DICOM Conformance Statement

MR Systems

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1. DICOM Conformance Statement Overview

This document is the DICOM Conformance Statement for MR systems later referred to as the MR System. This document holds for the following:

- Achieva dStream 1.5T
- Achieva dStream 3.0T
- BlueSeal SE
- BlueSeal XE
- Ingenia Ambition (S/X) 1.5T
- Ingenia Elition (S/X) 3.0T
- Ingenia Evolution 1.5T
- Ingenia Evolution 3.0T
- Ingenia (S) 1.5T
- Ingenia 3.0T
- Ingenia 1.5T CX
- Ingenia 3.0T CX
- Marlin 1.5T
- MR 5300
- MR 7700

The system creates the DICOM MR Image, Enhanced MR Image, MR Spectroscopy, Raw Data, Secondary Capture, CT Storage and RT Structure Set (Please refer to Chapter 8 for more details). These objects can be sent and received. It depends on the capabilities of the remote system, which of these objects are supported in the transactions. The capabilities of the remote systems are locally stored on the MR System in configuration files per DICOM node. In case the remote system does not support Enhanced MR Images, the MR System will send the object as standard ('classic') MR Images.

The MR System is a modality that generates MR Images. It supports the following DICOM functionality:

- 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 removable media.
- Printing of hardcopies on a remote DICOM printer.
- Query for data by a remote DICOM system.

The MR system includes the Real World Value Macro information in the MR Image and Enhanced MR Image objects.
The information in the RWV attributes is consistent with the information in the Rescaling attributes but might be differently scaled. Images of type APTW contain pixels that are outside of the range Real World Value First Value Mapped and Real World Value Last Value Mapped, such pixels have no real world values. As a result, a measurement that uses the Rescaling attributes might give a different value compared to the same measurement using the RWV attributes as not all Pixels might contribute to the measurement based on the real world values.

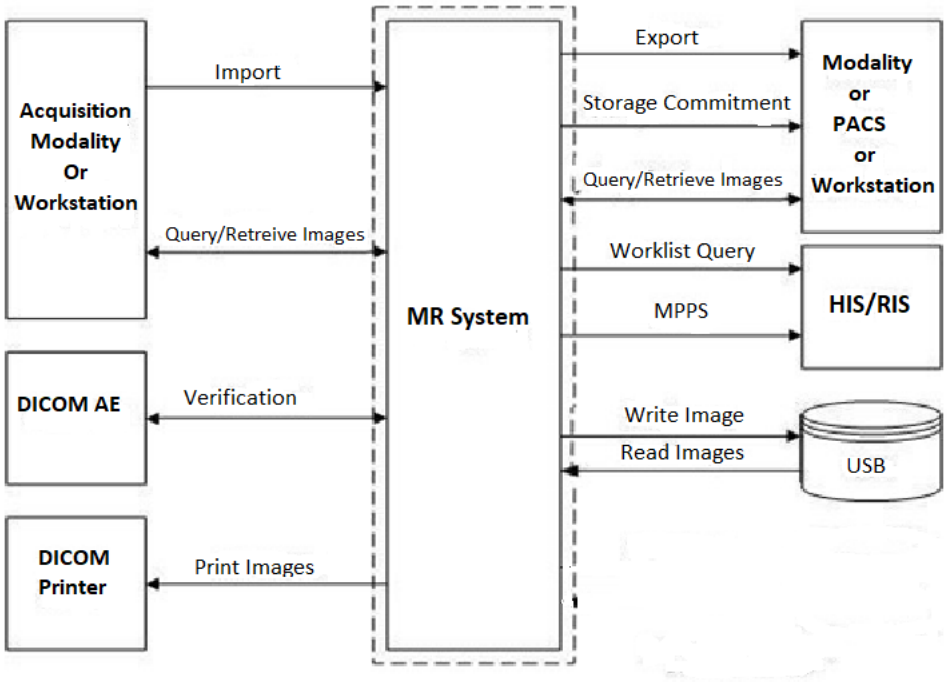

Figure 1: MR System in a DICOM network overview

Table 1: Network Services

SOP Class Name	UID	User of Service (SCU)	Provider of Service (SCP)
Other			
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
Print Management			
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
Query/Retrieve			
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Transfer			
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	No
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes

SOP Class Name	UID	User of Service (SCU)	Provider of Service (SCP)
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Yes	Yes
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Yes	No
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	Yes	Yes
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	Yes	Yes
Philips Private MR Examcard Storage	1.3.46.670589.11.0.0.12.4	Yes	Yes
Workflow Management			
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No

In case a remote DICOM system supports both the Enhanced MR Image Storage SOP Class and the MR Image Storage SOP Class and on the MR system both SOP Classes are enabled, then the MR system holds a preference to send data in the Enhanced format.

Table 2: Media Services

Media Storage Application Profile	File-set Creator (FSC)	File-set Updater (FSU)	File-set Reader (FSR)
USB			
General Purpose USB Media.	Yes	Yes	Yes

MR supports USB devices for media storage.
Image compression is not supported.

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3. Introduction

The introduction specifies product and relevant disclaimers as well as any general information that the vendor feels is appropriate.

3.1. Revision History

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

Table 3: Revision History

Document Version	Date of Issue	Description
01	01-Apr-2025	Initial Release of MR Systems

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 ensure 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

Table 4: Definitions, Terms and Abbreviations

Abbreviation/Term	Explanation
ACSE	Association Control Service Element
AE	Application Entity
AP	Application Profile
CD	Compact Disc
CT	Computed Tomography
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
FSC	File-set Creator
PSC	Philips Support Connect (configuration editor)
FSR	File-set Reader
FSU	File-set Updater
GUI	Graphic User Interface
ILE	DICOM Implicit VR Little Endian
IOD	Information Object Definition
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
PDU	Protocol Data Units
RIS	Radiology Information System
RQ	Request

Abbreviation/Term	Explanation
RSP	Response
RT	Radiotherapy
RWA	Real-World Activity
SC	Secondary Capture
SCM	Study Component Management
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
UL	Upper Layer
USB	Universal Serial Bus
WLM	Worklist Management

3.5. References

[DICOM] Digital Imaging and Communications in Medicine, Parts 1 - 22 (NEMA PS 3.1- PS 3.22),
National Electrical Manufacturers Association
1300 North 17th Street
Suite 900
Arlington, Virginia 22209
Internet: https://www.dicomstandard.org/current
Note that at any point in time the official standard consists of the most recent yearly edition of the base standard plus all the supplements and correction items that have been approved as Final Text.

4. Networking

This section contains the networking related services (vs. the media related ones).

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 networking application data flow as a functional overview of the MR system is shown in Figure 2.

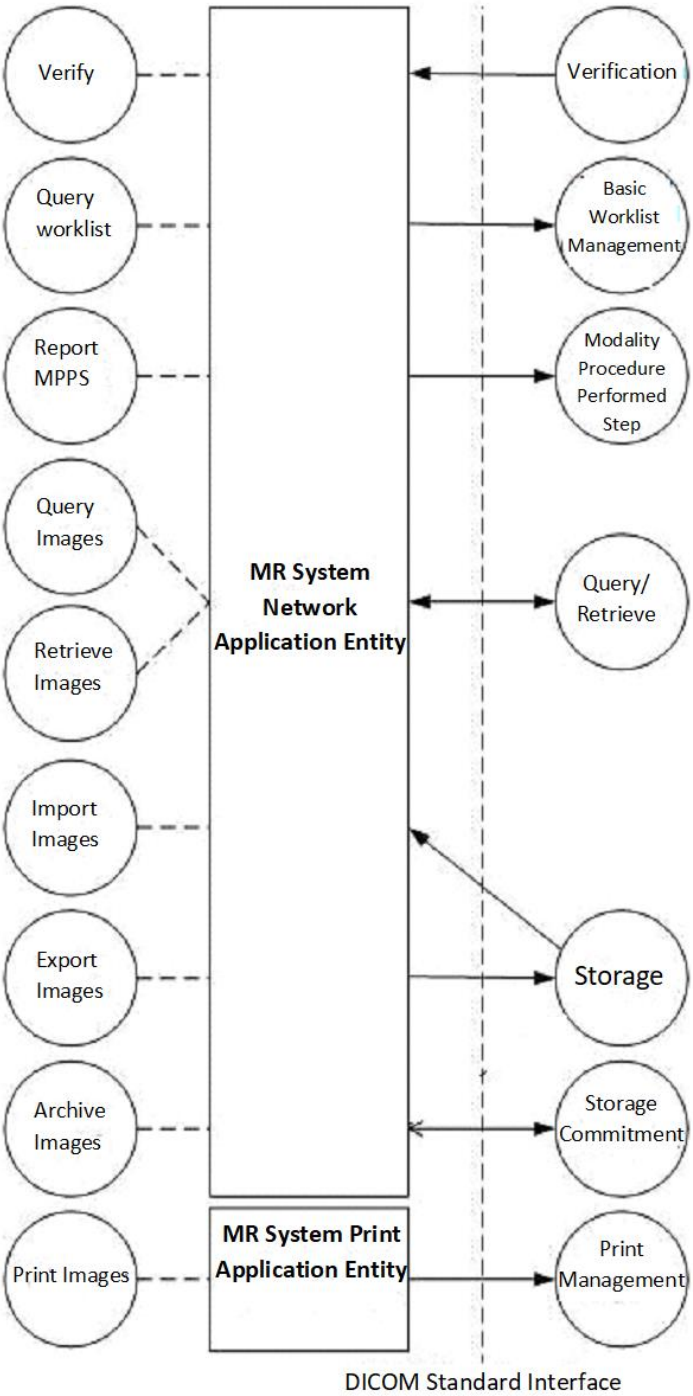

Figure 2: MR System AE Data Flow Diagram

4.1.2. Functional Definition of AE's

This section contains a functional definition for each individual local Application Entity.

4.1.2.1. Functional Definition of MR AE

Verification

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

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 selecting the "RIS" device. 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. The tags Performed Procedure Step Start Date – 0x0040,0244 and Performed Procedure Step Start Time- 0x0040,0245, are updated to the current date and time before the patient data is stored in the local database.

Report MPPS

The MR System Network AE as SCU implements the RWA Report MPPS to create and update a Modality Performed Procedure Step object.
The RWA is initiated at the start of the first scan of a new examination to inform the DICOM Radiology Information System (RIS) (status "IN-PROGRESS").
When the image objects have been acquired and archived one may click the "Complete Examination" button when the MPPS is completed or the "discontinue" button if the MPPS is discontinued. The MR System Network AE will send a new MPPS notification with the status "COMPLETED" or "DISCONTINUED".

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).
The MR System Network AE as Query/Retrieve SCP implements the RWA Query Images to let a remote system find Examinations on the MR system.

Retrieve Images

The MR System Network AE as Query/Retrieve SCU implements the RWA Retrieve Images to initiate MOVE of selected objects from a remote system (e.g. PACS).
The MR System Network AE as Query/Retrieve SCP implements the RWA Retrieve Images to move selected objects to another DICOM node.

Import Images

The MR System Network AE as Storage SCP implements the RWA Import Images to store images and related objects from a remote archive System using the relevant storage SOP classes.
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, MR images from a Philips MR System and Private Philips MR SOP classes) may be imported for reference purposes only; when these are exported again then consistency and completeness cannot be guaranteed.

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 storage SOP classes.
The acquired images and object data, as selected per Examinations, can be sent to a selected remote system, either manually or automatically.
The MR System can be configured to send Grayscale Softcopy Presentation State data for the selected Images.
If the Grayscale Softcopy Presentation State object is not configured to send, it will be included in the selected images as private sequence and will be converted to an overlay.
By default, a considerable amount of information is stored in private attributes of the exported images and related objects. When modifying/processing those images such application is responsible for data consistency and therefore should use the private data elements with caution. These images cannot be imported anymore on the MR scanner.

- **Splitting series into different dimensions**

  In the PSC of the MR system, options are present that can be used to split series on export from the MR system to a remote system. Parameters for series splitting are: Echo, Phases, Image Types, Dynamic and Diffusion b-value. Only one dimension can be split in order of priority.
  Note that when several related split series are imported again from a remote node, these will be combined again into one series.

- **Converting images with color to color Secondary Capture images**
  If Enhanced MR sop class is supported, Grey Scale Images with COLOR LUT is always exported as Grey Scale Enhanced MR Image.
  If Enhanced MR Image sop class is not supported, then based on PSC option user can export it as Secondary Capture (RGB) or it can be sent as GrayScale MR Image.
  Conversion of COLOR LUT data to Secondary capture cannot be reversed.
  MR COLOR Image generated as RGB, will be exported as Secondary Capture Image irrespective of whether Enhanced MR SOP class is supported or not. It can be reversed back on Import.

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 for all exported images and related objects. The storage commitment status is indicated in the Patient Directory User Interface. Deleting image(s) is independent of commitment from the PACS on the local MR system.

4.1.2.2. Functional Definition of MR System Print

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. Description of specific Sequencing of Integrated Workflow as performed by the MR AE

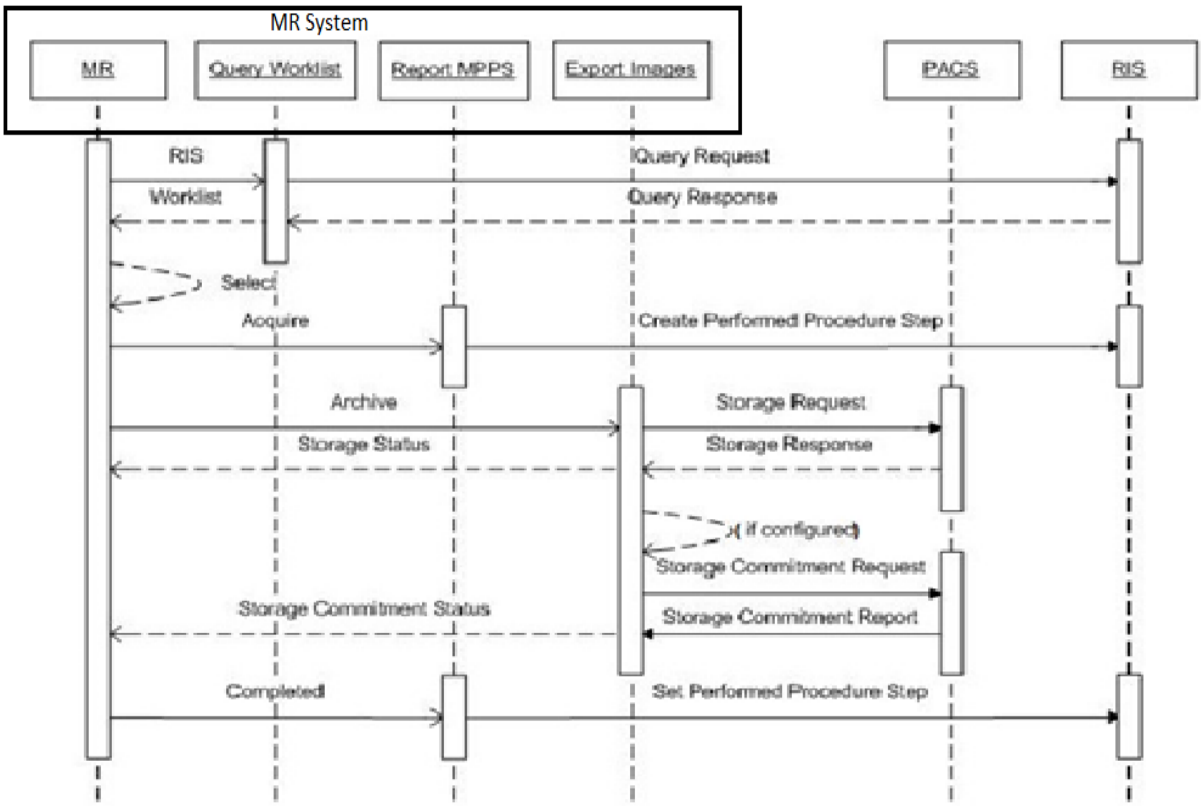

Figure 3: Sequencing of Integrated Workflow

Figure 3 shows a typical example of an integrated workflow (using a single acquisition, a single storage with commitment, without prefetching).

The MR System workflow is initiated by selecting the “RIS” device. 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 a restricted set of data only (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.

A remote system can send related images of one or more of the scheduled patients to the MR System (pre-fetching, for reference only).
After preparation of the scanner and the patient, the operator will perform the requested or locally planned procedure steps. Results may be MR images, Presentation State objects, object and screen-grabs stored as Secondary Capture images, MR Spectroscopy and Private Philips MR Series Data, images and other related objects; and data about the scan protocol and examcard data.

The created images are converted into DICOM objects that can be sent to the remote system or can be written on local disk. After storage in a remote archive the MR System will request a storage commitment, if configured.

4.1.3.2. Description of specific Sequencing of Import Images per Query/Retrieve

Figure 4 shows a typical example of a sequence for import of a series of images per Query/Retrieve (e.g. pre-fetching).

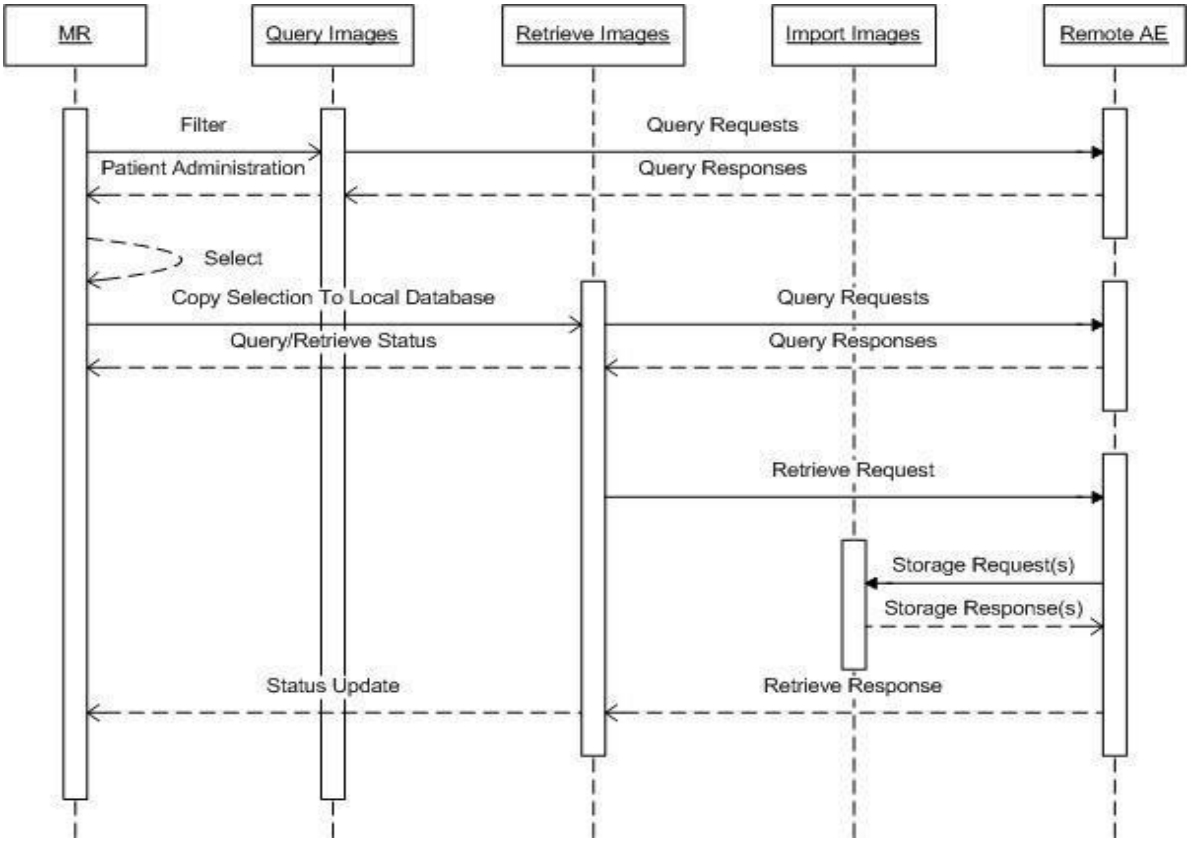

Figure 4: Sequencing of import Images per Query/Retrieve

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. 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. Query/Retrieve as SCP is supported by MR system.

Modality MR supports sending C-MOVE-RQ message with a move destination to its own AE only.

This section in the DICOM Conformance Statement is a set of Application Entity specifications. There are as many of these subsections as there are different AE's in the implementation.

4.2. AE Specifications

This section in the DICOM Conformance Statement is a set of Application Entity specifications. There are as many of these subsections as there are different AE's in the implementation.

4.2.1. MR AE

Detail of this specific Application Entity is specified in this section.

4.2.1.1. SOP Classes

This MR Application Entity provides Standard Conformance to the SOP Classes mentioned in the below table.

Table 5: SOP Classes for MR AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	No
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Yes	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Yes	No
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	Yes	Yes
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	Yes	Yes
Philips Private MR Examcard Storage	1.3.46.670589.11.0.0.12.4	Yes	Yes

MR Series can be exported either as Enhanced MR Image Storage or as ‘classic’ MR Image Storage. If both are supported by the destination, the Enhanced MR Image storage is preferred. This is configurable via PSC.

Note:

- RAW Data Storage is used to store MR Series Data and MR Examcard data if this is supported by the destination even if the Philips private SOP classes are supported.
- Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

4.2.1.2. Association Policies

Each AE specification contains a description of the general association establishment and acceptance policies of the AE.

4.2.1.2.1. General

The DICOM standard application context is specified in the below table.

Table 6: DICOM Application Context

Description	Value
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 an Application Entity may support as an Initiator or Acceptor is specified in Table 7 and Table 8.

Table 7: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	4 (fixed)

Table 8: Number of associations as an Association Acceptor for this AE

Description	Value
Maximum number of simultaneous incoming associations	50 (fixed)

4.2.1.2.3. Asynchronous Nature

The MR System Network AE supports both synchronous and asynchronous operations for Storage Commitment. User will be able to configure synchronous or asynchronous.

4.2.1.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID and version name are documented in Table 9.

Table 9: DICOM Implementation Class and Version for MR AE

Implementation Class UID	1.3.46.670589.54.2.123.x
Implementation Version Name	Philips MR 123.x

Note: “x” represents the Level release number from current software version.

4.2.1.2.5. Communication Failure Handling

The behavior of the AE during communication failure is summarized in the Table 10.

Table 10: Communication Failure Behavior

Exception	Behavior
ARTIM Timeout	Association setup failed and is closed. The reason is logged and reported to the user.

4.2.1.3. Association Initiation Policy

The MR AE initiates associations as a result of the following events:
-The operator or a remote (Query/Retrieve) application copies selected images from the MR System.
-The operator requests to print selected images of the MR system database.
-The operator queries a remote database.
-The operator copies selected images from a remote database to another database.
-The archive requests storage commitment of images on a remote database.
The possible Reject Responses during Association are shown in Table 11.

Table 11: Association Rejection response

Result	Source	Reason/Diagnosis	Behavior
1 - rejectedpermanent	1 - DICOM UL service-user	1 - no-reason-given	The user will be informed. The information is logged in central log file.
		2 - application-context-name-not supported	The user will be informed. The information is logged in central log file.
		3 - calling-AE-title-not-recognized	The user will be informed. The information is logged in central log file.
		7 - called-AE-title-not-recognized	The user will be informed. The information is logged in central log file.
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	The user will be informed. The information is logged in central log file.
		2 - protocol-version-notsupported	The user will be informed. The information is logged in central log file.
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	The user will be informed. The information is logged in central log file.
		2 - local-limit-exceeded	The user will be informed. The information is logged in central log file.
2 - rejectedtransient	1 - DICOM UL service-user	1 - no-reason-given	The user will be informed. The information is logged in central log file.
		2 - application-context-name-notsupported	The user will be informed. The information is logged in central log file.
		3 - calling-AE-title-not-recognized	The user will be informed. The information is logged in central log file.
		7 - called-AE-title-not-recognized	The user will be informed. The information is logged in central log file.

Result	Source	Reason/Diagnosis	Behavior
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	The user will be informed. The information is logged in central log file.
		2 - protocol-version-notsupported	The user will be informed. The information is logged in central log file.
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	The user will be informed. The information is logged in central log file.
		2 - local-limit-exceeded	The user will be informed. The information is logged in central log file.

The possible association Abort Responses is listed in Table12.

Table 12: Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	When received, the Network AE terminates the connection and logs the event. This is Sent when: 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. When received, the Network AE terminates the connection and logs the event.
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	When received, the Network AE terminates the connection and logs the event. This is Sent when: 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. This is Sent when: - An unrecognized PDU type is received.
	2 - unexpected-PDU	When received, the Network AE terminates the connection and logs the event. This is Sent when: The received PDU type is not expected in the current state of connection.
	4 - unrecognized-PDUparameter	When received, the Network AE terminates the connection and logs the event. This is Sent when: - An unrecognized Associate PDU item is received.

Source	Reason/Diagnosis	Behavior
	5 - unexpected-PDUparameter	When received, the Network AE terminates the connection and logs the event. This is Sent when: One of the Associate PDU items is received more than once. One of the Associate PDU items is received unexpectedly.
	6 - invalid-PDU-parametervalue	When received, the Network AE terminates the connection and logs the event. This is Sent when: 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. (Real-World) Activity – Verification as SCU

4.2.1.3.1.1. Description and Sequencing of Activities

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

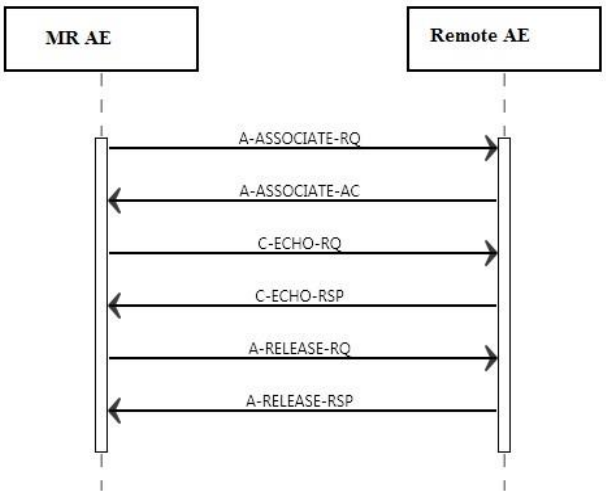

Figure 5: Sequencing of Verify

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

4.2.1.3.1.2. Proposed Presentation Contexts

The presentation contexts for Verification are defined in Table 13.

