11.8, Intera R1.8, Achieva R1.8 & Panorama 1.0.T R1.8.

3.2. Audience

This Conformance Statement is intended for:

- (potential) customers
- system integrators of medical equipment
- marketing staff interested in system functionality
- software designers implementing DICOM interfaces

It is assumed that the reader is familiar with the DICOM standard.

3.3. Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of [DICOM] PS 3.2.

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

- **Interoperability**
Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT 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 interoperability of Philips equipment with non-Philips equipment.
It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.
- **Validation**
Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
Where Philips equipment is linked to non-Philips 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 tests 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. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery.

The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

3.4. Definitions, Terms and Abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see [DICOM] PS 3.3 and PS 3.4.

The following definitions and terms are used in this document.

Examination	Part of a Study, being a collection of direct related Series of Images (originating from the same modality/SOP class). The user interface – Patient Administration – of the MR System shall present all data per Examination. A study shall contain one or more Examinations.
MR System	Intera R11.8, Intera R1.8, Achieva R1.8 and Panorama 1.0.T R1.8
Philips	Philips Medical Systems Nederland B.V.

The following acronyms and abbreviations are used in this document.

AE	Application Entity
AET	Application Entity Title
AP	Application Profile
BWLM	Basic Worklist Management
DHCP	Dynamic Host Configuration Protocol
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DVD	Digital Versatile Disc
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
FSC	File-set Creator
FSR	File-set Reader
FSU	File-set Updater
HIPAA	Health Insurance Portability and Accountability Act
HIS	Hospital Information System
IHE	Integrating the Healthcare Enterprise
ILE	DICOM Implicit VR Little Endian
IOD	Information Object Definition
MOD	Magneto-Optical Disk
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance
NEMA	National Electrical Manufacturers Association
PACS	Picture Archiving and Communication System
PDU	Protocol Data Unit
PR	Presentation State
Q/R	Query/Retrieve (service)
RIS	Radiology Information System
RWA	Real-World Activity
SC	Secondary Capture

SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
TLS	Transport Layer Security
UI	User Interface
UID	Unique Identifier

3.5. References

- [DICOM] Digital Imaging and Communications in Medicine (DICOM), Part 1 – 18 (NEMA PS 3.1-XXXX – PS 3.18-XXXX), National Electrical Manufacturers Association (NEMA) Publication Sales 1300 N. 17th Street, Suite 1847 Rosslyn, Virginia. 22209, United States of America

4. NETWORKING

4.1. Implementation model

The implementation model consists of three sections:

- the application data flow diagram, specifying the relationship between the Application Entities and the “external world” or Real-World Activities,
- a functional description of each Application Entity, and
- the sequencing constraints among them.

4.1.1. Application Data Flow

The MR System incorporates two networking Application Entities (AE). The related implementation model is shown in Figure 1.

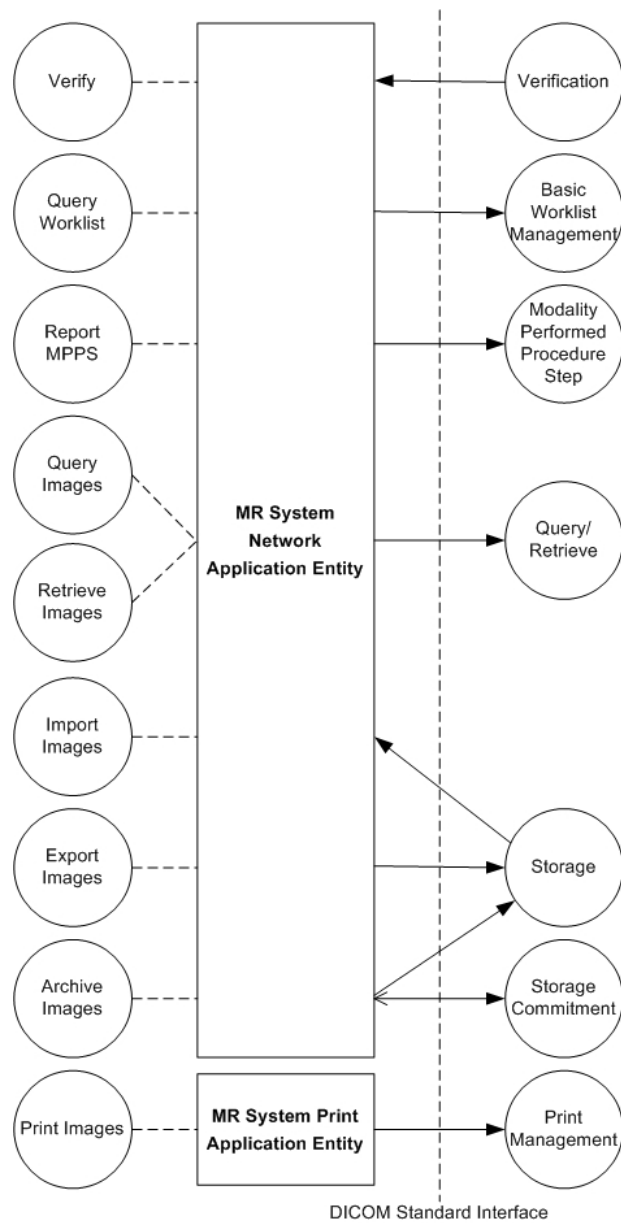


Figure 1: Application Data Flow Diagram

4.1.2. Functional Definition of AE's

This section describes in general terms the functions to be performed by the AE, and the DICOM services used to accomplish these functions.

4.1.2.1. Functional Definition of the Network AE

4.1.2.1.1. Verify

The MR System Network AE as Verification SCP implements the RWA Verify to handle verification requests.

4.1.2.1.2. Query Worklist

The MR System Network AE as Basic Worklist Management SCU implements the RWA Query Worklist to request the worklist from a DICOM Radiology Information System (RIS).

The function is initiated on the MR System by clicking the "RIS" button. After receiving the worklist data from the RIS the MR System will display the worklist on the user interface.

After selection of the relevant patient record the received patient data is displayed, and missing data may be manually added or invalid data may be modified before the patient data is stored in the local database.

4.1.2.1.3. Report MPPS

The MR System Network AE as Study Management SCU implements the RWA Report MPPS to create and update a Modality Performed Procedure Step object. The RWA is initiated at the start of a new examination to inform the DICOM Radiology Information System (RIS) (status "IN-PROGRESS").

When the image object has been acquired and archived one may click the "Ready" button when the MPPS is completed or the "Incomplete" button if the MPPS is discontinued. The MR System Network AE will send a new MPPS notification with the status "COMPLETED" or "DISCONTINUED".

4.1.2.1.4. Query Images

The MR System Network AE as Query/Retrieve SCU implements the RWA Query Images to find Examinations on a remote system (e.g. PACS).

4.1.2.1.5. Retrieve Images

The MR System Network AE as Query/Retrieve SCU implements the RWA Retrieve Images to initiate import images from a remote system (e.g. PACS).

4.1.2.1.6. Import Images

The MR System Network AE as Storage SCP implements the RWA Import Images to store images from a remote archive using the relevant image storage and/or Grayscale Softcopy Presentation State SOP class.

The MR System Network AE will respond to a remote request and store the images in the patient database. DICOM instances (Secondary Capture, original Grayscale Softcopy Presentation State and MR images from a Philips MR System, private SOP classes) may be imported for reference purposes only; when these are exported again then consistency and completeness cannot be guaranteed.

4.1.2.1.7. Export Images

The MR System Network AE as Storage SCU implements the RWA Export Images to store images and related object data on a remote system using the relevant image storage or Grayscale Softcopy Presentation State SOP class.

The acquired images and object data, as selected per Examinations, can be sent to a selected remote system, either manually or by acquisition protocol.

The MR System can be configured to send Grayscale Softcopy Presentation State data for the selected Examinations.

Depending on the capabilities of the application receiving the acquired images a large amount of information can be stored in private data elements. When modifying/processing those images such application is responsible for data consistency and therefore must remove the private data elements. Note that the MR System can be configured to suppress the storage of private data elements.

4.1.2.1.8. Archive Images

The MR System Network AE implements the RWA Archive Images to store (as Storage SCU) and, if configured, commit (as Storage Commitment SCU) images on the configured remote archive (e.g. PACS) using the Storage and Storage Commitment Push Model SOP class.

After sending a series of images to the archive, the MR System will request a storage commitment from this archive. The storage commitment status is indicated on the Patient Administration User Interface.

After commitment the user may decide to delete the images locally.

4.1.2.2. Functional Definition of the Print AE

4.1.2.2.1. Print Images

The MR System Print AE as Print Management SCU implements the RWA Print Images to send and print images on a DICOM network printer using the Basic Grayscale Print Management Meta SOP class.

After selecting the images these can be sent to a DICOM network printer.

4.1.3. Sequencing of Real World Activities

4.1.3.1. Integrated Workflow

The sequence diagram in Figure 2 shows a typical example of a workflow (using a single acquisition, a single storage with commitment, without pre-fetching).

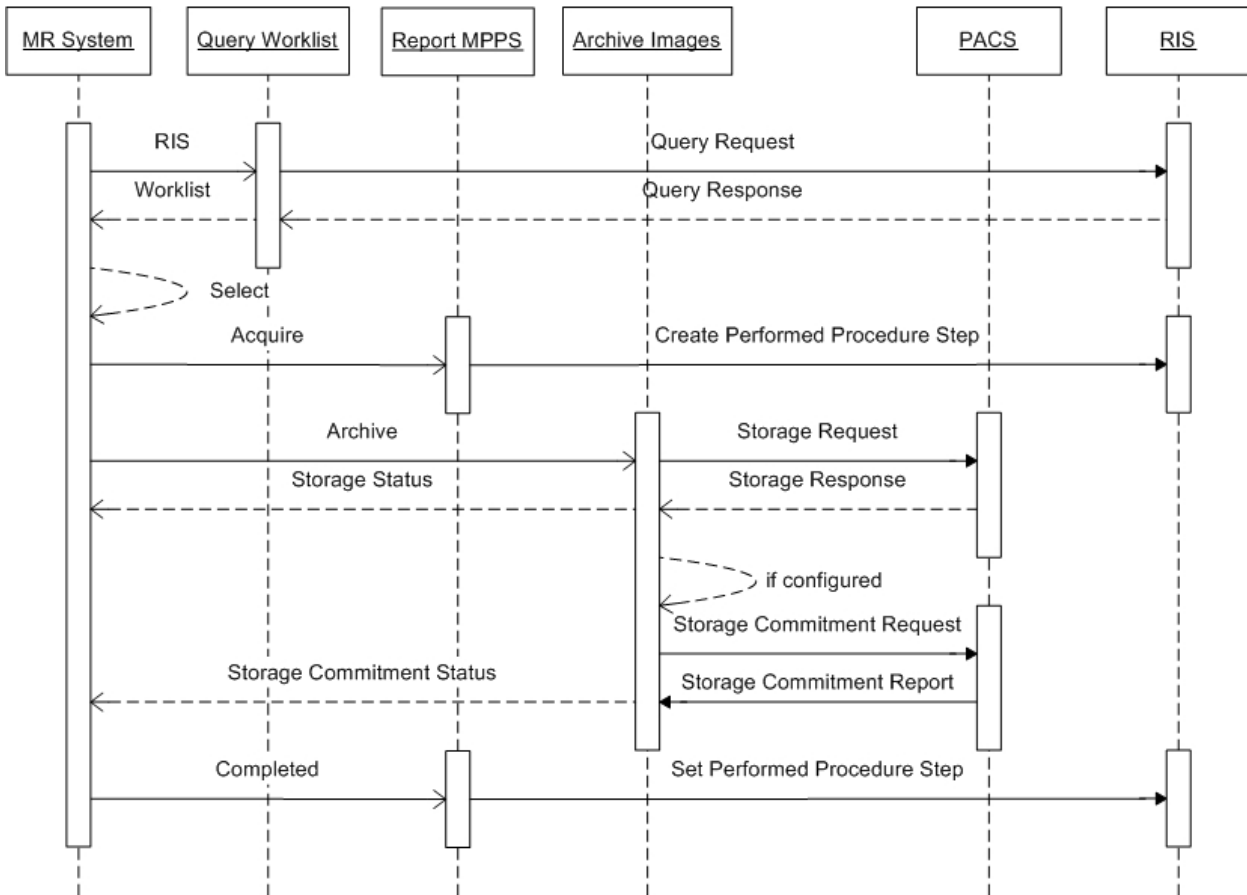


Figure 2: Sequencing of Integrated Workflow

The MR System workflow is initiated by clicking the “RIS” button. After receiving the worklist data from the RIS the MR System will display the worklist on the user interface.

Then one may select a relevant patient record and add missing data or modify invalid data (as specified) before the received patient data is stored in the local database. At the start and at the end of the acquisition/processing the configured MPPS system (RIS) is informed of the progress of the selected procedure step.

Before or after an acquisition a remote system can send related images of one or more of the scheduled patients to the MR System (pre-fetching, for reference only). The created images are converted into a DICOM message that can be sent to the remote system, or can be written onto DVD or local disk. After storage to a remote archive the MR System will request a storage commitment (as configured).

Note that, if no RIS is configured or no connection is possible, data can be introduced manually via the user interface.

After preparation of the scanner and the patient, the operator will perform the requested, or on his own initiative modified, procedure steps. Results may be MR images, Presentation State objects, and screen-grabs stored as Secondary Capture images, as well as Private MR Spectrum and Private MR Series Data.

4.1.3.2. Import Images per Query/Retrieve

The sequence diagram in Figure 3 shows a typical example of an import of a series of images per Query/Retrieve (e.g. pre-fetching).

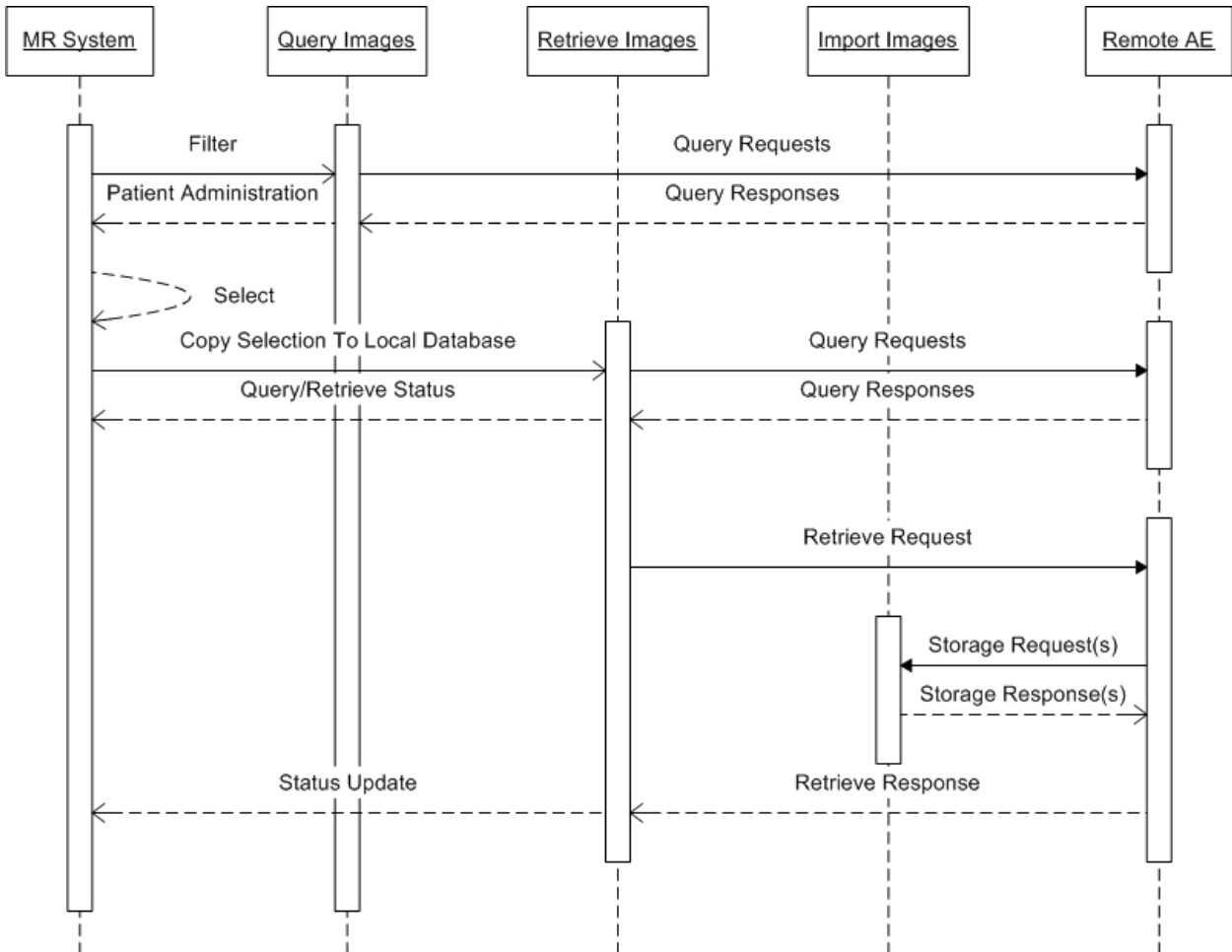


Figure 3: Sequencing of Import Images per Query/Retrieve

The MR System sends initial query requests to the remote AE to find all Examinations matching the specified filter. After selecting the Examinations to be retrieved the copy selection to local database is initiated. New query requests are sent to find the Series related to the selected Examinations. This is followed by retrieve requests to the remote AE to move all required Series of Images. Then for each retrieve request the remote AE will store the related Images on the MR System.

4.2. AE Specifications

The network capability of the system consists of two DICOM Application Entities:

- MR System Network AE
- MR System Print AE

These are specified in section 4.2.1 and section 4.2.2.

The media services are described in section 5.

4.2.1. Network AE

4.2.1.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 4: SOP Classes for the Network AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No*	Yes
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	No
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Yes	No
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	No
Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	Yes	Yes
Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	Yes	Yes

*The Verification SCU functionality is incorporated in the configuration tool.

4.2.1.2. Association Policies

This section describes the general association establishment and acceptance policies of the Network AE.

4.2.1.2.1. General

The following DICOM standard application context is specified.

Table 5: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

4.2.1.2.2. Number of Associations

The number of simultaneous associations that the Network AE may support as a SCU or SCP is specified as follows.

Table 6: Number of Associations as an Association Initiator for the Network AE

Maximum number of simultaneous associations	2
---	---

Table 7: Number of Associations as an Association Acceptor for the Network AE

Maximum number of simultaneous associations	Configurable, default is 2
---	----------------------------

4.2.1.2.3. Asynchronous Nature

Not applicable.

4.2.1.2.4. Implementation Identifying Information

The following values are used for Implementation Class UID and Implementation Version Name.

Table 8: DICOM Implementation Class and Version for the Network AE

Implementation Class UID	1.3.46.670589.11.0.0.51.4.4.0
Implementation Version Name	MR DICOM 4.0

4.2.1.2.5. Communication Failure Handling

The behavior of the Network AE during communication failure is summarized in Table 9.

Table 9: Communication Failure Behavior

Exception	Behavior
ARTIM Time-out	The association setup fails, the reason is logged and reported to the user.

4.2.1.3. Association Initiation Policy

This section describes the conditions under which the Network AE will initiate an association.

The behavior of the Network AE during association rejection is summarized in Table 10.

Table 10: DICOM Association Rejection Handling

Result	Source	Reason/Diagnosis	Behavior
1 – rejected-permanent	1 – DICOM UL service-user	1 – no-reason-given	The user is informed. Details are logged in central log file.
		2 – application-context-name-not-supported	The user is informed. Details are logged in central log file.
		3 – calling-AE-title-not-recognized	The user is informed. Details are logged in central log file.
		7 – called-AE-title-not-recognized	The user is informed. Details are logged in central log file.
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	The user is informed. Details are logged in central log file.
		2 – protocol-version-not-supported	The user is informed. Details are logged in central log file.
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	The user is informed. Details are logged in central log file.
		2 – local-limit-exceeded	The user is informed. Details are logged in central log file.
2 – rejected-transient	1 – DICOM UL service-user	1 – no-reason-given	The user is informed. Details are logged in central log file.
		2 – application-context-name-not-supported	The user is informed. Details are logged in central log file.
		3 – calling-AE-title-not-recognized	The user is informed. Details are logged in central log file.
		7 – called-AE-title-not-recognized	The user is informed. Details are logged in central log file.
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	The user is informed. Details are logged in central log file.
		2 – protocol-version-not-supported	The user is informed. Details are logged in central log file.
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	The user is informed. Details are logged in central log file.
		2 – local-limit-exceeded	The user is informed. Details are logged in central log file.

The behavior of the AE during association abort is summarized in Table 11.

Table 11: DICOM Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	<p>When received, the Network AE terminates the connection and logs the event.</p> <p>Sent when:</p> <ul style="list-style-type: none"> • N-EVENT-REPORT for printing received with status FAILURE. • Abort is issued. • Any other problem than the ones specified for the MR System as SCU in the rows below.

Source	Reason/Diagnosis	Behavior
2 – DICOM UL service-provider	0 – reason-not-specified	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • There are problems in SCU/SCP role negotiation. • Any other problem than the ones specified for the MR System as SCU in the rows below.
	1 – unrecognized-PDU	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • An unrecognized PDU type is received.
	2 – unexpected-PDU	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • The received PDU type is not expected in the current state of connection.
	4 – unrecognized-PDU parameter	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • An unrecognized Associate PDU item is received.
	5 – unexpected-PDU parameter	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • One of the Associate PDU items is received more than once. • One of the Associate PDU items is received unexpectedly.
	6 – invalid-PDU-parameter value	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • One of the Associate PDU items is received more than once. • One of the Associate PDU items is not received. • There is mismatch in the application context names between the SCU and the SCP. • Illegal Asynchronous Operations Window invoke value is received. • Illegal Asynchronous Operations Window perform value is received. • Unknown presentation context id is received. • Unknown abstract syntax is received. • The length or the format of a received PDU item is invalid.

4.2.1.3.1. Query Worklist

4.2.1.3.1.1. Description and Sequencing of Activities

The MR System RWA Query Worklist may be used to update the worklist for the MR System.