Table 13: Proposed Presentation Contexts for (Real-World) Activity – Verification as SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

The order of the proposed transfer syntaxes is configurable. The preferred transfer syntax is ELE and is chosen in case multiple Transfer Syntaxes are proposed in the Association Negotiation.
The MR System Network AE can accept multiple proposed Presentation Contexts with the same SOP class but different Transfer Syntaxes.
There is no check for duplicate contexts and these will therefore be accepted by MR. No extended negotiations supported by MR System Network AE.

4.2.1.3.1.3. SOP Specific Conformance for Verification SOP Class

4.2.1.3.1.3.1. Dataset Specific Conformance for Verification C-ECHO SCU

The Dataset Specific Response behavior is as shown in Table 14.

Table 14: Status Response

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

4.2.1.3.2. (Real-World) Activity – Modality worklist as SCU

4.2.1.3.2.1. Description and Sequencing of Activities

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

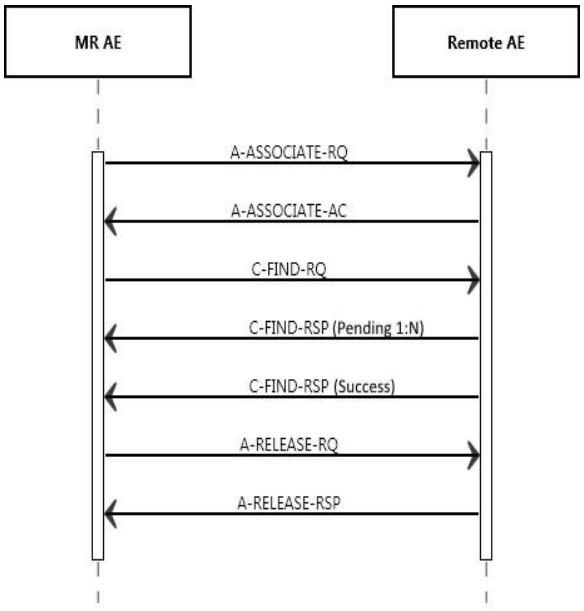

Figure 6: Sequencing of Query Worklist

The Query Worklist function is accessible through the MR System user interface. An association will be initiated to the configured remote system (typically a RIS) to send the worklist query. The RIS processes the query and returns the Worklist to the MR scanner (The scanning is allowed for any Modality Worklist response). After receiving the Worklist the association will be released.
There is no limit on the number of worklist results received and displayed.
When responses with different Scheduled station AE title is received, MR System automatically picks up the received AE title and allows to proceed for a scan. MR system has no restriction on Scheduled procedures that are not specific to MR Modality.
When responses with extra keys are received, MR System allows to proceed for scan. Behavior of the MWL claimed attributes are specified in Table 17.

4.2.1.3.2.2. Proposed Presentation Contexts

The proposed presentation contexts for Modality Worklist as SCU are defined in Table 15.

Table 15: Proposed Presentation Contexts for (Real-World) Activity – Modality worklist as SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Modality Worklist Information Model – FIND SOP Class	1.2.840.10008.5.1.4.31	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

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

4.2.1.3.2.3. SOP Specific Conformance for Modality Requested Procedure ID Scheduled Worklist Information Model - FIND SOP Class

The MR System provides the RIS dialog to enter criteria for the matching keys. The use of Specific Character Set is as specified in chapter 6, Support of Character Sets. Table 16 lists the attributes that are shown in the Patient Registration UI and provides the mapping of the DICOM attribute to the UI entry.
When Mandatory attributes are missing from RIS, MR System provides option for user to fill the missing mandatory attributes.
When MR System receives responses with optional attributes, MR System will add those attributes without any value and proceed for acquisition.
When Mandatory return key violation is sent in response, MR System continued querying for further studies without any error
When responses with missing mandatory attributes are received, MR System displayed that particular study.
When Mandatory attributes values are missing from RIR, MR system provides option for use to fill the missing values.

Table 16: Mapping between UI Fields and DICOM Attributes for New Exam.

UI Entry	DICOM Element Name	DICOM Element Tag	Exam Entry Editable	
			Manual	RIS
Examination				
Accession number	Accession Number	(0008,0050)	Yes	Yes
Referring Physician	Referring Physician's Name	(0008,0090)	Yes	Yes
Performing Physician	Performing Physician	(0008,1050)	Yes	Yes
Patient name	Patient's Name	(0010,0010)	Yes	Yes****
Patient ID	Patient ID	(0010,0020)	Yes	Yes*
Other Patient ID	Other Patient IDs	(0010,1000)	No	Yes
Date of birth	Patient’s Birth Date	(0010,0030)	Yes	Yes*
Sex	Patient's Sex	(0010,0040)	Yes	Yes
Weight	Patient’s Weight	(0010,1030)	Yes	Yes
	Scheduled Procedure Step Sequence	(0040,0100)	No	Yes
Study Description	Study Description	(0008,1030)	Yes	Yes
	> Scheduled Procedure Step Description of Scheduled Procedure Step ***	(0040,0007)	No	Yes
Study Date & Time	Study Date	(0008,0020)	Yes	Yes
	Performed Procedure Step Start Date	(0040,0244)	No	No

UI Entry	DICOM Element Name	DICOM Element Tag	Exam Entry Editable	
			Manual	RIS
	Performed Procedure Step End Date	(0040,0250)	No	No
Study Comments	Study Comments	(0032,4000)	Yes	Yes
	Comments on the Performed Procedure Step	(0040,0280)	Yes	Yes
Implant	Metal Implant Status	(2005,1578)	Yes	Yes
SAR Mode	SAR Operation Mode	(2005,1581)	Yes	Yes
Maximum SAR	MaxSAR	(2005,1575)	Yes	No
Max DB/dt	MaxDbDt	(2005,1574)	Yes	No
Maximum SAR B1+RMS	MRStudyB1rms	(2005,1587)	Yes	No
General Worklist (RIS)				
Medical Alerts	Medical Alerts	(0010,2000)	Yes	Yes
Allergies	Contrast Allergies	(0010,2110)	Yes	Yes
Pregnancy Status	Pregnancy Status	(0010,21C0)	Yes	Yes
Requested Procedure	Requested Procedure Code Sequence	(0032,1064)	No	Yes
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	Yes
Comments	Requested Procedure Comments	(0040,1400)	No	Yes
Procedure Description	> Scheduled Procedure Step Description	(0040,0007)	No	No
Scheduled Procedure Step				
	Scheduled Procedure Step Sequence	(0040,0100)	No	Yes
Modality	> Modality	(0008,0060)	No	No
	> Scheduled Protocol Code Sequence	(0040,0008)	No	No
Code Value	>> Code Value	(0008,0100)	No	No

UI Entry	DICOM Element Name	DICOM Element Tag	Exam Entry Editable	
			Manual	RIS
Coding 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
PreMedication	> 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	Yes
Code Value	>> Code Value	(0008,0100)	Yes	Yes
Coding 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)	Yes	Yes

*Date of birth is editable only if it comes empty from the RIS.
**Comments on the Performed Procedure Step are copied from the Comments on scheduled procedure Step.
***Study Description is copied from Scheduled Procedure Step Description of Scheduled Procedure Step
****Patient Name VR Limit is 64 characters; incase characters count exceeds the limit then it will be truncated in the UI.

4.2.1.3.2.3.1. Dataset Specific Conformance for Modality Worklist Information Model - FIND SOP Class C-FIND-SCU

Table 17 should be read as follows:

Attribute Name: Attributes supported to build a Modality Worklist Request Identifier.
Tag: DICOM tag for this attribute.
VR: DICOM VR for this attribute.
M: Matching Keys for (automatic) Worklist Update.

R: Return Keys. An "X" indicates that this attribute as matching key can be used.
Q: Interactive Query Key. An "X" indicates that this attribute as matching key can be used.
D: Displayed Keys. An "X" indicates that this attribute is displayed when registering a new patient in the New Exam window.
IOD: An "X" indicates that this attribute is included in all exported images after execution of the related Procedure Step.
Type of matching: The following type of matching exists:

Single Value Matching
List of UID Matching
Wild Card Matching
Range Matching
Sequence Matching
Universal Matching

Table 17: Worklist Request Identifier

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Patient Identification Module									
Other Patient IDs	0010,1000	LO		X			X		
Patient's Name	0010,0010	PN	X	X	X	X	X	Single value, Universal, WildCard	
Patient ID	0010,0020	LO	X	X	X	X	X	Single value, Universal, WildCard	Patient ID in UI
Patient Demographic Module									
Ethnic Group	0010,2160	SH		X			X		
Patient Comments	0010,4000	LT		X			X		
Patient's Birth Date	0010,0030	DA		X		X	X		
Patient's Sex	0010,0040	CS		X		X	X		
Patient's Weight	0010,1030	DS		X		X	X		
Patient's Size	0010,1020	DS		X			X		
Patient Medical Module									
Additional Patient History	0010,21B0	LT		X			X		
Allergies	0010,2110	LO		X		X	X		
Medical Alerts	0010,2000	LO		X		X	X		
Pregnancy Status	0010,21C0	US		X		X	X		
Names of Intended Recipients of Results	0040,1010	PN		X			X		

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Patient's Institution Residence	0038,0400	LO		X			X		
Study Comments	0032,4000	LT		X			X		
Patient Comments	0010,4000	LT		X			X		
Patient's Birth Time	0010,0032	TM		X			X		
Performing Physician's Name	0008,1050	PN	X	X	X	X	X	Single value, Universal, WildCard	
Physician(s) of Record	0008,1048	PM		X			X		
Study Description	0008,1030	LO		X		X	X		
Visit Status Module									
Current Patient Location	0038,0300	LO		X					
SOP Common Module									
Specific Character Set	0008,0005	CS		X			X		Required if expanded/replacement character set used.
Scheduled Procedure Step Module									
Scheduled Procedure Step Sequence	0040,0100	SQ		X					
>Comments on the Scheduled Procedure Step	0040,0400	LT		X		X			
>Modality	0008,0060	CS	X	X	X	X	X	Single Value	Select ALL or MR. Default value is empty
>Pre-Medication	0040,0012	LO		X					
>Requested Contrast Agent	0032,1070	LO		X					
>Scheduled Performing Physician's Name	0040,0006	PN	X	X	X	X	X		
>Scheduled Procedure Step Description	0040,0007	LO		X		X	X		
>Scheduled Procedure Step End Date	0040,0004	DA		X		X	X		

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
>Scheduled Procedure Step End Time	0040,0005	TM		X			X		
>Scheduled Procedure Step ID	0040,0009	SH		X			X		
>Scheduled Procedure Step Location	0040,0011	SH		X					
>Scheduled Procedure Step Start Date	0040,0002	DA	X	X	X	X	X	Range	Date selection is required on the UI
>Scheduled Procedure Step Start Time	0040,0003	TM	X	X			X		
>Scheduled Procedure Step Status	0040,0020	CS		X					
>Scheduled Station AE Title	0040,0001	AE	X	X	X	X		Single Value	Select one of the configured AE Titles. Default value is the local AE Title.
>Scheduled Station Name	0040,0010	SH		X					
>Scheduled Protocol Code Sequence	0040,0008	SQ		X			X		
>>Code Meaning	0008,0104	LO		X			X		
>>Code Value	0008,0100	SH		X			X		
>>Coding Scheme Designator	0008,0102	SH		X			X		
>>Coding Scheme Version	0008,0103	SH		X			X		
Requested Procedure Module									
Names of Intended Recipients of Results	0040,1010	PN		X					
Requested Procedure Comments	0040,1400	LT		X			X		
Requested Procedure Description	0032,1060	LO		X			X		
Requested Procedure ID	0040,1001	SH	X	X	X	X	X	Single value, Universal, WildCard	
Study Instance UID	0020,000D	UI		X			X		
Referenced Study Sequence	0008,1110	SQ		X			X		

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
>Referenced SOP Class UID	0008,1150	UI		X			X		
>Referenced SOP Instance UID	0008,1155	UI		X			X		
Requested Procedure Code Sequence	0032,1064	SQ		X					
>Code Meaning	0008,0104	LO		X					
>Code Value	0008,0100	SH		X					
>Coding Scheme Designator	0008,0102	SH		X					
>Coding Scheme Version	0008,0103	SH		X					
Imaging Service Request Module									
Accession Number	0008,0050	SH	X	X	X	X	X	Single value, Universal, WildCard	Any value, Default value is empty.
Imaging Service Request Comments	0040,2400	LT		X					
Referring Physician's Name	0008,0090	PN		X		X	X		
Requesting Physician	0032,1032	PN		X			X		
Requesting Service	0032,1033	LO		X			X		

The possible Status Responses during a Worklist query are shown in Table 18.

Table 18: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete	The query results are displayed. The association is released. Report message in console.
Failed	A900	Identifier does not match SOP	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.
Refused	A700	Out of resources	No query results are displayed. The association is released. The reason is logged and reported by message in console.

Service Status	Error Code	Further Meaning	Behavior
	0122	SOP Class not supported	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.
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. Note: No option to cancel the MWL query from MR System UI.

The possible Communication Failures during a Worklist query are shown in Table 19.

Table 19: DICOM Command Communication Failure Behavior.

Exception	Behavior
ARTIM 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 fails. The reason is logged and reported to the user.

4.2.1.3.3. (Real-World) Activity – Modality Performed Procedure Step as SCU

4.2.1.3.3.1. Description and Sequencing of Activities

When the first scan of an examination is initiated the Network AE sets up an association to the MPPS server (typically a RIS) and sends an N-CREATE message with all appropriate information about the examination on the MR scanner; 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 end time and a status of respectively “COMPLETED” or “DISCONTINUED”. The MPPS function is independent of the use of storage commitment.
The sequence diagram in Figure 7 shows the interaction for the MR System RWA Report MPPS.

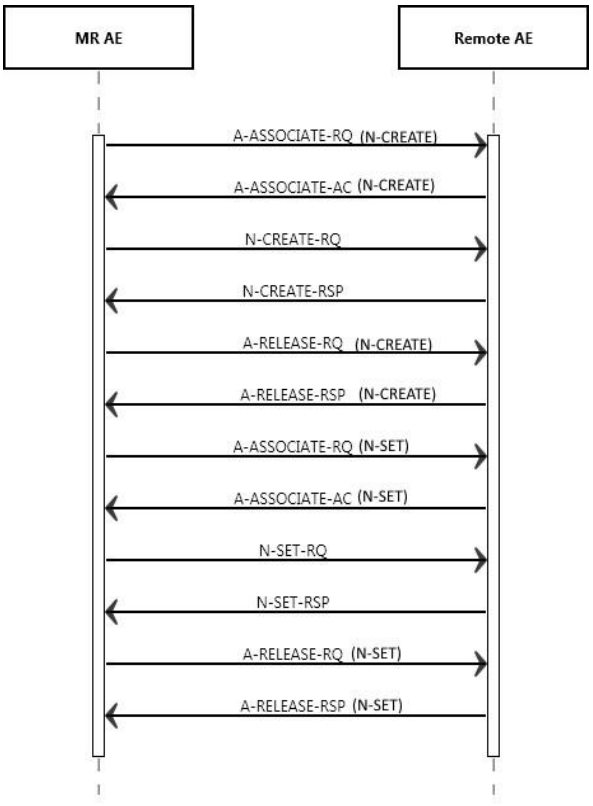

Figure 7: Sequencing of Report MPPS

4.2.1.3.3.2. Proposed Presentation Contexts

The presentation context proposed by Network AE for Report MPPS is defined in Table 20.

Table 20: Proposed Presentation Contexts for (Real-World) Activity – Modality Performed Procedure Step As SCU

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	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

Note that the order of the proposed transfer syntaxes is configurable.

4.2.1.3.3.3. SOP Specific Conformance for Modality Performed Procedure Step SOP Class

The mapping of attributes for Report MPPS is specified in chapter 8.1.2.

4.2.1.3.3.3.1. Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-CREATE-SCU

The possible responses behavior for N-CREATE-RQ is shown in Table 21.

Table 21: MPPS Request Identifiers for N-CREATE-RQ

Attribute Name	Tag	VR	Value	Comment
SOP Common Module				
Specific Character Set	0008,0005	CS	Default: ISO_IR 100. GB18030, ISO 2022 IR 100, ISO 2022 IR 101, ISO 2022 IR 109, ISO 2022 IR 110, ISO 2022 IR 126, ISO 2022 IR 127, ISO 2022 IR 13, ISO 2022 IR 138, ISO 2022 IR 144, ISO 2022 IR 148, ISO 2022 IR 149, ISO 2022 IR 166, ISO 2022 IR 6, ISO_IR 6, ISO_IR 100, ISO_IR 101, ISO_IR 109, ISO_IR 110, ISO_IR 126, ISO_IR 127, ISO_IR 13, ISO 2022 IR 87, ISO_IR 138, ISO_IR 144, ISO_IR 148, ISO_IR 166, ISO_IR 192	Attribute required if expanded character set used
Performed Procedure Step Relationship Module				
Patient ID	0010,0020	LO		
Patient's Birth Date	0010,0030	DA		
Patient's Name	0010,0010	PN		
Patient's Sex	0010,0040	CS	F, M, O	
Referenced Patient Sequence	0008,1120	SQ		
Scheduled Step Attributes Sequence	0040,0270	SQ		
>Accession Number	0008,0050	SH		
>Requested Procedure Description	0032,1060	LO		
>Requested Procedure Code Sequence	0032,1064	SQ		
>>Code Value	0008,0100	SH		
>>Coding Scheme Designator	0008,0102	SH		
>>Coding Scheme Version	0008,0103	SH		
>>Code Meaning	0008,0104	LO		
>Requested Procedure ID	0040,1001	SH		
>Scheduled Procedure Step Description	0040,0007	LO		
>Scheduled Procedure Step ID	0040,0009	SH		

Attribute Name	Tag	VR	Value	Comment
>Study Instance UID	0020,000D	UI		
>Referenced Study Sequence	0008,1110	SQ		
>>Referenced SOP Class UID	0008,1150	UI		
>>Referenced SOP Instance UID	0008,1155	UI		
>Scheduled Protocol Code Sequence	0040,0008	SQ		
>>Code Value	0008,0100	SH		
>>Coding Scheme Designator	0008,0102	SH		
>>Coding Scheme Version	0008,0103	SH		
>>Code Meaning	0008,0104	LO		
Performed Procedure Step Information Module				
Performed Location	0040,0243	SH		
Performed Procedure Step Description	0040,0254	LO		
Performed Procedure Step End Date	0040,0250	DA		
Performed Procedure Step End Time	0040,0251	TM		
Performed Procedure Step ID	0040,0253	SH		
Performed Procedure Step Start Date	0040,0244	DA		
Performed Procedure Step Start Time	0040,0245	TM		
Performed Procedure Step Status	0040,0252	CS	IN PROGRESS	
Performed Procedure Type Description	0040,0255	LO		
Performed Station AE Title	0040,0241	AE		
Performed Station Name	0040,0242	SH		
Performed Procedure Step Discontinuation Reason Code Sequence	0040,0281	SQ		
Procedure Code Sequence	0008,1032	SQ		
>Code Value	0008,0100	SH		
>Coding Scheme Designator	0008,0102	SH		

Attribute Name	Tag	VR	Value	Comment
>Coding Scheme Version	0008,0103	SH		
>Code Meaning	0008,0104	LO		
Image Acquisition Results Module				
Modality	0008,0060	CS	MR	Applied value: MR
Study Instance UID	0020,000D	UI		
Study ID	0020,0010	SH		
Performed Protocol Code Sequence	0040,0260	SQ		
>Code Value	0008,0100	SH		
>Coding Scheme Designator	0008,0102	SH		
>Coding Scheme Version	0008,0103	SH		
>Code Meaning	0008,0104	LO		
>Protocol Context Sequence	0040,0440	SQ		
Performed Series Sequence	0040,0340	SQ		Always EMPTY
>Code Value	0008,0100	SH		
>Coding Scheme Designator	0008,0102	SH		
>Coding Scheme Version	0008,0103	SH		
>Code Meaning	0008,0104	LO		
>Protocol Context Sequence	0040,0440	SQ		

The possible status responses for N-CREATE-RQ actions are shown in Table 22.

Table 22: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Conformation, Matching is complete	The SCU has successfully returned all matching information. The association will be released. Message in console.
Failed	xxxx	(any other failure)	The Association is aborted using A-ABORT and the MPPS is marked as failed. The status meaning is logged and reported to the user. Message in console. The reason is logged.
	0110	Performed procedure step object may no longer be updated	(Error ID A710) Message in console. The reason is logged.
Warning	0116	Attribute Value Out of Range	The MPPS operation is considered successful but the status meaning is logged. Additional

Service Status	Error Code	Further Meaning	Behavior
			information in the Response identifying the attributes out of range will be logged (i.e. Elements in the Modification List / Attribute List)

4.2.1.3.3.3.2. Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-SET-SCU

The possible responses behavior for N-SET-RQ is shown Table 23.

Table 23: MPPS Request Identifiers for N-SET-RQ

Attribute Name	Tag	VR	Value	Comment
Performed Procedure Step Information Module				
Performed Procedure Step Description	0040,0254	LO		
Performed Procedure Step End Date	0040,0250	DA		
Performed Procedure Type Description	0040,0255	LO		
Performed Procedure Step End Time	0040,0251	TM		
Performed Procedure Step Status	0040,0252	CS	IN-PROGRESS COMPLETED, DISCONTINUED	
Performed Protocol Code Sequence	0040,0260	SQ		
>Code Value	0008,0100	SH		
>Coding Scheme Designator	0008,0102	SH		
>Coding Scheme Version	0008,0103	SH		
>Code Meaning	0008,0104	LO		
Specific Character Set	0008,0005	CS		
Procedure Code Sequence	0008,1032	SQ		
>Code Value	0008,0100	SH		
>Coding Scheme Designator	0008,0102	SH		
>Coding Scheme Version	0008,0103	SH		
>Code Meaning	0008,0104	LO		
Referenced Performed Procedure Step Sequence	0008,1111	SQ		
>Referenced SOP Class UID	0008,1150	UI		
>Referenced SOP Instance UID	0008,1155	UI		

Attribute Name	Tag	VR	Value	Comment
Image Acquisition Results Module				
Performed Series Sequence	0040,0340	SQ		
>Operators' Name	0008,1070	PN		
>Performing Physician's Name	0008,1050	PN		
>Protocol Name	0018,1030	LO		
>Retrieve AE Title	0008,0054	AE		
>Series Description	0008,103E	LO		
>Series Instance UID	0020,000E	UI		
>Referenced Image Sequence	0008,1140	SQ		
>Referenced Non-Image Composite SOP Instance Sequence	0040,0220	SQ		

Possible status responses from N-SET-RQ actions are shown in Table 24.

Table 24: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation, The SCP has completed the operation successfully.	The association will be released. Message in console. The SCU has successfully returned all matching information
Failed	0110	Performed procedure step object may no longer be updated	(Error ID A710) Message in console. The reason is logged.
	xxxx	(Any other status code.)	The Association is aborted using A-ABORT and the MPPS is marked as failed. The status meaning is logged and reported to the user. Message in console. The reason is logged.
Warning	0116	Attribute Value Out of Range	The MPPS operation is considered successful but the status meaning is logged. Additional information in the Response identifying the attributes out of range will be logged (i.e. Elements in the Modification List/Attribute List)

4.2.1.3.4. (Real-World) Activity – FIND as SCU

4.2.1.3.4.1. Description and Sequencing of Activities

The MR System RWA Find as SCU (Find Remote Images) involves the query of a remote system to find matching data in the remote database. The operator queries a remote database by means of the query tool in the MR System. After clicking the Patient Directory and selecting the configured PACS/Network, the window offers the possibility to enter the required matching keys. The operator clicks on the “Search PACS/Network” button to activate the specified filter settings.

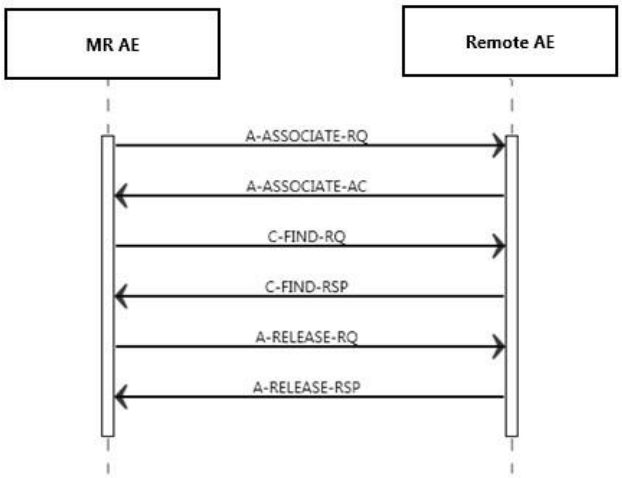

Figure 8: (Real World) Activity – Find Remote Images

The Network AE will try and request an association with 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 for Study level query (for Study Root model)
The association is released when the execution of the query completes.

4.2.1.3.4.2. Proposed Presentation Contexts

The proposed presentation contexts for FIND as SCU are defined in Table 25.

Table 25: Proposed Presentation Contexts for (Real-World) Activity – FIND As SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

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

The MR System does not support extended negotiations.

4.2.1.3.4.3. SOP Specific Conformance for Study Root QR Information Model - FIND SOP Class

The MR System provides standard conformance to this SOP class. The MR System AE does not generate queries containing optional keys and it does not generate relational queries.

4.2.1.3.4.3.1. Dataset Specific Conformance for Study Root QR Information Model - FIND SOP Class C-FIND-SCU

In Table 26 the supported query keys for each query level are described. Universal matching is supported as default.

Table 26: Supported Query Keys for Study Root Information Model

Study Root Information Model				
Attribute Name	**Tag**	**VR**	**Matching Key Type**	**Comments**
Query/Retrieve Level	0008,0052	CS		STUDY
Q/R Study Level				
Study Date	0008,0020	DA	Wild Card, Range	-
Accession Number	0008,0050	SH	Wild Card, Single Value	-
Modalities in Study	0008,0061	CS	Wild Card, Single Value	-
Study Description	0008,1030	LO	Wild Card, Single Value	-
Patient Name	0010,0010	PN	Wild Card, Single Value	-
Patient ID	0010,0020	LO	Wild Card, Single Value	-
Patient's Birth Date	0010,0030	DA	Wild Card, Single Value	-

The possible Status Responses for Study Root Information Model are shown in Table 27.

Table 27: Status response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete	The find results are displayed.
Refused	A700	Out of Resources	No find results are displayed. The reason is logged.
Failed	A900	Identifier does not match SOP class	No find results are displayed. The reason is logged.
	Cxxx	Unable to process	No find results are displayed. The reason is logged.
Cancel	FE00	Matching terminated due to Cancel Request	No find results are displayed. The reason is logged.
Pending	FF00	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	The find command continues.
	FF01	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	The find command continues.

The possible Communication Failures for Study Root Information Model are listed in Table 28.

Table 28: DICOM Command Communication Failure Behavior for Study Root Information Model.

Exception	Behavior
ARTIM Time-out	N/A

Exception	Behavior
Reply Time-out	The query 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 fails. The reason is logged and reported to the user.

4.2.1.3.5. (Real-World) Activity – MOVE as SCU

4.2.1.3.5.1. Description and Sequencing of Activities

The RWA Move as SCU (Move Remote Images) involves the retrieval of objects from a remote system by moving matching objects from the remote database to the local database or to another remote database.

The MR System Network AE initiates for each copy request an association to the selected remote DICOM node and uses this node to send the Retrieve (C-MOVE) request (and receives the associated responses). An examination may contain Images, Presentation states, Raw data objects or Private objects. For successfully operation all systems must be configured to make a Retrieve (C-MOVE) possible. In case the move is to a third station this must also be defined on both systems (MR system and system sending the objects). It is important that the definition on the MR system is consistent with the definition at the moving station.

The association is released after the final Retrieve (C-MOVE) response for the related request has been received (no more pending).

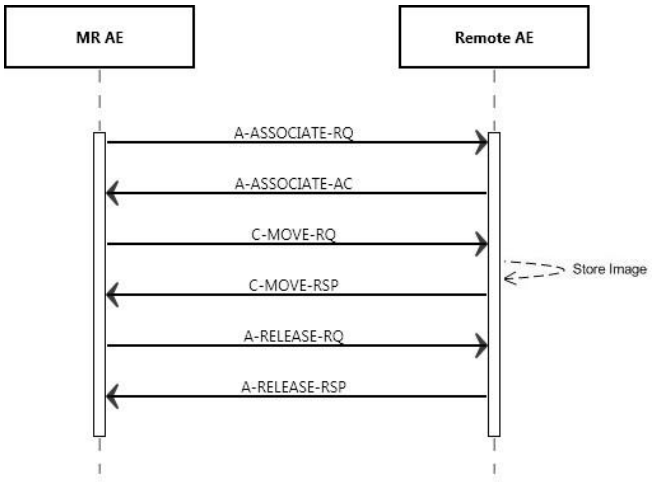

Figure 9: (Real World) Activity – Move Remote Images

4.2.1.3.5.2. Proposed Presentation Contexts

The presentation contexts for MOVE as SCU are defined in Table 29.

Table 29: Proposed Presentation Contexts for (Real-World) Activity – MOVE As SCU

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

The order of the proposed transfer syntaxes is configurable. The preferred transfer syntax is ELE. The MR System AE does not support extended negotiations.

4.2.1.3.5.3. SOP Specific Conformance for Study Root QR Information Model - MOVE SOP Class

The MR System provides standard conformance to this SOP class.

4.2.1.3.5.3.1. Dataset Specific Conformance for Study Root QR Information Model - MOVE SOP Class C-MOVE-SCU

The identifiers for C-MOVE as SCU are listed in Table 30.

Table 30: Identifiers for MOVE Study Root Information Model as SCU

Study Root Information Model			
Attribute Name	Tag	VR	Comment
Query/Retrieve Level	0008,0052	CS	Applied value: STUDY
Q/R Study level			
Study Instance UID	0020,000D	UI	

The DICOM Status Response for C-MOVE-SCU is shown in Table 31.

Table 31: Status response for Study Root Information Model C-MOVE-SCU.

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Sub-operations complete-No Failures	The move job is marked as completed. The association is released.
Refused	A701	Out of Resources- Unable to calculate number of matches	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A702	Out of Resources – Unable to perform sub-operations	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A801	Move Destination unknown	The move job is marked as failed. The association is released. The reason is logged and reported to the user.

Service Status	Error Code	Further Meaning	Behavior
Failed	A900	Identifier does not match SOP class	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	Cxxx	Unable to process	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Cancel	FE00	Sub-operations terminated due to Cancel Indication	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Warning	B000	Sub-operations complete – One or more Failures	The move job is marked as completed. The association is released.
Pending	FF00	Sub-operations are continuing.	The move job continues.

The possible Communication Failures for C-MOVE-SCU are shown in Table 32.

Table 32: DICOM Command Communication Failure Behavior for Study Root Information Model C-MOVE-SCU

Exception	Behavior
ARTIM Time-out	The move job fails in case of association setup. The reason is logged and reported to the user.
Reply Time-out	The move 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 move job fails. The reason is logged and reported to the user.

4.2.1.3.6. (Real-World) Activity – Image Export

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 export Images to the selected network destination by clicking the 'Export' button. For each selected Examination the Network AE will successively do the following actions.

Note: - For any other DICOM node configured as others, use Network button.

The Network AE initiates an association with the configured PACS node. Over this association all images, presentation states and other related data are exported. When the storage job has finished, be it successfully or not, the Network AE releases the association.
If the storage job failed, then the storage job has to be executed over again.
If storage commitment is configured for each exported Series, the Network AE requests storage commitment from the PACS. Each storage commitment request handles the storage commitment of one series of images over a separate association.

Figure 10 shows the sequence diagram for the storage of an Examination containing one Series of images.

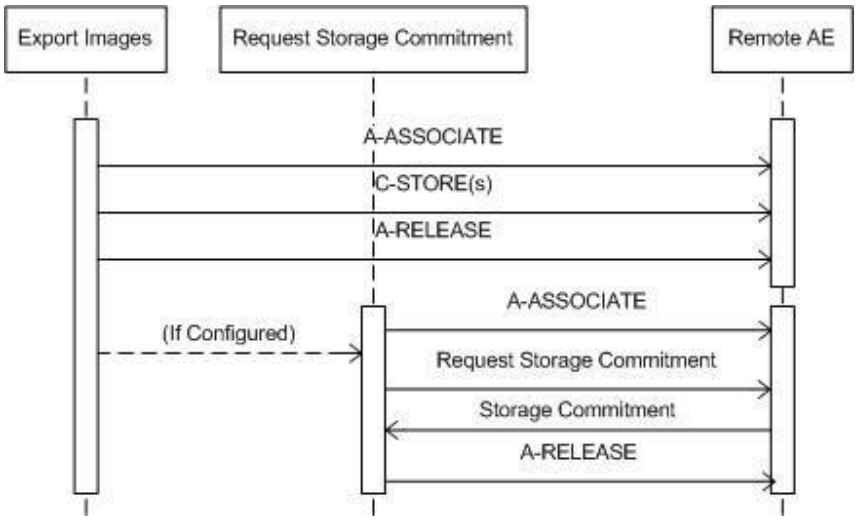

Figure 10: (Real Word) Activity - Export Images

4.2.1.3.6.2. Proposed Presentation Contexts

The presentation contexts proposed by Network AE for Image Export are defined in Table 33.

Table 33: Proposed Presentation Contexts for (Real-World) Activity – Image Export

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Philips Private MR Examcard Storage	1.3.46.670589.11.0.0.12.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
		Implicit VR Little Endian	1.2.840.10008.1.2		

The order of the proposed transfer syntaxes is configurable. The preferred transfer syntax is ELE. The MR System AE does not support extended negotiations.

4.2.1.3.6.3. SOP Specific Conformance for Storage SOP Classes

As Grayscale Softcopy Presentation State objects are stored as separate series together with the images they belong to. The Network AE initiates committing those Series in the same association if negotiated for, one after the other.

4.2.1.3.6.3.1. Dataset Specific Conformance for C-STORE-RQ

The possible Status Responses for the export Images storage are shown in Table 34.

Table 34: Status Response for C-STORE-RQ.

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Storage is complete. Successful stored	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.
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 store job fails and the association is released. The reason is logged and reported to the user.
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 Discard	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 reason is logged.
	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.

When receiving a C-STORE response with ‘Refused’ or ‘Error’ status the Network AE releases 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 possible communication failures during a C-STORE-RQ are listed in Table 35.

Table 35: DICOM Command Communication Failure Behavior for C-STORE-RQ.

Exception	Behavior
ARTIM Time-out	The store job fails in case of association setup. The reason is logged and reported to the user.
Reply Time-out	The store job fails in case of association setup. The reason is logged and reported to the user.
Association Time-out SCU	The association is released.
Association Aborted	The store job fails. The reason is logged and reported to the user.

4.2.1.3.7. (Real-World) Activity – Storage Commitment Push Model as SCU

4.2.1.3.7.1. Description and Sequencing of Activities

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 releases the association and the storage commitment continues asynchronously. The Figure below shows the sequence diagram for the storage and asynchronous storage commitment of an Examination containing one Series of images.

If configured, Storage Commitment will be initiated in a new association after closing the storage of the related image storage (CSTORE). This new association will be open until the remote archive sends a storage commitment report (Synchronous) or when the configured maximum time is passed. When this maximum configured period is passed, it is the responsibility of the remote archive to setup a new association with MR System and send the storage commitment report (asynchronous behavior).

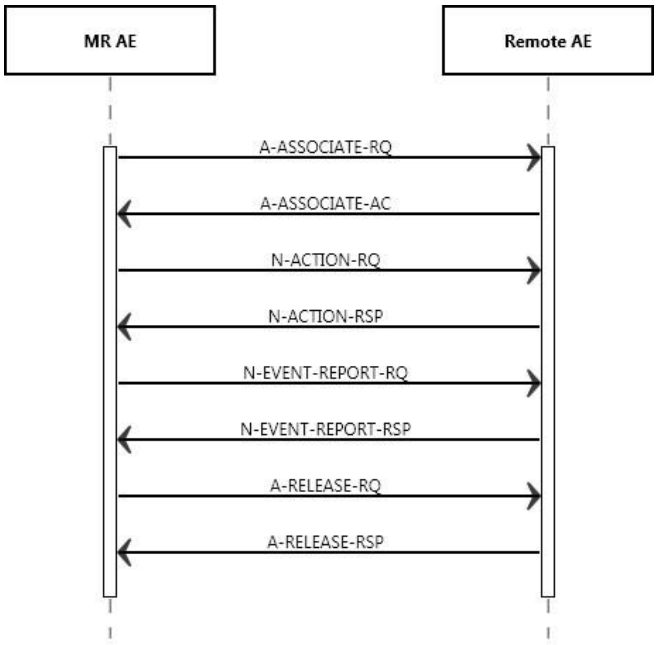

Figure 11: Sequencing of Storage Export with Synchronous Storage Commitment

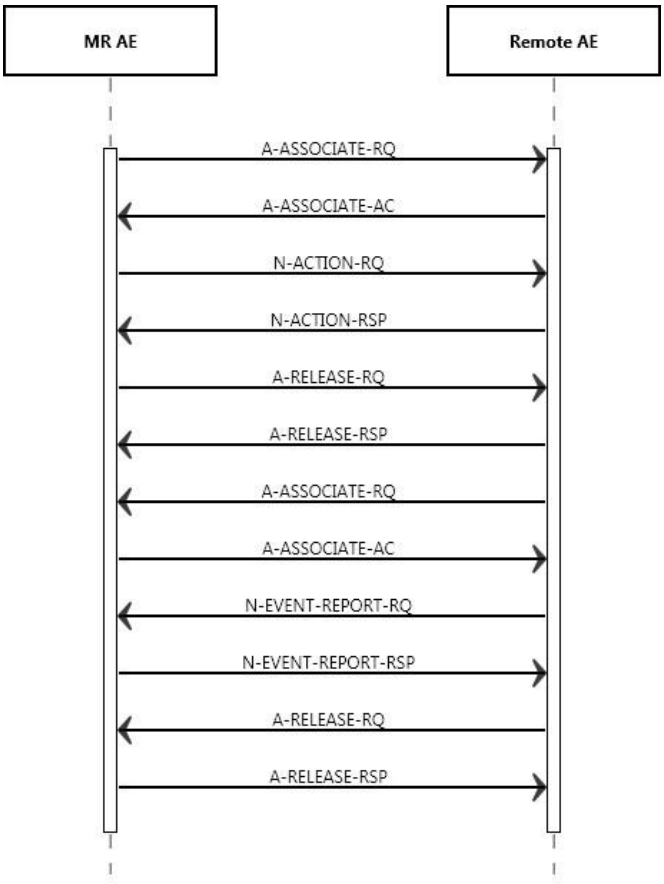

Figure 12: Sequencing of Storage Export with Asynchronous Storage Commitment

4.2.1.3.7.2. Proposed Presentation Contexts

The proposed presentation contexts for Storage Commitment Push Model as SCU are defined in Table 36.

Table 36: Proposed Presentation Contexts for (Real-World) Activity – Storage Commitment Push Model as SCU

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

The order of the proposed transfer syntaxes is configurable. The preferred transfer syntax is ELE. The MR System AE does not support extended negotiations.

4.2.1.3.7.3. SOP Specific Conformance for Storage Commitment Push Model SOP Class

MR System conforms to the standard Storage Commitment model.

As Grayscale Softcopy Presentation State objects are stored as separate series together with the images they belong to, the Network AE will initiate separate associations for committing those Series – one after the other.

Based on the configuration provided in PSC, if the storage commitment is set to True for the network device, N-ACTION-RQ is triggered once all the entity transfer status is validated and updated. The storage commitment status is shown in the Patient Directory.

If the storage commitment failed, the operator is responsible for exporting the images again.
It is user decision to delete the objects once it is archived. User can delete the object from SUT (deletion is supported at study and series level).

Details regarding the response behavior for the Archive Images storage commitment request are described in the next sections.

4.2.1.3.7.3.1. Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-EVENT-REPORT-SCP

Details regarding the Dataset Specific response behavior for Storage Commitment Attributes for N-EVENT-REPORT-RSP are described in this section.

On receiving a storage commitment result with Event Type ID 1 (Storage Commitment Request Successful) the archive status of the examination is updated in the Administration window of the MR scanner.
On receiving a storage commitment result with Event Type ID 2 (Storage Commitment Request Complete – Failures Exist) the Network AE behaves as summarized in Table 37.

Table 37: Status Response for N-EVENT-REPORT.

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Operation complete	Continues with waiting for storage commitment.
Failure	xxxx	(any failure)	The reason is logged.
	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 communication status behavior of the N-EVENT-REPORT is listed in Table 38.

Table 38: DICOM Command Communication Failure Behavior for N-EVENT-REPORT.

Exception	Behavior
ARTIM Time-out	The reason is logged.
Network Reply Time-out	The association is released. Continues with waiting for storage commitment.

Exception	Behavior
Association Time-out SCU	The association is released. Continues with waiting for storage commitment.
Association aborted	Continues with waiting for storage commitment.

4.2.1.3.7.3.2. Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-ACTION-SCU

This chapter describes the Dataset Specific response behavior for Storage Commitment Attribute N-ACTION-RQ.

Table 39: Storage Commitment Attribute for N-ACTION-RQ

Storage Commitment Module		
Attribute Name	**Tag**	**Comment**
Transaction UID	0008,1195	-
Referenced SOP Sequence	0008,1199	-
>Referenced SOP Class UID	0008,1150	-
>Referenced SOP Instance UID	0008,1155	-

The possible status responses for N-ACTION-RQ are shown in Table 40.

Table 40: Status Response for N-ACTION-RQ.

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

The possible communication failures are shown in Table 41.

Table 41: DICOM Command Communication Failure Behavior N-ACTION.

Exception	Behavior
ARTIM Time-out	The reason is logged.
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 MR system will accept an association from a remote system. The possible AE Association rejections are handled as shown in Table 42.

Table 42: Association Reject Reasons Handling

Result	Source	Reason/Diagnosis	Behavior
1 - rejected permanent	1 - DICOM UL service-user	1 – no reason given	Log entry.
		2 – application context name not supported	Log entry.
		3 – calling AE title not recognized	Log entry.
	2 - DICOM UL service provider (ACSE related function)	1 – no reason given	Log entry.
		2 – protocol version not supported	Log entry.
	3 - DICOM UL service provider (Presentation related function)	1 – temporary congestion	Log entry.
		2 – local limit exceeded	Log entry.
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	Log entry.
		2 – application context name not supported	Log entry.
		3 – calling AE title not recognized	Log entry.
	2 - DICOM UL service provider (ACSE related function)	1 – no reason given	Log entry.
		2 – protocol version not supported	Log entry.
	3 - DICOM UL service provider (Presentation related function)	1 – temporary congestion	Log entry.
		2 – local limit exceeded	Log entry.

The possible Association aborts are handled as shown in Table 43.

Table 43: Association Abort Policies Handling.

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	When received, the Network AE terminates the connection and logs the event. This is sent when: 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 (initiated abort)	0 - reason-not-specified	When received, the Network AE terminates the connection and logs the event. This is sent when Import fails.
	1 - unrecognized-PDU	When received, the Network AE terminates the connection and logs the event. This is sent when an unrecognized PDU type is received.
	2 - unexpected-PDU	When received, the Network AE terminates the connection and logs the event. This is sent when the received PDU type is not expected in the current state of connection.

Source	Reason/Diagnosis	Behavior
	4 - unrecognized-PDU parameter	When received, the Network AE terminates the connection and logs the event. This is sent when an unrecognized Associate PDU item is received.
	5 - unexpected-PDU parameter	When received, the Network AE terminates the connection and logs the event. This is sent when: 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. This is sent when: 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. (Real-World) Activity – Verification as SCP

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.

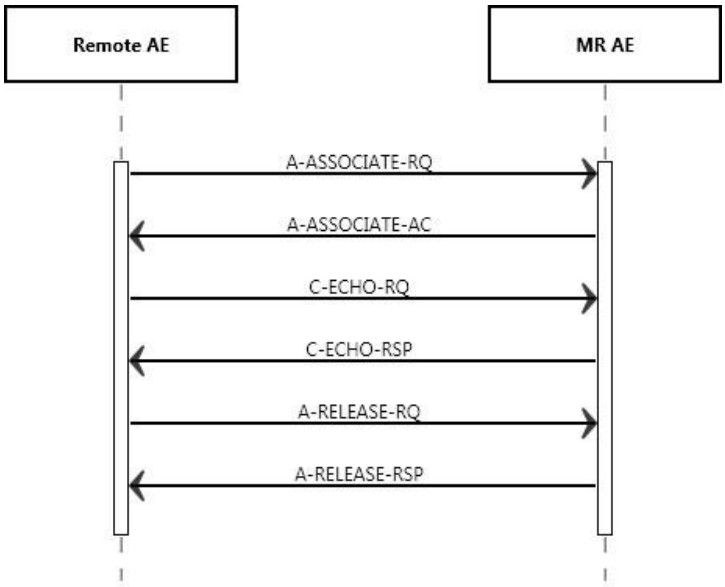

Figure 13: (Real World) Activity – Request Verification

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 acceptable presentation contexts for Verification as SCP are defined in Table 44.

Table 44: Acceptable Presentation Contexts for (Real-World) Activity – Verification as SCP

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

The order of the proposed transfer syntaxes is configurable. The preferred transfer syntax is ELE and shall be chosen in case multiple Transfer Syntaxes are proposed in the Association Negotiation.

The MR System does not support extended negotiations.

4.2.1.4.1.3. SOP Specific Conformance for Verification SOP Class

The MR System provides standard conformance to Verification SOP class as an SCP.

4.2.1.4.1.3.1. Dataset Specific Conformance for Verification C-ECHO RSP

This section describes the dataset specific response behavior for Verification C-ECHO-RSP.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 45: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Eg. Matching is complete	Eg. The SCP has successfully returned all matching information

Table 46: DICOM Command Communication Failure Behavior for C-ECHO RSP

Exception	Behavior
ARTIM Time-out	The verification request fails. The reason is logged.
Reply Time-out	The verification request fails, and association is aborted. The reason is logged.
Association Time-out SCU	The association is released.
Association aborted	The verification request fails. The reason is logged.

4.2.1.4.2. (Real-World) Activity – FIND as SCP

4.2.1.4.2.1. Description and Sequencing of Activities

The query dialog is initiated by the Remote AE. The Remote AE request an association with the MR AE to send query requests to the MR AE, 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).

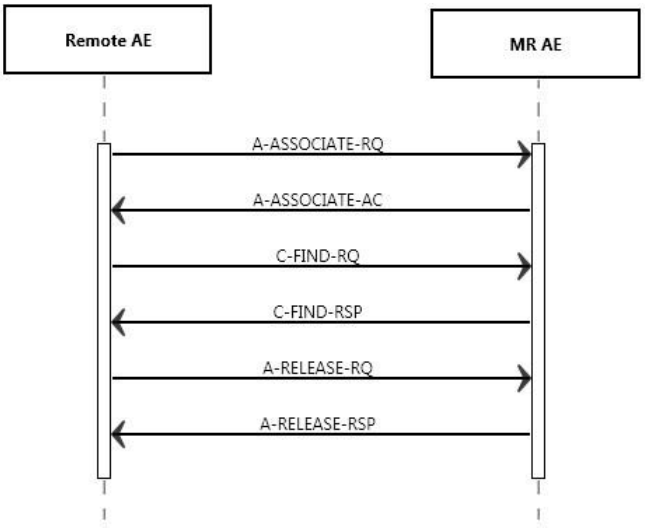

Figure 14: Sequencing of Query Images

4.2.1.4.2.2. Accepted Presentation Contexts

The acceptable presentation contexts for FIND as SCP are defined in below table

Table 47: Acceptable Presentation Contexts for (Real-World) Activity – FIND as SCP

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

The MR AE accepts all contexts that are common in the proposed and acceptable Presentation Contexts. This means that the MR AE can accept multiple proposed presentation contexts with the same SOP class but different transfer syntaxes.

There is no check for duplicate contexts, and these will therefore be accepted.

The MR AE does not support extended negotiations.

4.2.1.4.2.3. SOP Specific Conformance for Study Root QR Information Model - FIND SOP Class

The MR AE provides standard conformance to the Query/Retrieve service class. Relational queries are not supported. The MR AE can handle simultaneous C-FIND requests.

When queried with optional keys, the MR AE will respond successfully for available keys if queried for universal matching; otherwise, MR AE will respond with warning.

When queried with optional keys with non-universal matching, the MR AE returns information using universal matching for those keys.

4.2.1.4.2.3.1. Dataset Specific Conformance for Study Root QR Information Model - FIND SOP Class C-FIND-RSP

Available Query keys for C-FIND-RSP are listed in Table 48.

Table 48: Requested Query Keys for Study Root Information Model

Study Root Information Model				
Attribute Name	**Tag**	**VR**	**Type Of Matching**	**Comment**
Query/Retrieve Level	0008,0052	CS	-	-
Specific Character Set	0008,0005	CS	-	-
Q/R Study level				
Accession Number	0008,0050	SH	Single value, Universal, WildCard	-
Ethnic Group	0010,2160	SH	Single value, Universal, WildCard	-
Patient ID	0010,0020	LO	Single value, Universal, WildCard	-
Patient's Birth Date	0010,0030	DA	Single value, Universal, Range	-
Patient's Name	0010,0010	PN	Single value, Universal, WildCard	-
Patient's Sex	0010,0040	CS	Single value, Universal, WildCard	-
Study Date	0008,0020	DA	Single value, Universal, Range	-
Study ID	0020,0010	SH	Single value, Universal, WildCard	-
Study Instance UID	0020,000D	UI	Single value, Universal, List of UID	-
Study Time	0008,0030	TM	Single value, Universal, Range	-
Q/R Series level				
Body Part Examined	0018,0015	CS	Universal	-
Modality	0008,0060	CS	Universal	MR
Series Date	0008,0021	DA	Single value, Universal, Range	-
Series Instance UID	0020,000E	UI	Single value, Universal, List of UID	-
Series Time	0008,0031	TM	Single value, Universal, Range	-

Table 49 shows the possible status response for the C-FIND-RSP.

Table 49: Status Response for C-FIND-RSP

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete	The C-FIND request handling is completed, no more C-FIND responses are sent.
Failed	A900	Identifier does not match SOP class	N.A.

Service Status	Error Code	Further Meaning	Behavior
	C000	Unable to process	The C-FIND request cannot be parsed. MR logs the reason.
Refused	A700	Out of Resources	N.A.
Pending	FF00	Matches are continuing	Current match is supplied and any optional keys were supported in the same manner as required keys The C-FIND responses are continuing.
	FF01	Matches are continuing	Warning that one or more optional keys were not supported for existence and/or matching for this identifier The C-FIND responses are continuing.
Cancel	FE00	Matching terminated due to Cancel Request	Cancel-response is not supported. The find command continues.

The possible Communication Failures are shown in the below Table 50.

Table 50: DICOM Command Communication Failure Behavior

Exception	Behavior
ARTIM Time-out	The query fails in case of association setup. The reason is logged.
Reply Time-out	The query fails and association is aborted. The reason is logged.
Association Time-out SCU	The association is released.
Association Aborted The query fails.	The query fails. The reason is logged.

4.2.1.4.3. (Real-World) Activity – MOVE as SCP

4.2.1.4.3.1. Description and Sequencing of Activities

The MR system shall accept associations from systems that wish to retrieve images from the MR database using the C-MOVE command. After MR Retrieve Local Images the MR Export Images is started. Figure 15 shows the sequencing of retrieved images.

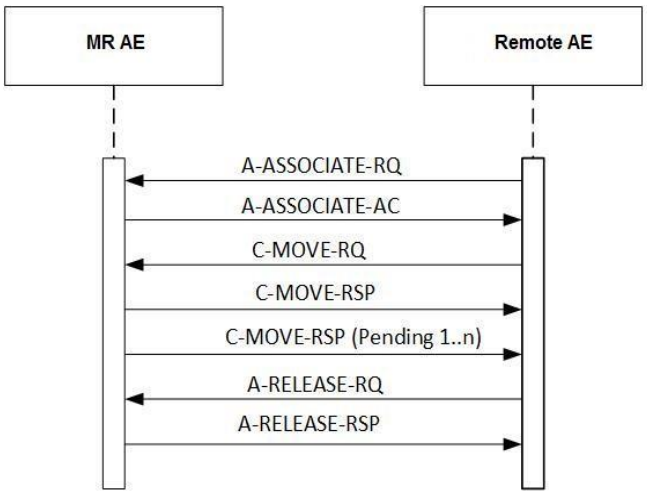

Figure 15: Sequencing of Retrieve Local Objects

4.2.1.4.3.2. Accepted Presentation Contexts

The acceptable presentation contexts for MOVE as SCP are shown in Table 51.