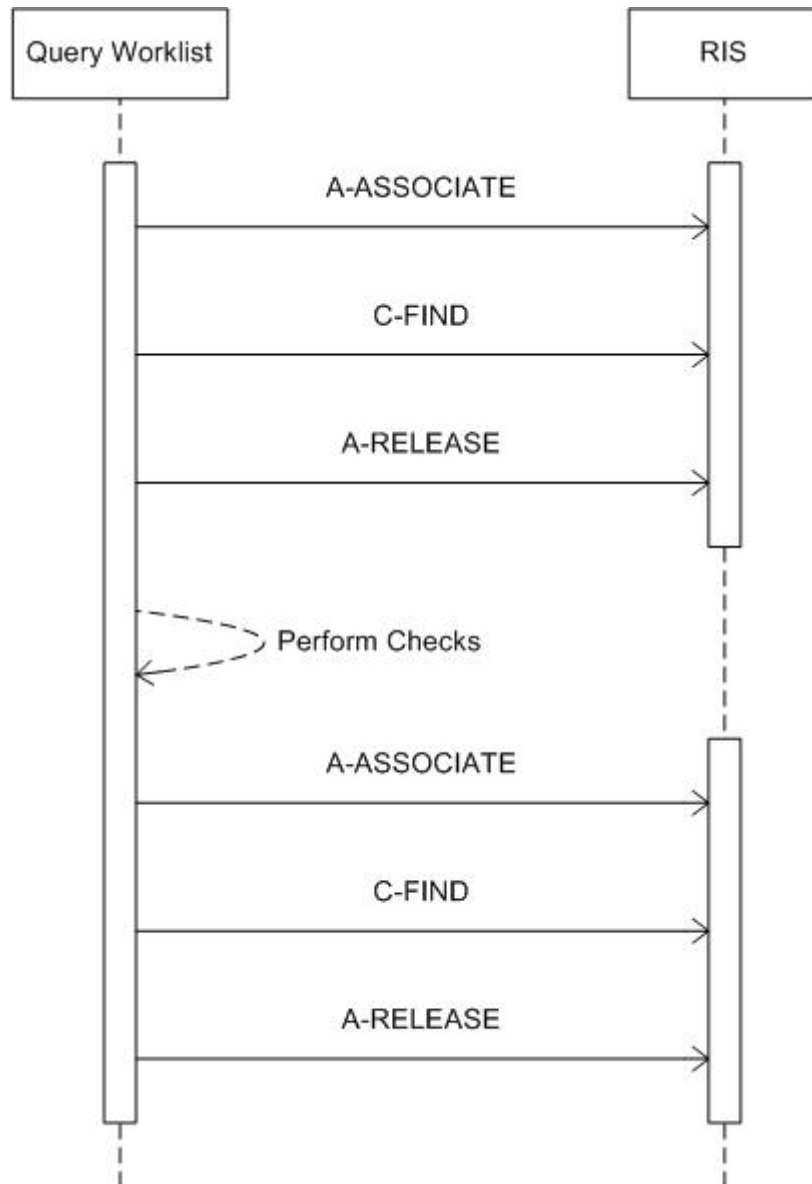


Figure 4: Sequencing of Query Worklist

The Query Worklist function will be accessible through the MR System user interface. An association will be initiated to the configured remote system (typically a RIS). After an initial worklist query the MR System will perform some checks on the received response data. Then it will send the actual worklist query. After receiving the worklist the association will be released.

4.2.1.3.1.2. Proposed Presentation Contexts

The presentation context proposed by the Network AE for Query Worklist is defined in Table 12.

Table 12: Proposed Presentation Contexts for Query Worklist

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

The order of the proposed transfer syntaxes is configurable; ELE is preferred.

4.2.1.3.1.3. SOP Specific Conformance for SOP Classes

The MR System provides the RIS dialog to enter matching criteria for the following matching keys.

Table 13: Matching Keys for Query Worklist

UI Matching Key	DICOM Matching Key		Note (UI input)
	Name	Tag	
Accession Number	Accession Number	(0008,0050)	Any value. Default value is empty.
	Scheduled Procedure Step Sequence	(0040,0100)	-
Modality	> Modality	(0008,0060)	Select * or MR. Default value is empty (*).
Scheduled Station	> Scheduled Station AE Title	(0040,0001)	Select one of the configured AET's. Default value is the local AET (LOCAL).
Start Date	> Scheduled Procedure Step Start Date	(0040,0002)	Begin of range: positive number for days before today. Default value is today (0).
End Date			End of range: positive number for days after today. Default value is tomorrow (1).

The complete set of matching keys for Query Worklist is specified in section 8.1.1 Created SOP Instances. The use of specific character set is as specified in section 6, Support of Character Sets.

Table 14 lists the attributes that are shown on the "New Exam" dialog, providing the mapping of the DICOM attribute to the UI entry.

Table 14: Mapping between UI Fields and DICOM Attributes for New Exam

UI Entry	DICOM Element		Examination Entry Editable	
	Name	Tag	Manual	RIS
Examination				
Accession number	Accession Number	(0008,0050)	Yes	No
Physician	Referring Physician's Name	(0008,0090)	Yes	No
Patient's name	Patient's Name	(0010,0010)	Yes	No
Registration ID	Patient ID	(0010,0020)	Yes	No
Date of birth	Patient's Birth Date	(0010,0030)	Yes	No
Sex	Patient's Sex	(0010,0040)	Yes	No
Patient weight	Patient's Weight	(0010,1030)	Yes	Yes
	Scheduled Procedure Step Sequence	(0040,0100)	No	No
Exam name	> Scheduled Procedure Step Description	(0040,0007)	Yes	Yes
Exam date	Study Date	(0008,0020)	Yes	Yes

UI Entry	DICOM Element		Examination Entry Editable	
	Name	Tag	Manual	RIS
	Performed Procedure Step Start Date	(0040,0244)		
	Performed Procedure Step End Date	(0040,0250)		
Comments	Study Comments	(0032,4000)	Yes	Yes
	Comments on the Performed Procedure Step	(0040,0280)		
General Worklist				
Medical Alerts	Medical Alerts	(0010,2000)	Yes	No
Contrast Allergies	Contrast Allergies	(0010,2110)	Yes	No
Pregnancy Status	Pregnancy Status	(0010,21C0)	Yes	No
Requested Procedure				
	Requested Procedure Code Sequence	(0032,1064)	No	No
Code Value	> Code Value	(0008,0100)	No	No
Code Scheme Designator	> Coding Scheme Designator	(0008,0102)	No	No
Code Scheme Version	> Coding Scheme Version	(0008,0103)	No	No
Code Meaning	> Code Meaning	(0008,0104)	No	No
Procedure ID	Requested Procedure ID	(0040,1001)	No	No
Comments	Requested Procedure Comments	(0040,1400)	No	No
Scheduled Procedure Step				
	Scheduled Procedure Step Sequence	(0040,0100)	No	No
Modality	> Modality	(0008,0060)	No	No
	> Scheduled Procedure Step Start Date	(0040,0002)	No	No
	> Scheduled Procedure Step Start Time	(0040,0003)	No	No
	> Scheduled Protocol Code Sequence	(0040,0008)	No	No
Code Value	>> Code Value	(0008,0100)	No	No
Code Scheme Designator	>> Coding Scheme Designator	(0008,0102)	No	No
Code Scheme Version	>> Coding Scheme Version	(0008,0103)	No	No
Code Meaning	>> Code Meaning	(0008,0104)	No	No
Procedure Step Description	> Scheduled Procedure Step Description	(0040,0007)	No	No
Procedure Step ID	> Scheduled Procedure Step ID	(0040,0009)	No	No
Pre-Medication	> Pre-Medication	(0040,0012)	No	No
Comments	> Comments on the Scheduled Procedure Step	(0040,0400)	No	No
Performed Procedure Step				
	Performed Protocol Code Sequence	(0040,0260)	No	No
Code Value	> Code Value	(0008,0100)	Yes	Yes
Code Scheme Designator	> Coding Scheme Designator	(0008,0102)	Yes	Yes
Code Scheme Version	> Coding Scheme Version	(0008,0103)	Yes	Yes
Code Meaning	> Code Meaning	(0008,0104)	Yes	Yes
Comments	Study Comments	(0032,4000)	Yes	Yes
	Comments on the Performed Procedure Step	(0040,0280)		

The details regarding the response behavior to status codes are provided in Table 15.

Table 15: DICOM Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Refused	A700	Out of resources	No query results are displayed. The association is released. The reason is logged and reported by message in console.
Failed	A900	Identifier does not match SOP class	No query results are displayed. The association is released. The reason is logged and reported by message in console.
	Cxxx	Unable to process	No query results are displayed. The association is released. The reason is logged and reported by message in console.
Cancel	FE00	Matching terminated due to Cancel request	No query results are displayed. The association is released. The reason is logged and reported by message in console.
Pending	FF00	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	The Query Worklist job continues.
	FF01	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	The Query Worklist job continues.
Success	0000	Matching is complete	The query results are displayed. The association is released. Report message in console.

The behavior of the AE during communication failure is summarized in Table 16.

Table 16: DICOM Command Communication Failure Behavior

Exception	Behavior
Reply Time-out	The Query Worklist job fails and the association is aborted. The reason is logged and reported to the user.
Association Time-out SCU	The association is released.
Association Aborted	The Query Worklist job fails. The reason is logged and reported to the user.

4.2.1.3.2. Report MPPS

4.2.1.3.2.1. Description and Sequencing of Activities

When the first scan of an examination is initiated the Network AE initiates an association to the MPPS server (typically a RIS) and sends an N-CREATE message with all appropriate information for the study; the status will be set to IN-PROGRESS. After clicking the "Ready" or "Incomplete" button the Network AE will Archive Images that were acquired (only those that have not been archived yet) and send an N-SET message with the end date and time and a status of respectively "COMPLETED" or "DISCONTINUED".

The following sequence diagram shows the interaction for the MR System RWA Report MPPS.

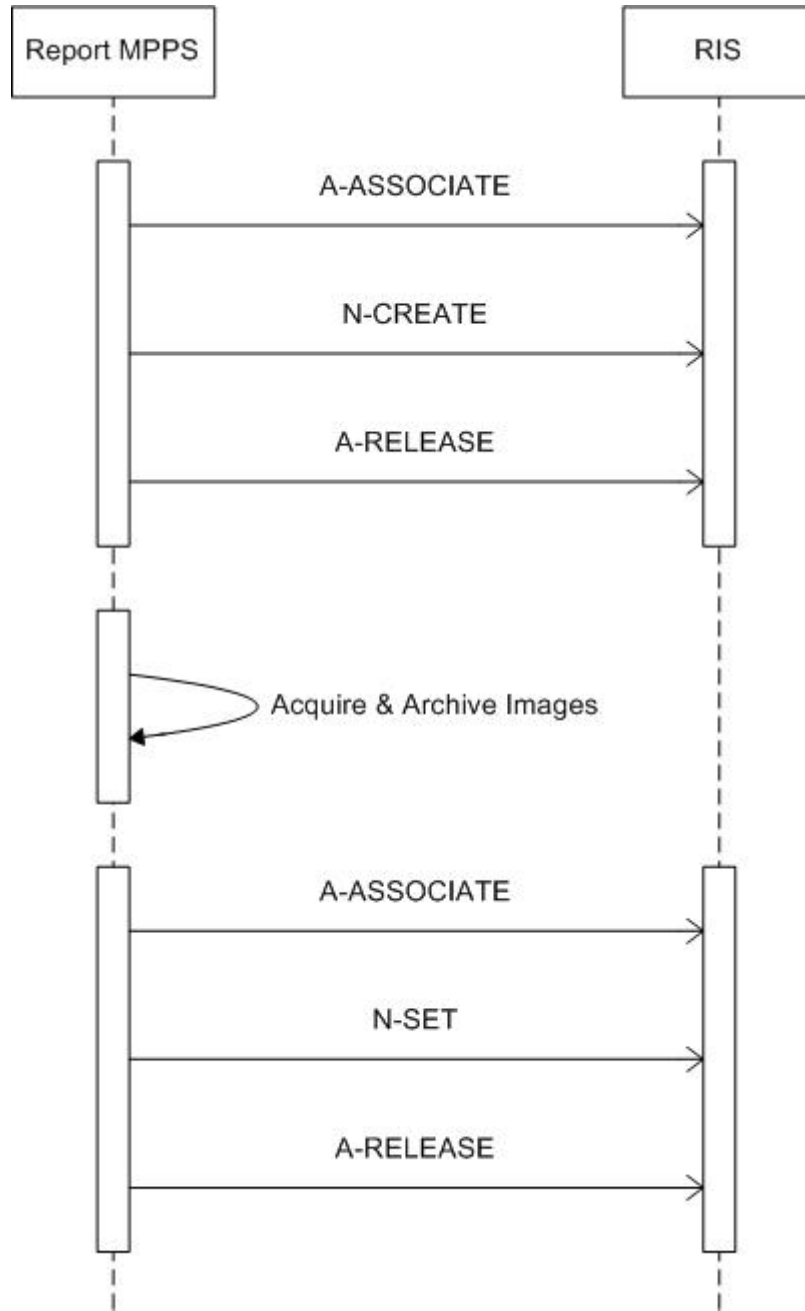


Figure 5: Sequencing of Report MPPS

4.2.1.3.2.2. Proposed Presentation Contexts

The presentation context proposed by Network AE for Report MPPS is defined in Table 17.

Table 17: Proposed Presentation Contexts for Report MPPS

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

The order of the proposed transfer syntaxes is configurable; ELE is preferred.

4.2.1.3.2.3. SOP Specific Conformance for SOP Classes

The mapping of attributes for Report MPPS are specified in the in section 8.1.3 Attribute Mapping.

The details regarding the response behavior to status codes for the N-CREATE DIMSE are provided in Table 18.

Table 18: DICOM N-CREATE Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Confirmation	The association will be released. Message in console.
Failure	xxxx	(any other failure)	Message in console. The reason is logged.

The behavior of the AE during an N-CREATE communication failure is summarized in Table 19.

Table 19: DICOM N-CREATE Command Communication Failure Behavior

Exception	Behavior
Reply Time-out	The N-CREATE command fails and the association is aborted. The reason is logged and reported to the user.
Association Time-out SCU	The association is released.
Association Aborted	The N-CREATE command fails. The reason is logged and reported to the user.

The details regarding the response behavior to status codes for the N-SET DIMSE are provided in Table 20.

Table 20: DICOM N-SET Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Confirmation	The association will be released. Message in console.
Failure	0110	Performed procedure step object may no longer be updated	(Error ID A710) Message in console. The reason is logged
	xxxx	(any other failure)	Message in console. The reason is logged.

The behavior of the AE during an N-SET communication failure is summarized in Table 21.

Table 21: DICOM N-SET Command Communication Failure Behavior

Exception	Behavior
Reply Time-out	The N-SET command fails and the association is aborted. The reason is logged and reported to the user.
Association Time-out SCU	The association is released.
Association Aborted	The N-SET command fails. The reason is logged and reported to the user.

4.2.1.3.3. Query Images

4.2.1.3.3.1. Description and Sequencing of Activities

The MR System RWA Query Images may be used to find Examinations on a remote system. After clicking the Patient Administration – “Filter” button the Filter dialog offers the possibility to enter the required matching keys. One may now click the “Apply Filter” button to activate the specified filter settings or the “Proceed” button to reset the Patient Administration according to the specified filter settings.

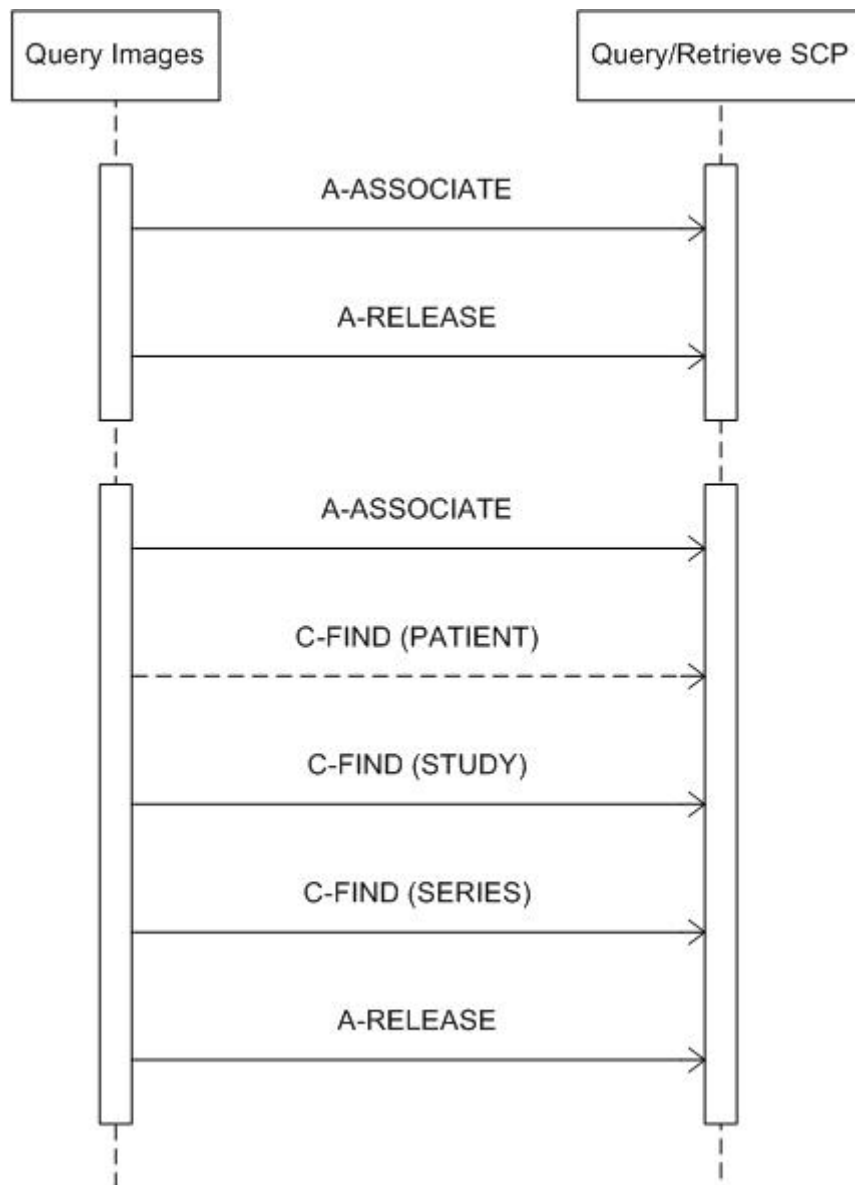


Figure 6: Sequencing of Query Images

The query dialog is initiated when clicking either the Patient Administration dialog – “Connect” button or the Filter dialog – “Proceed” button. The Network AE will try and request an association at the Query/Retrieve SCP. Then a query filter can be

specified and the Network AE initiates a new association to send query requests (as specified in the Filter dialog) to the Query/Retrieve SCP, starting with Patient or Study level query (for Patient Root (preferred) or Study Root model respectively) through to Series level queries (i.e. no Image level queries).

4.2.1.3.3.2. Proposed Presentation Contexts

The presentation context proposed by Network AE for Query Images is defined in Table 22.

Table 22: Proposed Presentation Contexts for Query Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
All configured Query/Retrieve Information Model – FIND SOP classes.	See Table 1.	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

The order of the proposed transfer syntaxes is configurable; ELE is preferred.

4.2.1.3.3.3. SOP Specific Conformance for SOP Classes

Depending on the configuration the MR System shows the following behaviour.

If the remote system is configured as archive (PACS) then the MR System requires a non-universal matching query filter before performing a query on the remote system. Otherwise the Network AE will perform an initial universal matching query. After this initial query the subsequent queries will be as specified in the Patient Administration Filter.

The MR System provides the Patient Administration – Filter dialog to enter matching criteria for the following matching keys.

Table 23: Patient Administration Filter

Filter Key	DICOM Matching Key		Note
	Name	Tag	
Patient name	Patient's Name	(0010,0010)	-
Registration ID	Patient ID	(0010,0020)	The initial query will always perform a universal match on Patient ID, independent on the entered matching value. Next the MR System will filter the relevant data, and implement further queries based on this data.
Date of birth	Patient's Birth Date	(0010,0030)	-
Exam date	Performed Procedure Step Start Date	(0040,0244)	-
Exam status	Performed Procedure Step Status	(0040,0252)	Enumerated value: Ready; Not ready.
Exam name	Performed Procedure Step Description	(0040,0254)	-

The complete set of matching keys for Query Images is specified in section 8.1.1 Created SOP Instances.

The use of specific character set is as specified in section 6, Support of Character Sets. The specific character set value is not checked.

The details regarding the response behavior to status codes are provided in Table 24.

Table 24: DICOM Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Refused	A700	Out of resources – Unable to calculate number of matches	No query results are displayed. The association is released. The reason is logged and reported by message in console.
Failed	A900	Identifier does not match SOP class	No query results are displayed. The association is released. The reason is logged and reported by message in console.
	Cxxx	Unable to process	No query results are displayed. The association is released. The reason is logged and reported by message in console.
Cancel*	FE00	Sub-operations terminated due to Cancel indication	No query results are displayed. The association is released. The reason is logged and reported by message in console.
Pending	FF00	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	The Query Images job continues.
	FF01	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	The Query Images job continues.
Success	0000	Matching is complete	The query results are displayed. The association is released. Report message in console.

*Note: As Query Images does not send Cancel requests this response behavior should not be applicable.

The behavior of the AE during communication failure is summarized in Table 25.

Table 25: DICOM Command Communication Failure Behavior

Exception	Behavior
Reply Time-out	The Query Images job fails and the association is aborted. The reason is logged and reported to the user.
Association Time-out SCU	The association is released.
Association Aborted	The Query Images job fails. The reason is logged and reported to the user.

4.2.1.3.4. Retrieve Images

4.2.1.3.4.1. Description and Sequencing of Activities

In order to be able to select any Examination one must first Query Images on the remote database. Then the Series of Images of the selected Examinations may be copied from the queried remote database to the local database by means of the “Local Database” button in the MR System Patient Administration – Destinations environment.

The process of the MR System RWA Retrieve Images includes the actions as shown in Figure 7.

For each examination the Network AE initiates a new association to send move requests on series level only. The status of this retrieve is shown in the Queue Manager. Note that the Network AE may only import original MR images from a Philips MR System (ref. Import Images).

Figure 7 shows the diagram for the move request for only one Examination containing only one Series of Images.

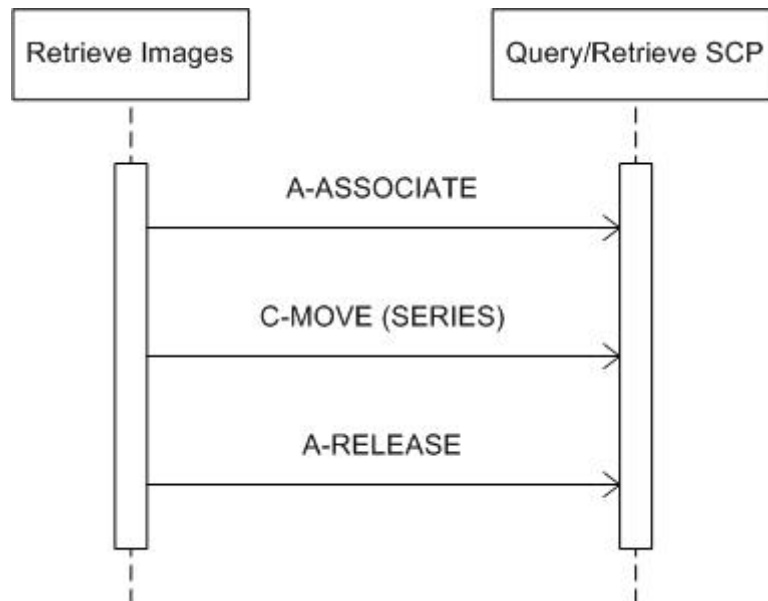


Figure 7: Sequencing of Retrieve Images

4.2.1.3.4.2. Proposed Presentation Contexts

The presentation context proposed by Network AE for Retrieve Images is defined in Table 26.

Table 26: Proposed Presentation Contexts for Retrieve Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
All configured Query/Retrieve Information Model – FIND SOP classes.	See Table 1.	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
All configured Query/Retrieve Information Model – MOVE SOP classes.	See Table 1.	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

The order of the proposed transfer syntaxes is configurable; ELE is preferred.

4.2.1.3.4.3. SOP Specific Conformance for SOP Classes

All details regarding the C-FIND response behavior to status codes are provided in Table 24. The behavior of the AE during C-FIND communication failure is summarized in Table 25.

All details regarding the C-MOVE response behavior to status codes are provided in Table 27.

Table 27: DICOM C-MOVE Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Refused	A701	Out of resources – Unable to calculate number of matches	The Retrieve Images job is marked as Failed at the queue manager. The association is released. The reason is logged and reported by message in console.
	A702	Out of resources – Unable to perform sub-operations	The Retrieve Images job is marked as Failed at the queue manager. The association is released. The reason is logged and reported by message in console.
	A801	Destination unknown	The Retrieve Images job is marked as Failed at the queue manager. The association is released. The reason is logged and reported by message in console.
Failed	A900	Identifier does not match SOP class	The Retrieve Images job is marked as Failed at the queue manager. The association is released. The reason is logged and reported by message in console.
	Cxxx	Unable to process	The Retrieve Images job is marked as Failed at the queue manager. The association is released. The reason is logged and reported by message in console.
Warning	B000	Sub-operations complete – One or more failures	The Retrieve Images job is marked as Completed at the queue manager. The association is released.
Cancel	FE00	Sub-operations terminated due to Cancel indication	The Retrieve Images job is marked as Failed at the queue manager. The association is released. The reason is logged and reported by message in console.
Pending	FF00	Sub-operations are continuing	The Retrieve Images job continues.
Success	0000	Sub-operations complete – No failures	The Retrieve Images job is marked as Completed at the queue manager. The association is released.

The behavior of the AE during C-MOVE communication failure is summarized in Table 28.

Table 28: DICOM C-MOVE Command Communication Failure Behavior

Exception	Behavior
Reply Time-out	The Retrieve Images job fails and the association is aborted. The reason is logged and reported to the user.
Association Time-out SCU	N/A
Association Aborted	The Retrieve Images job fails. The reason is logged and reported to the user.

4.2.1.3.5. Export Images

4.2.1.3.5.1. Description and Sequencing of Activities

As defined by the MR System RWA Export Images, using the local patient database one may export images to the selected network destination by clicking the Network button "Copy Selection To DICOM Node". For each selected Examination the Network AE will then initiate a successive association with the selected network node. Within such association all images and applicable presentation state objects of the particular Examination will be exported consecutively. When the storage job has finished, either successful or not, the Network AE will release the association. Export Images is only intended for MR images created by the MR System, not for imported images.

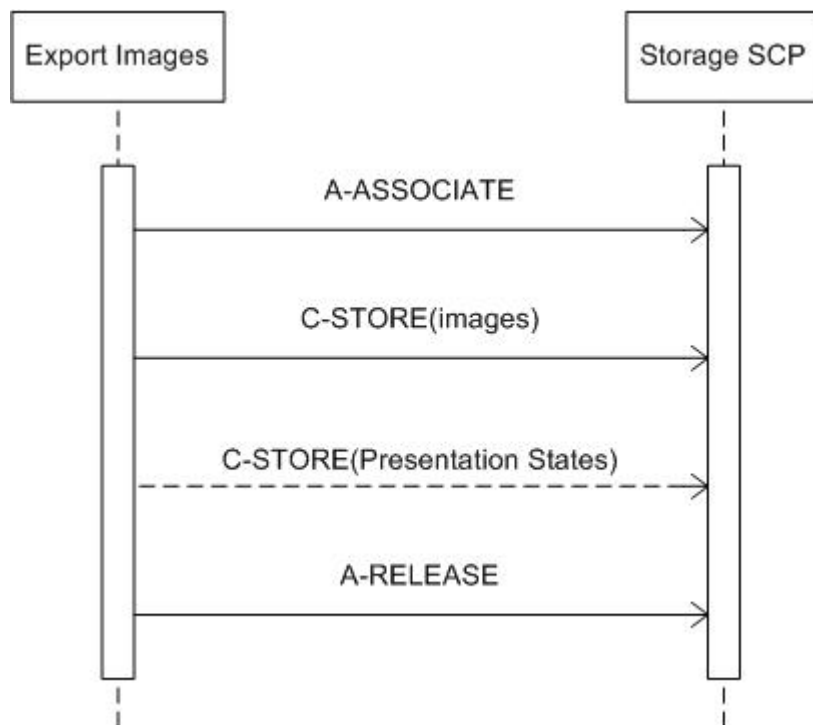


Figure 8: Sequencing of Export Images

4.2.1.3.5.2. Proposed Presentation Contexts

The presentation context proposed by Network AE for Export Images is defined in Table 29.

Table 29: Proposed Presentation Contexts for Export Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
All configured storage SOP classes.	See Table 1.	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

The order of the proposed transfer syntaxes is configurable; ELE is preferred.

4.2.1.3.5.3. SOP Specific Conformance for SOP Classes

When receiving a C-STORE response with Refused or Error status the Network AE will release the association. All the images associated with the job will be considered by the Network AE to have failed to transfer. The Network AE has the ability to automatically recover from this situation and will attempt to send all the images at a later time.

The details regarding the response behavior are provided in Table 30.

Table 30: DICOM Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Refused	A7xx	Out of resources	The Export Images job fails and the association is released. The reason is logged and reported by message in console.
Error	A9xx	Data set does not match SOP class	The Export Images job fails and the association is released. The reason is logged and reported by message in console.
	Cxxx	Cannot understand	The Export Images job fails and the association is released. The reason is logged and reported by message in console.
Warning	B000	Coercion of data elements	Message in console. The Export Images job continues. When the last image of the job has been stored the job is marked as Completed at the queue manager and the association is released.
	B006	Elements discarded	Message in console. The Export Images job continues. When the last image of the job has been stored the job is marked as Completed at the queue manager and the association is released.
	B007	Data set does not match SOP class	Message in console. The Export Images job continues. When the last image of the job has been stored the job is marked as Completed at the queue manager and the association is released.
Success	0000	Storage is complete	Message in console. The Export Images job continues. When the last image of the job has been stored the job is marked as Completed at the queue manager and the association is released.

The behavior of the AE during communication failure is summarized in Table 31.

Table 31: DICOM Command Communication Failure Behavior

Exception	Behavior
Reply Time-out	The Export Images job fails and the association is aborted. The reason is logged and reported to the user.
Association Time-out SCU	The association is released.
Association Aborted	The Export Images job fails. The reason is logged and reported to the user.

4.2.1.3.6. Archive Images

4.2.1.3.6.1. Description and Sequencing of Activities

As defined by the MR System RWA Archive Images, using the local patient database one may archive Images to the selected network destination by clicking the PACS button "Copy Selection To PACS". For each selected Examination the Network AE will then successively do the following.

First the Network AE will initiate an association with the configured PACS node. Within such association all images and applicable presentation state objects of the particular Examination will be exported consecutively. When the storage job has finished, either successful or not, the Network AE will release the association.

If the storage job failed then the storage job will have to be executed over again. Otherwise, if storage commitment is configured then, for each exported Series of Images the Network AE will request storage commitment on the PACS. Each storage commitment request handles the storage commitment of one series of images within its own association.

The Network AE supports both synchronous and asynchronous storage commitment. When synchronous storage commitment is configured and the event report is not received within the configured time-out interval, the Network AE will release the association and the storage commitment will commence as asynchronous.

Figure 9 shows the sequence diagram for the storage and synchronous storage commitment of an Examination containing one Series of images.

Figure 10 shows the same using asynchronous storage commitment.

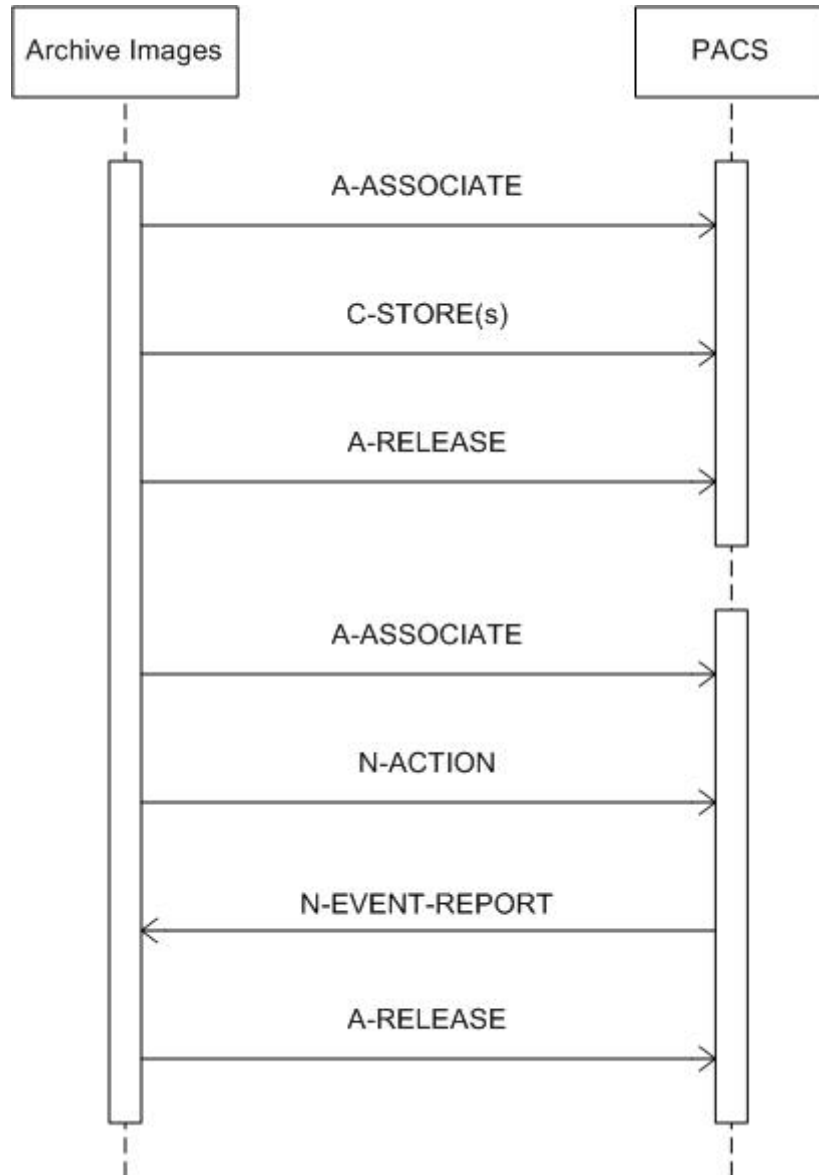


Figure 9: Sequencing of Synchronous Archive Images

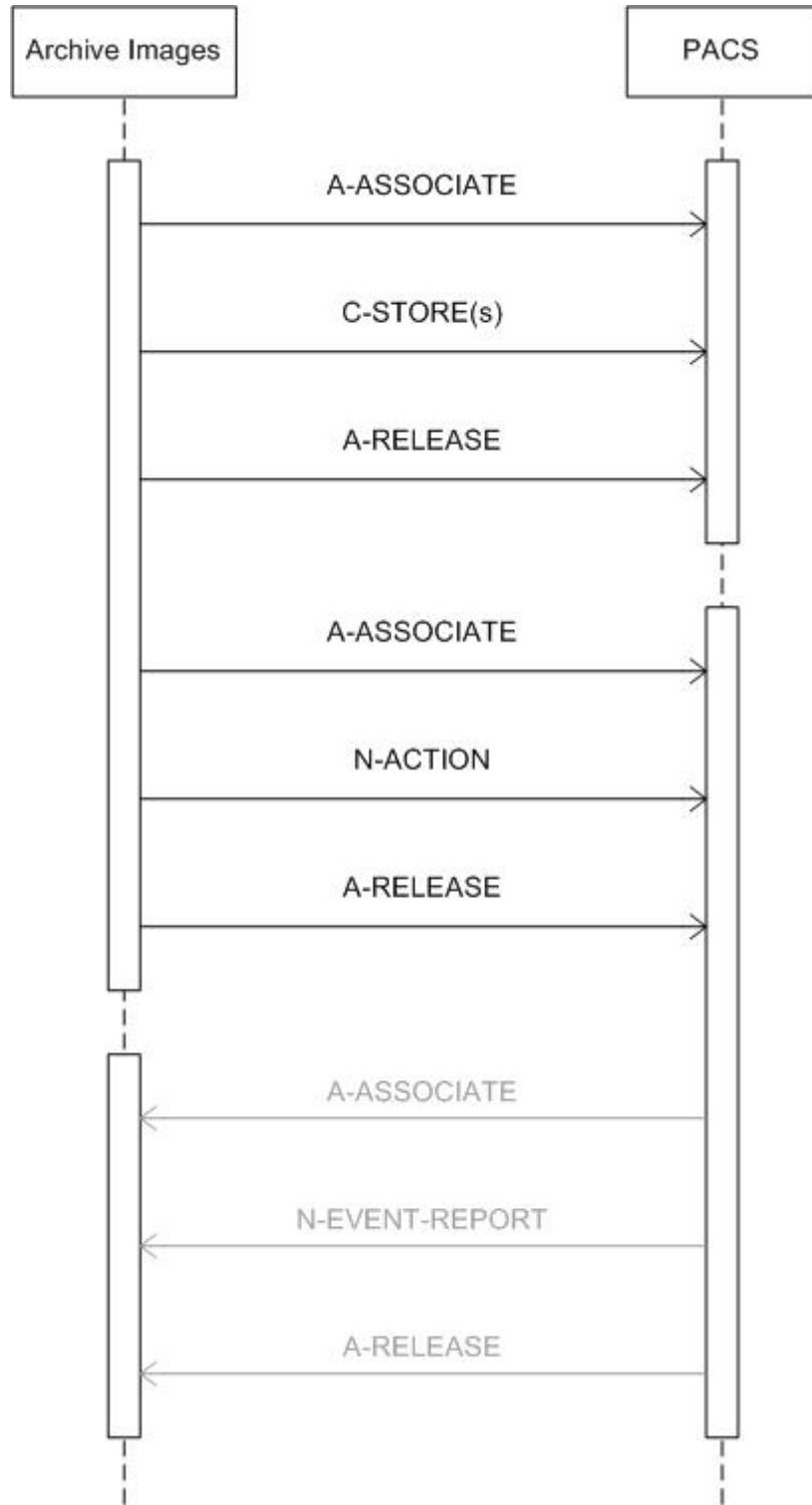


Figure 10: Sequencing of Asynchronous Archive Images

4.2.1.3.6.2. Proposed Presentation Contexts

The presentation context proposed by Network AE for Archive Images is defined in Table 32.

Table 32: Proposed Presentation Contexts for Archive Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
All configured Storage SOP classes.	See Table 1.	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

The order of the proposed transfer syntaxes is configurable; ELE is preferred.

4.2.1.3.6.3. SOP Specific Conformance for SOP Classes

As Grayscale Softcopy Presentation State objects are not stored in the same Series as the related Images, the Network AE will initiate separate associations for committing those Series – one after the other.

The details regarding the response behavior for the Archive Images storage are provided in Table 30.

The details regarding the response behavior for the Archive Images storage commitment request are provided in Table 33.

Table 33: DICOM N-ACTION Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Confirmation	The association will be released. Message in console.
Failure	xxxx	(any failure)	Message in console. The reason is logged.

The details regarding the response behavior for the Archive Images storage commitment event report are provided in section 4.2.1.4.3.3.

The behavior of the Network AE during storage communication failure is summarized in Table 31.

The behavior of the Network AE during storage commitment request communication failure is summarized in Table 34.

Table 34: DICOM N-ACTION Command Communication Failure Behavior

Exception	Behavior
Reply Time-out	The association is released. The Archive Images job expects storage commitment report.
Association Time-out SCU	The association is released. The Archive Images job expects storage commitment report.
Association Aborted	The Archive Images job expects storage commitment report.

4.2.1.4. Association Acceptance Policy

This section describes the conditions under which the Network AE will accept an association.

The AE association rejection policies are summarized in Table 35.

Table 35: DICOM Association Rejection Policies

Result	Source	Reason/Diagnosis	Explanation
1 – rejected-permanent	1 – DICOM UL service-user	1 – no-reason-given	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
		2 – application-context-name-not-supported	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
		3 – calling-AE-title-not-recognized	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
		7 – called-AE-title-not-recognized	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
		2 – protocol-version-not-supported	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
		2 – local-limit-exceeded	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
2 – rejected-transient	1 – DICOM UL service-user	1 – no-reason-given	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
		2 – application-context-name-not-supported	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
		3 – calling-AE-title-not-recognized	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
		7 – called-AE-title-not-recognized	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).

Result	Source	Reason/Diagnosis	Explanation
		2 – protocol-version-not-supported	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).
		2 – local-limit-exceeded	If applicable the command will be retried. Log entry. The user is notified via pop-up (in preview mode only).

The behavior of the AE during association abort is summarized in Table 36.

Table 36: DICOM Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • Association times out due to inactivity • Any other problem than the ones specified for the MR System as SCP in the rows below.
	2 – DICOM UL service-provider	0 – reason-not-specified
	1 – unrecognized-PDU	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • An unrecognized PDU type is received.
	2 – unexpected-PDU	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • The received PDU type is not expected in the current state of connection.
	4 – unrecognized-PDU parameter	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • An unrecognized Associate PDU item is received.
	5 – unexpected-PDU parameter	When received, the Network AE terminates the connection and logs the event. Sent when: <ul style="list-style-type: none"> • One of the Associate PDU items is received more than once. • One of the Associate PDU items is received unexpectedly.

Source	Reason/Diagnosis	Behavior
	6 – invalid-PDU-parameter value	<p>When received, the Network AE terminates the connection and logs the event.</p> <p>Sent when:</p> <ul style="list-style-type: none"> • One of the Associate PDU items is received more than once. • One of the Associate PDU items is not received. • Empty Called AE Title String (space-only) is received. • Empty Calling AE Title String (space-only) is received. • Unknown abstract syntax is received • The length or the format of the received PDU item is invalid.

4.2.1.4.1. Verify

4.2.1.4.1.1. Description and Sequencing of Activities

As defined by the MR System RWA Verify, the Network AE will act as a Verification SCP for any remote SCU as verification SCU.

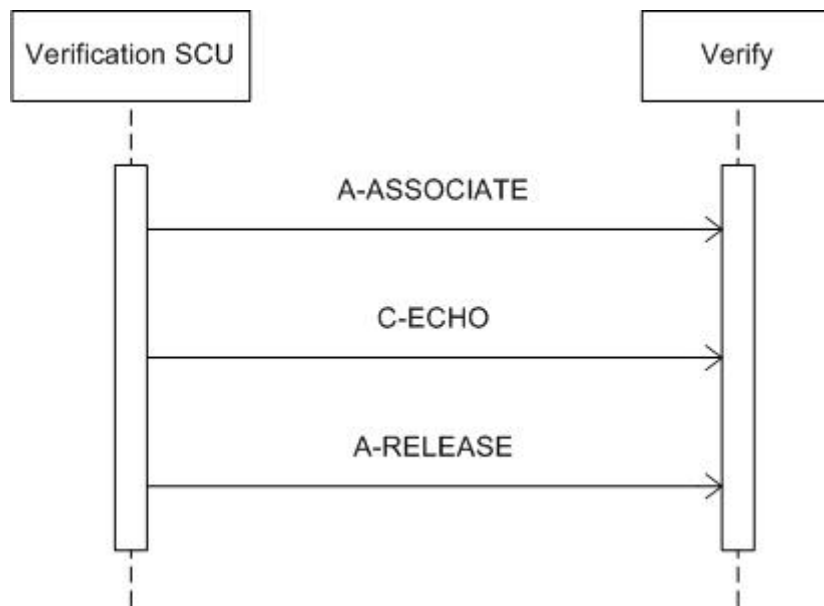


Figure 11: Sequencing of Verify

The Network AE accepts associations to verify application level communication using the C-ECHO command.

4.2.1.4.1.2. Accepted Presentation Contexts

The Network AE may accept the following presentation contexts.

Table 37: Acceptable Presentation Contexts for Verify

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	ELE	1.2.840.10008.1.2.1	SCP	None
		EBE	1.2.840.10008.1.2.2	SCP	None
		ILE	1.2.840.10008.1.2	SCP	None

The preferred transfer syntax is ELE.

4.2.1.4.1.3. SOP Specific Conformance for SOP Classes

The status behavior of the Network AE is as shown in Table 38.

Table 38: Network AE C-ECHO Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Confirmation	Message in log file.

4.2.1.4.2. Import Images

4.2.1.4.2.1. Description and Sequencing of Activities

As defined by the MR System RWA Import Images, the Network AE will act as a Storage SCP for any remote Storage SCU that is configured in the MR System configuration using an accepted presentation context.

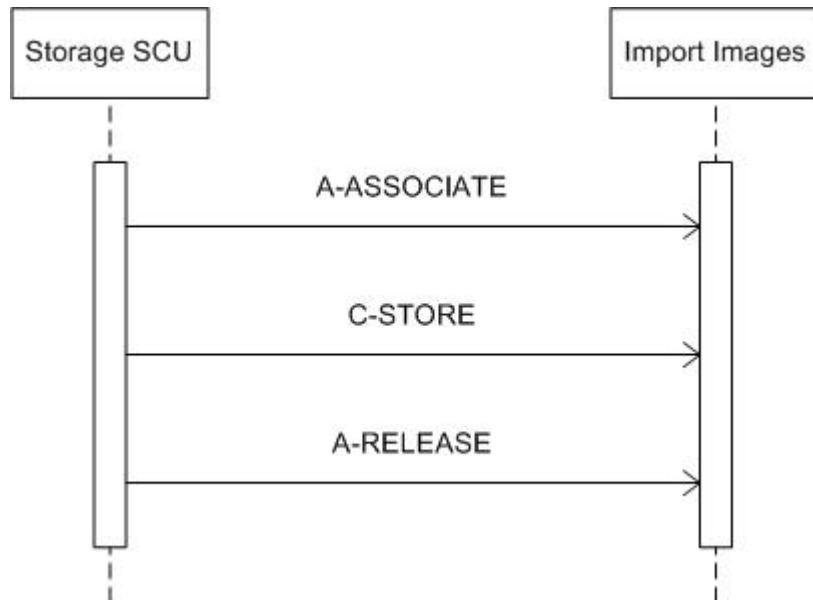


Figure 12: Sequencing of Import Images

After the Network AE accepts an association from the Storage SCU it will receive images, send store responses including the relevant status, and finally release the association on SCU request.

4.2.1.4.2.2. Accepted Presentation Contexts

The Network AE may accept the following presentation contexts.

Table 39: Acceptable Presentation Contexts for Import Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
All configured storage SOP classes	All storage SOP classes in Table 1	ELE	1.2.840.10008.1.2.1	SCP	None
		EBE	1.2.840.10008.1.2.2	SCP	None
		ILE	1.2.840.10008.1.2	SCP	None

The preferred transfer syntax is ELE.

4.2.1.4.2.3. SOP Specific Conformance for SOP Classes

The Network AE provides level 2 conformance to the storage SOP classes.

Secondary Capture images may be imported at any time and from any source. However, the Network AE may only import MR images and Presentation State objects that were created on an MR System. These imported images may be used for reference only; it is not the intention to export them again.

When the Network AE receives images that do not originate from a Philips MR System it may not import the images but respond with error status (C000) "Cannot understand" and abort the association.