Table 51: Acceptable Presentation Contexts for (Real-World) Activity – MOVE As SCP

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

The MR AE accepts all contexts that are common in the proposed and acceptable Presentation Contexts. This means that the MR AE can accept multiple proposed Presentation Contexts with the same SOP class but different Transfer Syntaxes.

The order of the proposed transfer syntaxes is configurable.

There is no check for duplicate contexts, and these will therefore be accepted.

The MR AE does not support extended negotiations for Patient Root QR Information Model MOVE SOP class and for Study Root QR Information Model - MOVE SOP Class.

4.2.1.4.3.3. SOP Specific Conformance for Study Root QR Information Model - MOVE SOP Class

The MR AE provides standard conformance to the MOVE SOP class as an SCP.

4.2.1.4.3.3.1. Dataset Specific Conformance for Study Root QR Information Model - MOVE SOP Class C-MOVE-RSP

Table 52 shows the MOVE Identifiers for Study Root Information model.

Table 52: Identifiers for MOVE Study Root Information Model as SCP

Study Root Information Model			
Attribute Name	Tag	VR	Comment
Query/Retrieve Level	0008,0052	CS	Applied value: Study
Q/R Study level			
Study Instance UID	0020,000D	UI	-

The possible status Responses for the C-MOVE-RSP are shown in Table 53.

Table 53: Status Response for C-MOVE

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Sub-operations complete – No Failures	The C-MOVE command has been completed.

Service Status	Error Code	Further Meaning	Behavior
Refused	A701	Out of Resources – Unable to calculate number of matches	N/A
	A702	Out of Resources – Unable to perform Suboperations	N/A
Failed	A801	Move Destination unknown	No C-STORE command will be sent. MR logs the reason.
	A900	Identifier does not match SOP class	N/A
Cancel	C000	Unable to process	The C-MOVE request cannot be parsed. No Store Command will be sent. MR logs the reason.
Warning	FE00	Sub-operations terminated due to Cancel Indication	The C-MOVE request is canceled, no more C-MOVE responses are sent.
Pending	B000	Sub-operations complete – One or more Failures	N/A

The possible communication failures for C-MOVE are shown in Table 54.

Table 54: DICOM Command Communication Failure Behavior for C-MOVE.

Exception	Behavior
ARTIM Time-out	The move job fails in case of association setup. The reason is logged.
Reply Time-out	The move job fails and association is aborted. The reason is logged.
Association Time-out SCU	The association is released.
Association aborted	The move job fails. The reason is logged.

4.2.1.4.4. (Real-World) Activity – Image Import

4.2.1.4.4.1. Description and Sequencing of Activities

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

The MR AE accepts associations from other systems that wish to store images in the MR System database, using the C-STORE command.

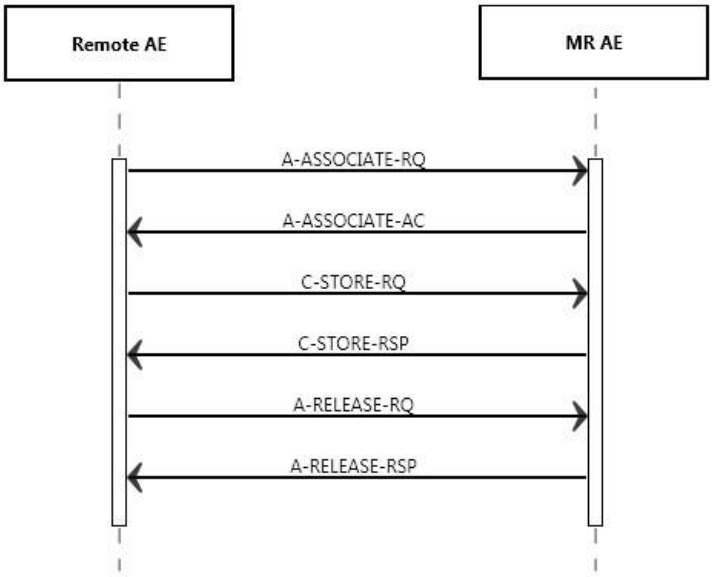

Figure 16: (Real World) Activity - Import Images

After the MR Network AE accepts an association from the remote Storage SCU the MR system will receive images from that remote Storage SCU, send store responses including the relevant status back, and releases the association on SCU request.

The MR supports a maximum number of incoming associations (default 4) for the set of SCPs. This number is configurable.

4.2.1.4.4.2. Accepted Presentation Contexts

The possible presentation contexts are shown in Table 55.

Table 55: Acceptable Presentation Contexts for (Real-World) Activity – Image Import

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG Lossless, NonHierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG Lossless, NonHierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG Lossless, NonHierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Philips Private MR Examcard Storage	1.3.46.670589.11.0.0.12.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

The MR System AE does not support extended negotiations for Image Import.

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

4.2.1.4.4.3. SOP Specific Conformance for Storage SOP Classes

The Network AE provides Level 2 (Full) conformance to the storage SOP classes.

Level 2 attributes indicates that all Type 1, Type 2, and Type 3
Attributes defined in the IOD etc. associated with the SOP Class, as well as any Standard Extended attributes (including private attributes) included in the SOP Instance, will be stored and may be accessed.

Secondary Capture images can be imported at any time and from any source.
However, the MR Network AE can only import MR images and belonging Presentation State objects that were created on a Philips System. These imported images may be used for reference only; successful further export is not guaranteed.

When the MR Network AE receives images that do not originate from a Philips MR System or no longer contain Philips MR Private tags, the MR Network AE responds with the success status (0000) but skips the objects since it is not understood by the system.

Images are considered to be originated from a Philips System if the SOP Instance UID of the image begins with the prefix “1.3.46.670589” or the Manufacturer contains the value "Philips”.

4.2.1.4.4.3.1. Dataset Specific Conformance for C-STORE-RSP

The possible Status Responses for C-STORE are shown in Table 56.

Table 56: Status Response for C-STORE-RSP

Service Status	Error Code	Further Meaning	Behavior (sent when)
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.
Success	0000	Successful stored	The image(s) shall be stored in the local database.
Error	A900	Data Set does not match SOP Class	The image(s) cannot be parsed. The MR System sends the failure response, logs the condition, and aborts the association.
	0117	Invalid Object Instance	Study Instance UID/Series Instance UID is not present.
	C000	Cannot understand	The image(s) cannot be parsed/ SOP Instance UID is not present. The MR System sends the failure response, logs the condition.
Warning	B000	Coercion of Data Elements	The image(s) cannot be parsed. The MR System sends the failure response, logs the condition, and aborts the association.
	B007	Data Set does not match SOP Class	The image(s) cannot be parsed. The MR System sends the failure response, logs the condition, and aborts the association.
	B006	Elements Discarded	The image(s) cannot be parsed. The MR System sends the failure response, logs the condition, and aborts the association.

Table 57 shows the possible communication failures for C-STORE-RSP.

Table 57: DICOM Command Communication Failure Behavior for C-STORE-RSP

Exception	Behavior
ARTIM Time-out	The store job fails in case of association setup. The reason is logged.
Reply Time-out	The store job fails and association is aborted. The reason is logged.
Association Time-out SCU	The association is released.
Association aborted	When the import is aborted, same is logged in application log as Aborted and the store job is failed.

4.2.2. MR System Print

This chapter describes the Print AE in detail.

4.2.2.1. SOP Classes

This Application Entity provides Standard Conformance to the SOP Classes shown in Table 58.

Table 58: SOP Classes for MR System Print

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	UID		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

4.2.2.2. Association Policies

This chapter describes the establishment of an association and the acceptance policies of the Print AE.

4.2.2.2.1. General

The following DICOM standard application context is specified.

Table 59: DICOM Application Context

Description	Value
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 supports is specified in Table 60. The Print AE does not accept any incoming associations.

Table 60: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	1

4.2.2.2.3. Asynchronous Nature

The MR system does not support asynchronous operations and will not perform asynchronous window negotiation.

4.2.2.2.4. Implementation Identifying Information

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

Table 61: DICOM Implementation Class and Version for MR System Print

Implementation Class UID	1.3.46.670589.54.2.123.x
Implementation Version Name	Philips MR 123.x

Note: “x” represents the Level release number from current software version.

4.2.2.2.5. Communication Failure Handling

The possible network communication failures are summarized in Table 62.

Table 62: Communication Failure Behavior

Exception	Behavior
ARTIM Timeout	The Association setup fails and using A-ABORT and the command is marked as failed. The reason is logged and reported to the user.
Association Aborted.	The Print Image job is marked as Failed. The reason is logged and reported to the user.
Association Time-Out SCU	The Association is Released.
Network reply Time-Out	The Association is Released.

4.2.2.3. Association Initiation Policy

This section describes the conditions under which the Print AE initiates an Association.

The possible Status Responses are summarized in Table 63.

Table 63: Response Status Handler Behavior

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete, successful operation.	The SCP has successfully returned all matching information. The status is logged.

The possible Association Rejection responses are listed in Table 64.

Table 64: Association Rejection response

Result	Source	Reason/Diagnosis	Behavior
1 - rejectedpermanent	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-notsupported	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 - rejectedtransient	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-notsupported	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-notsupported	The user is notified. If applicable the command will be retried. Log entry.
	3 - DICOM UL service-provider	1 - temporary-congestion	The user is notified. If applicable the command will be retried. Log entry.

Result	Source	Reason/Diagnosis	Behavior
	(Presentation related function)	2 - local-limit-exceeded	The user is notified. If applicable the command will be retried. Log entry.

4.2.2.3.1. (Real-World) Activity – Print Management as SCU

4.2.2.3.1.1. Description and Sequencing of Activities

Before MR images can be printed, 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 enabling the selected printer in the “Print Job Control” window. If the association could not be established, the Print AE has a ‘Redo’ option in the job viewer to retry to establish an association. The received printer status is displayed in the Printer Status Tool.

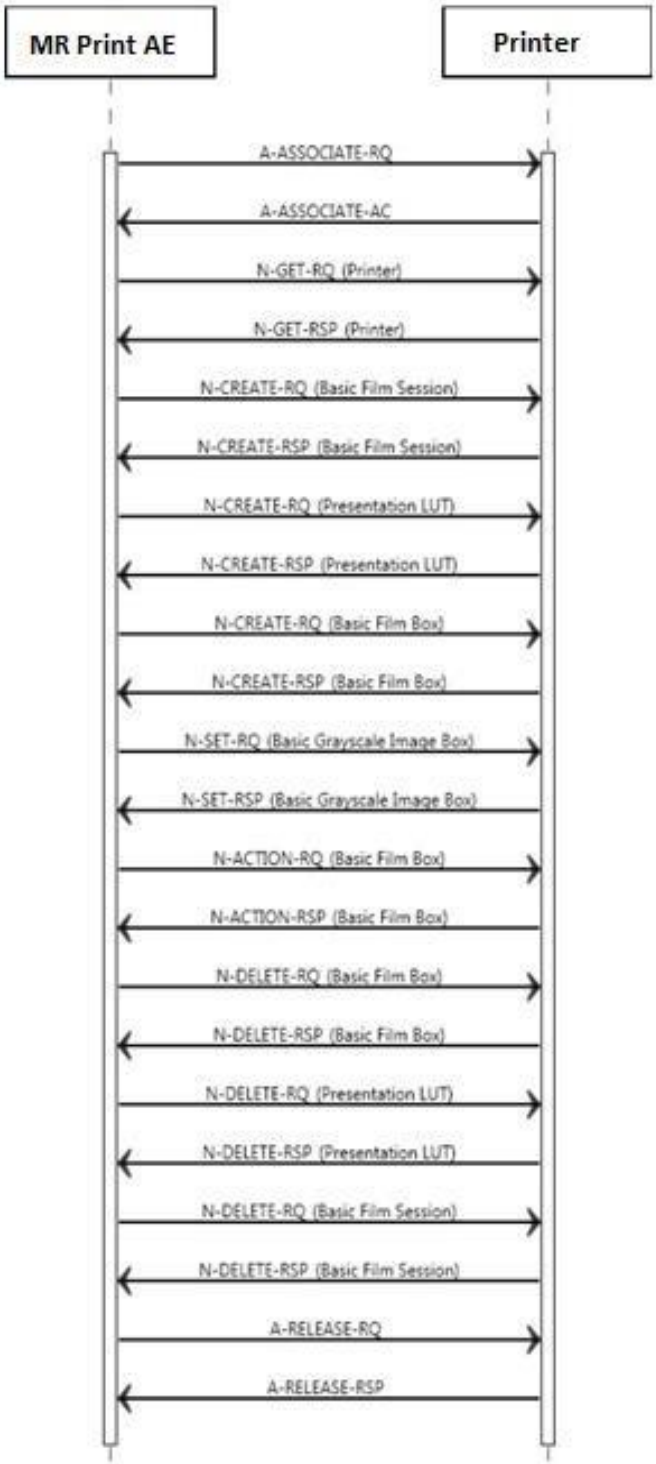

Figure 17: Sequencing of Print Images

Note that associations are proposed for grayscale and color printing. The following optional SOP classes from these Meta SOP classes are not supported:

- Print Job SOP class;

- Basic Annotation Box SOP class; - Reference Image Box SOP class.

The grayscale standard display function adjusts the brightness such that equal changes in P-Values will result in the same level of perceptibility.

The applied order of Print Service Elements (DIMSE's) is specified in Figure 17. Refer to the following sections for a description of the applied optional attributes in these Service Elements (i.e. non-mandatory attributes as Print SCU). Note that the Service Elements order is not specified by the DICOM standard. Overlay, Annotation (showing the values of some major identifying attributes) and Shutter information is processed in the images sent to the printer (i.e. burnt-in into the image).

The Status Codes of DIMSE Responses (Success, Warning, Failure) as returned by the printer will also be logged (for service purposes) and are mapped onto general print job status messages towards the operator. These User Interface messages indicate:

- "Job Completed" and has the meaning that the print job is accepted by the printer; the actual printing will be done afterwards. - "Print Error" indicating that a failure occurred during the DICOM Print. Also, most warning messages (like default printer values applied on optional print attributes) are interpreted as a print error because this might result in a different content (print quality or print layout) than expected.

The following implementation remarks are important to achieve successful printing:

- The number of Film Boxes per Film Session is one.
- The number of images per Film Box is one.
- The images to be printed on one film are rendered by the Print AE into one logical image. This logical image is very large, depending on the pixel matrix size (pixels per line, lines per image). A rough indication is 20 Mbytes for grayscale. One should take this into account when selecting the DICOM printer and the printer configuration (e.g. the amount of memory).

The Print AE does not send an attribute list to the printer. Therefore, the mandatory attributes listed in the following sections are the only attributes that are required to be supported by the printer.

4.2.2.3.1.2. Proposed Presentation Contexts

The presentation contexts for Print Management as SCU are defined in Table 65.

Table 65: Proposed Presentation Contexts for (Real-World) Activity – Print Management as SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9			SCU	None
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Printer SOP Class	1.2.840.10008.5.1.1.16	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

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

4.2.2.3.1.3. SOP Specific Conformance for Basic Film Session SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section specifies each IOD created (including private IOD's).

Abbreviations used in the IOD tables for the column "Presence of Module" are:

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

Abbreviations used in the Module table for the column "Presence of Value" are:

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

The abbreviations used in the Module table for the column "Source" are:

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 is the same as that use for Modality Performed Procedure Step
MWL The attribute value source is a Modality Worklist
USER The attribute value source is explicit user input

4.2.2.3.1.3.1. Dataset Specific Conformance for Basic Film Session SOP Class N-create-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section

Table 66: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Copies	2000,0010	IS	1	ALWAYS	USER	1-100
Print Priority	2000,0020	CS	MED	ALWAYS	AUTO	
Medium Type	2000,0030	CS	BLUE FILM	ALWAYS	USER	PAPER, CLEAR FILM, BLUE FILM
Film Destination	2000,0040	CS	-	ALWAYS	AUTO	Default value from Printer ex: PROCESSOR

The possible Status Responses are shown in Table 67.

Table 67: Status Response for Basic Film Session N-CREATE-SCU

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes. Status of the job is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.

Service Status	Error Code	Further Meaning	Behavior
Warning	B600	Memory allocation not supported.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	0107	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B601	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B602	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B603	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B604	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B605	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B606	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B608	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

Most of the warnings are treated as errors as the MR Print AE has no capability to recover from them producing a proper print.

4.2.2.3.1.3.2. Dataset Specific Conformance for Basic Film Session SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

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

Table 68: Status Response for N-DELETE-SCU

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

4.2.2.3.1.4. SOP Specific Conformance for Presentation LUT SOP Class

4.2.2.3.1.4.1. Dataset Specific Conformance for Presentation LUT SOP Class N-CREATE-SCU

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation LUT Shape	2050,0020	CS	IDENTITY	ALWAYS	AUTO	

4.2.2.3.1.5. SOP Specific Conformance for Basic Film Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.2.3.1.5.1. Dataset Specific Conformance for Basic Film Box SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 69: Basic Film Box Presentation Module.

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Display Format	2010,0010	ST	STANDARD\1,1	ALWAYS	AUTO	-
Film Orientation	2010,0040	CS	PORTRAIT, LANDSCAPE	ALWAYS	USER	-
Film Size ID	2010,0050	CS	10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, 8INX10IN, A3, A4	ALWAYS	USER	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Magnification Type	2010,0060	CS	REPLICATE, BILINEAR, CUBIC, NONE	OPTIONAL	AUTO	-
Max Density	2010,0130	US	300	OPTIONAL	AUTO	-
Trim	2010,0140	CS	NO, YES	ALWAYS	IMPLICIT/CONFIG	-
Configuration Information	2010,0150	ST	LUT=0,9	OPTIONAL	AUTO	-
Illumination	2010,015E	US		OPTIONAL	AUTO	-
Reflected Ambient Light	2010,0160	US		OPTIONAL	AUTO	-
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
Referenced Presentation LUT Sequence	2050,0500	SQ		ALWAYS	AUTO	-
> Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-

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

Table 70: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes. Status of the job is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	B600	Memory allocation not supported.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	0107	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.

Service Status	Error Code	Further Meaning	Behavior
	0116	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B601	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B602	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B603	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B604	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B605	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B606	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B608	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

Most of the warnings are treated as errors as the MR Print AE has no capability to recover from them producing a proper print.

4.2.2.3.1.5.2. Dataset Specific Conformance for Printer SOP Class N-GET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 71: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues.
Failure	xxxx	(any failure)	The print job fails, the error is logged and the association is released.
Warning	0001	Requested optional attributes are not supported	The print job continues and the warning is logged.

Service Status	Error Code	Further Meaning	Behavior
	xxxx	(any warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.6. SOP Specific Conformance for Basic Film Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

4.2.2.3.1.6.1. Dataset Specific Conformance for Basic Film Box SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 72: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created.	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	0107	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B600	(not defined)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B601	(not defined)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B602	(not defined)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B603	(not defined)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.

Service Status	Error Code	Further Meaning	Behavior
	B604	(not defined)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B606	(not defined)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B608	(not defined)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	(not defined)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

Most of the warnings are treated as errors as the MR Print AE has no capability to recover from them producing a proper print.

4.2.2.3.1.7. SOP Specific Conformance for Basic Grayscale Image Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.2.3.1.7.1. Dataset Specific Conformance for Basic Grayscale Image Box SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior of Basic Grayscale Image Box SOP Class N-SET-SCU is reported in this section.

Table 73: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Box Position	2020,0010	US	1	ALWAYS	AUTO	-
Polarity	2020,0020	CS	NORMAL	ALWAYS	AUTO	-
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	-
>Samples per Pixel	0028,0002	US		ALWAYS	AUTO	-
>Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	-
>Rows	0028,0010	US		ALWAYS	IMPLICIT	-
>Columns	0028,0011	US		ALWAYS	IMPLICIT	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	-
>Bits Stored	0028,0101	US	12	ALWAYS	IMPLICIT	-
>High Bit	0028,0102	US	11	ALWAYS	AUTO	-
>Pixel Representation	0028,0103	US		ALWAYS	AUTO	-
>Pixel Data	7FE0,0010	OW /OB		ALWAYS	AUTO	-

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

Table 74: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	B604	Image size is larger than image box size, the image has been demagnified.	The print job continues, and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B609	Image size is larger than the image box size. The image has been cropped to fit.	The print job is terminated, and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	Image size or combined print image size is larger than the image box size. Image or combined print image has been decimated to fit.	The print job is terminated, and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	0107	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116		The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B600		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B601		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B602		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.

Service Status	Error Code	Further Meaning	Behavior
	B603		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B605		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B606		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B608		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.8. SOP Specific Conformance for Basic Film Session SOP Class of the Basic Color Print Management Meta SOP Class

4.2.2.3.1.8.1. Dataset Specific Conformance for Basic Film Session SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 75: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Copies	2000,0010	IS	1	ALWAYS	USER	1-100
Print Priority	2000,0020	CS	MED	ALWAYS	AUTO	-
Medium Type	2000,0030	CS	BLUE FILM	ALWAYS	USER	PAPER, CLEAR FILM, BLUE FILM
Film Destination	2000,0040	CS	-	ALWAYS	AUTO	Default value from Printer Ex: PROCESSOR

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

Table 76: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.

Service Status	Error Code	Further Meaning	Behavior
Warning	B600	Memory allocation not supported.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	0107	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B601	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B602	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B603	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B604	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B605	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B606	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B608	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

Most of the warnings are treated as errors as the MR Print AE has no capability to recover from them producing a proper print.

4.2.2.3.1.8.2. Dataset Specific Conformance for Basic Film Session SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 77: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues.
Failure	xxxx	(any failure)	The print job fails, the error is logged and the association is released.
Warning	xxxx	(any warning)	The print job fails, the warning is logged and the association is released.

4.2.2.3.1.9. SOP Specific Conformance for Presentation LUT SOP Class

4.2.2.3.1.9.1. Dataset Specific Conformance for Presentation LUT SOP Class N-CREATE-SCU

Table 78: Presentation LUT Presentation module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation LUT Shape	2050,0020	CS	IDENTITY	ALWAYS	AUTO	-

4.2.2.3.1.10. SOP Specific Conformance for Basic Film Box SOP Class of the Basic Color Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.2.3.1.10.1. Dataset Specific Conformance for Basic Film Box SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 79: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Display Format	2010,0010	ST	STANDARD\1,1	ALWAYS	AUTO	-
Film Orientation	2010,0040	CS	PORTRAIT, LANDSCAPE	ALWAYS	USER	-
Film Size ID	2010,0050	CS	10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM,	ALWAYS	USER	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
			8INX10IN, A3, A4			
Magnification Type	2010,0060	CS	REPLICATE, BILINEAR, CUBIC, NONE	OPTIONAL	AUTO	Value from the printer template configuration
Max Density	2010,0130	US	300	OPTIONAL	AUTO	-
Trim	2010,0140	CS	NO, YES	ALWAYS	IMPLICIT/CONFIG	-
Configuration Information	2010,0150	ST	LUT=0,9	OPTIONAL	AUTO	-
Illumination	2010,015E	US		OPTIONAL	AUTO	-
Reflected Ambient Light	2010,0160	US		OPTIONAL	AUTO	-
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
Referenced Presentation LUT Sequence	2050,0500	SQ		ALWAYS	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-

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

Table 80: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	B600	Memory allocation not supported.	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.

Service Status	Error Code	Further Meaning	Behavior
	0107	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B601	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B602	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B603	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B604	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B605	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B606	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B608	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

Most of the warnings are treated as errors as the MR Print AE has no capability to recover from them producing a proper print.

4.2.2.3.1.10.2. Dataset Specific Conformance for Printer SOP Class N-GET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 81: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.

Service Status	Error Code	Further Meaning	Behavior
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	0001	Requested optional attributes are not supported	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	xxxx	(any warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.11. SOP Specific Conformance for Basic Film Box SOP Class of the Basic Color Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.2.3.1.11.1. Dataset Specific Conformance for Basic Film Box SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 82: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created.	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	0107	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B600	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.

Service Status	Error Code	Further Meaning	Behavior
	B601	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B602	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B603	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B604	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B606	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B608	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	(not defined)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.12. SOP Specific Conformance for Basic Color Image Box SOP Class of the Basic Color Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.2.3.1.12.1. Dataset Specific Conformance for Basic Color Image Box SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 83: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Box Position	2020,0010	US		ALWAYS	AUTO	-
Polarity	2020,0020	CS	NORMAL	ALWAYS	AUTO	-
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	-
>Samples per Pixel	0028,0002	US	3	ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Photometric Interpretation	0028,0004	CS	RGB	ALWAYS	IMPLICIT	-
>Rows	0028,0010	US		ALWAYS	IMPLICIT	-
>Columns	0028,0011	US		ALWAYS	IMPLICIT	-
>Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	-
>Bits Stored	0028,0101	US	8	ALWAYS	IMPLICIT	-
>High Bit	0028,0102	US	7	ALWAYS	AUTO	-
>Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	-
>Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	-

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

Table 84: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	B604	Image size is larger than image box size, the image has been demagnified.	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B609	Image size is larger than the image box size. The image has been cropped to fit.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	Image size or combined print image size is larger than the image box size. Image or combined print image has been decimated to fit.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	0107	(not defined)	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116		The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B600		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.

Service Status	Error Code	Further Meaning	Behavior
	B601		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B602		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B603		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B605		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B606		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B608		The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

Most of the warnings are treated as errors as the MR Print AE has no capability to recover from them producing a proper print.

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 Interfaces

The MR System supports DICOM TCP/IP Network Communication as defined in PS 3.8 of the standard. No OSI stack communications are provided with this implementation. TCP/IP is the only protocol stack supported.

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

The TCP/IP Stack as supported by the underlying Microsoft Windows Operating System.

4.3.2. Additional Protocols

Not applicable. MR System does not support additional protocols.

4.3.3. IPv4 and IPv6 Support

MR supports both IPv4 and IPv6.

4.4. Configuration

The configuration of the various DICOM services on the MR system are determined at the time of installation. This can also be changed. This chapter describes all the relevant parameters.

4.4.1. AE Title/Presentation Address Mapping

The DICOM operation of the MR system is configured with the Service Application tool. This tool can be started after logging in to the operating system. It is password protected and intended to be used by Philips Customer Support Engineers only.