The status behavior of the Network AE is as shown in Table 40.

Table 40: Network AE C-STORE Status Response

Service Status	Code	Further Meaning	Description
Refused	A700	Out of resources	The local database is full; recovery from this condition is left to the SCU. The MR System sends the failure response, logs the condition, and aborts the association.
Error	A900	Data set does not match SOP class	The SOP class of the image(s) does not match the negotiated abstract syntax. The MR System sends the failure response, logs the condition, and aborts the association.
	C000	Cannot understand	The image(s) cannot be parsed. The MR System sends the failure response, logs the condition, and aborts the association.
Success	0000	Storage is complete	The image(s) shall be stored in the local database.

4.2.1.4.3. Archive Images

4.2.1.4.3.1. Description and Sequencing of Activities

The Network AE will act as a Storage Commitment SCU for the configured Storage Commitment SCP to receive asynchronous Storage Commitment reports from Storage Commitment requests send by the MR System RWA Archive Images (as Storage Commitment SCU), using an accepted presentation context.

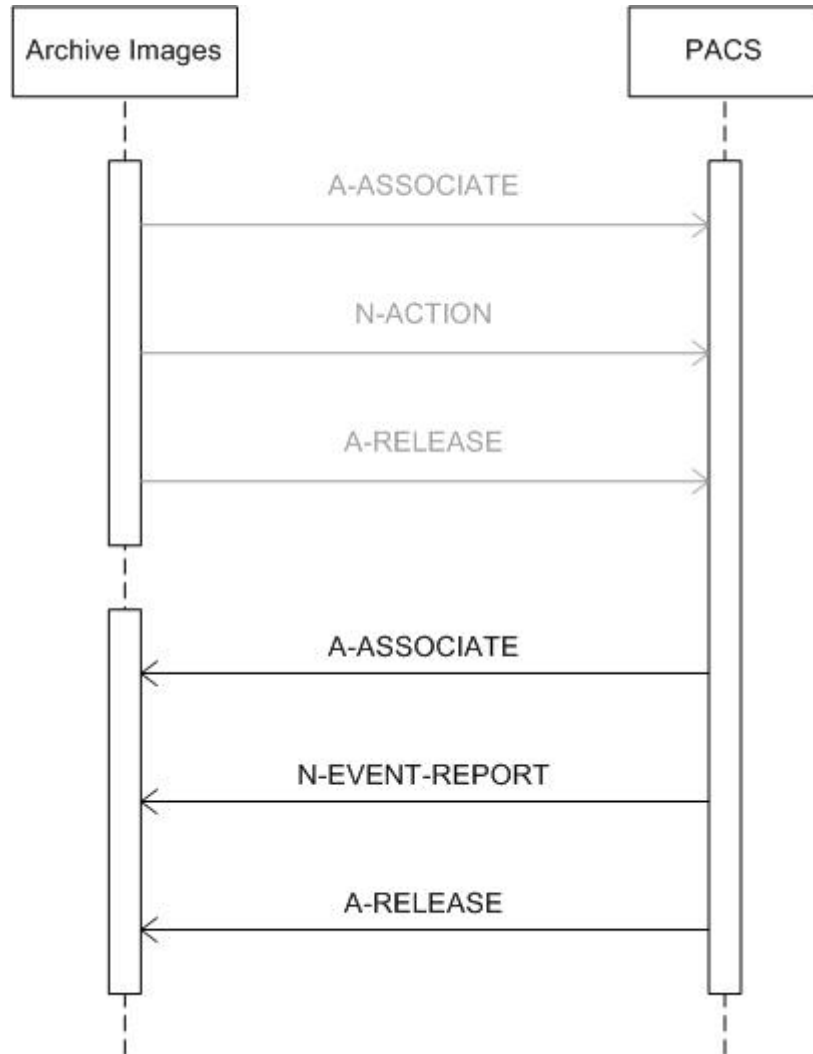


Figure 13: Sequencing of Archive Images

After the Network AE accepts an association from the remote Storage Commitment SCP it will receive Storage Commitment reports, send responses including the relevant status, and finally release the association on SCP request.

4.2.1.4.3.2. Accepted Presentation Contexts

The Network AE may accept the following presentation contexts.

Table 41: Acceptable Presentation Contexts for Archive Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model SOP Class	1.2.840	ELE	1.2.840.10008.1.2.1	SCU	None
	.10008.1.20	EBE	1.2.840.10008.1.2.2	SCU	None
	.1	ILE	1.2.840.10008.1.2	SCU	None

The preferred transfer syntax is ELE.

4.2.1.4.3.3. SOP Specific Conformance for SOP Classes

The storage commitment status is reflected in the Patient Administration Examination status. If the storage commitment failed, the operator is responsible to retry Archive Images.

On receiving a storage commitment result with Event Type ID 1 (Storage Commitment Request Successful) the MR System Patient Administration Examination status shall be updated to reflect the successful storage commitment.

On receiving a storage commitment result with Event Type ID 2 (Storage Commitment Request Complete – Failures Exist) the Network AE shall behave as summarized in Table 42.

Table 42: Network AE N-EVENT-REPORT Failure Handling Behavior

Failure Reason		Behavior
Code	Semantic	
0110	Processing failure	Retry storage commitment request.
0112	No such object instance	Retry store and storage commitment request.
0119	Class / Instance conflict	Inform user and abort.
0122	Referenced SOP class not supported	Inform user and abort.
0131	Duplicate transaction UID	Inform user and abort.
0213	Resource limitation	Retry storage commitment request.

The status processing behavior of the Network AE is summarized in Table 43.

Table 43: Network AE N-EVENT-REPORT Status Processing Behavior

Service Status	Code	Further Meaning	Description
Success	0000	Confirmation	The MR System logs the event.

4.2.2. Print AE

4.2.2.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 44: SOP Classes for the Print AE

SOP Class Name	SOP Class UID	SCU	SCP
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	Yes	No
> Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
> Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
> Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
> Printer	1.2.840.10008.5.1.1.16	Yes	No

4.2.2.2. Association Policies

This section describes the general association establishment and acceptance policies of the Print AE.

4.2.2.2.1. General

The following DICOM standard application context is specified.

Table 45: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

4.2.2.2.2. Number of Associations

The number of simultaneous associations that the Print AE may support is specified as follows. The Print AE does not accept any associations.

Table 46: Number of Associations as an Association Initiator for the Print AE

Maximum number of simultaneous associations	1
---	---

4.2.2.2.3. Asynchronous Nature

Not applicable.

4.2.2.2.4. Implementation Identifying Information

The following values are used for Implementation Class UID and Implementation Version Name.

Table 47: DICOM Implementation Class and Version for the Print AE

Implementation Class UID	2.16.124.113531.1.1.1
Implementation Version Name	MR PRINT 1.2

4.2.2.2.5. Communication Failure Handling

The behavior of the Print AE during communication failure is summarized in Table 48.

Table 48: Communication Failure Behavior

Exception	Behavior
ARTIM Time-out	The association setup fails, the reason is logged and reported to the user.

4.2.2.3. Association Initiation Policy

This describes the conditions under which the Print AE will initiate an association.

The behavior of the Print AE during association rejection is summarized in Table 49.

Table 49: DICOM Association Rejection Handling

Result	Source	Reason/Diagnosis	Behavior
1 – rejected-permanent	1 – DICOM UL service-user	1 – no-reason-given	The user is notified. If applicable the command will be retried. Log entry.
		2 – application-context-name-not-supported	The user is notified. If applicable the command will be retried. Log entry.
		3 – calling-AE-title-not-recognized	The user is notified. If applicable the command will be retried. Log entry.
		7 – called-AE-title-not-recognized	The user is notified. If applicable the command will be retried. Log entry.
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	The user is notified. If applicable the command will be retried. Log entry.
		2 – protocol-version-not-supported	The user is notified. If applicable the command will be retried. Log entry.
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	The user is notified. If applicable the command will be retried. Log entry.
		2 – local-limit-exceeded	The user is notified. If applicable the command will be retried. Log entry.
2 – rejected-transient	1 – DICOM UL service-user	1 – no-reason-given	The user is notified. If applicable the command will be retried. Log entry.
		2 – application-context-name-not-supported	The user is notified. If applicable the command will be retried. Log entry.
		3 – calling-AE-title-not-recognized	The user is notified. If applicable the command will be retried. Log entry.
		7 – called-AE-title-not-recognized	The user is notified. If applicable the command will be retried. Log entry.
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	The user is notified. If applicable the command will be retried. Log entry.
		2 – protocol-version-not-supported	The user is notified. If applicable the command will be retried. Log entry.
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	The user is notified. If applicable the command will be retried. Log entry.
		2 – local-limit-exceeded	The user is notified. If applicable the command will be retried. Log entry.

4.2.2.3.1. Print Images

4.2.2.3.1.1. Description and Sequencing of Activities

Before Print Images the Print AE must have an open association with the Printer. If no association is opened yet, the operator may initiate an association manually by selecting "On" in the printer queue manager dialog; otherwise the Print AE may try and initiate an association automatically at certain time intervals.

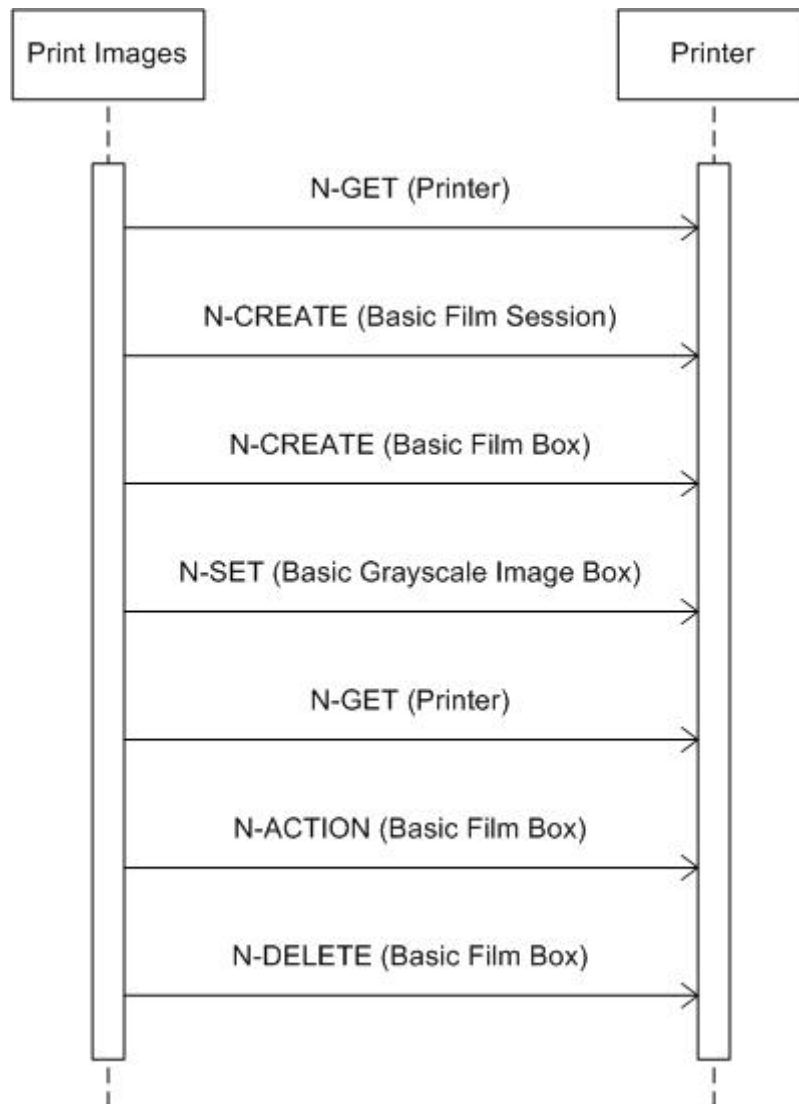


Figure 14: Sequencing of Print Images

Note that the first N-GET message is used to inquire for general printer information, where the second N-GET message is used to inquire for printer status information only.

4.2.2.3.1.2. Proposed Presentation Contexts

The presentation context proposed by Print AE for Print Images is defined in Table 50.

Table 50: Proposed Presentation Contexts for Print Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	ILE	1.2.840.10008.1.2	SCU	None
Presentation LUT	1.2.840.10008.5.1.1.23	ILE	1.2.840.10008.1.2	SCU	None

4.2.2.3.1.3. SOP Specific Conformance for SOP Classes

This section includes the SOP specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

The Print AE cannot handle any N-EVENT-REPORT messages.

The details regarding the response behavior to all status codes, both from an application level and communication errors are provided in Table 51 to Table 56.

Table 51: DICOM Command Response Status Handling Behavior for Printer N-GET

Service Status	Code	Further Meaning	Behavior
Success	0000	Successful operation	The print job continues.
Warning	xxxx	(any warning)	The print job continues and the warning is logged.
Failure	xxxx	(any failure)	The print job is marked as failed, the reason is reported and logged. Eventually the association is released.

Table 52: DICOM Command Response Status Handling Behavior for Basic Film Session N-CREATE

Service Status	Code	Further Meaning	Behavior
Success	0000	Film session successfully created	The print job continues.
Warning	B600	Memory allocation not supported	The print job continues and the warning is logged.

Table 53: DICOM Command Response Status Handling Behavior for Basic Film Box N-CREATE

Service Status	Code	Further Meaning	Behavior
Success	0000	Successful operation	The print job continues.
Warning	B605	Requested Min Density or Max Density outside of printer's operating range	The print job continues and the warning is logged.
Failure	C616	There is an existing Film Box that has not been printed	The print job is marked as failed, the reason is logged.

Table 54: DICOM Command Response Status Handling Behavior for Basic Grayscale Image Box N-SET

Service Status	Code	Further Meaning	Behavior
Success	0000	Successful operation	The print job continues.
Warning	B604	Image size is larger than image box size – the image has been de-magnified	The print job continues and the warning is reported and logged.
	B605	Requested Min Density or Max Density outside of printer's operating range	The print job continues and the warning is reported and logged.
	B609	Image size is larger than image box size – the image has been cropped to fit	The print job continues and the warning is reported and logged.
	B60A	Image size or combined print image size is larger than image box size – the image or combined print image has been decimated to fit	The print job continues and the warning is reported and logged.
Failure	C603	Image size is larger than image box size	The print job is marked as failed, the reason is reported and logged.
	C605	Insufficient memory in printer to store the image	The print job is marked as failed, the reason is reported and logged.
	C613	Combined print image size is larger than image box size	The print job is marked as failed, the reason is reported and logged.

Table 55: DICOM Command Response Status Handling Behavior for Basic Film Box N-ACTION

Service Status	Code	Further Meaning	Behavior
Success	0000	Successful operation	The print job continues.
Warning	B603	Film Box SOP instance hierarchy does not contain Image Box SOP instances	The print job continues and the warning is reported and logged.
	B604	Image size is larger than image box size – the image has been de-magnified	The print job continues and the warning is reported and logged.
	B609	Image size is larger than image box size – the image has been cropped to fit	The print job continues and the warning is reported and logged.
	B60A	Image size or combined print image size is larger than image box size – the image or combined print image has been decimated to fit	The print job continues and the warning is reported and logged.

Service Status	Code	Further Meaning	Behavior
Failure	C602	Unable to create print job SOP instance – print queue is full	The print job is marked as failed, the reason is reported and logged.
	C603	Image size is larger than image box size	The print job is marked as failed, the reason is reported and logged.
	C613	Combined print image size is larger than image box size	The print job is marked as failed, the reason is reported and logged.

Table 56: DICOM Command Response Status Handling Behavior for Basic Film Box N-DELETE

Service Status	Code	Further Meaning	Behavior
Success	0000	Successful operation	The status is logged.
Failure	0110	Processing failure	The status is logged.
	0112	No such object instance	The status is logged.
	0117	Invalid object instance	The status is logged.
	0118	No such SOP class	The status is logged.
	0119	Class instance conflict	The status is logged.
	0210	Duplicate invocation	The status is logged.
	0211	Unrecognized operation	The status is logged.
	0212	Mistyped argument	The status is logged.
	0213	Resource limitation	The status is logged.

The behavior of the AE during communication failure is summarized in Table 57.

Table 57: DICOM Command Communication Failure Behavior

Exception	Behavior
Reply Time-out	The association is released.
Association Time-out SCU	The association is released.
Association Aborted	The Print Images job is marked as failed. The reason is logged and reported to the user.

4.2.2.4. Association Acceptance Policy

The MR System Print AE does not accept any associations.

4.3. Network Interfaces

4.3.1. Physical Network Interface

The MR System provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM standard. No OSI stack communications are provided with this implementation.

The MR System supports Ethernet v2.0 and IEEE 802.3, 10/100/1000 Base-T.

4.3.2. Additional Protocols

Not applicable.

4.4. Configuration

The MR System is configured by means of a configuration program. This program is accessible from the login prompt of the operating system. It is password protected and intended to be used by Philips Customer Support Engineers only. The program allows the Customer Support Engineer to enter configuration information needed by the MR System applications.

4.4.1. AE Title/Presentation Address Mapping

4.4.1.1. Local AE Titles

The MR System can be configured in two ways for the local IP network:

- Automatically via DHCP (hospital provided).
- By assigning a dedicated IP address, (sub)net mask and gateway (if necessary) manually.

This is determined upon installation time of the MR System.

The MR System host name is configurable.

The local AE title mapping and configuration is as specified in the following table.

Table 58: AE Title Configuration Table

Application Entity	Default AE Title	Default TCP/IP Port
Network AE	NODENAME	3010
Print AE	NODENAME	3010

4.4.1.2. Remote AE Title/Presentation Address Mapping

4.4.1.2.1. Remote SCP Configuration

All relevant remote applications that are able to accept an association from the MR System must be configured on the MR System with the following information:

- IP Address.
- Host name and listening port number.
- AE Title.
- The SOP classes and transfer syntaxes that are supported by the remote application.

4.4.1.2.2. Remote SCU Configuration

All relevant remote applications that are able to initiate an association with the MR System must be configured on the MR System with the following information:

- IP Address.
- Host name and listening port number.
- AE Title.
- The SOP classes and transfer syntaxes for which the MR System accepts associations.

4.4.2. Parameters

This section specifies any important operational parameters and, if configurable, their default value and range.

Table 59: Configuration Parameters table

Parameter	Configurable	Default Value
General Parameters		
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	No	180 [s]
General DIMSE level time-out values	No	300 [s]
Time-out waiting for response to TCP/IP connect request. (Low-level timeout)	No	ref. operating system
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	No	ref. operating system
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	No	ref. operating system
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	ref. operating system
AE Specific Parameters		
Size constraint in maximum object size	No	-
Maximum PDU size the AE can receive	Yes	32768
Maximum PDU size the AE can send	Yes	32768
AE specific DIMSE level time-out values	No	300 [s]
SOP Class support	Yes	per template
Convert MR image to Secondary Capture	No	No
Transfer Syntax support	Yes	ELE, EBE, ILE

4.4.2.1. Configuration of the Local System

The following items are configurable per MR System installation:

Table 60: Installation Configuration Items of MR System

Parameter	Explanation	Default
Maximum data PDU size	For associations initiated by the MR System; value must be greater than 0	32768
Allow incoming queries?	Not used – should not be changed	No
ARTIM timeout	Max. time MR System waits for an incoming association	60 seconds
Max nbr of associations	Simultaneous incoming connections to the MR System	2
Image number direction	Order of instance number given upon storage export	Feet to Head (F-H) Left to Right (L-R) Anterior to Posterior (A-P)
Institution name	Must be shorter than 40 characters	-
Automatic association timeout (seconds)	The period of inactivity after which the association with the target node will be closed	Q/R: 5 s RIS: 60 s else: 3600 s

4.4.2.2. Configuration per Remote System

All relevant remote applications are defined through selection of one of the available preconfigured templates. Each defined remote application can be fine-tuned (if necessary) through several configurable parameters. What parameters are configurable depends on the selected template.

Table 61: Configurable Parameters for Remote Systems of MR System

Parameter	Explanation	Default
IsArchive	If set to Yes then the network node plays role of archive	-
Storage Commitment Network Node Name	Only when IsArchive is Yes;	-
Storage Commitment Max. Reply Waiting Time	Only when IsArchive is Yes; For asynchronous storage commitment use -1	-
Supported SOP classes	Depends on used template; SOP classes can be unconfigured	-
Supported Transfer Syntaxes	Depends on used template; the preference can be configured by ordering the supported transfer syntaxes	-
ARTIM timeout	Maximum time MR System waits for association acknowledge	60 seconds
Split multiple day range	Only with RIS template	No
Pure DICOM	Do not send private attributes: only standard attributes	No
Combine MR Rescaling	Rescaling for pixel calibration is discarded (combined with window)	Yes
Send logging	For trouble shooting purposes	No
Receive logging	For trouble shooting purposes	No
Add group length attributes	For trouble shooting purposes	No

- The Basic Worklist Management services may be configured for one node only.
- A worklist query can be configured in two ways:
 - MR System requests one worklist: for today till tomorrow
 - MR System requests two worklists: one for today and one for tomorrow (default)
 This is configurable through the parameter 'Split multiple day range'.
- The MPPS service may be configured for one node only.
- If IsArchive is set to Yes then the following statements apply:
 - Only complete series can be sent;
 - Storage commitment will be enabled;
 - A committed image will be marked in the Patient Administration UI with "archive" flag set;
 - Query filter must be specified and applied.
- The MR System can auto-push MR images to the selected remote application. Whether or not to auto-push a scan is defined in the scan protocol.

4.4.2.3. Print Configuration

Configurable per MR System installation:

- The DICOM printers to be selected by the operator.

Configurable for each defined DICOM printer:

All relevant DICOM printers are defined through selection of one of the available preconfigured templates. Each defined DICOM printer can be fine-tuned (if necessary) through several configurable parameters.

The following list shows all the configurable printer parameters. Depending on the type of printer not all parameters may be present.

-
- Medium type
 - Film formats
 - Destination
 - Photometric Interpretation
 - Film size ID
 - Orientation
 - Magnification
 - Smoothing
 - Border density
 - Empty image density
 - Min. density
 - Max. density
 - Trim
 - Configuration Info
 - Polarity

The MR System can print to only one DICOM printer at a time.

5. MEDIA INTERCHANGE

5.1. Implementation Model

5.1.1. Application Data Flow Diagram

Figure 15 shows the application data flow diagram presenting all of the Application Entities present in an implementation and graphically depicting the relationship of the AE's use of DICOM to Real-World Activities.