4.4.1.1. Local Network settings

The local network settings of the MR system can be made in two ways.

• Automatically via DHCP (hospital provided).
• By assigning a dedicated IP address, subnet mask, gateway and DNS server manually.

This is determined during the installation of the MR System. It is strongly advised to use only a manually assigned IP address.
The MR System host name is configured via the Computer Name in the MS operating system.

4.4.1.2. Local AE Titles and listen port

The local AE title mapping and configuration is as specified in Table 85.

Table 85: AE Title configuration table

Application Entity	Default AE Title	Default TCP/IP Port
Network AE	NODENAME	104*
Print AE	NODENAME	104*

* The default TCP/IP listen port number for Network AE and Print AE is 104. If needed this listen port number can be changed.

4.4.1.3. Remote AE Title/Presentation Address Mapping

This section describes the configuration of remote DICOM nodes on the MR system.

NOTE: For MOVE to a third node this node must be known at the MR system (that act as SCU) and also at the station that will start the STORE operation, as this information will be used by the MR system in the MOVE command to initiate the STORE action.

Remote Association Acceptors (SCP) Configuration:

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

• IP Address or Host name
• listening port number.
• AE Title.

Remote Association Initiators (SCU) Configuration:

All remote DICOM nodes that are able to initiate an association with the MR System (that act as SCP) must be configured on the MR System with the following information: • IP Address or Host name

• listening port number.
• AE Title.

4.4.2. Configurable parameters

This section describes all the parameters that can be configured on the MR system via the service application tool. These parameters are organized in the following groups:

- Parameters of the local MR AE.
- Parameters for the remote DICOM nodes.
- General Print Parameters.
- Printer Specific Print Parameters.

Table 86: Configuration Parameters Table

Parameter	Configurable	Default Value
Local node Parameters		
AE title	Yes	MySCU
Port Number	Yes	104
Maximum PDU Length (for incoming association) in Bytes	Yes	32768
Network Timeout (seconds)	No	30 sec
Artim Timeout	Yes	30 sec
Support SOP classes	No	(refer Table1 for supported SOP class)
Supported Transfer Syntaxes	No	ELE ILE EBE JPEG Lossless Non-Hierarchical FOP (Process 14) In order in which these are listed above determines the prevalence.
Institution name	Yes	Must be shorter than 64 characters
Automatic association timeout	No	10 sec
Automatic association timeout SCP	No	QR=5sec / RIS=60 sec / other=3600 sec
Remote node Parameters		
Size constraint in maximum object size	No	-
Maximum data PDU Length (for associations initiated on the MR) in Bytes	Yes	32768
Network reply timeout (SCU)	Yes	3600 sec (set to 60 sec for MR Images SOP export)
Artim timeout	Yes	60 sec

Parameter	Configurable	Default Value
Supported SOP classes.	Yes	Depends on used template; SOP classes can be configured as per Table1 for sending and receiving.
Supported Transfer Syntaxes	Yes	ELE EBE ILE JPEG Lossless Non-Hierarchical FOP (Process 14) In order in which these are listed above determines the prevalence.
Storage Commit Mode	Yes	Asynchronous or Synchronous
Is Archive	Yes	If set to Yes, then the network node is an archive.
Send Storage Commit Request	Yes	Only when 'IsArchive' is Yes.
Pure DICOM (Do not send private attributes: only standard attributes)	Yes	No (= send all attributes)
Write SQ Explicit Length	Yes	No
Verify Objects	Yes	NONE
Combine MR Rescaling for pixel calibration	Yes	Checkbox not checked
No LUT-2-RGB conversion	Yes	Checkbox is checked
ADC correction	Yes	Checkbox not checked
Splitting Series on export	Yes	Echo/Dynamic/Diffusion Image Type / Scanning Sequence
General DICOM Print Parameters		
The DICOM printers that may be selected by the operator	Yes	Per template
Printer Specific Print Parameters (Paper)		
Name	Yes	New Printer
Printer Type	Yes	3M-HQ969-DICOM
Host Name or IP Address	Yes	-
AE Tittle	Yes	AE_Print
Port Number	Yes	3950
Media Names	Yes	(Depends on used template)
Type of Film	Yes	(Depends on used template)

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

Some remarks to configurable Parameters for Remote Systems:

- The Basic Worklist Management services may be configured for one or more RIS stations.
- Multiple MPPS nodes can be configured but MPPS message will only be sent to one node.
- PACS node will be configured with IsArchive set to true.
- With the MR System it is possible to 'auto-push' the MR images to a selected remote application. Whether or not to auto-push a scan is defined in the scan protocol.

5. Media Interchange

5.1. Implementation model

The implementation model identifies the DICOM Application Entities for Media in specific implementation and relates the Application Entities to Real-World Activities.

5.1.1. Application Data Flow Diagram

Figure as below shows the Media Interchange 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.

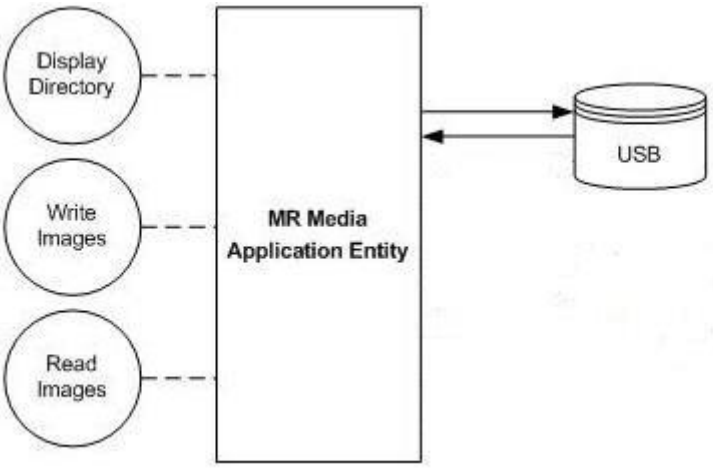

Figure 18: Media Interchange Application Data Flow Diagram

The supported DICOM Media Services are specified in Table 87.

Table 87: Media Services

Media Storage Application Profile	File-set Creator (FSC)	File-set Updater (FSU)	File-set Reader (FSR)
USB			
General Purpose USB Media Interchange with JPEG	Yes	Yes	Yes

Table 88: Photometric interpretations supported by the MR AE

Photometric Interpretation	Import	Export	Viewing
RGB (only SC)	YES	YES	YES
MONOCHROME2	YES	YES	YES

Table 89: Transfer Syntaxes of Media supported by the MR AE

Abstract Syntax Name / UID	Transfer Syntax Name	Transfer Syntax UID	Role	Extended Negotiation
Any of the standard image storage and ILE	ELE	1.2.840.10008.1.2.1	SCU	None

The MR system supports the Media transfer syntax listed in Table 89. The supported transfer syntax is ELE.

5.1.2. Functional Definitions of AE's

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

For USB the Media AE can perform in one or more of the following 3 roles:
- RWA Display Directory (as FSR);
- RWA Read Image (as FSR);
- RWA Write Image (as FSC and FSU).

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.

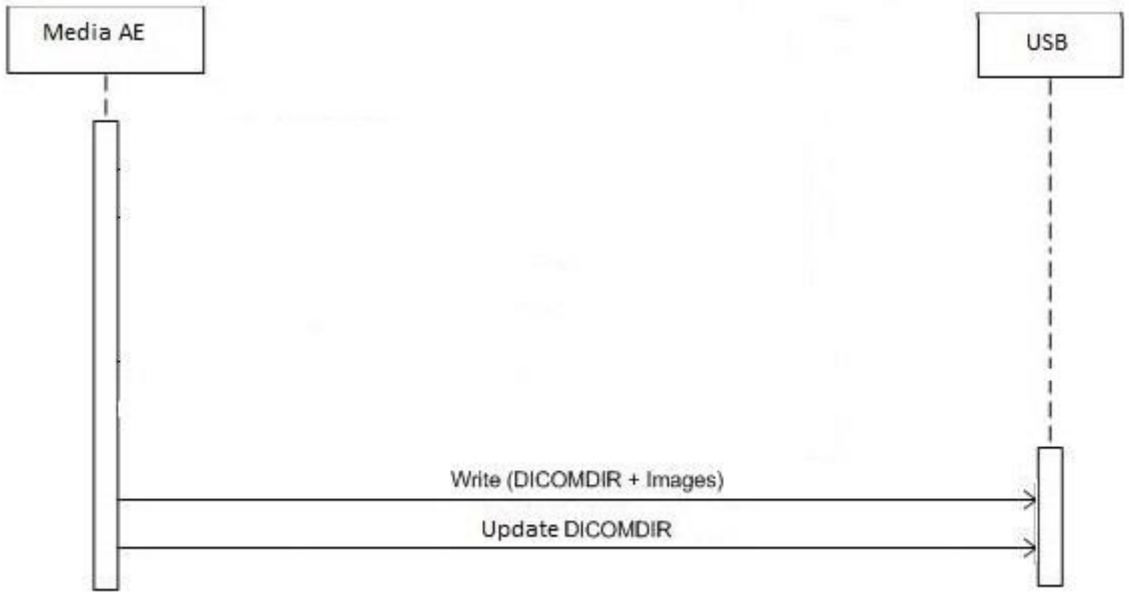

Figure 19: Sequencing of RWA Write Image

5.2. AE Specifications

This section in the DICOM Conformance Statement specifies a set of Media Application Entities.

5.2.1. MR Media AE - Specification

The Media AE provides standard conformance to the DICOM Media Storage Service and File Format ([DICOM] PS 3.10),
Media Storage Application Profiles STD-GEN-USB-JPEG ([DICOM] PS 3.11) for reading and writing.
For one or more Application Profiles, Table 90 shows the Real-World Activities and the roles of each of these Real-World Activities.

Notes:

- Read File-set = Display Directory, Read Image
- Create File-set = Write Image (using ELE only)
- Update File-set = Write Image (using ELE only)

Table 90: AE MR Media AE related Application Profiles, RWA activities and roles

Supported Application Profile	Identifier	Real-World Activities	Roles
General Purpose USB Media Interchange with JPEG	STD-GEN-USB-JPEG	Create File-set	FSC
		Read File-set	FSR
		Update File-set	FSU

5.2.1.1. File Meta Information for the MR Media AE

The Implementation Class UID and the Implementation Version Name in the File Meta Header are as specified for networking.

The Media AE has no specific File Meta Information.

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

Table 91: File Meta Information for the MR Media AE

Implementation Class UID	1.3.46.670589.54.2.123.x
Implementation Version Name	Philips MR 123.x

Note: “x” represents the Level release number from current software version.

5.2.1.2. Real-World Activities

The AE specification contains a description of the Real-World Activities, which invoke the particular AE.

5.2.1.2.1. RWA - Read File-set

The Media AE supports the FSR (File Set Reader) role to interchange stored data on DICOM media. (Display Directory and Read Image).

Display Directory:

When a database open action is initiated on the media then the Media AE acts as an FSR using the interchange option to read the DICOMDIR of the medium.
The MR System will act as a FSR when reading the directory (DICOMDIR) of the medium. This allows the System Integrator to see the results in an overview of the patients, studies, series presentation states and images.

The MR system will not access DICOM media when either:

- Patient ID is absent; or
- Study Instance UID has no value; or
- Series Instance UID has no value.

Read Images

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 a Philips MR System will be imported again; these imported images are to be used for reference only, it is not intended to export them again. Images without the Philips private attributes are not imported.

5.2.1.2.1.1. Media Storage Application Profile

This chapter refers to the related Application Profiles in Table in section 5.2.1.

5.2.1.2.1.1.1. Options

Display Directory

The mandatory DICOMDIR keys are required for the correct display of directory information. The display is structured according the DICOM Composite Information Model: Patient, Study, Series, and Image.

Read Image

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

5.2.1.2.2. RWA - Create File-set

This Media Application Entity has a File-set Creator functionality which is described here.

Write Images

The Media AE acts as an FSC when writing DICOM objects onto DICOM media. The Media AE can also store private attributes. 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.

5.2.1.2.2.1. Media Storage Application Profile

This chapter refers to the related Application Profiles in Table in section 5.2.1.

5.2.1.2.2.1.1. Options

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.

5.2.1.2.3. RWA - Update File-set

This Media Application Entity supports the File-set Updater functionality (FSU) for USB only.

The Media AE supports the FSU role to interchange stored data on DICOM media (Write Image).

The mandatory DICOMDIR keys are required for the correct display of directory information. The display is structured according the DICOM Composite Information Model: Patient, Study, Series and Image.

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 Profile

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

The MR System Media AE will act as a FSC when writing all images of the selected Examinations to DICOM media. All Images made on an MR System can be exported. This results in writing the patients, studies, series and images on the MR System to the DICOM medium.

5.2.1.2.3.1.1. Options

The mandatory DICOM attributes are verified before accepting imported SOP instances.

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.

5.3. Augmented and Private Application Profiles

Not applicable. Augmented and Private Application profiles are not implemented by MR System.

5.4. Media Configuration

Not Applicable. Media Configurations are not implemented by MR System.

6. Support of Character Sets

Any support for character sets in Network and Media services is described here.

Table 92: Supported DICOM Character Sets

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
GB18030	GB18030	-	-	-	-
Latin alphabet No. 1	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
Latin alphabet No. 2	ISO 2022 IR 101	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/02	ISO-IR 101	G1	Supplementary set of ISO 8859
Latin alphabet No. 3	ISO 2022 IR 109	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/03	ISO-IR 109	G1	Supplementary set of ISO 8859
Latin alphabet No. 4	ISO 2022 IR 110	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/04	ISO-IR 110	G1	Supplementary set of ISO 8859
Greek	ISO 2022 IR 126	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/06	ISO-IR 126	G1	Supplementary set of ISO 8859
Arabic	ISO 2022 IR 127	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/07	ISO-IR 127	G1	Supplementary set of ISO 8859
Japanese	ISO 2022 IR 13	ESC 02/08 04/10	ISO-IR 14	G0	JIS X 0201: Romaji
		ESC 02/09 04/09	ISO-IR 13	G1	JIS X 0201: Katakana
Hebrew	ISO 2022 IR 138	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/08	ISO-IR 138	G1	Supplementary set of ISO 8859
Cyrillic	ISO 2022 IR 144	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/12	ISO-IR 144	G1	Supplementary set of ISO 8859
Latin alphabet No. 5	ISO 2022 IR 148	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/13	ISO-IR 148	G1	Supplementary set of ISO 8859

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Thai	ISO 2022 IR 166	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 05/04	ISO-IR 166	G1	TIS 620-2533 (1990)
Default repertoire	ISO IR 6	-	ISO-IR 6	G0	ISO 646
Latin alphabet No. 1	ISO_IR 100	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 100	G1	Supplementary set of ISO 8859
Latin alphabet No. 2	ISO_IR 101	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 101	G1	Supplementary set of ISO 8859
Latin alphabet No. 3	ISO_IR 109	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 109	G1	Supplementary set of ISO 8859
Latin alphabet No. 4	ISO_IR 110	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 110	G1	Supplementary set of ISO 8859
Greek	ISO_IR 126	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 126	G1	Supplementary set of ISO 8859
Arabic	ISO_IR 127	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 127	G1	Supplementary set of ISO 8859
Japanese	ISO_IR 13	-	ISO-IR 14	G0	JIS X 0201: Romaji
		-	ISO-IR 13	G1	JIS X 0201: Katakana
	ISO 2022 IR 87	ESC 02/04 04/02	ISO-IR 87	G0	JIS X 0208: Kanji
	ISO_IR 159 (does not exist, keep for legacy)	-	ISO-IR 159	G0	JIS X 0212: Kanji
Hebrew	ISO_IR 138	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 138	G1	Supplementary set of ISO 8859
Cyrillic	ISO_IR 144	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 144	G1	Supplementary set of ISO 8859

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Latin alphabet No. 5	ISO_IR 148	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 148	G1	Supplementary set of ISO 8859
Thai	ISO_IR 166	-	ISO-IR 6	G0	ISO 646
			ISO-IR 166	G1	TIS 620-2533 (1990)
Unicode in UTF-8	ISO_IR 192	-	-	-	-
Korean	ISO 2022 IR 149	ESC 02/04 02/09 04/03	ISO-IR 149	G1	KS X 1001: Hangul and Hanja

- The default character set for the MR System is ISO_IR 100. If nothing is defined the MR system uses ISO-IR 6, as per DICOM Standard.
- When an unsupported character is received it shall be tried and decoded according to the default repertoire. Otherwise, unsupported characters shall be displayed as "?".
- 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 too.
- If RIS worklist contains a Specific Character Set attribute that is not empty and not supported according to Table 92 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.

7. Security

7.1. Security Profiles

If configured MR System supports the following security measures:

• Secure transport using TLS
• De-identification of data for export.
• Time Synchronization Profile.

7.1.1. Security Use Profiles

Not applicable. Security use Profiles are not implemented by MR System.

7.1.2. Security Transport Connection Profiles

Secure communication is a “mode of operation” of the MR System supported by the implementation of the DICOM TLS 1.2 Secure Transport Connection Profile. This functionality will be used by the nodes that can authenticate each other before they exchange DICOM information. For secure communication the TLS protocol v1.2 is used which provides message authentication, integrity, confidentiality, and replay protection. Confidentiality is optional and can be controlled by the encryption settings.

The MR System may communicate using the following Cipher Suites:

1. TLS_RSA_WITH_NULL_SHA (Node authentication without encryption)
2. TLS_RSA_WITH_3DES_SHA (Node authentication with encryption)
3. TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
4. TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
5. TLS_DHE_RSA_WITH_AES_128_GCM_SHA256
6. TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384
7. TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384
8. TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
9. TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA
10. TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA
11. TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
12. TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
13. TLS_RSA_WITH_AES_128_GCM_SHA256
14. TLS_RSA_WITH_AES_256_CBC_SHA256
15. TLS_RSA_WITH_AES_128_CBC_SHA256
16. TLS_RSA_WITH_AES_256_CBC_SHA
17. TLS_RSA_WITH_AES_128_CBC_SHA
18. TLS_RSA_WITH_3DES_EDE_CBC_SHA
19. TLS_DHE_RSA_WITH_AES_256_CBC_SHA
20. TLS_DHE_RSA_WITH_AES_128_CBC_SHA
21. TLS_DHE_DSS_WITH_3DES_EDE_CBC_SHA
22. TLS_RSA_WITH_RC4_128_SHA
23. TLS_RSA_WITH_RC4_128_MD5

The MR System supports X.509 certificates. The following TLS Certification checks will be done (TLS Handshake). The machine (either server or client) that will send its certificate will:

1. Choose the certificate according to Common Name (CN) value in the Subject-field. This name is case-sensitive. All present certificates should have unique CN names.
2. The server verifies
   - that the client certificate is a X.509 certificate which is not tampered with
   - that the client certificate is in the list of trusted certificates
   - that the client certificate is not expired (present time is between "Valid From" and "Valid To" fields of the X.509 certificate).
   - that the client certificate has the correct purpose (at least the Client Authentication purpose)
3. The client verifies
   - that the server certificate is a X.509 certificate which is not tampered with
   - that the server certificate is in the list of trusted certificates
   - that the server certificate is not expired (present time is between "Valid From" and "Valid To" fields of the X.509 certificate)
   - that the server certificate has the correct purpose (at least Server Authentication purpose)

No verification is done on:

- revocation of certificates
- limiting the connection to a limited set of IP-addresses.

Node authentication with or without encryption is only possible when both nodes have:

- an access to their own private keys
- an access to a copy of the certificate of the other node containing its public key

The MR System can only read certificates from the certificate stores of the HKEY_LOCAL_MACHINE registry key. It is the responsibility of the Hospital to setup and maintain the certificate stores. This includes the removal of revoked certificates and certificate updates prior to their expiration. Since neither X.500 directories, Lightweight Directory Access Protocol (LDAP) nor Certificate Revocation Lists (CRLs) are supported, the whole certificate chain needs to be replaced after a security breach.

Figure 20 presents the message flow of TLS handshake supported by the MR System.

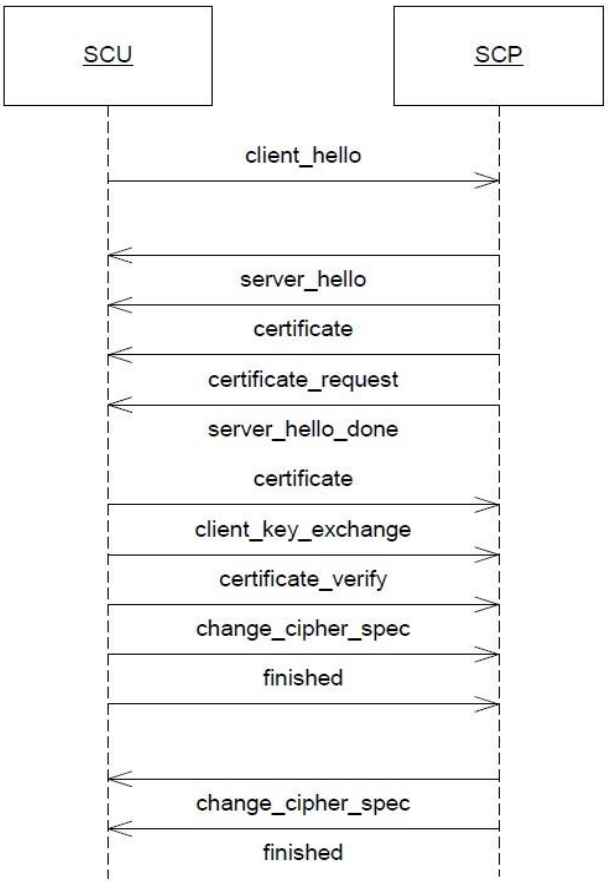

Figure 20: Message flow of TLS handshake

7.1.3. Digital Signature Profiles

Not applicable. Digital Signature are not implemented by MR System.

7.1.4. Media Storage Security Profiles

Not applicable. Media Storage Security Profiles are not implemented by MR System.

7.1.5. Attribute Confidentiality Profiles

This functionality is targeted toward creating a special purpose, de-identified version of an already-existing Data Set. The de-identified SOP Instances are useful, for example, in creating teaching or research files, where the identity of the patient should be protected. The MR System does not create instances of the Encrypted Attributes Data Set; therefore, reconstruction of the original Data Set will not be possible.

Table 93 presents all attributes that can be de-identified by the MR System. Each Attribute to be protected has its value replaced by a different “replacement value” which does not allow identification of the patient. Integrity of dummy values for references (such as SOP Instance UID, etc.) if multiple SOP instances are protected is ensured within the scope of one job.

The MR System does not ensure that identifying information that is burned into the image pixel data is “blackened” (removed).

Table 93 specifies the attributes that are modified when de-identification is performed (Suppression). De-identification is only applicable when it concerns writing to USB/file.

Table 93: Basic Application Level Confidentiality Profile Attributes

Attribute Name	Tag	Standard Basic Prof.	De-Identification support
Accession Number	(0008,0050)	Z	Z
Acquisition Context Sequence	(0040,0555)	X/Z	Z
Acquisition Date	(0008,0022)	X/Z	Z
Acquisition DateTime	(0008,002A)	X/Z/D	D
Acquisition Device Processing Description	(0018,1400)	X/D	D
Acquisition Time	(0008,0032)	X/Z	D
Concatenation UID	(0020,9161)	U	U
Consulting Physician's Name	(0008,009C)	Z	Z
Content Creator's Name	(0070,0084)	Z/D	D
Content Date	(0008,0023)	Z/D	D
Content Sequence	(0040,A730)	D	D
Content Time	(0008,0033)	Z/D	D
Contrast Bolus Agent	(0018,0010)	Z/D	D
Detector ID	(0018,700A)	X/D	D
Device Serial Number	(0018,1000)	X/Z/D	D
Device UID	(0018,1002)	U	U
Digital Signature UID	(0400,0100)	U	U
Dimension Organization UID	(0020,9164)	U	U
Dose Reference UID	(300A,0013)	U	U
End Acquisition DateTime	(0018,9517)	X/D	D
Failed SOP Instance UID List	(0008,0058)	U	U
Fiducial UID	(0070,031A)	U	U
Filler Order Number / Imaging Service Request	(0040,2017)	Z	D
First Treatment Date	(3008,0054)	X/D	D
Frame of Reference UID	(0020,0052)	U	U
Graphic Annotation Sequence	(0070,0001)	D	Z

Attribute Name	Tag	Standard Basic Prof.	De-Identification support
Instance Creator UID	(0008,0014)	U	U
Institution Code Sequence	(0008,0082)	X/Z/D	Z
Institution Name	(0008,0080)	X/Z/D	Z
Irradiation Event UID	(0008,3010)	U	U
Media Storage SOP Instance UID	(0002,0003)	U	U
Most Recent Treatment Date	(3008,0056)	X/D	D
Observation Subject UID (Trial)	(0040,A402)	U	U
Observation UID	(0040,A171)	U	U
Operators' Identification Sequence	(0008,1072)	X/D	D
Operators' Name	(0008,1070)	X/Z/D	D
Palette Color Lookup Table UID	(0028,1199)	U	U
Patient's Birth Date	(0010,0030)	Z	Z
Patient's Name	(0010,0010)	Z	D
Patient's Sex	(0010,0040)	Z	Z
Patient ID	(0010,0020)	Z	D
Patient Sex Neutered	(0010,2203)	X/Z	Z
Person Identification Code Sequence	(0040,1101)	D	D
Person Name	(0040,A123)	D	D
Placer Order Number / Imaging Service Request	(0040,2016)	Z	Z
Presentation Display Collection UID	(0070,1101)	U	U
Presentation Sequence Collection UID	(0070,1102)	U	U
Referenced Dose Reference UID	(300A,0083)	U	U
Referenced Frame of Reference UID	(3006,0024)	U	U
Referenced General Purpose Scheduled Procedure Step Transaction UID	(0040,4023)	U	U
Referenced Image Sequence	(0008,1140)	X/Z/U	Z
Referenced Observation UID (Trial)	(0040,A172)	U	U
Referenced Performed Procedure Step Sequence	(0008,1111)	X/Z/D	D
Referenced SOP Instance UID	(0008,1155)	U	U

Attribute Name	Tag	Standard Basic Prof.	De-Identification support
Referenced SOP Instance UID in File	(0004,1511)	U	U
Referenced Study Sequence	(0008,1110)	X/Z	Z
Referring Physician's Name	(0008,0090)	Z	Z
Related Frame of Reference UID	(3006,00C2)	U	U
Requested Procedure Description	(0032,1060)	X/Z	Z
Reviewer Name	(300E,0008)	X/Z	Z
RT Plan Date	(300A,0006)	X/D	D
RT Plan Label	(300A,0002)	D	D
RT Plan Time	(300A,0007)	X/D	D
Series Date	(0008,0021)	X/D	D
Series Instance UID	(0020,000E)	U	U
Series Time	(0008,0031)	X/D	D
SOP Instance UID	(0008,0018)	U	U
Source Image Sequence	(0008,2112)	X/Z/U	U
Source Serial Number	(3008,0105)	X/Z	Z
Start Acquisition DateTime	(0018,9516)	X/D	D
Station Name	(0008,1010)	X/Z/D	D
Storage Media File-set UID	(0088,0140)	U	U
Study Date	(0008,0020)	Z	D
Study ID	(0020,0010)	Z	Z
Study Instance UID	(0020,000D)	U	U
Study Time	(0008,0030)	Z	Z
Synchronization Frame of Reference UID	(0020,0200)	U	U
Target UID	(0018,2042)	U	U
Template Extension Creator UID	(0040,DB0D)	U	U
Template Extension Organization UID	(0040,DB0C)	U	U
Tracking UID	(0062,0021)	U	U
Transaction UID	(0008,1195)	U	U
Treatment Date	(3008,0250)	X/D	D
Treatment Time	(3008,0251)	X/D	D

Attribute Name	Tag	Standard Basic Prof.	De-Identification support
UID	(0040,A124)	U	U
Verifying Observer Identification Code Sequence	(0040,A088)	Z	Z
Verifying Observer Name	(0040,A075)	D	D
Verifying Observer Sequence	(0040,A073)	D	D
Verifying Organization	(0040,A027)	D	D

The following action codes are used in Table:

- D - replace with a non-zero length value that may be a dummy value and consistent with the VR
- Z - replace with a zero length value, or a non-zero length value that may be a dummy value and consistent with the VR
- X - remove
- U - replace with a non-zero length UID that is internally consistent within a set of Instances

For locally created data, Private attributes not containing personal data are retained during de-identification.

7.1.6. Network Address Management Profiles

Not applicable. Network Address Management Profiles are not implemented by MR System.

7.1.7. Time Synchronization Profiles

MR System conforms to the Basic Time Synchronization Profile as NTP client.

7.1.8. Application Configuration Management Profiles

Not applicable. Application Configuration management Profiles are not implemented by MR System.

7.1.9. Audit Trail Profiles

7.1.9.1. Generation of Audit Records

The MR System can create audit messages according to the IHE Basic Security Integration Profile [IHE] to audit activities, to detect non-compliant behavior in the enterprise, and to facilitate detection of improper creation, access, modification and deletion of Protected Health Information (PHI). These messages may contain information that identifies the patient. The following messages will be created and sent to a central Audit Record Repository according to the Syslog protocol [SYSLOG]:

The MR subsystem supports Audit events mentioned in Table 94.

Table 94: List of supported events

Audit Event Trigger	Description	Message DICOM PS 3.15 A.5.3
Actor-start-stop	When application has started or is closed.	Application Activity
Audit-log-used	When audit logs are accessed.	Audit log used

Audit Event Trigger	Description	Message DICOM PS 3.15 A.5.3
Begin-storing-instances	Begin storing SOP Instances for a study to an external repository.	Begin Transferring DICOM Instances
Instances-Stored	Storage of SOP instances to a remote repository has been completed.	DICOM Instances Transferred
Node-Authentication-failure	A secure node authentication failure has occurred during TLS negotiation, e.g., invalid certificate.	Security Alert
Patient-record	Patient is created/Updated/Merged	Patient record
PHI-export	Any export of PHI to media.	Export
PHI-import	Any import of PHI from media.	Import
Query Information	A query has been initiated from patient directory to a remote node.	Query
Security Alert	When software, security or networking configuration of the system is changed via the field service functionality.	Security Alert
Instances-deleted	SOP Instances are deleted from a specific study. One event covers all instances deleted for the particular study.	DICOM Instances Accessed" or "DICOM Study Deleted
Study-used	SOP Instances from a specific study are created or accessed. One event covers all instances used for the particular study.	DICOM Instances Accessed

If the central Audit Record Repository is not available, the audit trail record will be stored by the MR System in a local buffer. Once the central Audit Record Repository is available again, the content of that buffer will be transferred to the central Audit Record Repository.

The time that is part of the audit message will be the local time of the MR System. This time will be synchronized with a Time Server. The Time Server and central Audit Record Repository are elements of the Hospital infrastructure.

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 DIMSE secure or non-secure communication, the secure communication is based on the Transport Layer Security (TLS) protocol [TLS]. If configured, the MR System supports security measures for:

1. secure authentication of a node

2. integrity and confidentiality of transmitted data
3. replay protection
4. generation of audit trail records
5. Access control and user authentication.

8. Annexes of application "MR System Network AE"

8.1. IOD Contents

8.1.1. Created SOP Instance

This section specifies each IOD created by this application.

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.

This section specifies each IOD created (including private IOD's). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

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

Abbreviations used in the Module table for the column "Presence of Value" are:

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

The abbreviations used in the Module table for the column "Source" are:

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 is the same as that use for 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. List of created SOP Classes

Table 95: List of created SOP Classes

SOP Class Name	SOP Class UID
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66
RT Structure Set SOP Class	1.2.840.10008.5.1.4.1.1.481.3
Media Storage Directory SOP Class	1.2.840.10008.1.3.10
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2
Philips Private MR Examcard Storage	1.3.46.670589.11.0.0.12.4

8.1.1.2. CT Image Storage SOP Class

Table 96: IOD of Created CT Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Acquisition	General Acquisition Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Plane Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	CT Image Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 97: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	COPY	-
Patient ID	0010,0020	LO		ALWAYS	COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Birth Date	0010,0030	DA		ALWAYS	COPY	-
Patient's Sex	0010,0040	CS		ALWAYS	COPY	-
Other Patient IDs	0010,1000	LO		ANAP	COPY	Only present when received from RIS

Table 98: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS`	COPY	-
Study Time	0008,0030	TM		ALWAYS	COPY	-
Accession Number	0008,0050	SH		VNAP	COPY	-
Referring Physician's Name	0008,0090	PN		VNAP	COPY	-
Study Description	0008,1030	LO		VNAP	COPY	-
Study Instance UID	0020,000D	UI		ALWAYS	COPY	-
Study ID	0020,0010	SH		ALWAYS	COPY	-

Table 99: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Weight	0010,1030	DS		ALWAYS	COPY	-
Medical Alerts	0010,2000	LO		ANAP	COPY	-
Allergies	0010,2110	LO		ANAP	COPY	-
Patient’s Age	0010,1010	AS		ANAP	COPY	-
Pregnancy Status	0010,21C0	US		ANAP	COPY	-

Table 100: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	Copy from MRCAT mDixon source scan.
Series Time	0008,0031	TM		ALWAYS	AUTO	Copy from MRCAT mDixon source scan.
Modality	0008,0060	CS	CT	ALWAYS	FIXED	-
Series Description	0008,103E	LO		ANAP	AUTO	-
Performing Physicians’ Name	0008,1050	PN		ANAP	COPY	-
Operators’ Name	0008,1070	PN		ANAP	AUTO, USER	-
Body Part Examined	0018,0015	CS		ANAP	COPY	-
Protocol Name	0018,1030	LO		ALWAYS	COPY	-
Patient Position	0018,5100	CS		ALWAYS	COPY	-
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Number	0020,0011	IS		ALWAYS	AUTO	-
Laterality	0020,0060	CS		ANAP	COPY	-

Table 101: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	COPY	-
Position Reference Indicator	0020,1040	LO		EMPTY	FIXED	-

Table 102: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	COPY	-
Institution Name	0008,0080	LO		ANAP	CONFIG	Configured on the system.
Institution Address	0008,0081	ST		ANAP	CONFIG	-
Station Name	0008,1010	SH		ANAP	CONFIG	Same as the Host Name.
Institutional Department Name	0008,1040	LO		ANAP	CONFIG	-
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	System serial number.
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	Inline to system software version

Table 103: General Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ANAP	COPY	Same as Content Date.
Acquisition Time	0008,0032	TM		ANAP	COPY	Same as Content Time.
Acquisition Number	0020,0012	IS		ANAP	COPY	Scan Number on UI.

Table 104: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ANAP	AUTO	-
Content Date	0008,0023	DA		ANAP	AUTO	-
Content Time	0008,0033	TM		ANAP	AUTO	-
Instance Number	0020,0013	IS		VNAP	AUTO	-

Table 105: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Slice Thickness	0018,0050	DS		VNAP	COPY	-
Image Position (Patient)	0020,0032	DS		ALWAYS	COPY	-
Image Orientation (Patient)	0020,0037	DS		ALWAYS	COPY	-
Pixel Spacing	0028,0030	DS		ALWAYS	COPY	-

Table 106: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED	-
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	FIXED	-
Rows	0028,0010	US		ALWAYS	IMPLICIT	-
Columns	0028,0011	US		ALWAYS	IMPLICIT	-
Bits Allocated	0028,0100	US	16	ALWAYS	FIXED	-
Bits Stored	0028,0101	US	12	ALWAYS	IMPLICIT	-
High Bit	0028,0102	US	11	ALWAYS	IMPLICIT	-
Pixel Representation	0028,0103	US	0	ALWAYS	IMPLICIT	-
Pixel Data	7FE0,0010	OB/OW		ANAP	IMPLICIT	-

Table 107: CT Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	DERIVED\PRIMARY\REFORMATTED\REFORMATTED\DERIVED	ALWAYS	AUTO	-
KVP	0018,0060	DS	0	VNAP	FIXED	Derived from MR image so no KVP
Acquisition Number	0020,0012	IS		VNAP	COPY	-
Samples per Pixel	0028,0002	US	1	ALWAYS	COPY	-
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	COPY	-
Bits Allocated	0028,0100	US	16	ALWAYS	COPY	-
Bits Stored	0028,0101	US	12	ALWAYS	COPY	-
High Bit	0028,0102	US	11	ALWAYS	COPY	-
Rescale Intercept	0028,1052	DS	-1000	ALWAYS	FIXED	-
Rescale Slope	0028,1053	DS	1	ALWAYS	FIXED	-
Rescale Type	0028,1054	LO	HU	ANAP	FIXED	-

Table 108: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ANAP	AUTO	-
Window Width	0028,1051	DS		ANAP	AUTO	-

Table 109: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	COPY	-
Instance Creation Date	0008,0012	DA		ANAP	AUTO	-
Instance Creation Time	0008,0013	TM		ANAP	AUTO	-
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4 .1.1.2	ALWAYS	FIXED	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Instance Number	0020,0013	IS		ANAP	AUTO	-

8.1.1.3. MR Image Storage SOP Class

Table 110:IOD of Created MR Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Acquisition	General Acquisition Module	ALWAYS
Image	General Image Module	ALWAYS
Image	General Reference Module	CONDITIONAL
Image	Image Plane Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Contrast/Bolus Module	CONDITIONAL
Image	MR Image Module	ALWAYS
Image	Overlay Plane Module	CONDITIONAL
Image	VOI LUT Module	CONDITIONAL
Image	SOP Common Module	ALWAYS

Table 111: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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 Birth Time	0010,0032	TM		ANAP	MWL, USER	-
Patient's Sex	0010,0040	CS		ALWAYS	MWL, USER	-
Other Patient IDs	0010,1000	LO		ANAP	MWL, USER	Only present when supplied by the RIS.
Ethnic Group	0010,2160	SH		ANAP	MWL, USER	Only present when supplied by the RIS.
Patient Comments	0010,4000	LT		ANAP	MWL	Only present when supplied by the RIS.

Table 112: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO, MWL	-
Study Time	0008,0030	TM		ALWAYS	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	-
>Mapping Resource	0008,0105	CS		ANAP	AUTO	-
>Context Group Version	0008,0106	DT		ANAP	AUTO	-
>Context Group Local Version	0008,0107	DT		ANAP	AUTO	-
>Context Group Extension Flag	0008,010B	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	-
Physician(s) of Record	0008,1048	PN		ANAP	AUTO	-
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	AUTO	-
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO, MWL	-
>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 Service	0032,1033	LO		ANAP		-

Table 113: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Age	0010,1010	AS		ANAP	COPY	-
Patient's Size	0010,1020	DS		VNAP	MWL	-
Patient's Weight	0010,1030	DS		ALWAYS	MWL, USER	-
Medical Alerts	0010,2000	LO		ANAP	MWL, USER	-
Occupation	0010,2180	SH		ANAP	MWL	Only present when patient demographics received from RIS.
Additional Patient History	0010,21B0	LT		ANAP	MWL	-
Allergies	0010,2110	LO		ANAP	MWL, USER	-
Pregnancy Status	0010,21C0	US		ANAP	MWL, USER	-

Table 114: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	-
Series Time	0008,0031	TM		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	MR	ALWAYS	FIXED	-
Series Description	0008,103E	LO		ANAP	AUTO, USER	-
Performing Physician's Name	0008,1050	PN		ANAP	AUTO	-
Operators' Name	0008,1070	PN		ANAP	AUTO, USER	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ALWAYS	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	MWL, USER	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MWL, USER	-
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 combination of the acquisition number and the private reconstruction number.
Laterality	0020,0060	CS		ANAP	USER	-
Request Attributes Sequence	0040,0275	SQ		VNAP	MWL	-
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	-
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	MWL	-
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	MWL, USER	-
>>Code Value	0008,0100	SH		ALWAYS	MWL	-
>>Code Scheme Designator	0008,0102	SH		ALWAYS	MWL	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Coding Scheme Version	0008,0103	SH		ALWAYS	MWL	-
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	-
>Scheduled Procedure Step ID	0040,0009	SH		VNAP	MWL	-
>Requested Procedure ID	0040,1001	SH		ALWAYS	MWL	-
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		ANAP	AUTO	-
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO	-
>Code Value	0008,0100	SH		ALWAYS	MWL, USER	-
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL, USER	-
>Code meaning	0008,0104	LO		ALWAYS	MWL, USER	-
>Coding Scheme Version	0008,0103	SH		ANAP	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		ANAP	MWL	-
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	COPY	maximum of 64 characters
Performed Procedure Step End Date	0040,0250	DA		ANAP	MWL, USER	-
Performed Procedure Step End Time	0040,0251	TM		ANAP	MWL, USER	-

Table 115: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	-
Position Reference Indicator	0020,1040	LO		EMPTY	FIXED	-

Table 116: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		ALWAYS	FIXED	Applied value: Philips
Institution Name	0008,0080	LO		ANAP	CONFIG	Configured on the system.
Institution Address	0008,0081	ST		ANAP	CONFIG	-
Station Name	0008,1010	SH		ANAP	CONFIG	-
Institutional Department Name	0008,1040	LO		ANAP	CONFIG	-
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	System serial number.
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	Inline to system software version

Table 117: General Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ALWAYS	AUTO, COPY	Same as Content Date.
Acquisition Time	0008,0032	TM		ALWAYS	AUTO, COPY	Same as Content Time.
Acquisition DateTime	0008,002A	DT		ANAP	AUTO	-
Acquisition Duration	0018,9073	FD		ALWAYS	AUTO	-
Acquisition Number	0020,0012	IS		ALWAYS	AUTO	Scan Number on UI.

Table 118: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	-
Content Time	0008,0033	TM		ALWAYS	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Patient Orientation	0020,0020	CS		ANAP	AUTO	-
Lossy Image Compression	0028,2110	CS		ANAP	FIXED	Applied value: 00
Presentation LUT Shape	2050,0020	CS		ANAP	FIXED	Applied value: IDENTITY
Image Comments	0020,4000	LT		ANAP	AUTO	-
Real World Value Mapping Sequence	0040,9096	SQ		ANAP	AUTO	-
>LUT Explanation	0028,3003	LO		ANAP	AUTO	-
> Measurement Units Code Sequence	0040,08EA	SQ		ALWAYS	AUTO	-
>>Code value	0008,0100	SH		ANAP	AUTO	-
>>Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	-
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>>Context UID	0008,0117	UI		ANAP	AUTO	-
>LUT Label	0040,9210	SH		ALWAYS	AUTO	-
>Real World Value Last Value Mapped	0040,9211	US		ANAP	AUTO	-
>Real World Value First Value Mapped	0040,9216	US		ANAP	AUTO	-
>Real World Value Intercept	0040,9224	FD		ANAP	AUTO	-
>Real World Value Slope	0040,9225	FD		ANAP	AUTO	-

Table 119: General Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	-

Table 120: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Spacing Between Slices	0018,0088	DS		ALWAYS	IMPLICIT, USER	Spacing Between Slices
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	Value is the distance for the plane to a fixed point. Taking direction into account.
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	-

Table 121: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	-
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	-
Planar Configuration	0028,0006	US		ANAP	AUTO	-
Rows	0028,0010	US		ALWAYS	IMPLICIT	Applied values: min: 64 - max: 2048
Columns	0028,0011	US		ALWAYS	IMPLICIT	Applied values: min: 64 - max: 2048
Pixel Aspect Ratio	0028,0034	IS		ANAP	AUTO	-
Bits Allocated	0028,0100	US		ALWAYS	IMPLICIT	-
Bits Stored	0028,0101	US		ALWAYS	IMPLICIT	-
High Bit	0028,0102	US		ALWAYS	IMPLICIT	-
Pixel Representation	0028,0103	US		ALWAYS	IMPLICIT	Applied value: 0
Pixel Data	7FE0,0010	OW/OB		ALWAYS	IMPLICIT	-

Table 122: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		ANAP	USER, IMPLICIT	Will have value only if contrast is applied for scans Present if contrast bolus is present in the image, values: Gadolinium, Iodamide meglumine, Iodipamide, Iodixanol, Iodized oil, Iodoalphionic acid, Iodophthalein, Iodopyracet, Iohexol, Ionic iodinated contrast agent, Iopamidol, Iopanoic acid, Iophendylate, Iophenoxic acid, Iothalamate, Ioversol, Ioxaglate, Ipodate, Mangafodipir trisodium, Meglumine diatrizoate, Meglumine iodipamide, Metrizamide, Metrizoate, Non radiopaque medium, Non-ionic iodinated contrast agent, Oxygen, Propyliodone, Radiopaque medium, Sodium acetriozate, Sodium diatrizoate, Sodium diprotrizoate, Sodium iodipamide, Sodium iodomethamate, Sodium tyropanate, Water not present when no contrast agent is present in the image.
Contrast/Bolus Route	0018,1040	LO		ANAP	AUTO	Applied Values: Intravenous route, Intra-arterial route, Intramuscular route, Subcutaneous route, Intracutaneous route, Intraperitoneal route, Intramedullary route, Intrathecal route, Intra-articular route, Intraepithelial route, Topical route, Oral route, Transluminal route, Intraluminal route, Extraluminal route, By inhalation, Per rectum, Vaginal route
Contrast/Bolus Volume	0018,1041	DS		ANAP	IMPLICIT	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Start Time	0018,1042	TM		ANAP	IMPLICIT	-
Contrast/Bolus Total Dose	0018,1044	DS		ANAP	IMPLICIT	-
Contrast/Bolus Ingredient	0018,1048	CS		ANAP	AUTO	Applied Values: AIR, BARIUM, CARBON DIOXIDE, GADOLINIUM, IODINE, IRON, OXYGEN, WATER, XENON.
Contrast/Bolus Ingredient Concentration	0018,1049	DS		ANAP	IMPLICIT	-

Table 123: MR Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	Applied values: ({ORIGINAL, DERIVED}, PRIMARY, {METABOLITE_MAP, REALTIME, VELOCITY, KTRANS, KEP, M_FFE, B0, B0_MAP, VE, VP, APTW_SE, M, M_SE, R, I, P, CR, T0, T1, T2, RHO, SPECTRO, CO, DERIVED, ADC, RCBV, RCBF, MTT, TTP, FA, EADC, DELAY, MAXRELENH, RELENH, MAXENH, WASHIN, WASHOUT, BREVENH, AREACURV, ANATOMIC, T_TEST, STD_DEVIATION, PERFUSION, T2_STAR, R2, R2_STAR, W, IP, OP, F, KTRANS, KEP, SPARE1, SPARE2, AD, RD, RA, SW_M, SW_P, FF, STIFF, WAVE, APT, SUM, SENC_STRAIN, SENC_ANATOMY, CDWI, RELCBV, RELCBF, D, D_STAR, PF, GOODNESS, F FIT, K, REFVOXELS, RCBVCORR, RCBVUNCORR, K2, K1, FIBER, FAD, FMRI, AUC}, {ADC, B0, DELAYED_IMAGE, DELAYED_RECON, DIFFUSION,

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
						DIFFUSION_ANISO, ENHANCEMENT, FLOW_ENCODED, FLUID_ATTENUATED, FOV_FUSION, INVERSE_RECON, M, MAXIMUM, MIXED, MTT, NONE, PERFUSION, PROTON_DENSITY, RCBF, RCBV, RESAMPLED, SPECTRO, STIR, SUBTRACTION, T1, T2, T2_STAR, TAGGING, TOF, TTP, UNKNOWN, R2, R2_STAR, W, F, IP, OP, KTRANS, KEP, VE, VP, STIFF, WAVE, APTW, SUM, SENC_STRAIN, SENC_ANATOMY, R, I, P, CR, T0, RHO, SPECTRO, DERIVED, RCBV, RCBF, MTT, TTP, FA, EADC, DELAY, MAXRELENH, RELENH, MAXENH, WASHIN, WASHOUT, BREVENH, AREACURV, ANATOMIC, T_TEST, STD_DEVIATION, PERFUSION, F, SPARE1, SPARE2, AD, RD, RA, SW_M, SW_P, FF, APT, CDWI, RELCBV, RELCBF, D, D_STAR, PF, GOODNESS, F FIT, K, REFVOXELS, RCBVCORR, RCBVUNCORR, K2, K1, METABOLITE MAP, FIBER, FAD, FMRI, AUC}, {FFE, MRE, NONE, NSPECIFIED,SE})
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	-
Sequence Name	0018,0024	SH		ANAP	AUTO	-
Angio Flag	0018,0025	CS		ANAP	AUTO	-
Repetition Time	0018,0080	DS		ANAP	IMPLICIT, USER	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	IMPLICIT	-
Imaged Nucleus	0018,0085	SH		ALWAYS	IMPLICIT	-
Echo Number(s)	0018,0086	IS		VNAP	IMPLICIT	-
Magnetic Field Strength	0018,0087	DS		VNAP	CONFIG	-
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		ANAP	USER	Will only have a value if Dynamic Series (2001,1012) Equals 1
Nominal Interval	0018,1062	IS		ANAP	AUTO	-
Beat Rejection Flag	0018,1080	CS		ANAP	AUTO	-
Low R-R Value	0018,1081	IS		ANAP	IMPLICIT	-
High R-R Value	0018,1082	IS		ANAP	IMPLICIT	-
Intervals Acquired	0018,1083	IS		ANAP	IMPLICIT	-
Intervals Rejected	0018,1084	IS		ANAP	IMPLICIT	-
PVC Rejection	0018,1085	LO		ANAP	AUTO	-
Skip Beats	0018,1086	IS		ANAP	AUTO	-
Heart Rate	0018,1088	IS		ANAP	IMPLICIT, USER	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Cardiac Number of Images	0018,1090	IS		ANAP	AUTO	-
Trigger Window	0018,1094	IS		ANAP	IMPLICIT	-
Reconstruction Diameter	0018,1100	DS		VNAP	CONFIG	Value is a copy of the largest value of the Field of View
Receive Coil Name	0018,1250	SH		ALWAYS	IMPLICIT, USER	-
Transmit Coil Name	0018,1251	SH		ANAP	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	-
Variable Flip Angle Flag	0018,1315	CS		ANAP	AUTO	-
SAR	0018,1316	DS		VNAP	IMPLICIT, USER	-
dB/dt	0018,1318	DS		ANAP	AUTO	-
B1rms	0018,1320	FL		ALWAYS	AUTO	-
Temporal Position Identifier	0020,0100	IS		VNAP	IMPLICIT	-
Number of Temporal Positions	0020,0105	IS		VNAP	IMPLICIT, USER	-
Temporal Resolution	0020,0110	DS		ANAP	AUTO	-
Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED	-
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	FIXED	-
Bits Allocated	0028,0100	US	16	ALWAYS	FIXED	-
Bits Stored	0028,0101	US	12	ALWAYS	FIXED	-
High Bit	0028,0102	US	11	ALWAYS	FIXED	-

Table 124: Overlay Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Rows	6000,0010	US		ALWAYS	AUTO	-
Overlay Columns	6000,0011	US		ALWAYS	AUTO	-
Overlay Description	6000,0022	LO		ANAP	AUTO	-
Overlay Type	6000,0040	CS		ALWAYS	AUTO	-
Overlay Subtype	6000,0045	LO		ANAP	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		ANAP	AUTO	-
ROI Mean	6000,1302	DS		ANAP	AUTO	-
ROI Standard Deviation	6000,1303	DS		ANAP	AUTO	-
Overlay Label	6000,1500	LO		EMPTY	FIXED	-
Overlay Data	6000,3000	OW/OB		ALWAYS	AUTO	-

Table 125: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	-
Window Width	0028,1051	DS		ALWAYS	AUTO	-

Table 126: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	Default: ISO_IR 100. GB18030, ISO 2022 IR 100, ISO 2022 IR 101, ISO 2022 IR 109, ISO 2022 IR 110, ISO 2022 IR 126, ISO 2022 IR 127, ISO 2022 IR 13, ISO 2022 IR 138, ISO 2022 IR 144, ISO 2022 IR 148, ISO 2022 IR 149, ISO 2022 IR 166, ISO 2022 IR 6, ISO_IR 100, ISO_IR 101, ISO_IR 109, ISO_IR 110, ISO_IR 126, ISO_IR 127, ISO_IR 13, ISO 2022 IR 87, ISO_IR 138,

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
						ISO_IR 144, ISO_IR 148, ISO_IR 166, ISO_IR 192
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	1.2.840.10008.5.1.4.1.1.4	ALWAYS	FIXED	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Timezone Offset From UTC	0008,0201	SH		ALWAYS	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Instance Origin Status	0400,0600	CS		ALWAYS	AUTO	-