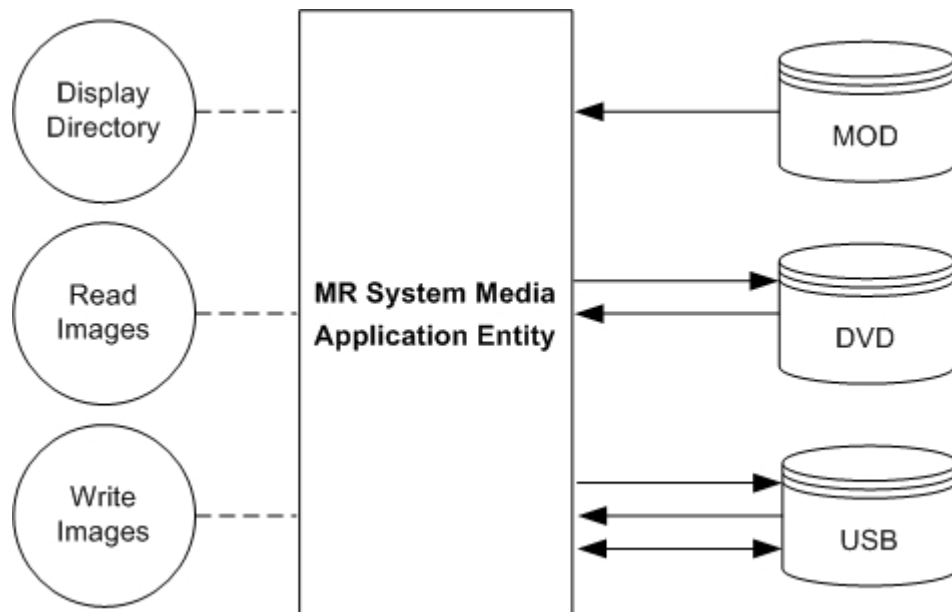


Figure 15: Application Data Flow Diagram

5.1.2. Functional Definitions of AE's

This section describes in general terms the functions to be performed by the AE, and the DICOM services used to accomplish these functions.

5.1.2.1. Functional Definition of the Media AE

The Media AE is the one and only Media application entity within the MR System. It includes the following service class.

Media Storage Service Class

The Media AE can perform the Media Storage service as SCU, with capabilities for RWA Display Directory (as FSR), RWA Write Images (as FSC or FSU), and RWA Read Images (as FSR).

Using initialized media, Write Images can be initiated by selecting the requested images and clicking the media copy button.

5.1.3. Sequencing of Real World Activities

Whenever media has to be written the Media AE first tries to read the DicomDIR. Then the Media AE will write the images of the selected Examinations and the updated DicomDIR to the DICOM media.

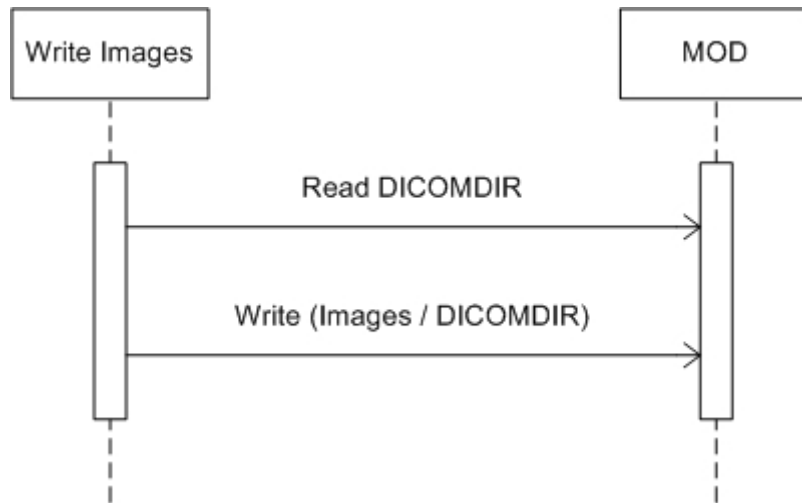


Figure 16: Sequencing of Media Write

5.1.4. File Meta Information for Implementation Class and Version

The following values are assigned to the File Meta Information attributes (see PS 3.10) that pertain to the Implementation Class and Version.

Table 62: DICOM Implementation Class and Version for MR System

File Meta Information Version	00, 01
Implementation Class UID	1.3.46.670589.11.0.0.51.4.4.0
Implementation Version Name	MR DICOM 4.0

5.2. AE Specifications

5.2.1. Media AE

The following table lists the Application Profiles and their Real-World Activities, the roles required for each of these Real-World Activities, and the Service Class option.

Table 63: AE Related Application Profiles, Real-World Activities, and Roles

Supported Application Profile	Real-World Activity	Roles	SC Option
AUG-CTMR-MOD23	Display Directory	FSR	Interchange
	Read Images	FSR	Interchange
AUG-CTMR-MOD41	Display Directory	FSR	Interchange
	Read Images	FSR	Interchange
AUG-CTMR-DVD	Display Directory	FSR	Interchange
	Write Images	FSC	Interchange
	Read Images	FSR	Interchange
STD-GEN-USB-JPEG*	Display Directory	FSR	Interchange
	Write Images	FSC, FSU	Interchange
	Read Images	FSR	Interchange

*No JPEG support; uncompressed data only.

The next table gives an overview of the supported SOP Classes that can be read and written according the Application Profiles in Table 63.

Table 64: Supported SOP Classes by the Media AE

SOP Class	
Name	UID
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1
Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2

Note that the Grayscale Softcopy Presentation State object is not in the application profile but is written as an additional SOP class (extended application profile).

5.2.1.1. File Meta Information for the Media AE

The Media AE has no specific File Meta Information.

5.2.1.2. Real-World Activities

5.2.1.2.1. Display Directory

The Media AE supports the FSR role to interchange stored data on DICOM media.

5.2.1.2.1.1. Media Storage Application Profiles

The Media AE will act as a FSR when reading the directory of DICOM media. This will result in an overview of the Examinations on the MR System Patient Administration.

5.2.1.2.2. Read Images

The Media AE supports the FSR role to interchange stored data on DICOM media.

5.2.1.2.2.1. Media Storage Application Profiles

The MR System Media AE will act as a FSR when reading all images of the selected Examinations from DICOM media. Only images made on an MR System are allowed to be imported again; these imported images are to be used for reference only, it is not intended to export them again.

5.2.1.2.2.1.1. Options

The mandatory attributes of the DICOM images are required for the correct storage of the images in the MR System internal image database. For conformance see section 8.

5.2.1.2.3. Write Images

The Media AE supports the FSC and FSU role to interchange stored data on DICOM media.

The Media AE acts as an FSC when writing DICOM objects onto DICOM media in case the medium contains no DICOM file-set.

When the medium contains a DICOM file-set then the Media AE acts as an FSU. Thus it can merge new objects into the existing file-set or can remove objects from that file-set.

5.2.1.2.3.1. Media Storage Application Profiles

The Media AE will act as a FSC or FSU when writing all images of the selected Examinations onto DICOM media.

5.2.1.2.3.1.1. Options

The DICOMDIR file will be extended when new images are written. In case some attributes are not present in the images but are specified Mandatory in the DICOMDIR definition in DICOM Media, a generated dummy value will be filled in.

Implementation remarks and restriction:

- When writing the DICOMDIR records the following key values are generated if no value of the corresponding attribute is supplied:
 - Patient ID;
 - Study ID;
 - Study Instance UID;
 - Series Number;
 - Series Instance UID;
 - Image Number;
 - SOP Instance UID.
- The mechanism of generating a value for Patient ID creates each time a new value based on Patient's Name for each new study written to DICOM media, even if this study belongs to a patient recorded earlier.
- The default value for the Pixel Intensity Relationship (0028,1040) is set to DISP.
- A number of attributes (e.g., Window Width and Window Centre) can be formatted as floating point numbers.

5.3. Augmented and Private Application Profiles

This section describes any augmented and private Application Profiles.

5.3.1. Augmented Application Profiles

5.3.1.1. Augmented Application Profile AUG-CTMR-MOD23

5.3.1.1.1. SOP Class Augmentations

As an augmentation to the STD-CTMR-MOD23 application profiles, also grayscale softcopy presentation state and private objects shall be interchanged per MOD.

5.3.1.1.2. Directory Augmentations

Not applicable.

5.3.1.1.3. Other Augmentations

Not applicable.

5.3.1.2. Augmented Application Profile AUG-CTMR-MOD41

5.3.1.2.1. SOP Class Augmentations

As an augmentation to the STD-CTMR-MOD41 application profiles, also grayscale softcopy presentation state and private objects shall be interchanged per MOD.

5.3.1.2.2. Directory Augmentations

Not applicable.

5.3.1.2.3. Other Augmentations

Not applicable.

5.3.1.3. Augmented Application Profile AUG-CTMR-DVD**5.3.1.3.1. SOP Class Augmentations**

As an augmentation to the STD-CTMR-DVD application profiles, also grayscale softcopy presentation state and private objects shall be interchanged per DVD.

5.3.1.3.2. Directory Augmentations

Not applicable.

5.3.1.3.3. Other Augmentations

Not applicable.

5.3.2. Private Application Profiles

Not applicable.

5.4. Media Configuration

Not applicable.

6. SUPPORT OF CHARACTER SETS

The MR System supports the following character sets.

Table 65: Supported Character Sets of the MR System

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Latin alphabet No. 1	ISO_IR 100	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 100	G1	Supplementary set of ISO 8859
	ISO 2022 IR 100	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/01	ISO-IR 100	G1	Supplementary set of ISO 8859
Japanese	ISO_IR 13	-	ISO-IR 13	G1	JIS X 0201: Katakana
		-	ISO-IR 14	G0	JIS X 0201: Romaji
	ISO 2022 IR 13	ESC 02/09 04/09	ISO-IR 13	G1	JIS X 0201: Katakana
		ESC 02/08 04/10	ISO-IR 14	G0	JIS X 0201: Romaji
	ISO 2022 IR 87	ESC 02/04 04/02	ISO-IR 87	G0	JIS X 0208: Kanji
	ISO 2022 IR 159	ESC 02/04 02/08 04/04	ISO-IR 159	G0	JIS X 0212: Supplementary Kanji set

Note that the MR System supports Japanese character sets only for use in the Patient's Name attribute (0010,0010).

Internally the MR System only uses Unicode characters. This implies that text will be displayed as Unicode to.

If the MR System receives a Specific Character Set that is not supported then the related association will be aborted.

However, if a RIS worklist contains a Specific Character Set attribute that is not empty and not supported according Table 65 then the MR System will send a C-CANCEL request to the RIS and a "RIS ERROR" message will be displayed; the MR System will reject the RIS import.

The Print AE provides no support for extended character sets in the communication with DICOM SCP's.

7. SECURITY

7.1. Transport Layer Security (TLS)

TLS is supported, certificate validation is in preparation.

7.2. Association Level Security

The MR System accepts associations only from known applications or an application whose "calling AE Title" is defined in its configuration file. The MR System will reject association requests from unknown applications, i.e. applications that offer an unknown "calling AE title". An application entity (AE) is known if – and only if – it is defined during configuration of the MR System, which is done via the configuration application.

7.3. Application Level Security

The MR System allows the use of either conventional (non-secure) communication or secure communication based on the Transport Layer Security (TLS) protocol. If configured, the MR System supports security measures for:

- secure authentication of a node;
- replay protection;
- access control

7.4. HIPAA

Among the list of HIPAA requirements to be supported the security mechanisms outlined below have been implemented.

Table 66: Security Mechanisms

Requirement	Implementation	Technical Solution
Access Control	Role-based access	The MR System system enables applications to provide access to functionality based on roles.
	User-based access	The MR System system protects files, applications, and other system resources from unauthorized use based on user roles.
	Encryption	N/A
Audit Trail	-	N/A
Data Authentication	-	N/A
Entity Authentication	Unique user identification	The number of users and their privileges are limited based on predefined user roles. In addition, the MR System supports hardware dongle and SmartCard based user privilege allocation.
	Password	Requirements for MR System user passwords can be configured via the Group Policy management application. Options include minimum password length, maximum password age, password re-use, etc.
	Token	Windows 2000 operating system supports authentication via both hardware dongle and SmartCard.

8. ANNEXES

8.1. IOD Contents

8.1.1. Created SOP Instances

This section specifies each IOD created by the MR System Network AE.

Used abbreviations are:

For module and macro Usage

ALWAYS the module is always present
 CONDITIONAL the module is used under specified condition

For attribute Definition

The first value is about the presence of the attribute and the next value(s) tell something about the source. In case the source contains multiple values, then either one of these may be applicable depending on the use of the system.

Presence

ALWAYS the attribute is always present with a value
 EMPTY the attribute is always present without any value (attribute sent zero length)
 VNAP the attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
 ANAP the attribute is present under specified condition – if present then it will always have a value
 ANAPCV the attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
 ANAPEV the attribute is present under specified condition – if present then it will not have any value

Source

AUTO the attribute value is generated automatically
 CONFIG the attribute value source is a configurable parameter
 COPY the attribute value source is another SOP instance
 FIXED the attribute value is hard-coded in the application
 IMPLICIT the attribute value source is a user-implicit setting
 MPPS the attribute value source is a Modality Performed Procedure Step
 MWL the attribute value source is a Modality Worklist
 USER the attribute value source is explicit user input

8.1.1.1. MR Image Storage SOP Class

Table 67: Modules of the MR Image Storage SOP Class

Information Entity	Module Name	Usage
Patient	Patient	ALWAYS
	Patient Medical	ALWAYS
Study	General Study	ALWAYS
	Patient Study	ALWAYS
Series	General Series	ALWAYS
Frame of Reference	Frame of Reference	ALWAYS
Equipment	General Equipment	ALWAYS
Image	General Image	ALWAYS
	Image Plane	ALWAYS
	Image Pixel	ALWAYS
	MR Image	ALWAYS
	Overlay Plane	CONDITIONAL, not if Presentation State objects are supported
	Modality LUT	CONDITIONAL, not for combined MR rescaling
	VOI LUT	ALWAYS
	Private Group	CONDITIONAL, not for pure DICOM images

Table 68: Created MR Image Storage SOP Class Attributes

Name	Tag	VR	Definition	Comment
Patient Module				
Patient's Name	0010,0010	PN	ALWAYS, MWL / USER	-
Patient ID	0010,0020	LO	ALWAYS, MWL / USER	-
Patient's Birth Date	0010,0030	DA	ALWAYS, MWL / USER	-
Patient's Sex	0010,0040	CS	ALWAYS, MWL / USER	-
Ethnic Group	0010,2160	SH	ANAPCV, MWL / USER	Only present when patient demographics received from RIS.
Patient Comments	0010,4000	LT	ANAPCV, MWL	Only present when patient demographics received from RIS.
Patient Medical Module				
Medical Alerts	0010,2000	LO	ANAPCV, MWL / USER	Only present when patient demographics received from RIS.
Contrast Allergies	0010,2110	LO	ANAPCV, MWL / USER	Only present when patient demographics received from RIS.
Pregnancy Status	0010,21C0	US	VNAP, MWL / USER	-

Name	Tag	VR	Definition	Comment
Special Needs	0038,0050	LO	ANAPCV, MWL	Only present when patient demographics received from RIS.
Patient State	0038,0500	LO	ANAPCV, MWL	Only present when patient demographics received from RIS.
General Study Module				
Study Date	0008,0020	DA	ALWAYS, AUTO / MWL	-
Study Time	0008,0030	TM	ALWAYS, AUTO / MWL	-
Accession Number	0008,0050	SH	ALWAYS, AUTO / MWL / USER	-
Referring Physician's Name	0008,0090	PN	VNAP, MWL / USER	-
Study Description	0008,1030	LO	VNAP, MWL / USER	-
Procedure Code Sequence	0008,1032	SQ	ANAP, MWL / USER	-
>Code Value	0008,0100	SH	ALWAYS, MWL / USER	-
>Coding Scheme Designator	0008,0102	SH	ALWAYS, MWL / USER	-
>Coding Scheme Version	0008,0103	SH	ANAP, MWL / USER	-
>Code Meaning	0008,0104	LO	ALWAYS, MWL / USER	-
>Context Group Local Version	0008,0107	DT	ANAP, MWL	-
>Context Group Extension Flag	0008,010B	CS	ALWAYS, MWL	-
>Context Group Extension Creator UID	0008,010D	UI	ANAP, MWL	-
Referenced Study Sequence	0008,1110	SQ	ALWAYS, AUTO / MWL	As received from RIS or else default.
>Referenced SOP Class UID	0008,1150	UI	ALWAYS, AUTO / MWL	-
>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, AUTO / MWL	-
Study Instance UID	0020,000D	UI	ALWAYS, AUTO / MWL	-
Study ID	0020,0010	SH	ALWAYS, AUTO	-
Requesting Physician	0032,1032	PN	VNAP, MWL	-
Requesting Service	0032,1033	LO	VNAP, MWL	-

Name	Tag	VR	Definition	Comment
Requested Procedure Description	0032,1060	LO	VNAP, MWL	-
Requested Contrast Agent	0032,1070	LO	VNAP, MWL	-
Study Comments	0032,4000	LT	VNAP, COPY	Maximally 32 characters copied from (0040,0280) Comments on the Performed Procedure Steps.
Performed Station AE Title	0040,0241	AE	ALWAYS, CONFIG	-
Performed Station Name	0040,0242	SH	ANAPCV, CONFIG	If MPPS applied.
Performed Location	0040,0243	SH	ANAPCV, CONFIG	If MPPS applied.
Performed Procedure Step End Date	0040,0250	DA	VNAP, AUTO	-
Performed Procedure Step End Time	0040,0251	TM	VNAP, AUTO	-
Performed Procedure Step Status	0040,0252	CS	ANAP, IMPLICIT	If MPPS applied.
Performed Procedure Type Description	0040,0255	LO	ANAP, IMPLICIT	If MPPS value applied.
Requested Procedure ID	0040,1001	SH	VNAP, MWL	-
Reason for the Requested Procedure	0040,1002	LO	VNAP, MWL	-
Requested Procedure Priority	0040,1003	SH	VNAP, MWL	-
Patient Transport Arrangements	0040,1004	LO	VNAP, MWL	-
Requested Procedure Location	0040,1005	LO	VNAP, MWL	-
Requested Procedure Comments	0040,1400	LT	VNAP, MWL	-
Reason for the Imaging Service Request	0040,2001	LO	VNAP, MWL	-
Issue Date of Imaging Service Request	0040,2004	DA	VNAP, MWL	-
Issue Time of Imaging Service Request	0040,2005	TM	VNAP, MWL	-
Order Enterer's Location	0040,2009	SH	VNAP, MWL	-
Order Callback Phone Number	0040,2010	SH	VNAP, MWL	-
Imaging Service Request Comments	0040,2400	LT	VNAP, MWL	-
Patient Study Module				
Admitting Diagnoses Description	0008,1080	LO	VNAP, MWL	-
Patient's Weight	0010,1030	DS	ALWAYS, MWL / USER	-
Occupation	0010,2180	SH	ANAPCV, MWL	Only present when patient demographics received from RIS.
Additional Patient History	0010,21B0	LT	VNAP, MWL	-
General Series Module				
Series Date	0008,0021	DA	ALWAYS, AUTO	-

Name	Tag	VR	Definition	Comment
Series Time	0008,0031	TM	ALWAYS, AUTO	-
Modality	0008,0060	CS	ALWAYS, FIXED	Applied value: MR
Series Description	0008,103E	LO	ANAP, AUTO / USER	Contains Sub-anatomy and Scan name
Operator's Name	0008,1070	PN	EMPTY, FIXED	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ	ALWAYS, AUTO	-
>Instance Creation Date	0008,0012	DA	ALWAYS, AUTO	-
>Instance Creation Time	0008,0013	TM	ALWAYS, AUTO	-
>Instance Creator UID	0008,0014	UI	ALWAYS, AUTO	-
>Referenced SOP Class UID	0008,1150	UI	ALWAYS, FIXED	Applied value: 1.2.840.10008.3.1.2.3.3
>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, MPPS	-
>Instance Number	0020,0013	IS	ALWAYS, AUTO	-
Body Part Examined	0018,0015	CS	ANAP, AUTO	If ExamCard scan.
Protocol Name	0018,1030	LO	ALWAYS, USER	Scan name.
Patient Position	0018,5100	CS	ALWAYS, AUTO	-
Series Instance UID	0020,000E	UI	ALWAYS, AUTO	Generated by MR System.
Series Number	0020,0011	IS	ALWAYS, AUTO	Created dynamically at export. Contains the concatenation of the acquisition number and the private reconstruction number.
Laterality	0020,0060	CS	ANAPCV, USER	-
Performed Procedure Step Start Date	0040,0244	DA	ALWAYS, AUTO	-
Performed Procedure Step Start Time	0040,0245	TM	ALWAYS, AUTO	-
Performed Procedure Step ID	0040,0253	SH	ALWAYS, AUTO	-
Performed Procedure Step Description	0040,0254	LO	VNAP, MWL / USER	-
Performed Protocol Code Sequence	0040,0260	SQ	ANAPCV, MWL / USER	Filled if scheduled.
>Code Value	0008,0100	SH	ALWAYS, MWL / USER	-
>Coding Scheme Designator	0008,0102	SH	ALWAYS, MWL / USER	-
>Coding Scheme Version	0008,0103	SH	ANAP, MWL / USER	-

Name	Tag	VR	Definition	Comment
>Code Meaning	0008,0104	LO	ALWAYS, MWL / USER	-
>Mapping Resource	0008,0105	CS	ANAP, MWL	-
>Context Group Version	0008,0106	DT	ANAP, MWL	-
>Context Group Local Version	0008,0107	DT	ANAP, MWL	-
>Context Group Extension Flag	0008,010B	CS	ALWAYS, MWL	-
>Context Group Extension Creator UID	0008,010D	UI	ANAP, MWL	-
>Context Identifier	0008,010F	CS	VNAP, MWL	-
Request Attributes Sequence	0040,0275	SQ	VNAP, MWL	-
>Scheduled Procedure Step Description	0040,0007	LO	VNAP, MWL	-
>Scheduled Procedure Step ID	0040,0009	SH	ALWAYS, MWL	-
>Requested Procedure ID	0040,1001	SH	ALWAYS, MWL	-
Comments on the Performed Procedure Steps	0040,0280	ST	ANAPCV, MWL / USER	Maximum of 64 characters.
Frame of Reference Module				
Frame of Reference UID	0020,0052	UI	ALWAYS, AUTO	-
Position Reference Indicator	0020,1040	LO	EMPTY, FIXED	-
General Equipment Module				
Manufacturer	0008,0070	LO	ALWAYS, FIXED	Applied value: Philips Medical Systems
Institution Name	0008,0080	LO	ALWAYS, CONFIG	Configured on the system.
Station Name	0008,1010	SH	ALWAYS, CONFIG	Same as the Host Name.
Institutional Department Name	0008,1040	LO	ALWAYS, CONFIG	-
Manufacturer's Model Name	0008,1090	LO	ALWAYS, FIXED	Applied values: Achieva, Intera, Panorama 1.0T
Device Serial Number	0018,1000	LO	ALWAYS, FIXED	System serial number.
Software Version(s)	0018,1020	LO	ALWAYS, FIXED	The release text of the original image.
General Image Module				
Acquisition Date	0008,0022	DA	ALWAYS, AUTO	Same as Content Date.
Content Date	0008,0023	DA	ALWAYS, AUTO	-
Acquisition Time	0008,0032	TM	ALWAYS, AUTO	Same as Content Time.
Content Time	0008,0033	TM	ALWAYS, AUTO	-
Referenced Image Sequence	0008,1140	SQ	VNAP, AUTO	-
>Referenced SOP Class UID	0008,1150	UI	ALWAYS, IMPLICIT	-