8.1.1.4. Enhanced MR Image Storage SOP Class

Table 127: IOD of Created Enhanced MR Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Series	MR Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Frame of Reference	Synchronization Module	CONDITIONAL
Equipment	General Equipment Module	ALWAYS
Equipment	Enhanced General Equipment Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Enhanced Contrast/Bolus Module	CONDITIONAL
Image	Acquisition Context Module	ALWAYS
Image	Multi-frame Functional Groups Module (Enhanced MR Image)	ALWAYS

Image	Multi-frame Dimension Module	ALWAYS
Image	Cardiac Synchronization Module	CONDITIONAL
Image	Respiratory Synchronization Module	CONDITIONAL
Image	Bulk Motion Synchronization Module	CONDITIONAL
Image	Enhanced MR Image Module	ALWAYS
Image	MR Pulse Sequence Module	CONDITIONAL
Image	Supplemental Palette Color Table Lookup Module	CONDITIONAL
Image	SOP Common Module	ALWAYS

Table 128: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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 Birth Time	0010,0032	TM		ANAP	MWL, USER	-
Patient's Sex	0010,0040	CS		ANAP	MWL, USER	-
Other Patient IDs	0010,1000	LO		ANAP	MWL	Only present when present in patient demographics received from RIS
Ethnic Group	0010,2160	SH		ANAP	MWL, USER	Only present when present in patient demographics received from RIS
Patient Comments	0010,4000	LT		ANAP	MWL	Only present when present in patient demographics received from RIS

Table 129: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	-
Study time	0008,0030	TM		ANAP	MWL, USER	-
Accession Number	0008,0050	SH		VNAP	AUTO, MWL, USER	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referring Physician's Name	0008,0090	PN		VNAP	MWL, USER	-
Study Description	0008,1030	LO		ANAP	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	-
>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		ANAP	MWL	-
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO, MWL	As received from RIS.
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO, MWL	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO, MWL	-
Study Instance UID	020,000D	UI		ALWAYS	AUTO, MWL	-
Study ID	0020,0010	SH		ALWAYS	AUTO	-
Requesting services	0032,1033	LO		ANAP	MWL, USER	-
Physician(s) of Record	0008,1048	PN		ANAP	MWL, USER	

Table 130: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Size	0010,1020	DS		ANAP	MWL	-
Patient's Weight	0010,1030	DS		ALWAYS	MWL, USER	-
Occupation	0010,2180	SH		ANAP	MWL	Only present when present in patient demographics received from RIS
Additional Patient History	0010,21B0	LT		ANAP	MWL	-
Patient's Age	0010, 1010	AS		ANAP	MWL, USER	-
Medical Alerts	0010,2000	LO		ANAP	MWL, USER	-
Allergies	0010,2110	LO		ANAP	MWL, USER	-
Pregnancy status	0010,21C0	US		ANAP	MWL, USER	-

Table 131: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	-
Series Time	0008,0031	TM		ALWAYS	AUTO	-
Modality	0008,0060	CS	MR	ALWAYS	FIXED	-
Series Description	0008,103E	LO		ANAP	AUTO, USER	-
Performing Physician's Name	0008,1050	PN		ANAP	MWL, USER	-
Operators' Name	0008,1070	PN		ANAP	MWL, USER	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ALWAYS	MWL, USER	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	MWL, USER	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MWL, USER	-
Body Part Examined	0018,0015	CS		ANAP	AUTO	-
Protocol Name	0018,1030	LO		ALWAYS	USER	Scan name.
Patient Position	0018,5100	CS		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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		ANAP	USER	-
Request Attributes Sequence	0040,0275	SQ		ANAP	MWL	Only present when patient demographics received from RIS
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	MWL	-
>Scheduled Protocol Code Sequence	0040,0008	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	-
>>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		ANAP	MWL	-
>>Context Group Extension Creator UID	0008,010D	UI		ANAP	MWL	-
>>Context Identifier	0008,010F	CS		ANAP	MWL	-
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	MWL	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Requested Procedure ID	0040,1001	SH		ALWAYS	MWL	-
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO	-
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO	-
Performed Procedure Step End Date	0040,0250	DA		ANAP	MWL, USER	-
Performed Procedure Step End Time	0040,0251	TM		ANAP	MWL, USER	-
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	-
Performed Procedure Step Description	0040,0254	LO		VNAP	MWL, USER	-
Performed Protocol Code Sequence	0040,0260	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	-
>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	-
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	COPY	Only present when present in patient demographics received from RIS Maximum of 64 characters.

Table 132: MR Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	MR	ALWAYS	FIXED	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ALWAYS	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MWL, USER	-

Table 133: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	-
Position Reference Indicator	0020,1040	LO		EMPTY	FIXED	-

Table 134: Synchronization Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Synchronization Trigger	0018,106A	CS		ALWAYS	AUTO	-
Acquisition Time Synchronized	0018,1800	CS		ALWAYS	AUTO	-
Time Distribution Protocol	0018,1802	CS		ALWAYS	AUTO	-
Synchronization Frame of Reference UID	0020,0200	UI		ALWAYS	AUTO	-

Table 135: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	-
Institution Name	0008,0080	LO		ANAP	CONFIG	Configured in the system
Institution Address	0008,0081	ST		ANAP	CONFIG	-
Station Name	0008,1010	SH		ANAP	CONFIG	Same as the Hostname
Institutional Department Name	0008,1040	LO		ANAP	CONFIG	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	-
Software Versions	0018,1020	LO		ALWAYS	AUTO	Inline to system software version

Table 136: Enhanced General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	-
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	System serial number
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	Inline to system software version

Table 137: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rows	0028,0010	US		ALWAYS	AUTO	-
Columns	0028,0011	US		ALWAYS	AUTO	-
Pixel Aspect Ratio	0028,0034	IS	Value 1: 1	ANAP	AUTO	-
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	Applied value: 0000
Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	-
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	-
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	-
Bits Allocated	0028,0100	US		ALWAYS	AUTO	-
Bits Stored	0028,0101	US		ALWAYS	AUTO	-
High Bit	0028,0102	US		ALWAYS	AUTO	-

Table 138: Enhanced Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent Sequence	0018,0012	SQ		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
> Code Value	0008,0100	US		ANAP	COPY	Code value from contrast agent applied.
> Coding Scheme Designator	0008,0102	IS		ANAP	COPY	Code Scheme Designator from contrast agent applied.
> Code Meaning	0008,0104	US		ANAP	COPY	Default value: Contrast Agent.
> Context UID	0008,0117	OW/OB		ANAP	FIXED	1.2.840.10008.6.1.10
> Contrast/Bolus Administration Route Sequence	0018,0014	SQ		ANAP	AUTO	-
>> Code Value	0008,0100	SH		ANAP	COPY	Code value from contrast route applied.
>> Coding Scheme Designator	0008,0102	SH		ANAP	COPY	Code Scheme Designator from contrast route applied.
>> Code Meaning	0008,0104	LO		ANAP	COPY	Contrast route value
>> Context UID	0008,0117	UI		ANAP	FIXED	1.2.840.10008.6.1.9
> Contrast/Bolus Volume	0018,1041	DS		ANAP	USER	-
> Contrast/Bolus Ingredient Concentration	0018,1049	DS		ANAP	USER	-
> Contrast/Bolus Agent Number	0018,9337	US		ANAP	AUTO	-
> Contrast/Bolus Ingredient Code Sequence	0018,9338	SQ		ANAP	AUTO	-
>> Code Value	0008,0100	SH		ANAP	AUTO, COPY	Code value from contrast Ingredient applied.
>> Coding Scheme Designator	0008,0102	SH		ANAP	AUTO, COPY	Code Scheme Designator from contrast Ingredient applied.
>> Code Meaning	0008,0104	LO		ANAP	AUTO, COPY	Contrast Ingredient value
>> Context UID	0008,0117	UI		ANAP	FIXED	1.2.840.10008.6.1.11

Table 139: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		EMPTY	VNAP	-

Table 140: Multi-frame Functional Groups Module (Enhanced MR Image)

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	-
Content Time	0008,0033	TM		ALWAYS	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Number of Frames	0028,0008	IS		ALWAYS	AUTO	-
Shared Functional Groups Sequence	5200,9229	SQ		ALWAYS	AUTO	-
>Pixel Measures Sequence	0028,9110	SQ		ALWAYS	AUTO	-
>>Slice Thickness	0018,0050	DS		ANAP	AUTO	-
>>Spacing Between Slices	0018,0088	DS		ANAP	AUTO	-
>>Pixel Spacing	0028,0030	DS		ANAP	AUTO	-
>Plane Position Sequence	0020,9113	SQ		ALWAYS	AUTO	-
>>Image Position (Patient)	0020,0032	DS		ANAP	AUTO	-
>Plane Orientation Sequence	0020,9116	SQ		ALWAYS	AUTO	-
>>Image Orientation (Patient)	0020,0037	DS		ANAP	AUTO	-
>Cardiac Synchronization Sequence	0018,9118	SQ		ANAP	AUTO	-
>>Nominal Cardiac Trigger Delay Time	0020,9153	FD		ALWAYS	AUTO	-
>>R - R Interval Time Nominal	0020,9251	FD		ANAP	AUTO	-
>Pixel Value Transformation	0028,9145	SQ		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Sequence						
>>Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	-
>>Rescale Slope	0028,1053	DS		ALWAYS	AUTO	-
>>Rescale Type	0028,1054	LO		ALWAYS	AUTO	no units, Normalized, US, cm/s, mrad, milliradian, ms, mm^2/s, s,%,/s, S/m, kPa, millimol, parts per million, Hz, um^2/s, mm^2/s, 10^-6, mm^2/s
>Frame VOI LUT Sequence	0028,9132	SQ		ALWAYS	AUTO	-
>>Window Center	0028,1050	DS		ALWAYS	AUTO	-
>>Window Width	0028,1051	DS		ALWAYS	AUTO	-
>Frame Anatomy Sequence	0020,9071	SQ		ALWAYS	AUTO	-
>>Frame Laterality	0020,9072	CS		ALWAYS	AUTO	value from examcard.
>>Anatomic Region Sequence	0008,2218	SQ		ALWAYS	AUTO	-
>>>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>>>Context UID	0008,0117	UI		ANAP	AUTO	
>>>Anatomic Region Modifier Sequence	0008,2220	SQ		ANAP	AUTO	-
>>>>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	if scan was planned on another scan
>>Purpose of Reference Code Sequence	0040,A170	SQ		ALWAYS	AUTO	-
>>>Code Value	0008,0100	SH		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>>>Context UID	0008,0117	UI		ANAP	AUTO	
>>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	-
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
>Real World Value Mapping Sequence	0040,9096	SQ		ANAP	AUTO	-
>>LUT Explanation	0028,3003	LO		ALWAYS	AUTO	-
>>Measurement Units Code Sequence	0040,08EA	SQ		ALWAYS	AUTO	-
>>>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>>LUT Label	0040,9210	SH		ALWAYS	AUTO	-
>>Real World Value Last Value Mapped	0040,9211	US /SS		ALWAYS	AUTO	-
>>Real World Value First Value Mapped	0040,9216	US /SS		ALWAYS	AUTO	-
>>Real World Value Intercept	0040,9224	FD		ANAP	AUTO	-
>>Real World Value Slope	0040,9225	FD		ANAP	AUTO	-
>Respiratory Synchronization Sequence	0020,9253	SQ		ANAP	AUTO	-
>>Respiratory Interval Time	0020,9254	FD		ALWAYS	AUTO	-
>>Nominal Respiratory Trigger Delay Time	0020,9255	FD		ALWAYS	AUTO	-
>MR Image Frame Type	0018,9226	SQ		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Sequence						
>>Frame Type	0008,9007	CS		ALWAYS	AUTO	-
>>Pixel Presentation	0008,9205	CS		ALWAYS	AUTO	-
>>Volumetric Properties	0008,9206	CS		ALWAYS	AUTO	-
>>Volume Based Calculation Technique	0008,9207	CS		ALWAYS	AUTO	Applied values: MAX_IP, MPR, NONE
>>Complex Image Component	0008,9208	CS		ALWAYS	AUTO	-
>>Acquisition Contrast	0008,9209	CS		ALWAYS	AUTO	-
>MR Timing and Related Parameters Sequence	0018,9112	SQ		ALWAYS	AUTO	-
>>Repetition Time	0018,0080	DS		ANAP	AUTO	-
>>Echo Train Length	0018,0091	IS		ANAP	AUTO	-
>>Flip Angle	0018,1314	DS		ANAP	AUTO	-
>>Operating Mode Sequence	0018,9176	SQ		ANAP	AUTO	-
>>>Operating Mode Type	0018,9177	CS		ALWAYS	AUTO	-
>>>Operating Mode	0018,9178	CS		ALWAYS	AUTO	-
>>Gradient Output Type	0018,9180	CS		ANAP	AUTO	-
>>Gradient Output	0018,9182	FD		ANAP	AUTO	-
>>Specific Absorption Rate Sequence	0018,9239	SQ		ANAP	AUTO	-
>>>Specific Absorption Rate Definition	0018,9179	CS		ALWAYS	AUTO	-
>>>Specific Absorption Rate Value	0018,9181	FD		ALWAYS	AUTO	-
>>RF Echo Train Length	0018,9240	US		ANAP	AUTO	-
>>Gradient Echo Train Length	0018,9241	US		ANAP	AUTO	
>MR Echo Sequence	0018,9114	SQ		ALWAYS	AUTO	-
>>Effective Echo Time	0018,9082	FD		ANAP	AUTO	-
>MR Modifier Sequence	0018,9115	SQ		ALWAYS	AUTO	
>>Inversion Recovery	0018,9009	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Flow Compensation	0018,9010	CS		ANAP	AUTO	-
>>Spoiling	0018,9016	CS		ANAP	AUTO	-
>>T2 Preparation	0018,9021	CS		ANAP	AUTO	-
>>Spectrally Selected Excitation	0018,9026	CS		ANAP	AUTO	-
>>Spatial Pre-saturation	0018,9027	CS		ANAP	AUTO	-
>>Partial Fourier Direction	0018,9036	CS		ANAP	AUTO	-
>>Parallel Reduction Factor Inplane	0018,9069	FD		ANAP	AUTO	-
>>Parallel Acquisition	0018,9077	CS		ANAP	AUTO	-
>>Parallel Acquisition Technique	0018,9078	CS		ANAP	AUTO	-
>>Inversion Times	0018,9079	FD		ANAP	AUTO	-
>>Partial Fourier	0018,9081	CS		ANAP	AUTO	-
>>Parallel Reduction Factor out-of-plane	0018,9155	FD		ANAP	AUTO	-
>>Parallel Reduction Factor Second In-plane	0018,9168	FD		ANAP	AUTO	-
>>Flow Compensation Direction	0018,9183	CS		ANAP	AUTO	-
>MR FOV/Geometry Sequence	0018,9125	SQ		ALWAYS	AUTO	-
>>Percent Sampling	0018,0093	DS		ANAP	AUTO	-
>>Percent Phase Field of View	0018,0094	DS		ANAP	AUTO	-
>>In-plane Phase Encoding Direction	0018,1312	CS		ANAP	AUTO	-
>>MR Acquisition Frequency Encoding Steps	0018,9058	US		ANAP	AUTO	-
>>MR Acquisition Phase Encoding Steps in-plane	0018,9231	US		ANAP	AUTO	-
>>MR Acquisition Phase Encoding Steps out-of-plane	0018,9232	US		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>MR Imaging Modifier Sequence	0018,9006	SQ		ANAP	AUTO	-
>>Pixel Bandwidth	0018,0095	DS		ANAP	AUTO	-
>>Tag Angle First Axis	0018,9019	FD		ANAP	AUTO	-
>>Magnetization Transfer	0018,9020	CS		ANAP	AUTO	-
>>Blood Signal Nulling	0018,9022	CS		ANAP	AUTO	-
>>Tagging	0018,9028	CS		ANAP	AUTO	-
>>Tag Spacing First Dimension	0018,9030	FD		ANAP	AUTO	-
>>Tag Thickness	0018,9035	FD		ANAP	AUTO	-
>>Transmitter Frequency	0018,9098	FD		ANAP	AUTO	-
>>Tag Spacing Second Dimension	0018,9218	FD		ANAP	AUTO	-
>>Tag Angle Second Axis	0018,9219	SS		ANAP	AUTO	-
>MR Receive Coil Sequence	0018,9042	SQ		ALWAYS	AUTO	-
>>Receive Coil Name	0018,1250	SH		ANAP	AUTO	-
>>Receive Coil Manufacturer Name	0018,9041	LO		ANAP	AUTO	-
>>Receive Coil Type	0018,9043	CS		ANAP	AUTO	-
>>Quadrature Receive Coil	0018,9044	CS		ANAP	AUTO	-
>>Multi-Coil Definition Sequence	0018,9045	SQ		ANAP	AUTO	-
>>>Multi-Coil Element Name	0018,9047	SH		ALWAYS	AUTO	-
>>>Multi-Coil Element Used	0018,9048	CS		ALWAYS	AUTO	-
>MR Transmit Coil Sequence	0018,9049	SQ		ALWAYS	AUTO	-
>>Transmit Coil Name	0018,1251	SH		ALWAYS	AUTO	-
>>Transmit Coil Manufacturer Name	0018,9050	LO		EMPTY	FIXED	-
>>Transmit Coil Type	0018,9051	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>MR Diffusion Sequence	0018,9117	SQ		ANAP	AUTO	-
>>Diffusion Directionality	0018,9075	CS		ANAP	AUTO	-
>>Diffusion Gradient Direction Sequence	0018,9076	SQ		ANAP	AUTO	-
>>>Diffusion Gradient Orientation	0018,9089	FD		ANAP	AUTO	-
>>Diffusion b-value	0018,9087	FD		ANAP	AUTO	-
>>Diffusion Anisotropy Type	0018,9147	CS		ANAP	AUTO	Applied value: FRACTIONAL
>MR Averages Sequence	0018,9119	SQ		ALWAYS	AUTO	-
>>Number of Averages	0018,0083	DS		ANAP	AUTO	-
>MR Spatial Saturation Sequence	0018,9107	SQ		ANAP	AUTO	if slab information is present
>>Slab Thickness	0018,9104	FD		ALWAYS	AUTO	-
>>Slab Orientation	0018,9105	FD		ALWAYS	AUTO	-
>>Mid Slab Position	0018,9106	FD		ALWAYS	AUTO	-
>MR Metabolite Map Sequence	0018,9152	SQ		ANAP	AUTO	-
>>Metabolite Map Description	0018,9080	ST		ANAP	AUTO	-
>MR Velocity Encoding Sequence	0018,9197	SQ		ANAP	AUTO	-
>>Velocity Encoding Direction	0018,9090	FD		ANAP	AUTO	-
>>Velocity Encoding Minimum Value	0018,9091	FD		ANAP	AUTO	Applied value: 0.0
>>Velocity Encoding Maximum Value	0018,9217	FD		ANAP	AUTO	-
Per-frame Functional Groups Sequence	5200,9230	SQ		ALWAYS	AUTO	-
>Pixel Measures Sequence	0028,9110	SQ		ALWAYS	AUTO	-
>>Slice Thickness	0018,0050	DS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Spacing Between Slices	0018,0088	DS		ANAP	AUTO	-
>>Pixel Spacing	0028,0030	DS		ANAP	AUTO	-
>Frame Content Sequence	0020,9111	SQ		ALWAYS	AUTO	-
>>Frame Acquisition Datetime	0018,9074	DT		ANAP	AUTO	-
>>Frame Reference Datetime	0018,9151	DT		ANAP	AUTO	-
>>Frame Acquisition Duration	0018,9220	FD		ANAP	AUTO	-
>>Stack ID	0020,9056	SH		ANAP	AUTO	-
>>In-Stack Position Number	0020,9057	UL		ANAP	AUTO	-
>>Dimension Index Values	0020,9157	UL		ANAP	AUTO	-
>>Temporal Position Index	0020,9128	UL		ANAP	AUTO	-
>Plane Position Sequence	0020,9113	SQ		ALWAYS	AUTO	-
>>Image Position (Patient)	0020,0032	DS		ANAP	AUTO	-
>Plane Orientation Sequence	0020,9116	SQ		ALWAYS	AUTO	-
>>Image Orientation (Patient)	0020,0037	DS		ANAP	AUTO	-
>Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	if scan was planned on another scan
>>Purpose of Reference Code Sequence	0040,A170	SQ		ALWAYS	AUTO	-
>>>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Cardiac Synchronization Sequence	0018,9118	SQ		ANAP	AUTO	-
>>Nominal Cardiac Trigger Delay Time	0020,9153	FD		ALWAYS	AUTO	-
>>R - R Interval Time Nominal	0020,9251	FD		ANAP	AUTO	-
>Pixel Value Transformation Sequence	0028,9145	SQ		ALWAYS	AUTO	-
>>Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	-
>>Rescale Slope	0028,1053	DS		ALWAYS	AUTO	-
>>Rescale Type	0028,1054	LO		ALWAYS	AUTO	no units, Normalized, US, cm/s, mrad, milliradian, ms, mm^2/s, s, %, /s, S/m, kPa, millimol, parts per million, Hz, um^2/s, mm^2/s, 10^-6 mm^2/s
>Frame VOI LUT Sequence	0028,9132	SQ		ALWAYS	AUTO	-
>>Window Center	0028,1050	DS		ALWAYS	AUTO	-
>>Window Width	0028,1051	DS		ALWAYS	AUTO	-
>Real World Value Mapping Sequence	0040,9096	SQ		ANAP	AUTO	-
>>LUT Explanation	0028,3003	LO		ALWAYS	AUTO	-
>>Measurement Units Code Sequence	0040,08EA	SQ		ALWAYS	AUTO	-
>>>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>>>Context UID	0008,0117	UI		ANAP	AUTO	-
>>LUT Label	0040,9210	SH		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Real World Value Last Value Mapped	0040,9211	US /SS		ALWAYS	AUTO	-
>>Real World Value First Value Mapped	0040,9216	US /SS		ALWAYS	AUTO	-
>>Real World Value Intercept	0040,9224	FD		ALWAYS	AUTO	-
>>Real World Value Slope	0040,9225	FD		ALWAYS	AUTO	-
>Respiratory Synchronization Sequence	0020,9253	SQ		ANAP	AUTO	-
>>Respiratory Interval Time	0020,9254	FD		ALWAYS	AUTO	-
>>Nominal Respiratory Trigger Delay Time	0020,9255	FD		ALWAYS	AUTO	-
>MR Image Frame Type Sequence	0018,9226	SQ		ALWAYS	AUTO	-
>>Frame Type	0008,9007	CS		ALWAYS	AUTO	-
>>Pixel Presentation	0008,9205	CS		ALWAYS	AUTO	-
>>Volumetric Properties	0008,9206	CS		ALWAYS	AUTO	-
>>Volume Based Calculation Technique	0008,9207	CS		ALWAYS	AUTO	Applied values: MAX_IP, MPR, NONE
>>Complex Image Component	0008,9208	CS		ALWAYS	AUTO	-
>>Acquisition Contrast	0008,9209	CS		ALWAYS	AUTO	-
>MR Timing and Related Parameters Sequence	0018,9112	SQ		ALWAYS	AUTO	-
>>Repetition Time	0018,0080	DS		ANAP	AUTO	-
>>Echo Train Length	0018,0091	IS		ANAP	AUTO	-
>>Flip Angle	0018,1314	DS		ANAP	AUTO	-
>>Operating Mode Sequence	0018,9176	SQ		ANAP	AUTO	-
>>>Operating Mode Type	0018,9177	CS		ALWAYS	AUTO	-
>>>Operating Mode	0018,9178	CS		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Gradient Output Type	0018,9180	CS		ANAP	AUTO	-
>>Gradient Output	0018,9182	FD		ANAP	AUTO	-
>>Specific Absorption Rate Sequence	0018,9239	SQ		ANAP	AUTO	-
>>>Specific Absorption Rate Definition	0018,9179	CS		ALWAYS	AUTO	-
>>>Specific Absorption Rate Value	0018,9181	FD		ALWAYS	AUTO	-
>>RF Echo Train Length	0018,9240	US		ANAP	AUTO	-
>>Gradient Echo Train Length	0018,9241	US		ANAP	AUTO	-
>MR FOV/Geometry Sequence	0018,9125	SQ		ALWAYS	AUTO	-
>>Percent Sampling	0018,0093	DS		ANAP	AUTO	-
>>Percent Phase Field of View	0018,0094	DS		ANAP	AUTO	-
>>In-plane Phase Encoding Direction	0018,1312	CS		ANAP	AUTO	-
>>MR Acquisition Frequency Encoding Steps	0018,9058	US		ANAP	AUTO	-
>>MR Acquisition Phase Encoding Steps in-plane	0018,9231	US		ANAP	AUTO	-
>>MR Acquisition Phase Encoding Steps out-of-plane	0018,9232	US		ANAP	AUTO	-
>MR Echo Sequence	0018,9114	SQ		ALWAYS	AUTO	-
>>Effective Echo Time	0018,9082	FD		ANAP	AUTO	-
>MR Modifier Sequence	0018,9115	SQ		ALWAYS	AUTO	-
>>Inversion Recovery	0018,9009	CS		ANAP	AUTO	-
>>Flow Compensation	0018,9010	CS		ANAP	AUTO	-
>>Spoiling	0018,9016	CS		ANAP	AUTO	-
>>T2 Preparation	0018,9021	CS		ANAP	AUTO	-
>>Spectrally Selected Excitation	0018,9026	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Spatial Pre-saturation	0018,9027	CS		ANAP	AUTO	-
>>Partial Fourier Direction	0018,9036	CS		ANAP	AUTO	-
>>Parallel Reduction Factor In-plane	0018,9069	FD		ANAP	AUTO	-
>>Parallel Acquisition	0018,9077	CS		ANAP	AUTO	-
>>Parallel Acquisition Technique	0018,9078	CS		ANAP	AUTO	-
>>Inversion Times	0018,9079	FD		ANAP	AUTO	-
>>Partial Fourier	0018,9081	CS		ANAP	AUTO	-
>>Parallel Reduction Factor out-of-plane	0018,9155	FD		ANAP	AUTO	-
>>Parallel Reduction Factor Second In-plane	0018,9168	FD		ANAP	AUTO	-
>>Flow Compensation Direction	0018,9183	CS		ANAP	AUTO	-
>MR Imaging Modifier Sequence	0018,9006	SQ		ANAP	AUTO	-
>>Pixel Bandwidth	0018,0095	DS		ANAP	AUTO	-
>>Tag Angle First Axis	0018,9019	FD		ANAP	AUTO	-
>>Magnetization Transfer	0018,9020	CS		ANAP	AUTO	-
>>Blood Signal Nulling	0018,9022	CS		ANAP	AUTO	-
>>Tagging	0018,9028	CS		ANAP	AUTO	-
>>Tag Spacing First Dimension	0018,9030	FD		ANAP	AUTO	-
>>Tag Thickness	0018,9035	FD		ANAP	AUTO	Applied value: 0.0
>>Transmitter Frequency	0018,9098	FD		ANAP	AUTO	-
>>Tag Spacing Second Dimension	0018,9218	FD		ANAP	AUTO	-
>>Tag Angle Second Axis	0018,9219	SS		ANAP	AUTO	-
>MR Receive Coil Sequence	0018,9042	SQ		ALWAYS	AUTO	-
>>Receive Coil Name	0018,1250	SH		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Receive Coil Manufacturer Name	0018,9041	LO		EMPTY	FIXED	-
>>Receive Coil Type	0018,9043	CS		ANAP	AUTO	-
>>Quadrature Receive Coil	0018,9044	CS		ANAP	AUTO	-
>>Multi-Coil Definition Sequence	0018,9045	SQ		ANAP	AUTO	-
>>>Multi-Coil Element Name	0018,9047	SH		ALWAYS	AUTO	-
>>>Multi-Coil Element Used	0018,9048	CS		ALWAYS	AUTO	-
>MR Transmit Coil Sequence	0018,9049	SQ		ALWAYS	AUTO	-
>>Transmit Coil Name	0018,1251	SH		ALWAYS	AUTO	-
>>Transmit Coil Manufacturer Name	0018,9050	LO		EMPTY	FIXED	-
>>Transmit Coil Type	0018,9051	CS		ANAP	AUTO	-
>MR Diffusion Sequence	0018,9117	SQ		ANAP	AUTO	-
>>Diffusion Directionality	0018,9075	CS		ANAP	AUTO	-
>>Diffusion Gradient Direction Sequence	0018,9076	SQ		ANAP	AUTO	-
>>>Diffusion Gradient Orientation	0018,9089	FD		ANAP	AUTO	-
>>Diffusion b-value	0018,9087	FD		ANAP	AUTO	-
>>Diffusion Anisotropy Type	0018,9147	CS		ANAP	AUTO	Applied value: FRACTIONAL
>MR Averages Sequence	0018,9119	SQ		ALWAYS	AUTO	-
>>Number of Averages	0018,0083	DS		ANAP	AUTO	-
>MR Spatial Saturation Sequence	0018,9107	SQ		ANAP	AUTO	if slab information is present
>>Slab Thickness	0018,9104	FD		ALWAYS	AUTO	-
>>Slab Orientation	0018,9105	FD		ALWAYS	AUTO	-
>>Mid Slab Position	0018,9106	FD		ALWAYS	AUTO	-
>MR Metabolite Map Sequence	0018,9152	SQ		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Metabolite Map Description	0018,9080	ST		ANAP	AUTO	-
>MR Velocity Encoding Sequence	0018,9197	SQ		ANAP	AUTO	-
>>Velocity Encoding Direction	0018,9090	FD		ANAP	AUTO	-
>>Velocity Encoding Minimum Value	0018,9091	FD		ANAP	AUTO	Applied value: 0.0
>>Velocity Encoding Maximum Value	0018,9217	FD		ANAP	AUTO	-
>Frame Anatomy Sequence	0020,9071	SQ		ALWAYS	AUTO	-
>>Frame Laterality	0020,9072	CS		ALWAYS	AUTO	-
>>Anatomic Region Sequence	0008,2218	SQ		ALWAYS	AUTO	-
>>>Anatomic Region Modifier Sequence	0008,2220	SQ		ALWAYS	AUTO	-
>>>>Code Value	0008,0100	SH		ALWAYS	COPY	-
>>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	-
>>>>Code Meaning	0008,0104	LO		ALWAYS	COPY	Value from examcard from STANDARD table, possibly translated
> Contrast/Bolus Usage Sequence	0018,9341	SQ		ANAP	AUTO	Required if the Enhanced Contrast/Bolus Module is present YES, if the selected agent had begun by the time frame acquired else NO.
>> Contrast/Bolus Agent Number	0018,9337	US		ANAP	AUTO	-
>> Contrast/Bolus Agent Administered	0018,9342	CS		ANAP	AUTO	-
>> Contrast/Bolus Agent Detected	0018,9343	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>> Contrast/Bolus Agent Phase	0018,9344	CS		ANAP	AUTO	IMMEDIATE if Contrast/Bolus Route (0018,1040) is Intravenous Route.