Name	Tag	VR	Definition	Comment
>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, IMPLICIT	-
Acquisition Number	0020,0012	IS	ALWAYS, AUTO	Scan Number.
Instance Number	0020,0013	IS	ALWAYS, AUTO	-
Lossy Image Compression	0028,2110	CS	ALWAYS, FIXED	Applied value: 00
Presentation LUT Shape	2050,0020	CS	ALWAYS, FIXED	Applied value: IDENTITY
Image Plane Module				
Slice Thickness	0018,0050	DS	ALWAYS, AUTO	-
Image Position (Patient)	0020,0032	DS	ALWAYS, AUTO	-
Image Orientation (Patient)	0020,0037	DS	ALWAYS, AUTO	-
Slice Location	0020,1041	DS	ALWAYS, AUTO	-
Pixel Spacing	0028,0030	DS	ALWAYS, AUTO	-
Image Pixel Module				
Rows	0028,0010	US	ALWAYS, IMPLICIT	Applied values: 64, 128, 256, 512, 1024, 2048
Columns	0028,0011	US	ALWAYS, IMPLICIT	Applied values: 64, 128, 256, 512, 1024, 2048
Pixel Aspect Ratio	0028,0034	IS	ALWAYS, FIXED	Applied value: (1,1)
Bits Stored	0028,0101	US	ALWAYS, IMPLICIT	-
High Bit	0028,0102	US	ALWAYS, IMPLICIT	-
Pixel Representation	0028,0103	US	ALWAYS, FIXED	Applied value: 0000
Pixel Data	7FE0,0010	OW	ALWAYS, IMPLICIT	-
MR Image Module				
Image Type	0008,0008	CS	ALWAYS, AUTO	Applied values: ({DERIVED, ORIGINAL}, PRIMARY, {METABOLITE_MAP, REALTIME, VELOCITY}, {ADC, DELAYED_IMAGE, DELAYED_RECON, DIFFUSION, DIFFUSION_ANISO, ENHANCEMENT, FLOW_ENCODED, FLUID_ATTENUATED, FOV_FUSION, INVERSE_RECON, MAXIMUM, MIXED, MTT, NONE, PERFUSION, PROTON_DENSITY, RCBF, RCBV, RESAMPLED, SPECTRO, STIR, SUBTRACTION, T1, T2, T2_STAR, TAGGING, TOF, TTP, UNKNOWN})

Name	Tag	VR	Definition	Comment
Scanning Sequence	0018,0020	CS	ALWAYS, AUTO	-
Sequence Variant	0018,0021	CS	ALWAYS, AUTO	-
Scan Options	0018,0022	CS	VNAP, IMPLICIT	-
MR Acquisition Type	0018,0023	CS	ALWAYS, AUTO	-
Repetition Time	0018,0080	DS	ANAP, IMPLICIT / USER	-
Echo Time	0018,0081	DS	ALWAYS, IMPLICIT / USER	-
Inversion Time	0018,0082	DS	ANAP, IMPLICIT / USER	-
Number of Averages	0018,0083	DS	ALWAYS, IMPLICIT / USER	-
Imaging Frequency	0018,0084	DS	ALWAYS, CONFIG	-
Imaged Nucleus	0018,0085	SH	ALWAYS, IMPLICIT	-
Echo Number(s)	0018,0086	IS	VNAP, IMPLICIT	-
Magnetic Field Strength	0018,0087	DS	VNAP, CONFIG	-
Spacing Between Slices	0018,0088	DS	ALWAYS, IMPLICIT / USER	-
Number of Phase Encoding Steps	0018,0089	IS	VNAP, IMPLICIT / USER	-
Echo Train Length	0018,0091	IS	VNAP, IMPLICIT / USER	-
Percent Sampling	0018,0093	DS	VNAP, IMPLICIT / USER	-
Percent Phase Field of View	0018,0094	DS	VNAP, IMPLICIT / USER	-
Pixel Bandwidth	0018,0095	DS	ALWAYS, AUTO	-
Trigger Time	0018,1060	DS	VNAP, IMPLICIT / USER	Will only have a value for Dynamic Series (2001,1012).
Low R-R Value	0018,1081	IS	ANAPCV, IMPLICIT	-
High R-R Value	0018,1082	IS	ANAPCV, IMPLICIT	-
Intervals Acquired	0018,1083	IS	ANAP, IMPLICIT	-
Intervals Rejected	0018,1084	IS	ANAPCV, IMPLICIT	-
Heart Rate	0018,1088	IS	ANAPCV, IMPLICIT / USER	-
Trigger Window	0018,1094	IS	ANAPCV, IMPLICIT	-

Name	Tag	VR	Definition	Comment
Reconstruction Diameter	0018,1100	DS	VNAP, CONFIG	-
Receiving Coil	0018,1250	SH	ALWAYS, IMPLICIT / USER	-
Transmitting Coil	0018,1251	SH	ALWAYS, IMPLICIT / USER	-
Acquisition Matrix	0018,1310	US	VNAP, IMPLICIT	-
In-plane Phase Encoding Direction	0018,1312	CS	VNAP, IMPLICIT	-
Flip Angle	0018,1314	DS	VNAP, IMPLICIT / USER	-
Temporal Position Identifier	0020,0100	IS	VNAP, IMPLICIT	-
Number of Temporal Positions	0020,0105	IS	VNAP, IMPLICIT / USER	-
Samples per Pixel	0028,0002	US	ALWAYS, FIXED	Applied value: 1
Photometric Interpretation	0028,0004	CS	ALWAYS, FIXED	Applied value: MONOCHROME2
Bits Allocated	0028,0100	US	ALWAYS, FIXED	Applied value: 16
Overlay Plane Module				
Overlay Rows	6000,0010	US	ALWAYS, AUTO	-
Overlay Columns	6000,0011	US	ALWAYS, AUTO	-
Overlay Description	6000,0022	LO	ANAPEV, AUTO	-
Overlay Type	6000,0040	CS	ALWAYS, AUTO	-
Overlay Subtype	6000,0045	LO	ANAPEV, AUTO	-
Overlay Origin	6000,0050	SS	ALWAYS, AUTO	-
Overlay Bits Allocated	6000,0100	US	ALWAYS, AUTO	-
Overlay Bit Position	6000,0102	US	ALWAYS, AUTO	-
ROI Area	6000,1301	IS	ANAPEV, AUTO	-
ROI Mean	6000,1302	DS	ANAPEV, AUTO	-
ROI Standard Deviation	6000,1303	DS	ANAPEV, AUTO	-
Overlay Label	6000,1500	LO	EMPTY, FIXED	-
Overlay Data	6000,3000	OW	ALWAYS, AUTO	-
Modality LUT Module				
Rescale Intercept	0028,1052	DS	ALWAYS, AUTO	-
Rescale Slope	0028,1053	DS	ALWAYS, AUTO	-

Name	Tag	VR	Definition	Comment
Rescale Type	0028,1054	LO	ALWAYS, AUTO	Applied values: cm/sec, milliradials, milliseconds, mm ² /sec, normalized, seconds, US
VOI LUT Module				
Window Center	0028,1050	DS	ALWAYS, AUTO	-
Window Width	0028,1051	DS	ALWAYS, AUTO	-
VOI LUT Sequence	0028,3010	SQ	ALWAYS, AUTO	-
LUT Descriptor	0028,3002	US/ SS	ALWAYS, AUTO	Applied value: (0,0,0)
LUT Explanation	0028,3003	LO	EMPTY, FIXED	-
LUT Data	0028,3006	US/ SS/ OW	ALWAYS, AUTO	Applied value: 0
SOP Common Module				
Specific Character Set	0008,0005	CS	ALWAYS, AUTO	Applied values: ISO_IR 13, ISO_IR 100, ISO 2022 IR 13, ISO 2022 IR 87, ISO 2022 IR 100, ISO 2022 IR 159
Instance Creation Date	0008,0012	DA	ALWAYS, AUTO	-
Instance Creation Time	0008,0013	TM	ALWAYS, AUTO	-
Instance Creator UID	0008,0014	UI	ALWAYS, AUTO	-
SOP Class UID	0008,0016	UI	ALWAYS, FIXED	-
SOP Instance UID	0008,0018	UI	ALWAYS, AUTO	-
Private Group				
Private Creator Group 2001	2001,0010	LO	ALWAYS, FIXED	Applied value: Philips Imaging DD 001
Chemical Shift	2001,1001	FL	ANAPCV, USER	Only applicable for spectro 2dsi.
Chemical Shift Number MR	2001,1002	IS	ANAPCV, IMPLICIT	Only applicable for spectro 2dsi.
Diffusion B-Factor	2001,1003	FL	ANAPCV, USER	Only applicable for diffusion scans.
Diffusion Direction	2001,1004	CS	ANAPCV, USER	Indicates the diffusion sensitive direction, i.e. which of the 6 elements of the symmetrical tensor of rank 2 (3x3 matrix) is measured. Isotropic means that no direction sensitivity is applied. Possible values: P (Preparation Direction) M (Measurement Direction) S (Selection Direction) O (Oblique Direction) I (Isotropic) Only applicable for diffusion scans.

Name	Tag	VR	Definition	Comment
Image Enhanced	2001,1006	CS	VNAP, IMPLICIT / USER	-
Image Type ED ES	2001,1007	CS	VNAP, IMPLICIT / USER	-
Phase Number	2001,1008	IS	ALWAYS, IMPLICIT	When cardiac synchronization used.
Slice Number MR	2001,100A	IS	ALWAYS, IMPLICIT	-
Diffusion Echo Time	2001,1011	FL	ANAPCV, IMPLICIT	Only applicable for diffusion scans.
Dynamic Series	2001,1012	CS	VNAP, USER	-
EPI Factor	2001,1013	SL	ALWAYS, IMPLICIT / USER	-
Number of Echoes	2001,1014	SL	VNAP, USER	-
Number of Locations	2001,1015	SS	VNAP, IMPLICIT / USER	-
Number of PC Directions	2001,1016	SS	VNAP, USER	-
Number of Phases MR	2001,1017	SL	VNAP, IMPLICIT / USER	-
Number of Slices MR	2001,1018	SL	VNAP, IMPLICIT / USER	-
Partial Matrix Scanned	2001,1019	CS	VNAP, IMPLICIT / USER	-
PC Velocity	2001,101A	FL	ALWAYS, IMPLICIT / USER	-
Prepulse Delay	2001,101B	FL	VNAP, IMPLICIT / USER	-
Prepulse Type	2001,101C	CS	VNAP, USER	-
Reconstruction Number MR	2001,101D	IS	VNAP, IMPLICIT	-
Respiration Sync	2001,101F	CS	VNAP, USER	-
SPIR	2001,1021	CS	VNAP, USER	-
Water Fat Shift	2001,1022	FL	VNAP, IMPLICIT / USER	-
Flip Angle Philips	2001,1023	DS	ALWAYS, IMPLICIT / USER	-
Number of Stacks	2001,1060	SL	VNAP, USER	-
Number of Dynamic Scans	2001,1081	IS	VNAP, IMPLICIT / USER	-
Acquisition Number	2001,107B	IS	ALWAYS, IMPLICIT	-
Private Creator Group 2005	2005,0010	LO	ALWAYS, FIXED	Applied value: Philips MR Imaging DD 001

Name	Tag	VR	Definition	Comment
Number of Chemical Shift	205,1020	SL	ANAPCV, USER	Only applicable for spectro 2dsi.
Syncra Scan Type	205,10A1	CS	ANAPCV, USER	If syncra scan. Applied values: SENSE, SYN_CLASSIC, SYN_COCA
Diffusion Direction RL	205,10B0	FL	ANAP, AUTO	Only applicable if Diffusion Direction is Oblique.
Diffusion Direction AP	205,10B1	FL	ANAP, AUTO	Only applicable if Diffusion Direction is Oblique.
Diffusion Direction FH	205,10B2	FL	ANAP, AUTO	Only applicable if Diffusion Direction is Oblique.

8.1.1.2. Secondary Capture Image Storage SOP Class

Table 69: Modules of the Secondary Capture Image Storage SOP Class

Information Entity	Module Name	Usage
Patient	Patient	ALWAYS
	Patient Medical	ALWAYS
Study	General Study	ALWAYS
	Patient Study	ALWAYS
Series	General Series	ALWAYS
Equipment	General Equipment	ALWAYS
	SC Equipment	ALWAYS
Image	General Image	ALWAYS
	Image Pixel	ALWAYS
	SC Image	ALWAYS
	SOP Common	ALWAYS

Table 70: Created Secondary Capture Image Storage SOP Class Attributes

Name	Tag	VR	Definition	Comment
Patient Module				
Patient's Name	0010,0010	PN	ALWAYS, COPY	-
Patient ID	0010,0020	LO	ALWAYS, COPY	-
Patient's Birth Date	0010,0030	DA	ALWAYS, COPY	-
Patient's Sex	0010,0040	CS	ALWAYS, COPY	-
Patient Medical Module				
Medical Alerts	0010,2000	LO	ANAPCV, COPY	-
Contrast Allergies	0010,2110	LO	ANAPCV, COPY	-
Pregnancy Status	0010,21C0	US	VNAP, COPY	-
Special Needs	0038,0050	LO	ANAPCV, COPY	-
Patient State	0038,0500	LO	ANAPCV, COPY	-
General Study Module				
Study Date	0008,0020	DA	ALWAYS, COPY	-
Study Time	0008,0030	TM	ALWAYS, COPY	-
Accession Number	0008,0050	SH	ALWAYS, COPY	-
Referring Physician's Name	0008,0090	PN	VNAP, COPY	-
Study Description	0008,1030	LO	VNAP, COPY	-
Procedure Code Sequence	0008,1032	SQ	ANAP, COPY	If present in original study.
>Code Value	0008,0100	SH	ALWAYS, COPY	-
>Coding Scheme Designator	0008,0102	SH	ALWAYS, COPY	-

Name	Tag	VR	Definition	Comment
>Coding Scheme Version	0008,0103	SH	ANAP, COPY	-
>Code Meaning	0008,0104	LO	ALWAYS, COPY	-
>Context Group Local Version	0008,0107	DT	ANAP, COPY	-
>Context Group Extension Flag	0008,010B	CS	ALWAYS, COPY	-
>Context Group Extension Creator UID	0008,010D	UI	ANAP, COPY	-
Referenced Study Sequence	0008,1110	SQ	ANAP, COPY	If present in original study.
>Referenced SOP Class UID	0008,1150	UI	ALWAYS, COPY	-
>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, COPY	-
Study Instance UID	0020,000D	UI	ALWAYS, COPY	-
Study ID	0020,0010	SH	ALWAYS, COPY	-
Patient Study Module				
Admitting Diagnoses Description	0008,1080	LO	VNAP, COPY	-
Patient's Weight	0010,1030	DS	ALWAYS, COPY	-
General Series Module				
Series Date	0008,0021	DA	ALWAYS, AUTO	-
Series Time	0008,0031	TM	ALWAYS, AUTO	-
Series Description	0008,103E	LO	ANAP, AUTO / USER	-
Operator's Name	0008,1070	PN	EMPTY, AUTO	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ	ALWAYS, AUTO	-
>Instance Creation Date	0008,0012	DA	ALWAYS, AUTO	-
>Instance Creation Time	0008,0013	TM	ALWAYS, AUTO	-
>Instance Creator UID	0008,0014	UI	ALWAYS, AUTO	-
>Referenced SOP Class UID	0008,1150	UI	ALWAYS, AUTO	-
>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, AUTO	-
>Instance Number	0020,0013	IS	ALWAYS, AUTO	-
Body Part Examined	0018,0015	CS	ANAP, COPY	-
Protocol Name	0018,1030	LO	ALWAYS, COPY	-
Series Instance UID	0020,000E	UI	ALWAYS, AUTO	-
Series Number	0020,0011	IS	ALWAYS, AUTO	-
Laterality	0020,0060	CS	ANAPCV, COPY	-

Name	Tag	VR	Definition	Comment
Performed Procedure Step Start Date	0040,0244	DA	ALWAYS, COPY	-
Performed Procedure Step Start Time	0040,0245	TM	ALWAYS, COPY	-
Performed Procedure Step ID	0040,0253	SH	ALWAYS, COPY	-
Performed Procedure Step Description	0040,0254	LO	VNAP, COPY	-
Performed protocol code sequence	0040,0260	SQ	ANAPCV, COPY	-
>Code Value	0008,0100	SH	ALWAYS, COPY	-
>Coding Scheme Designator	0008,0102	SH	ALWAYS, COPY	-
>Coding Scheme Version	0008,0103	SH	ANAP, COPY	-
>Code Meaning	0008,0104	LO	ALWAYS, COPY	-
>Context Group Local Version	0008,0107	DT	ANAP, COPY	-
>Context Group Extension Flag	0008,010B	CS	ALWAYS, COPY	-
>Context Group Extension Creator UID	0008,010D	UI	ANAP, COPY	-
Request Attributes Sequence	0040,0275	SQ	ANAPCV, COPY	-
>Scheduled Procedure Step Description	0040,0007	LO	VNAP, COPY	-
>Scheduled Procedure Step ID	0040,0009	SH	ALWAYS, COPY	-
>Requested Procedure ID	0040,1001	SH	ALWAYS, COPY	-
Comments on the Performed Procedure Steps	0040,0280	ST	ANAPCV, COPY	Maximum of 64 characters.
General Equipment Module				
Manufacturer	0008,0070	LO	ALWAYS, AUTO	Applied value: Philips Medical Systems
Institution Name	0008,0080	LO	ALWAYS, CONFIG	-
Institution Address	0008,0081	ST	ANAPCV, CONFIG	-
Station Name	0008,1010	SH	ALWAYS, CONFIG	-
Institutional Department Name	0008,1040	LO	ALWAYS, CONFIG	-
Manufacturer's Model Name	0008,1090	LO	ALWAYS, AUTO	Applied values: Achieva, Intera, Panorama 1.0T
Device Serial Number	0018,1000	LO	ALWAYS, AUTO	-
Software Version(s)	0018,1020	LO	ALWAYS, AUTO	-
SC Equipment Module				
Modality	0008,0060	CS	ALWAYS, AUTO	Applied value: MR
Conversion Type	0008,0064	CS	ALWAYS, AUTO	Applied values: SYN, WSD
Secondary Capture Device Manufacturer	0018,1016	LO	ANAP, AUTO	-

Name	Tag	VR	Definition	Comment
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO	ANAP, AUTO	-
Secondary Capture Device Software Version(s)	0018,1019	LO	ANAP, AUTO	-
General Image Module				
Content Date	0008,0023	DA	ALWAYS, AUTO	-
Content Time	0008,0033	TM	ALWAYS, AUTO	-
Acquisition Number	0020,0012	IS	ALWAYS, AUTO	-
Instance Number	0020,0013	IS	ALWAYS, AUTO	-
Patient Orientation	0020,0020	CS	EMPTY, AUTO	-
Image Comments	0020,4000	LT	EMPTY, AUTO	-
Lossy Image Compression	0028,2110	CS	ALWAYS, AUTO	Applied value: 00
Image Pixel Module				
Samples per Pixel	0028,0002	US	ALWAYS, AUTO	Applied values: 1, 3
Photometric Interpretation	0028,0004	CS	ALWAYS, IMPLICIT	Applied values: MONOCHROME2, RGB
Planar Configuration	0028,0006	US	ANAP, AUTO	-
Rows	0028,0010	US	ALWAYS, AUTO	-
Columns	0028,0011	US	ALWAYS, AUTO	-
Pixel Aspect Ratio	0028,0034	IS	ALWAYS, AUTO	Applied value: (1,1)
Bits Allocated	0028,0100	US	ALWAYS, AUTO	-
Bits Stored	0028,0101	US	ALWAYS, AUTO	-
High Bit	0028,0102	US	ALWAYS, AUTO	-
Pixel Representation	0028,0103	US	ALWAYS, AUTO	-
Pixel Data	7FE0,0010	OW	ALWAYS, AUTO	-
SC Image Module				
Date of Secondary Capture	0018,1012	DA	ANAP, AUTO	-
Time of Secondary Capture	0018,1014	TM	ANAP, AUTO	-
SOP Common Module				
Specific Character Set	0008,0005	CS	ALWAYS, AUTO	Applied values: ISO_IR 13, ISO_IR 100, ISO 2022 IR 13, ISO 2022 IR 87, ISO 2022 IR 100, ISO 2022 IR 159
Instance Creation Date	0008,0012	DA	ALWAYS, AUTO	-
Instance Creation Time	0008,0013	TM	ALWAYS, AUTO	-

Name	Tag	VR	Definition	Comment
Instance Creator UID	0008,0014	UI	ALWAYS, AUTO	-
SOP Class UID	0008,0016	UI	ALWAYS, AUTO	Applied value: 1.2.840.10008.5.1.4.1.1. 7
SOP Instance UID	0008,0018	UI	ALWAYS, AUTO	-

8.1.1.3. Grayscale Softcopy Presentation State Storage SOP Class

Table 71: Modules of the Grayscale Softcopy Presentation State Storage SOP Class

Information Entity	Module Name	Usage
Patient	Patient	ALWAYS
	Patient Medical	ALWAYS
Study	General Study	ALWAYS
	Patient Study	ALWAYS
Series	General Series	ALWAYS
	Presentation Series	ALWAYS
Equipment	General Equipment	ALWAYS
Presentation State	Overlay Plane	CONDITIONAL – Required if an Overlay is to be applied to referenced images
	Displayed Area	ALWAYS
	Graphic Annotation	CONDITIONAL – Required if Graphic Annotations are to be applied to referenced images
	Spatial Transformation	CONDITIONAL – Required if Rotation or Flipping are to be applied to referenced images
	Graphic Layer	CONDITIONAL – Required if Graphic Annotations or Overlays or Curves are to be applied to referenced image(s)
	Modality LUT	CONDITIONAL – Required if a Modality LUT is to be applied to referenced images
	Softcopy Presentation LUT	ALWAYS
	Overlay Activation	CONDITIONAL
	Softcopy VOI LUT	ALWAYS
	Presentation State Identification	ALWAYS
	Presentation State Relationship	ALWAYS
	Presentation State Shutter	ALWAYS
SOP Common	ALWAYS	

Table 72: Created Grayscale Softcopy Presentation State Storage SOP Class Attributes

Name	Tag	VR	Definition	Comment
Patient Module				
Patient's Name	0010,0010	PN	ALWAYS, COPY	-
Patient ID	0010,0020	LO	ALWAYS, COPY	-
Patient's Birth Date	0010,0030	DA	ALWAYS, COPY	-
Patient's Sex	0010,0040	CS	ALWAYS, COPY	-
Ethnic Group	0010,2160	SH	ANAPCV, COPY	-
Patient Comments	0010,4000	LT	ANAPCV, COPY	-
Patient Medical Module				
Medical Alerts	0010,2000	LO	ANAPCV, COPY	-

Name	Tag	VR	Definition	Comment
Contrast Allergies	0010,2110	LO	ANAPCV, COPY	-
Pregnancy Status	0010,21C0	US	VNAP, COPY	-
Special Needs	0038,0050	LO	ANAPCV, COPY	-
Patient State	0038,0500	LO	ANAPCV, COPY	-
General Study Module				
Study Date	0008,0020	DA	ALWAYS, COPY	-
Study Time	0008,0030	TM	ALWAYS, COPY	-
Accession Number	0008,0050	SH	ALWAYS, COPY	-
Referring Physician's Name	0008,0090	PN	VNAP, COPY	-
Study Description	0008,1030	LO	VNAP, COPY	-
Procedure Code Sequence	0008,1032	SQ	ANAP, COPY	If present in original study.
>Code Value	0008,0100	SH	ALWAYS, COPY	-
>Coding Scheme Designator	0008,0102	SH	ALWAYS, COPY	-
>Coding Scheme Version	0008,0103	SH	ANAP, COPY	-
>Code Meaning	0008,0104	LO	ALWAYS, COPY	-
>Context Group Local Version	0008,0107	DT	ANAP, COPY	-
>Context Group Extension Flag	0008,010B	CS	ALWAYS, COPY	-
>Context Group Extension Creator UID	0008,010D	UI	ANAP, COPY	-
Referenced Study Sequence	0008,1110	SQ	ANAP, COPY	If present in original study.
>Referenced SOP Class UID	0008,1150	UI	ALWAYS, COPY	-
>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, COPY	-
Study Instance UID	0020,000D	UI	ALWAYS, COPY	-
Study ID	0020,0010	SH	ALWAYS, COPY	-
Patient Study Module				
Admitting Diagnoses Description	0008,1080	LO	VNAP, COPY	-
Patient's Weight	0010,1030	DS	ALWAYS, COPY	-
Occupation	0010,2180	SH	ANAPCV, COPY	-
Additional Patient History	0010,21B0	LT	ANAPCV, COPY	-
General Series Module				
Series Date	0008,0021	DA	ALWAYS, AUTO	-
Series Time	0008,0031	TM	ALWAYS, AUTO	-

Name	Tag	VR	Definition	Comment
Series Description	0008,103E	LO	ANAP, AUTO / USER	-
Operator's Name	0008,1070	PN	EMPTY, AUTO	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ	ALWAYS, AUTO	-
>Instance Creation Date	0008,0012	DA	ALWAYS, AUTO	-
>Instance Creation Time	0008,0013	TM	ALWAYS, AUTO	-
>Instance Creator UID	0008,0014	UI	ALWAYS, AUTO	-
>Referenced SOP Class UID	0008,1150	UI	ALWAYS, AUTO	-
>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, AUTO	-
>Instance Number	0020,0013	IS	ALWAYS, AUTO	-
Body Part Examined	0018,0015	CS	ANAP, COPY	-
Protocol Name	0018,1030	LO	ANAP, COPY	-
Patient Position	0018,5100	CS	ANAP, COPY	-
Series Instance UID	0020,000E	UI	ALWAYS, AUTO	-
Series Number	0020,0011	IS	ALWAYS, AUTO	-
Laterality	0020,0060	CS	ANAPCV, COPY	-
Performed Procedure Step Start Date	0040,0244	DA	ALWAYS, COPY	-
Performed Procedure Step Start Time	0040,0245	TM	ALWAYS, COPY	-
Performed Procedure Step ID	0040,0253	SH	ALWAYS, COPY	-
Performed Procedure Step Description	0040,0254	LO	VNAP, COPY	-
Performed protocol code sequence	0040,0260	SQ	ANAPCV, COPY	-
>Code Value	0008,0100	SH	ALWAYS, COPY	-
>Coding Scheme Designator	0008,0102	SH	ALWAYS, COPY	-
>Coding Scheme Version	0008,0103	SH	ANAP, COPY	-
>Code Meaning	0008,0104	LO	ALWAYS, COPY	-
>Context Group Local Version	0008,0107	DT	ANAP, COPY	-
>Context Group Extension Flag	0008,010B	CS	ALWAYS, COPY	-
>Context Group Extension Creator UID	0008,010D	UI	ANAP, COPY	-
Request Attributes Sequence	0040,0275	SQ	ANAPCV, COPY	-
>Scheduled Procedure Step Description	0040,0007	LO	VNAP, COPY	-

Name	Tag	VR	Definition	Comment
>Scheduled Procedure Step ID	0040,0009	SH	ALWAYS, COPY	-
>Requested Procedure ID	0040,1001	SH	ALWAYS, COPY	-
Comments on the Performed Procedure Steps	0040,0280	ST	ANAPCV, COPY	Maximum of 64 characters.
Presentation Series Module				
Modality	0008,0060	CS	ALWAYS, AUTO	-
General Equipment Module				
Manufacturer	0008,0070	LO	ALWAYS, AUTO	Applied value: Philips Medical Systems
Institution Name	0008,0080	LO	ALWAYS, CONFIG	-
Station Name	0008,1010	SH	ALWAYS, CONFIG	Same as the Host Name.
Institutional Department Name	0008,1040	LO	ALWAYS, CONFIG	-
Manufacturer's Model Name	0008,1090	LO	ALWAYS, AUTO	Applied values: Achieva, Intera, Panorama 1.0T
Device Serial Number	0018,1000	LO	ALWAYS, AUTO	-
Software Version(s)	0018,1020	LO	ALWAYS, AUTO	-
Overlay Plane Module				
Overlay Rows	6000,0010	US	ALWAYS, AUTO	-
Overlay Columns	6000,0011	US	ALWAYS, AUTO	-
Overlay Description	6000,0022	LO	ANAPEV, AUTO	-
Overlay Type	6000,0040	CS	ALWAYS, AUTO	-
Overlay Subtype	6000,0045	LO	ANAPEV, AUTO	-
Overlay Origin	6000,0050	SS	ALWAYS, AUTO	-
Overlay Bits Allocated	6000,0100	US	ALWAYS, AUTO	-
Overlay Bit Position	6000,0102	US	ALWAYS, AUTO	-
ROI Area	6000,1301	IS	ANAPEV, AUTO	-
ROI Mean	6000,1302	DS	ANAPEV, AUTO	-
ROI Standard Deviation	6000,1303	DS	ANAPEV, AUTO	-
Overlay Label	6000,1500	LO	EMPTY, AUTO	-
Overlay Data	6000,3000	OW	ALWAYS, AUTO	-
Displayed Area Module				
Displayed Area Selection Sequence	0070,005A	SQ	ALWAYS, IMPLICIT	-
>Referenced Image Sequence	0008,1140	SQ	ANAP, IMPLICIT	-
>>Referenced SOP Class UID	0008,1150	UI	ALWAYS, IMPLICIT	-

Name	Tag	VR	Definition	Comment
>>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, IMPLICIT	-
>Displayed Area Top Left Hand Corner	0070,0052	SL	ALWAYS, IMPLICIT	-
>Displayed Area Bottom Right Hand Corner	0070,0053	SL	ALWAYS, IMPLICIT	-
>Presentation Size Mode	0070,0100	CS	ALWAYS, IMPLICIT	Applied values: MAGNIFY, SCALE TO FIT
>Presentation Pixel Spacing	0070,0101	DS	ANAP, IMPLICIT	Applied value: (0.0, 0.0)
>Presentation Pixel Aspect Ratio	0070,0102	IS	ANAP, IMPLICIT	-
>Presentation Pixel Magnification Ratio	0070,0103	IS	ANAP, IMPLICIT	Applied value: 1.0
>Zoom Mode	2001,103F	CS	VNAP, IMPLICIT	-
Graphic Annotation Module				
Graphic Annotation Sequence	0070,0001	SQ	ALWAYS, IMPLICIT	-
>Referenced Image Sequence	0008,1140	SQ	ANAP, IMPLICIT	-
>>Referenced SOP Class UID	0008,1150	UI	ALWAYS, IMPLICIT	-
>>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, IMPLICIT	-
>Graphic Layer	0070,0002	CS	ALWAYS, IMPLICIT	-
>Text Object Sequence	0070,0008	SQ	ANAP, IMPLICIT	-
>>Anchor Point Annotation Units	0070,0004	CS	ALWAYS, IMPLICIT	-
>>Unformatted Text Value	0070,0006	ST	ALWAYS, IMPLICIT	-
>>Anchor Point	0070,0014	FL	ALWAYS, IMPLICIT	-
>>Anchor Point Visibility	0070,0015	CS	ALWAYS, IMPLICIT	-
>Graphic Object Sequence	0070,0009	SQ	ANAP, IMPLICIT	-
>>Graphic Annotation Units	0070,0005	CS	ALWAYS, IMPLICIT	-
>>Graphic Dimensions	0070,0020	US	ALWAYS, IMPLICIT	-
>>Number of Graphics Points	0070,0021	US	ALWAYS, IMPLICIT	-
>>Graphic Data	0070,0022	FL	ALWAYS, IMPLICIT	-
>>Graphic Type	0070,0023	CS	ALWAYS, IMPLICIT	-
>>Graphic Filled	0070,0024	CS	ANAP, IMPLICIT	-
Spatial Transformation Module				
Image Horizontal Flip	0070,0041	CS	ALWAYS, IMPLICIT	-
Image Rotation	0070,0042	US	ALWAYS, IMPLICIT	-
Graphic Layer Module				
Graphic Layer Sequence	0070,0060	SQ	ALWAYS, IMPLICIT	-

Name	Tag	VR	Definition	Comment
>Graphic Layer	0070,0002	CS	ALWAYS, IMPLICIT	-
>Graphic Layer Order	0070,0062	IS	ALWAYS, IMPLICIT	-
Modality LUT Module				
Rescale Intercept	0028,1052	DS	ALWAYS, COPY	-
Rescale Slope	0028,1053	DS	ALWAYS, COPY	-
Rescale Type	0028,1054	LO	ALWAYS, COPY	Applied Values: cm/sec, milliradians, milliseconds, mm ² /sec, normalized, seconds, US (default)
Softcopy Presentation LUT Module				
Presentation LUT Shape	2050,0020	CS	ALWAYS, AUTO	-
Overlay Activation Module				
Overlay Activation Layer	6000,1001	CS	ANAP, AUTO	Applied value: 1
Softcopy VOI LUT Module				
Softcopy VOI LUT Sequence	0028,3110	SQ	ALWAYS, AUTO	-
>Referenced Image Sequence	0008,1140	SQ	ANAP, AUTO	-
>>Referenced SOP Class UID	0008,1150	UI	ALWAYS, AUTO	-
>>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, AUTO	-
>Window Center	0028,1050	DS	ALWAYS, AUTO	-
>Window Width	0028,1051	DS	ALWAYS, AUTO	-
Presentation State Identification Module				
Instance Number	0020,0013	IS	ALWAYS, AUTO	-
Content Label	0070,0080	CS	ALWAYS, AUTO	Applied values: AS LAST SEEN, NEW AT IMPORT
Content Description	0070,0081	LO	VNAP, AUTO	-
Presentation Creation Date	0070,0082	DA	ALWAYS, AUTO	-
Presentation Creation Time	0070,0083	TM	ALWAYS, AUTO	Applied value: 000000
Content Creator's Name	0070,0084	PN	VNAP, AUTO	Same as Manufacturer's Model Name.
Presentation State Relationship Module				
Referenced Series Sequence	0008,1115	SQ	ALWAYS, AUTO	-
>Referenced Image Sequence	0008,1140	SQ	ANAP, AUTO	-
>>Referenced SOP Class UID	0008,1150	UI	ALWAYS, AUTO	-
>>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, AUTO	-
>Series Instance UID	0020,000E	UI	ALWAYS, AUTO	-

Name	Tag	VR	Definition	Comment
Presentation State Shutter Module				
Shutter Presentation Value	0018,1622	US	ANAP, AUTO	Applied value: 0
SOP Common Module				
Specific Character Set	0008,0005	CS	ALWAYS, AUTO	Applied Value(s): ISO_IR 13, ISO_IR 100, ISO 2022 IR 13, ISO 2022 IR 87, ISO 2022 IR 100, ISO 2022 IR 159
Instance Creation Date	0008,0012	DA	ALWAYS, AUTO	-
Instance Creation Time	0008,0013	TM	ALWAYS, AUTO	-
Instance Creator UID	0008,0014	UI	ALWAYS, AUTO	-
SOP Class UID	0008,0016	UI	ALWAYS, AUTO	Applied Value(s): 1.2.840.10008.5.1.4.1.1. 11.1
SOP Instance UID	0008,0018	UI	ALWAYS, AUTO	-

8.1.1.4. Patient Root Query/Retrieve Information Model – FIND SOP Class

Table 73: Created Patient Root Query/Retrieve Information Model – FIND SOP Class Attributes

Name	Tag	VR	Definition	Comment
Patient Level				
Specific Character Set	0008,0005	CS	ALWAYS, AUTO	Applied value: ISO_IR 100
Query/Retrieve Level	0008,0052	CS	ALWAYS, AUTO	-
Patient's Name	0010,0010	PN	VNAP, USER	Filter value.
Patient ID	0010,0020	LO	EMPTY, AUTO	Not Filter value.
Patient's Birth Date	0010,0030	DA	VNAP, USER	Filter value.
Patient's Sex	0010,0040	CS	EMPTY, AUTO	-
Ethnic Group	0010,2160	SH	EMPTY, AUTO	-
Study Level				
Specific Character Set	0008,0005	CS	ALWAYS, AUTO	Applied value: ISO_IR 100
Study Date	0008,0020	DA	EMPTY, AUTO	-
Study Time	0008,0030	TM	EMPTY, AUTO	-
Accession Number	0008,0050	SH	EMPTY, AUTO	-
Query/Retrieve Level	0008,0052	CS	ALWAYS, AUTO	-
Study Description	0008,1030	LO	EMPTY, AUTO	-
Patient ID	0010,0020	LO	ALWAYS, COPY	Filter value.
Study Instance UID	0020,000D	UI	EMPTY, AUTO	-
Study ID	0020,0010	SH	EMPTY, AUTO	-
Performed Procedure Step Start Date	0040,0244	DA	VNAP, USER	Filter value.
Performed Procedure Step Status	0040,0252	CS	VNAP, USER	Filter value.
Performed Procedure Step Description	0040,0254	LO	VNAP, USER	Filter value.
Private Creator Group 2001	2001,0010	LO	ALWAYS, AUTO	Applied value: Philips Imaging DD 001
Examination Source	2001,1063	CS	EMPTY, AUTO	-
Series Level				
Specific Character Set	0008,0005	CS	ALWAYS, AUTO	Applied value: ISO_IR 100
Series Date	0008,0021	DA	EMPTY, AUTO	-
Series Time	0008,0031	TM	EMPTY, AUTO	-
Query/Retrieve Level	0008,0052	CS	ALWAYS, AUTO	-

Name	Tag	VR	Definition	Comment
Modality	0008,0060	CS	EMPTY, AUTO	-
Series Description	0008,103E	LO	EMPTY, AUTO	-
Patient ID	0010,0020	LO	ALWAYS, COPY	Filter value.
Body Part Examined	0018,0015	CS	EMPTY, AUTO	-
Protocol Name	0018,1030	LO	EMPTY, AUTO	-
Study Instance UID	0020,000D	UI	ALWAYS, COPY	-
Series Instance UID	0020,000E	UI	EMPTY, AUTO	-
Series Number	0020,0011	IS	EMPTY, AUTO	-
Number of Series Related Instances	0020,1209	IS	EMPTY, AUTO	-

8.1.1.5. Patient Root Query/Retrieve Information Model – MOVE SOP Class

Table 74: Created Patient Root Query/Retrieve Information Model – MOVE SOP Class Attributes

Name	Tag	VR	Definition	Comment
Series Level				
Query/Retrieve Level	0008,0052	CS	ALWAYS, AUTO	-
Patient ID	0010,0020	LO	ALWAYS, COPY	-
Study Instance UID	0020,000D	UI	ALWAYS, COPY	-
Series Instance UID	0020,000E	UI	ALWAYS, COPY	-

8.1.1.6. Study Root Query/Retrieve Information Model – FIND SOP Class

Table 75: Created Study Root Query/Retrieve Information Model – FIND SOP Class Attributes

Name	Tag	VR	Definition	Comment
Study Level				
Specific Character Set	0008,0005	CS	ALWAYS, AUTO	Applied value: ISO_IR 100
Study Date	0008,0020	DA	EMPTY, AUTO	-
Study Time	0008,0030	TM	EMPTY, AUTO	-
Accession Number	0008,0050	SH	EMPTY, AUTO	-
Query/Retrieve Level	0008,0052	CS	ALWAYS, AUTO	-
Study Description	0008,1030	LO	EMPTY, AUTO	-
Patient's Name	0010,0010	PN	VNAP, USER	Filter value.
Patient ID	0010,0020	LO	VNAP, USER	Filter value
Patient's Birth Date	0010,0030	DA	VNAP, USER	Filter value.
Patient's Sex	0010,0040	CS	EMPTY, AUTO	-
Ethnic Group	0010,2160	SH	EMPTY, AUTO	-
Study Instance UID	0020,000D	UI	EMPTY, AUTO	-
Study ID	0020,0010	SH	EMPTY, AUTO	-
Performed Procedure Step Start Date	0040,0244	DA	VNAP, USER	Filter value.
Performed Procedure Step Status	0040,0252	CS	VNAP, USER	Filter value.
Performed Procedure Step Description	0040,0254	LO	VNAP, USER	Filter value.
Private Creator Group 2001	2001,0010	LO	ALWAYS, AUTO	Applied value: Philips Imaging DD 001
Examination Source	2001,1063	CS	EMPTY, AUTO	-
Series Level				
Specific Character Set	0008,0005	CS	ALWAYS, AUTO	Applied value: ISO_IR 100
Series Date	0008,0021	DA	EMPTY, AUTO	-
Series Time	0008,0031	TM	EMPTY, AUTO	-
Query/Retrieve Level	0008,0052	CS	ALWAYS, AUTO	-
Modality	0008,0060	CS	EMPTY, AUTO	-
Series Description	0008,103E	LO	EMPTY, AUTO	-
Body Part Examined	0018,0015	CS	EMPTY, AUTO	-
Protocol Name	0018,1030	LO	EMPTY, AUTO	-

Name	Tag	VR	Definition	Comment
Study Instance UID	0020,000D	UI	ALWAYS, COPY	-
Series Instance UID	0020,000E	UI	EMPTY, AUTO	-
Series Number	0020,0011	IS	EMPTY, AUTO	-
Number of Series Related Instances	0020,1209	IS	EMPTY, AUTO	-

8.1.1.7. Study Root Query/Retrieve Information Model – MOVE SOP Class

Table 76: Created Study Root Query/Retrieve Information Model – MOVE SOP Class Attributes

Name	Tag	VR	Definition	Comment
Series Level				
Query/Retrieve Level	0008,0052	CS	ALWAYS, AUTO	Applied value: SERIES
Study Instance UID	0020,000D	UI	ALWAYS, COPY	-
Series Instance UID	0020,000E	UI	ALWAYS, COPY	-

8.1.1.8. Storage Commitment Push Model SOP Class

Table 77: Modules of the Storage Commitment Push Model SOP Class

Information Entity	Module Name	Usage
-	Storage Commitment	ALWAYS

Table 78: Created Storage Commitment Push Model SOP Class Attributes

Name	Tag	VR	Definition	Comment
Storage Commitment Module				
Transaction UID	0008,1195	UI	ALWAYS, AUTO	-
Referenced SOP Sequence	0008,1199	SQ	ALWAYS, AUTO	-
>Referenced SOP Class UID	0008,1150	UI	ALWAYS, COPY	-
>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, COPY	-

8.1.1.9. Modality Performed Procedure Step SOP Class

Table 79: Modules of the Modality Performed Procedure Step SOP Class – N-CREATE

Information Entity	Module Name	Usage
Study	Performed Procedure Step Relationship	ALWAYS
	Performed Procedure Step Information	ALWAYS
	Image Acquisition Results	ALWAYS
General	SOP Common	ALWAYS

Table 80: Created Modality Performed Procedure Step SOP Class N-CREATE Attributes

Name	Tag	VR	Definition	Comment
SOP Common Module				
Specific Character Set	0008,0005	CS	VNAP, IMPLICIT	Applied values: ISO_IR 13, ISO_IR 100, ISO 2022 IR 13, ISO 2022 IR 87, ISO 2022 IR 100, ISO 2022 IR 159
Performed Procedure Step Relationship Module				
Referenced Patient Sequence	0008,1120	SQ	VNAP, AUTO	Always empty
Patient's Name	0010,0010	PN	ALWAYS, MWL / USER	-
Patient ID	0010,0020	LO	ALWAYS, MWL / USER	-
Patient's Birth Date	0010,0030	DA	ALWAYS, MWL / USER	-
Patient's Sex	0010,0040	CS	ALWAYS, MWL / USER	-
Scheduled Step Attribute Sequence	0040,0270	SQ	ALWAYS, AUTO	-
>Accession Number	0008,0050	SH	VNAP, MWL / USER	-
>Referenced Study Sequence	0008,1110	SQ	EMPTY, AUTO	-
>Study Instance UID	0020,000D	UI	ALWAYS, AUTO	-
>Requested Procedure Description	0032,1060	LO	VNAP, MWL	-
>Scheduled Procedure Step Description	0040,0007	LO	VNAP, MWL	-
>Scheduled Action Item Code Sequence	0040,0008	SQ	EMPTY, AUTO	-
>Scheduled Procedure Step ID	0040,0009	SH	VNAP, MWL	-
>Requested Procedure ID	0040,1001	SH	VNAP, MWL	-
Performed Procedure Step Information Module				
Procedure Code Sequence	0008,1032	SQ	EMPTY, AUTO	Attribute always empty.

Name	Tag	VR	Definition	Comment
Performed Station AE Title	0040,0241	AE	ALWAYS, CONFIG	-
Performed Station Name	0040,0242	SH	VNAP, CONFIG	-
Performed Location	0040,0243	SH	VNAP, CONFIG	-
Performed Procedure Step Start Date	0040,0244	DA	ALWAYS, AUTO	-
Performed Procedure Step Start Time	0040,0245	TM	ALWAYS, AUTO	-
Performed Procedure Step End Date	0040,0250	DA	VNAP, AUTO	-
Performed Procedure Step End Time	0040,0251	TM	VNAP, AUTO	-
Performed Procedure Step Status	0040,0252	CS	ALWAYS, AUTO	Applied value: IN PROGRESS
Performed Procedure Step ID	0040,0253	SH	ALWAYS, COPY	-
Performed Procedure Step Description	0040,0254	LO	VNAP, MWL / USER	-
Performed Procedure Type Description	0040,0255	LO	EMPTY, AUTO	-
Image Acquisition Results Module				
Modality	0008,0060	CS	ALWAYS, AUTO	Applied value: MR
Study ID	0020,0010	SH	ALWAYS, AUTO	-
Performed protocol code sequence	0040,0260	SQ	VNAP, IMPLICIT	-
>Code Value	0008,0100	SH	ALWAYS, MWL / USER	-
>Coding Scheme Designator	0008,0102	SH	ALWAYS, MWL / USER	-
>Coding Scheme Version	0008,0103	SH	VNAP, MWL / USER	-
>Code Meaning	0008,0104	LO	VNAP, MWL / USER	-
Performed Series Sequence	0040,0340	SQ	EMPTY, AUTO	-

Table 81: Modules of the Modality Performed Procedure Step SOP Class – N-SET

Information Entity	Module Name	Usage
Study	Performed Procedure Step Information	ALWAYS
	Image Acquisition Results	ALWAYS

Table 82: Created Modality Performed Procedure Step SOP Class N-SET Attributes

Name	Tag	VR	Definition	Comment
Performed Procedure Step Information Module				
Performed Procedure Step End Date	0040,0250	DA	ALWAYS, AUTO	-

Name	Tag	VR	Definition	Comment
Performed Procedure Step End Time	0040,0251	TM	ALWAYS, AUTO	-
Performed Procedure Step Status	0040,0252	CS	ALWAYS, IMPLICIT	Applied values: COMPLETED, DISCONTINUED
Performed Procedure Step Description	0040,0254	LO	VNAP, MWL / USER	-
Image Acquisition Results Module				
Performed protocol code sequence	0040,0260	SQ	VNAP, IMPLICIT	-
>Code Value	0008,0100	SH	ALWAYS, MWL / USER	-
>Coding Scheme Designator	0008,0102	SH	ALWAYS, MWL / USER	-
>Coding Scheme Version	0008,0103	SH	VNAP, MWL / USER	-
>Code Meaning	0008,0104	LO	VNAP, MWL / USER	-
Performed Series Sequence	0040,0340	SQ	VNAP, IMPLICIT	-
>Retrieve AE Title	0008,0054	AE	EMPTY, AUTO	-
>Series Description	0008,103E	LO	VNAP, COPY	-
>Performing Physician's Name	0008,1050	PN	EMPTY, AUTO	-
>Operator's Name	0008,1070	PN	EMPTY, AUTO	-
>Referenced Image Sequence	0008,1140	SQ	VNAP, IMPLICIT	Empty while in progress.
>>Referenced SOP Class UID	0008,1150	UI	ALWAYS, IMPLICIT	-
>>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, IMPLICIT	-
>Protocol Name	0018,1030	LO	ALWAYS, COPY	-
>Series Instance UID	0020,000E	UI	VNAP, COPY	-
>Referenced Standalone SOP Instance Sequence	0040,0220	SQ	EMPTY, AUTO	-

8.1.1.10. Modality Worklist Information Model – FIND SOP Class

Table 83: Modules of the Modality Worklist Information Model – FIND SOP Class

Information Entity	Module Name	Usage
Patient	Patient Identification	ALWAYS
	Patient Demographic	ALWAYS
	Patient Medical	ALWAYS
Visit	Visit Status	ALWAYS
Study	Scheduled Procedure Step	ALWAYS
	Requested Procedure	ALWAYS
	Imaging Service Request	ALWAYS

Table 84: Created Modality Worklist Information Model – FIND SOP Class Attributes

Name	Tag	VR	Definition	Comment
Patient Identification Module				
Patient's Name	0010,0010	PN	EMPTY, AUTO	-
Patient ID	0010,0020	LO	EMPTY, AUTO	-
Other Patient IDs	0010,1000	LO	EMPTY, AUTO	-
Patient Demographic Module				
Patient's Birth Date	0010,0030	DA	EMPTY, AUTO	-
Patient's Sex	0010,0040	CS	EMPTY, AUTO	-
Patient's Weight	0010,1030	DS	EMPTY, AUTO	-
Ethnic Group	0010,2160	SH	EMPTY, AUTO	-
Patient Comments	0010,4000	LT	EMPTY, AUTO	-
Patient Medical Module				
Medical Alerts	0010,2000	LO	EMPTY, AUTO	-
Contrast Allergies	0010,2110	LO	EMPTY, AUTO	-
Additional Patient History	0010,21B0	LT	EMPTY, AUTO	-
Pregnancy Status	0010,21C0	US	EMPTY, AUTO	-
Visit Status Module				
Current Patient Location	0038,0300	LO	EMPTY, AUTO	-
Scheduled Procedure Step Module				
Scheduled Procedure Step Sequence	0040,0100	SQ	ALWAYS, AUTO	-
>Modality	0008,0060	CS	VNAP, USER	Can be used as matching key.
>Requested Contrast Agent	0032,1070	LO	EMPTY, AUTO	-
>Scheduled Station AE Title	0040,0001	AE	VNAP, USER	Can be used as matching key.
>Scheduled Procedure Step Start Date	0040,0002	DA	VNAP, USER	Can be used as range matching key.

Name	Tag	VR	Definition	Comment
>Scheduled Procedure Step Start Time	0040,0003	TM	EMPTY, AUTO	-
>Scheduled Procedure Step End Date	0040,0004	DA	EMPTY, AUTO	-
>Scheduled Procedure Step End Time	0040,0005	TM	EMPTY, AUTO	-
>Scheduled Performing Physician's Name	0040,0006	PN	EMPTY, AUTO	-
>Scheduled Procedure Step Description	0040,0007	LO	EMPTY, AUTO	-
>Scheduled Action Item Code Sequence	0040,0008	SQ	ALWAYS, AUTO	-
>>Code Value	0008,0100	SH	EMPTY, AUTO	-
>>Coding Scheme Designator	0008,0102	SH	EMPTY, AUTO	-
>>Coding Scheme Version	0008,0103	SH	EMPTY, AUTO	-
>>Code Meaning	0008,0104	LO	EMPTY, AUTO	-
>Scheduled Procedure Step ID	0040,0009	SH	EMPTY, AUTO	-
>Scheduled Station Name	0040,0010	SH	EMPTY, AUTO	-
>Scheduled Procedure Step Location	0040,0011	SH	EMPTY, AUTO	-
>Pre-Medication	0040,0012	LO	EMPTY, AUTO	-
>Scheduled Procedure Step Status	0040,0020	CS	EMPTY, AUTO	-
>Comments on the Scheduled Procedure Step	0040,0400	LT	EMPTY, AUTO	-
Requested Procedure Module				
Referenced Study Sequence	0008,1110	SQ	ALWAYS, AUTO	-
>Referenced SOP Class UID	0008,1150	UI	EMPTY, AUTO	-
>Referenced SOP Instance UID	0008,1155	UI	EMPTY, AUTO	-
Study Instance UID	0020,000D	UI	EMPTY, AUTO	-
Requested Procedure Description	0032,1060	LO	EMPTY, AUTO	-
Requested Procedure Code Sequence	0032,1064	SQ	ALWAYS, AUTO	-
>Code Value	0008,0100	SH	EMPTY, AUTO	-
>Coding Scheme Designator	0008,0102	SH	EMPTY, AUTO	-
>Coding Scheme Version	0008,0103	SH	EMPTY, AUTO	-
>Code Meaning	0008,0104	LO	EMPTY, AUTO	-
Requested Procedure ID	0040,1001	SH	EMPTY, AUTO	-
Names of Intended Recipients of Results	0040,1010	PN	EMPTY, AUTO	-
Requested Procedure Comments	0040,1400	LT	EMPTY, AUTO	-

Name	Tag	VR	Definition	Comment
Imaging Service Request Module				
Accession Number	0008,0050	SH	VNAP, USER	Can be used as matching key.
Referring Physician's Name	0008,0090	PN	EMPTY, AUTO	-
Requesting Physician	0032,1032	PN	EMPTY, AUTO	-
Requesting Service	0032,1033	LO	EMPTY, AUTO	-
Imaging Service Request Comments	0040,2400	LT	EMPTY, AUTO	-

8.1.1.11. Basic Film Session SOP Class

Table 85: Modules of the Basic Film Session SOP Class – N-CREATE

Information Entity	Module Name	Usage
Print Management	Basic Film Session Presentation	ALWAYS

Table 86: Created Basic Film Session SOP Class N-CREATE Attributes

Name	Tag	VR	Definition	Comment
Basic Film Session Presentation Module				
Number of Copies	2000,0010	IS	ALWAYS, IMPLICIT / USER	Between 1 and 99. Applied value: 1
Medium Type	2000,0030	CS	ALWAYS, IMPLICIT	Applied value: BLUE FILM

8.1.1.12. Basic Film Box SOP Class

Table 87: Modules of the Basic Film Box SOP Class – N-CREATE

Information Entity	Module Name	Usage
Print Management	Basic Film Box Presentation	ALWAYS
	Basic Film Box Relationship	ALWAYS

Table 88: Created Basic Film Box SOP Class N-CREATE Attributes

Name	Tag	VR	Definition	Comment
Basic Film Box Presentation Module				
Image Display Format	2010,0010	ST	ALWAYS, CONFIG	Applied values: COL, CUSTOM, CUSTOM1, ROW, SLIDE, STANDARD, STANDARD1,1, SUPERSLIDE
Film Orientation	2010,0040	CS	ALWAYS, CONFIG	Applied value: PORTRAIT
Film Size ID	2010,0050	CS	ALWAYS, CONFIG	Applied values: 10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, 8INX10IN
Magnification Type	2010,0060	CS	ALWAYS, CONFIG	Applied value: CUBIC
Smoothing Type	2010,0080	CS	ALWAYS, AUTO	SCP specific. Applied value: 140
Border Density	2010,0100	CS	ALWAYS, AUTO	The desired density in hundredths of OD. Applied value: BLACK
Empty Image Density	2010,0110	CS	ALWAYS, AUTO	<i> where <i> represents the desired density in hundredths of OD. Applied value: BLACK
Min Density	2010,0120	US	ALWAYS, CONFIG	Maximum density of the images on the film, expressed in hundredths of OD. If Max Density is higher than maximum printer density than Max Density is set to maximum printer density.
Max Density	2010,0130	US	ALWAYS, CONFIG	Minimum density of the images on the film, expressed in hundredths of OD. If Min Density is lower than minimum printer density than Min Density is set to minimum printer density.
Trim	2010,0140	CS	ALWAYS, CONFIG	Applied value: NO
Configuration Information	2010,0150	ST	ALWAYS, CONFIG	LUT.
Basic Film Box Relationship Module				
Referenced Film Session Sequence	2010,0500	SQ	ALWAYS, AUTO	Parent Film Session.

Name	Tag	VR	Definition	Comment
>Referenced SOP Class UID	0008,1150	UI	ALWAYS, AUTO	Applied value: 1.2.840.10008.5.1.1.1
>Referenced SOP Instance UID	0008,1155	UI	ALWAYS, AUTO	-

8.1.1.13. Basic Grayscale Image Box SOP Class

Table 89: Modules of the Basic Grayscale Image Box SOP Class – N-SET

Information Entity	Module Name	Usage
Print Management	Image Box Pixel Presentation	ALWAYS

Table 90: Created Basic Grayscale Image Box SOP Class N-SET Attributes

Name	Tag	VR	Definition	Comment
Image Box Pixel Presentation Module				
Magnification Type	2010,0060	CS	ALWAYS, CONFIG	Applied value: CUBIC
Smoothing Type	2010,0080	CS	ALWAYS, CONFIG	SCP specific. Applied value: 140
Image Position	2020,0010	US	ALWAYS, AUTO	Applied value: 1
Polarity	2020,0020	CS	ALWAYS, AUTO	Applied value: NORMAL
Preformatted Grayscale Image Sequence	2020,0110	SQ	ALWAYS, AUTO	-
>Samples per Pixel	0028,0002	US	ALWAYS, AUTO	Applied value: 1
>Photometric Interpretation	0028,0004	CS	ALWAYS, AUTO	Applied value: MONOCHROME2
>Rows	0028,0010	US	ALWAYS, IMPLICIT	Depending on the selected printer type and film size.
>Columns	0028,0011	US	ALWAYS, IMPLICIT	Depending on the selected printer type and film size.
>Pixel Aspect Ratio	0028,0034	IS	ALWAYS, AUTO	Applied value: (1,1)
>Bits Allocated	0028,0100	US	ALWAYS, AUTO	Applied value: 8
>Bits Stored	0028,0101	US	ALWAYS, AUTO	Applied value: 8
>High Bit	0028,0102	US	ALWAYS, AUTO	Applied value: 7
>Pixel Representation	0028,0103	US	ALWAYS, AUTO	Applied value: 0x0000
>Pixel Data	7FE0,0010	OW	ALWAYS, AUTO	-

8.1.1.14. Printer SOP Class

Table 91: Modules of the Printer SOP Class – N-GET

Information Entity	Module Name	Usage
Print Management	Printer	ALWAYS

Table 92: Created Printer SOP Class N-GET Attributes

Name	Tag	VR	Definition	Comment
Printer Module				
Manufacturer	0008,0070	LO	ANAPEV, AUTO	Initial message only.
Manufacturer's Model Name	0008,1090	LO	ANAPEV, AUTO	Initial message only.
Device Serial Number	0018,1000	LO	ANAPEV, AUTO	Initial message only.
Software Version(s)	0018,1020	LO	ANAPEV, AUTO	Initial message only.
Printer Status	2110,0010	CS	ANAPEV, AUTO	Final message only.
Printer Status Info	2110,0020	CS	ANAPEV, AUTO	Final message only.
Printer Name	2110,0030	LO	ANAPEV, AUTO	Initial message only.

8.1.1.15. Media Storage Directory Storage SOP Class

Table 93: Modules of the Media Storage Directory Storage SOP Class

Information Entity	Module Name	Usage
Media	File-set Identification	ALWAYS
	Directory Information	ALWAYS

Table 94: Created Media Storage Directory Storage SOP Class Attributes

Name	Tag	VR	Definition	Comment
File-set Identification Module				
File-set ID	0004,1130	CS	ALWAYS, AUTO	-
Directory Information Module				
Offset of the First Directory Record of the Root Directory Entity	0004,1200	UL	ALWAYS, AUTO	-
Offset of the Last Directory Record of the Root Directory Entity	0004,1202	UL	ALWAYS, AUTO	-
File-set Consistency Flag	0004,1212	US	ALWAYS, AUTO	-
Directory Record Sequence	0004,1220	SQ	VNAP, AUTO	-
> Offset of the Next Directory Record	0004,1400	UL	ALWAYS, AUTO	-
> Record In-use Flag	0004,1410	US	ALWAYS, AUTO	-
> Offset of Referenced Lower-Level Directory Entity	0004,1420	UL	ALWAYS, AUTO	-
> Directory Record Type	0004,1430	CS	ALWAYS, AUTO	-
> Private Record UID	0004,1432	UI	ANAP, AUTO	-
> Referenced File ID	0004,1500	CS	ANAP, AUTO	-
> MRDR Directory Record Offset	0004,1504	UL	ANAP, AUTO	-
> Referenced SOP Class UID in File	0004,1510	UI	ANAP, AUTO	-
> Referenced SOP Instance UID in File	0004,1511	UI	ANAP, AUTO	-
> Referenced Transfer Syntax UID in File	0004,1512	UI	ANAP, AUTO	-
> Patient Keys				
> Patient's Name	0010,0010	PN	ALWAYS, COPY	-
> Patient ID	0010,0020	LO	ALWAYS, COPY	-
> Patient's Birth Date	0010,0030	DA	ALWAYS, COPY	-
> Patient's Sex	0010,0040	CS	ALWAYS, COPY	-
> Study Keys				
> Study Date	0008,0020	DA	ALWAYS, COPY	-
> Study Time	0008,0030	TM	ALWAYS, COPY	-
> Accession Number	0008,0050	SH	VNAP, COPY	-

Name	Tag	VR	Definition	Comment
> Study Description	0008,1030	LO	VNAP, COPY	-
> Study Instance UID	0020,000D	UI	ALWAYS, COPY	-
> Study ID	0020,0010	SH	ALWAYS, COPY	-
> Performed Procedure Step Start Date	0040,0244	DA	VNAP, COPY	-
> Performed Procedure Step Description	0040,0254	LO	VNAP, COPY	-
> Series Keys				
> Series Date	0008,0021	DA	VNAP, COPY	-
> Series Time	0008,0031	TM	VNAP, COPY	-
> Modality	0008,0060	CS	ALWAYS, COPY	-
> Protocol Name	0018,1030	LO	VNAP, COPY	-
> Series Instance UID	0020,000E	UI	ALWAYS, COPY	-
> Series Number	0020,0011	IS	ALWAYS, COPY	-
> Image Keys				
> Image Type	0008,0008	CS	VNAP, COPY	-
> SOP Class UID	0008,0016	UI	VNAP, COPY	-
> SOP Instance UID	0008,0018	UI	VNAP, COPY	-
> Referenced Image Sequence	0008,1140	SQ	VNAP, COPY	-
>> Referenced SOP Class UID	0008,1150	UI	VNAP, COPY	-
>> Referenced SOP Instance UID	0008,1155	UI	VNAP, COPY	-
> Instance Number	0020,0013	IS	ALWAYS, COPY	-
> Image Position (Patient)	0020,0032	DS	VNAP, COPY	-
> Image Orientation (Patient)	0020,0037	DS	VNAP, COPY	-
> Frame of Reference UID	0020,0052	UI	VNAP, COPY	-
> Photometric Interpretation	0028,0004	CS	VNAP, COPY	-
> Rows	0028,0010	US	VNAP, COPY	-
> Cols	0028,0011	US	VNAP, COPY	-
> Pixel Spacing	0028,0030	DS	VNAP, COPY	-
> Bits Stored	0028,0101	US	VNAP, COPY	-
> High Bit	0028,0102	US	VNAP, COPY	-
> Presentation Keys				
> SOP Instance UID	0008,0018	UI	VNAP, COPY	-

Name	Tag	VR	Definition	Comment
> Referenced Series Sequence	0008,1115	SQ	ALWAYS, COPY	-
>> Referenced Image Sequence	0008,1140	SQ	ANAP, COPY	If available.
>>> Referenced SOP Class UID	0008,1150	UI	ALWAYS, COPY	-
>>> Referenced SOP Instance UID	0008,1155	UI	ALWAYS, COPY	-
>> Series Instance UID	0020,000E	UI	ALWAYS, COPY	-
> Instance Number	0020,0013	IS	ALWAYS, COPY	-
> Content Label	0070,0080	CS	ALWAYS, COPY	-
> Content Description	0070,0081	LO	VNAP, COPY	-
> Presentation Creation Date	0070,0082	DA	ALWAYS, COPY	-
> Presentation Creation Time	0070,0083	TM	ALWAYS, COPY	-
> Content Creator's Name	0070,0084	PN	VNAP, COPY	-
> Private Keys				
> Private Creator Group 2001	2001,0010	LO	ALWAYS, AUTO	-
> Number of Echoes	2001,1014	SL	VNAP, COPY	-
> Number of Phases MR	2001,1017	SL	VNAP, COPY	-
> Number of Slices MR	2001,1018	SL	VNAP, COPY	-
> Reconstruction Number MR	2001,101D	IS	VNAP, COPY	-
> Scanning Technique Description MR	2001,1020	LO	VNAP, COPY	-
> Echo Time Display MR	2001,1025	SH	VNAP, COPY	-
> Stack Sequence	2001,105F	SQ	VNAP, COPY	-
>> Stack Number Of Slices	2001,102D	SS	VNAP, COPY	-
>> Stack Radial Angle	2001,1032	FL	VNAP, COPY	-
>> Stack Radial Axis	2001,1033	CS	VNAP, COPY	-
>> Stack Slice Number	2001,1035	SS	VNAP, COPY	-
>> Stack Type	2001,1036	CS	VNAP, COPY	-
> Examination Source	2001,1063	CS	VNAP, COPY	-
> Private Creator Group 2005	2005,0010	LO	ALWAYS, AUTO	-
> Number of Chemical Shift	2005,1020	SL	VNAP, COPY	-
> Syncra Scan Type	2005,10A1	CS	VNAP, COPY	-

8.1.2. Usage of Attributes from Received IOD's

The MR System will only function correctly on original MR images from a Philips MR System; it is not the intention to operate on other images.

8.1.3. Attribute Mapping

The following table shows the relation between MWL and MPPS attributes and image storage attributes.

Table 95: Correlation of DICOM Object

Nr.	Level	Attribute	MWL Find Tag	MPPS Create Tag	Related Store Tag	MPPS Set Tag
1	Patient	Patient's Name	0010,0010	0010,0010	0010,0010	-
2		Patient ID	0010,0020	0010,0020	0010,0020	-
3		Patient's Birth Date	0010,0030	0010,0030	0010,0030	-
4		Patient's Sex	0010,0040	0010,0040	0010,0040	-
5	Study	Accession Number	0008,0050	0008,0050	0008,0050	-
6		Patient's Weight	0010,1030	-	0010,1030	-
7		Study Instance UID	0020,000D	0020,000D	0020,000D	-
8		Request Procedure Description	0032,1060	0032,1060	0032,1060	-
9		Request Procedure ID	0040,1001	0040,1001	0040,1001	-
10	Exam	Scheduled Procedure Step Start Date	0040,0002	0040,0244	0008,0020	-
11				0040,0250	-	-
12		Scheduled Procedure Step Description	0040,0007	0040,0007	0040,0007	-
-		Performed Protocol Code Sequence	0040,0008	0040,0260	0040,0260	0040,0260
13		>Code Value	0008,0100	0008,0100	0008,0100	0008,0100
14		>Code Scheme Designator	0008,0102	0008,0102	0008,0102	0008,0102
15		>Coding Scheme Version	0008,0103	0008,0103	0008,0103	0008,0103
16		>Code Meaning	0008,0104	0008,0104	0008,0104	0008,0104
17		Scheduled Procedure Step ID	0040,0009	0040,0009	0040,0009	-
-		Scheduled Procedure Step Sequence	0040,0100	-	-	-
18		>Comments on the Scheduled Procedure Step	0040,0400	-	0032,4000	-
19					0040,0280	-
20		Performed Procedure Step ID	-	0040,0253	0040,0253	-
		Study ID	-	-	0020,0010	-
-	Series / Image / Grayscale softcopy presentation state	Performed Series Sequence	-	-	-	0040,0340
-		>Referenced Image Sequence	-	-	-	0008,1140
21		>>Referenced SOP Class UID	-	-	0008,0016	0008,1150
22		>>Referenced SOP Instance UID	-	-	0008,0018	0008,1155
-		>Referenced Stand Alone SOP Inst. Seq for the grayscale softcopy presentation state objects	-	-	-	0040,0220
23		>>Referenced SOP Class UID	-	-	0008,0016	0008,1150
24		>>Referenced SOP Instance UID	-	-	0008,0018	0008,1155
25		>Series Protocol Name	-	-	0018,1030	0018,1030
26		>Series Description	-	-	0008,103E	0008,103E
27		>Series Instance UID	-	-	0020,000E	0020,000E

8.1.4. Coerced/Modified fields

The Network AE will only import MR images and Presentation State objects that were created on an MR System. These imported images may be coerced or modified and are to be used for reference only; it is not the intention to export them again.

8.2. Data Dictionary of Private Attributes

Refer to section 8.1.1.

8.3. Coded Terminology and Templates

The MR System has no specific support for coded terminology or templates.

8.4. Grayscale Image consistency

The MR System has no specific support for any DICOM Grayscale Standard Display Function.

8.5. Standard Extended/Specialized/Private SOPs

8.5.1. Standard Extended MR Image SOP Class

The following standard extensions are applied for the MR Image Storage SOP class. See also the overview of the applied MR Image IOD in section 8.1.1.

Table 96: Applied Standard Extensions

IOD	Module	Note
MR Image	Patient Medical Module	-
MR Image	Study Classification Module	-
MR Image	Study Scheduling Module	-
MR Image	Requested Procedure Module	Additional attribute: Requested Contrast Agent
MR Image	Imaging Service Request Module	-
MR Image	Performed Procedure Step Information Module	-
MR Image	Billing and Material Management Code Module	-
MR Image	General Series Module	Additional attributes in Referenced Performed Procedure Step Sequence: >Specific Character Set >Instance Creation Date >Instance Creation Time >Instance Creator UID >Instance Number
MR Image	Modality LUT Module	Present if configured. Must be applied when viewing the image.
MR Image	Private Group	Private MR attributes.

8.5.2. Private SOP Classes

The MR System system supports private SOP classes; for the C-STORE services these private SOP classes are listed in the following table.

Table 97: Supported Private SOP Classes as SCU and SCP by the MR System

SOP Class Name	UID
Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1
Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2

8.6. Private Transfer Syntaxes

The MR System does not support any private transfer syntaxes.