Note: Shared Functional Groups Sequence is always present in combination with the Per-frame Functional Groups Sequence (5200,9230).

Table 141: Multi-frame Dimension Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Dimension Organization Sequence	0020,9221	SQ		VNAP	AUTO	-
>Dimension Organization UID	0020,9164	UI		ALWAYS	AUTO	-
Dimension Index Sequence	0020,9222	SQ		VNAP	AUTO	-
>Dimension Organization UID	0020,9164	UI		ALWAYS	AUTO	-
>Dimension Index Pointer	0020,9165	AT		ALWAYS	AUTO	-
>Functional Group Pointer	0020,9167	AT		ANAP	AUTO	-
>Dimension Index Private Creator	0020,9213	LO		ANAP	AUTO	-
>Functional Group Private Creator	0020,9238	LO		ANAP	AUTO	-
>Dimension Description Label	0020,9421	LO		ANAP	AUTO	Free text description that explains the meaning of the dimension.

Table 142: Cardiac Synchronization Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Low R-R Value	0018,1081	IS		ANAP	AUTO	-
High R-R Value	0018,1082	IS		ANAP	AUTO	-
Intervals Acquired	0018,1083	IS		ANAP	AUTO	-
Intervals Rejected	0018,1084	IS		ANAP	AUTO	-
Cardiac Synchronization Technique	0018,9037	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Cardiac R-R Interval Specified	0018,9070	FD		ANAP	AUTO	-
Cardiac Signal Source	0018,9085	CS		ANAP	AUTO	-
Cardiac Beat Rejection Technique	0018,9169	CS		ANAP	AUTO	-

Table 143: Respiratory Synchronization Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Respiratory Motion Compensation Technique	0018,9170	CS		ANAP	AUTO	-
Respiratory Signal Source	0018,9171	CS		ANAP	AUTO	-
Respiratory Trigger Delay Threshold	0020,9256	FD		ANAP	AUTO	-

Table 144: Bulk Motion Synchronization Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bulk Motion Compensation Technique	0018,9172	CS		ANAP	AUTO	Applied value: NONE

Table 145: Enhanced MR Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	Applied values: ({ORIGINAL, DERIVED}, PRIMARY, {METABOLITE_MAP, REALTIME, VELOCITY, KTRANS, KEP, M_FFE, B0, B0_MAP, VE, VP, APTW_SE, M, R, I, P, CR, T0, T1, T2, RHO, SPECTRO, DERIVED, ADC, RCBV, RCBF, MTT, TTP, FA, EADC, DELAY, MAXRELENH, RELENH, MAXENH, WASHIN, WASHOUT, BREVENH, AREACURV, ANATOMIC, T_TEST, STD_DEVIATION, PERFUSION, T2_STAR, R2,

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
						R2_STAR, W, IP, OP, F, SPARE1, SPARE2, AD, RD, RA, SW_M, SW_P, FF, STIFF, WAVE, APT, SUM, SENC_STRAIN, SENC_ANATOMY, CDWI, RELCBV, RELCBF, D, D_STAR, PF, GOODNESS, F FIT, K, REFVOXELS, RCBVCORR, RCBVUNCORR, K2, K1, FIBER, FAD, FMRI, AUC}, {ADC, B0, DELAYED_IMAGE, DELAYED_RECON, DIFFUSION, DIFFUSION_ANISO, ENHANCEMENT, FLOW_ENCODED, FLUID_ATTENUATED, FOV_FUSION, INVERSE_RECON, M, MAXIMUM, MIXED, MTT, NONE, PERFUSION, PROTON_DENSITY, RCBF, RCBV, RESAMPLED, SPECTRO, STIR, SUBTRACTION, T1, T2, T2_STAR, TAGGING, TOF, TTP, UNKNOWN, R2, R2_STAR, W, F, IP, OP, KTRANS, KEP, VE, VP, STIFF, WAVE, APTW, SUM, R, I, P, CR, T0, RHO, SPECTRO, DERIVED, RCBV, RCBF, TTP, FA, EADC, DELAY, MAXRELENH, RELENH, MAXENH, WASHIN, WASHOUT, BREVENH, AREACURV, ANATOMIC, T_TEST, STD_DEVIATION, PERFUSION, W, IP, OP, F, KTRANS, KEP, VE, VP, SPARE1, SPARE2, AD, RD, RA, SW_M, , SW_P, FF, STIFF, WAVE, APT, SUM, SENC_STRAIN, SENC_ANATOMY, CDWI, RELCBV, RELCBF, D, D_STAR, PF, GOODNESS , F FIT, K,

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
						REFVOXELS, RCBVCORR, RCBVUNCORR, K2, K1, METABOLITE MAP, FIBER, FAD, FMRI, AUC}, {FFE,MRE,NONE, UNSPECIFIED,SE})
B1rms	0018,1320	FL		ALWAYS	AUTO	-
Spacing Between Slices	0018,0088	DS		ANAP	AUTO	-
Samples per Pixel	0028,0002	US		ALWAYS	FIXED	-
Photometric Interpretation	0028,0004	CS		ALWAYS	FIXED	-
Bits Allocated	0028,0100	US		ALWAYS	IMPLICIT	-
Bits Stored	0028,0101	US		ALWAYS	IMPLICIT	-
High Bit	0028,0102	US		ALWAYS	AUTO	-
Pixel Representation	0028,0103	US		ALWAYS	AUTO	-
Burned In Annotation	0028,0301	CS	NO	ALWAYS	AUTO	-
Lossy Image Compression	0028,2110	CS	00	ALWAYS	AUTO	-
Presentation LUT Shape	2050,0020	CS		ALWAYS	AUTO	-
Acquisition Datetime	0008,002A	DT		ANAP	AUTO	-
Referenced Image Evidence Sequence	0008,9092	SQ		ALWAYS	AUTO	-
>Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO	-
>>Referenced SOP Sequence	0008,1199	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	-
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	-
Source Image Evidence Sequence	0008,9154	SQ		ANAP	AUTO	-
>Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO	-
>>Referenced SOP Sequence	0008,1199	SQ		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>>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	-
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	-
Magnetic Field Strength	0018,0087	DS		ANAP	AUTO	-
Content Qualification	0018,9004	CS		ALWAYS	AUTO	-
k-space Filtering	0018,9064	CS	None	ANAP	AUTO	Applied values: COSINE, COSINE_SQUARED, FERMI, GAUSSIAN, HAMMING, HANNING, LORENTZIAN, LRNTZ_GSS_TRNSFM, NONE, RIESZ, TUKEY, USER_DEFINED
Acquisition Duration	0018,9073	FD		ANAP	AUTO	-
Resonant Nucleus	0018,9100	CS		ANAP	AUTO	Applied values: 129XE, 13C, 19F, 1H, 23NA, 31P, 3HE, 7LI, 17O, OTHER
Applicable Safety Standard Agency	0018,9174	CS		ANAP	AUTO	-
Applicable Safety Standard Description	0018,9175	LO		ANAP	AUTO	-
Acquisition Number	0020,0012	IS		ANAP	AUTO	-
Image Comments	0020,4000	LT		ANAP	USER	-
Pixel Presentation	0008,9205	CS		ALWAYS	AUTO	-
Volumetric Properties	0008,9206	CS		ALWAYS	AUTO	-
Volume Based Calculation Technique	0008,9207	CS		ALWAYS	AUTO	Applied values: MAX_IP, MPR, NONE
Complex Image Component	0008,9208	CS		ALWAYS	AUTO	-
Acquisition Contrast	0008,9209	CS		ALWAYS	AUTO	-

Table 146: MR Pulse Sequence Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MR Acquisition Type	0018,0023	CS		ANAP	AUTO	Applied values: 1D, 2D, 3D, UNKNOWN
Pulse Sequence Name	0018,9005	SH		ANAP	AUTO	-
Echo Pulse Sequence	0018,9008	CS		ANAP	AUTO	-
Multiple Spin Echo	0018,9011	CS		ANAP	AUTO	-
Multi-planar Excitation	0018,9012	CS		ANAP	AUTO	-
Phase Contrast	0018,9014	CS		ANAP	AUTO	-
Time of Flight Contrast	0018,9015	CS		ANAP	AUTO	-
Steady State Pulse Sequence	0018,9017	CS		ANAP	AUTO	-
Echo Planar Pulse Sequence	0018,9018	CS		ANAP	AUTO	-
Saturation Recovery	0018,9024	CS		ANAP	AUTO	-
Spectrally Selected Suppression	0018,9025	CS		ANAP	AUTO	-
Oversampling Phase	0018,9029	CS		ANAP	AUTO	-
Geometry of k-Space Traversal	0018,9032	CS		ANAP	AUTO	-
Segmented k-Space Traversal	0018,9033	CS		ANAP	AUTO	-
Rectilinear Phase Encode Reordering	0018,9034	CS		ANAP	AUTO	Applied values: CENTRIC, LINEAR, REVERSE_CENTRIC, REVERSE_LINEAR, SEGMENTED, UNKNOWN
Number of k-Space Trajectories	0018,9093	US		ANAP	AUTO	-
Coverage of k-Space	0018,9094	CS		ANAP	AUTO	-

Table 147: Supplemental Palette Color Table Lookup Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Red Palette Color Lookup Table Descriptor	0028,1101	US/SS		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Green Palette Color Lookup Table Descriptor	0028,1102	US/SS		ALWAYS	AUTO	-
Blue Palette Color Lookup Table Descriptor	0028,1103	US/SS		ALWAYS	AUTO	-
Red Palette Color Lookup Table Data	0028,1201	OW		ALWAYS	AUTO	-
Green Palette Color Lookup Table Data	0028,1202	OW		ALWAYS	AUTO	-
Blue Palette Color Lookup Table Data	0028,1203	OW		ALWAYS	AUTO	-

Table 148: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	Default: ISO_IR 100. GB18030, ISO 2022 IR 100, ISO 2022 IR 101, ISO 2022 IR 109, ISO 2022 IR 110, ISO 2022 IR 126, ISO 2022 IR 127, ISO 2022 IR 13, ISO 2022 IR 138, ISO 2022 IR 144, ISO 2022 IR 148, ISO 2022 IR 149, ISO 2022 IR 166, ISO 2022 IR 6, ISO_IR 100, ISO_IR 101, ISO_IR 109, ISO_IR 110, ISO_IR 126, ISO_IR 127, ISO_IR 13, ISO 2022 IR 87, ISO_IR 138, ISO_IR 144, ISO_IR 148, ISO_IR 166, ISO_IR 192
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	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Timezone Offset From UTC	0008,0201	SH		ANAP	AUTO	-
Content Qualification	0018,9004	CS		ALWAYS	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Origin Status	0400,0600	CS		ANAP	AUTO	-

8.1.1.5. MR Spectroscopy Storage SOP Class

Table 149: IOD of Created MR Spectroscopy Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Series	MR Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Frame of Reference	Synchronization Module	CONDITIONAL
Equipment	General Equipment Module	ALWAYS
Equipment	Enhanced General Equipment Module	ALWAYS
MR Spectroscopy	Acquisition Context Module	ALWAYS
MR Spectroscopy	Multi-frame Functional Groups Module (MR Spectroscopy)	ALWAYS
MR Spectroscopy	Multi-frame Dimension Module	ALWAYS
MR Spectroscopy	Cardiac Synchronization Module	CONDITIONAL
MR Spectroscopy	Respiratory Synchronization Module	CONDITIONAL
MR Spectroscopy	Bulk Motion Synchronization Module	CONDITIONAL
MR Spectroscopy	MR Spectroscopy Module	ALWAYS
MR Spectroscopy	MR Spectroscopy Pulse Sequence Module	CONDITIONAL
MR Spectroscopy	MR Spectroscopy Data Module	ALWAYS
MR Spectroscopy	SOP Common Module	ALWAYS

Table 150: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	-
Patient ID	0010,0020	LO		ALWAYS	COPY, MWL, USER	-
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Birth Time	0010,0032	TM		ANAP	MWL, USER	-
Patient's Sex	0010,0040	CS		ALWAYS	COPY, MWL, USER	-
Other Patient IDs	0010,1000	LO		ANAP	MWL	Only present when patient demographics received from RIS.
Ethnic Group	0010,2160	SH		ANAP	COPY, MWL, USER	Only present when patient demographics received from RIS.
Patient Comments	0010,4000	LT		ANAP	MWL	Only present when patient demographics received from RIS.

Table 151: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO, MWL	-
Study Time	0008,0030	TM		ALWAYS	AUTO, MWL	-
Accession Number	0008,0050	SH		VNAP	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	AUTO, MWL, USER	-
>Code Value	0008,0100	SH		ALWAYS	AUTO, MWL, USER	-
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO, MWL, USER	-
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO, MWL, USER	-
>Code Meaning	0008,0104	LO		ALWAYS	AUTO, 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	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Context Group Extension Creator UID	0008,010D	UI		ANAP	MWL	-
>Context Identifier	0008,010F	CS		ANAP	MWL	-
Referenced Study Sequence	0008,1110	SQ		ANAP	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	-
Physician(s) of Record	0008,1048	PN		ANAP	MWL	-
Requesting Service	0032,1033	LO		ANAP	MWL	-

Table 152: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Size	0010,1020	DS		ANAP	MWL	-
Patient's Weight	0010,1030	DS		ANAP	COPY, MWL, USER	-
Medical Alerts	0010,2000	LO		ANAP	MWL, USER	-
Occupation	0010,2180	SH		ANAP	MWL	As received from RIS or else default (Empty).
Patient's Age	0010,1010	AS		ALWAYS	MWL, USER	-
Additional Patient History	0010,21B0	LT		ANAP	MWL	-
Pregnancy Status	0010,21C0	US		ALWAYS	MWL, USER	-
Allergies	0010,2110	LO		ANAP	MWL, USER	-

Table 153: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	-
Series Time	0008,0031	TM		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Description	0008,103E	LO		ANAP	AUTO, USER	-
Operators' Name	0008,1070	PN		ANAP	USER	-
Body Part Examined	0018,0015	CS		ANAP	AUTO	-
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		ANAP	USER	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	-
> Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
Request Attributes Sequence	0040,0275	SQ		ANAP	MWL	Only present when patient demographics received from RIS.
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	-
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	MWL	-
>Scheduled Protocol Code Sequence	0040,0008	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	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	MWL	-
>Requested Procedure ID	0040,1001	SH		ALWAYS	MWL	-
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO	-
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO	-
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	-
Performed Procedure Step Description	0040,0254	LO		VNAP	MWL, USER	-
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO, MWL	Only present when patient demographics received from RIS.
>Code Value	0008,0100	SH		ALWAYS	MWL, USER	-
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO, MWL	-
>Coding Scheme Version	0008,0103	SH		ANAP	MWL, USER	-
>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		ANAP	MWL	-
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	COPY	Only present when patient demographics received from RIS. Maximum of 64 characters.
Performed procedure step End date	0040,0250	DA		VNAP	MWL, AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Performed procedure step End time	0040,0251	TM		VNAP	MWL, AUTO	-
Modality	0008,0060	CS		ALWAYS	FIXED	Applied Value: MR
Performing Physician's Name	0008,1050	PN		ANAP	MWL, USER	-

Table 154: MR Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	FIXED	Applied value: MR
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ALWAYS	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MPPS	-

Table 155: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	-
Position Reference Indicator	0020,1040	LO		EMPTY	FIXED	-

Table 156: Synchronization Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Synchronization Frame of Reference UID	0020,0200	UI		ALWAYS	AUTO	-
Synchronization Trigger	0018,106A	CS		ALWAYS	AUTO	-
Trigger Source or Type	0018,1061	LO		ANAP	AUTO	-
Synchronization Channel	0018,106C	US		ANAP	AUTO	-
Acquisition Time Synchronized	0018,1800	CS		ALWAYS	AUTO	-
Time Source	0018,1801	SH		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Time Distribution Protocol	0018,1802	CS		ALWAYS	AUTO	-
NTP source Address	0018,1803	LO		ANAP	AUTO	-

Table 157: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Name	0008,0080	LO		ANAP	CONFIG	Configured on the system.
Station Name	0008,1010	SH		ANAP	CONFIG	Same as the Host Name.
Institutional Department Name	0008,1040	LO		ANAP	CONFIG	-
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	-
Institution Address	0008,0081	ST		ANAP	CONFIG	-
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	-
Software Versions	0018,1020	LO		ALWAYS	AUTO	Inline to system software version

Table 158: Enhanced General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	-
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	System serial number.
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	Inline to system software version

Table 159: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		EMPTY	FIXED	-

Table 160: Multi-frame Functional Groups Module (MR Spectroscopy)

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	-
Content Time	0008,0033	TM		ALWAYS	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Number of Frames	0028,0008	IS		ALWAYS	AUTO	-
Shared Functional Groups Sequence	5200,9229	SQ		VNAP	AUTO	Always present in combination with the Per-frame Functional Groups Sequence (5200,9230)
>Pixel Measures Sequence	0028,9110	SQ		ALWAYS	AUTO	-
>>Slice Thickness	0018,0050	DS		ANAP	AUTO	-
>>Pixel Spacing	0028,0030	DS		ANAP	AUTO	-
>Plane Position Sequence	0020,9113	SQ		ALWAYS	AUTO	-
>>Image Position (Patient)	0020,0032	DS		ANAP	AUTO	-
>Plane Orientation Sequence	0020,9116	SQ		ALWAYS	AUTO	-
>>Image Orientation (Patient)	0020,0037	DS		ANAP	AUTO	-
>Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	if scan was planned on another scan.
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
>>Purpose of Reference Code Sequence	0040,A170	SQ		ALWAYS	AUTO	-
>>>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>>> Context UID	0008,0117	UI		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	-
>Cardiac Synchronization Sequence	0018,9118	SQ		ANAP	AUTO	-
>>Nominal Cardiac Trigger Delay Time	0020,9153	FD		ALWAYS	AUTO	-
>>R - R Interval Time Nominal	0020,9251	FD		ANAP	AUTO	-
>Respiratory Synchronization Sequence	0020,9253	SQ		ANAP	AUTO	-
>>Respiratory Interval Time	0020,9254	FD		ALWAYS	AUTO	-
>>Nominal Respiratory Trigger Delay Time	0020,9255	FD		ALWAYS	AUTO	-
>MR Spectroscopy Frame Type Sequence	0018,9227	SQ		ALWAYS	AUTO	-
>>Frame Type	0008,9007	CS		ALWAYS	AUTO	-
>>Volumetric Properties	0008,9206	CS		ALWAYS	AUTO	-
>>Volume Based Calculation Technique	0008,9207	CS		ALWAYS	AUTO	-
>>Complex Image Component	0008,9208	CS		ALWAYS	AUTO	-
>>Acquisition Contrast	0008,9209	CS		ALWAYS	AUTO	-
>MR Timing and Related Parameters Sequence	0018,9112	SQ		ALWAYS	AUTO	-
>>Repetition Time	0018,0080	DS		ANAP	AUTO	-
>>Echo Train Length	0018,0091	IS		ANAP	AUTO	-
>>Flip Angle	0018,1314	DS		ANAP	AUTO	-
>>Operating Mode Sequence	0018,9176	SQ		ANAP	AUTO	-
>>>Operating Mode Type	0018,9177	CS		ALWAYS	AUTO	-
>>>Operating Mode	0018,9178	CS		ALWAYS	AUTO	-
>>Gradient Output Type	0018,9180	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Gradient Output	0018,9182	FD		ANAP	AUTO	-
>>Specific Absorption Rate Sequence	0018,9239	SQ		ANAP	AUTO	-
>>>Specific Absorption Rate Definition	0018,9179	CS		ALWAYS	AUTO	-
>>>Specific Absorption Rate Value	0018,9181	FD		ALWAYS	AUTO	-
>>RF Echo Train Length	0018,9240	US		ANAP	AUTO	-
>>Gradient Echo Train Length	0018,9241	US		ANAP	AUTO	-
>MR Spectroscopy FOV/Geometry Sequence	0018,9103	SQ		ALWAYS	AUTO	-
>>Percent Sampling	0018,0093	DS		ANAP	AUTO	-
>>Percent Phase Field of View	0018,0094	DS		ANAP	AUTO	-
>>Spectroscopy Acquisition Phase Rows	0018,9095	UL		ANAP	AUTO	-
>>Spectroscopy Acquisition Data Columns	0018,9127	UL		ANAP	AUTO	-
>>Spectroscopy Acquisition Out-of-plane Phase Steps	0018,9159	UL		ANAP	AUTO	-
>>Spectroscopy Acquisition Phase Columns	0018,9234	UL		ANAP	AUTO	-
>MR Echo Sequence	0018,9114	SQ		ALWAYS	AUTO	-
>>Effective Echo Time	0018,9082	FD		ANAP	AUTO	-
>MR Modifier Sequence	0018,9115	SQ		ALWAYS	AUTO	-
>>Inversion Recovery	0018,9009	CS		ANAP	AUTO	-
>>Flow Compensation	0018,9010	CS		ANAP	AUTO	-
>>Spoiling	0018,9016	CS		ANAP	AUTO	-
>>T2 Preparation	0018,9021	CS		ANAP	AUTO	-
>>Spectrally Selected Excitation	0018,9026	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Spatial Pre-saturation	0018,9027	CS		ANAP	AUTO	-
>>Partial Fourier Direction	0018,9036	CS		ANAP	AUTO	-
>>Parallel Reduction Factor In-plane	0018,9069	FD		ANAP	AUTO	-
>>Parallel Acquisition	0018,9077	CS		ANAP	AUTO	-
>>Parallel Acquisition Technique	0018,9078	CS		ANAP	AUTO	-
>>Inversion Times	0018,9079	FD		ANAP	AUTO	-
>>Partial Fourier	0018,9081	CS		ANAP	AUTO	-
>>Parallel Reduction Factor out-of-plane	0018,9155	FD		ANAP	AUTO	-
>>Parallel Reduction Factor Second In-plane	0018,9168	FD		ANAP	AUTO	-
>>Flow Compensation Direction	0018,9183	CS		ANAP	AUTO	-
>MR Receive Coil Sequence	0018,9042	SQ		ALWAYS	AUTO	-
>>Receive Coil Name	0018,1250	SH		ANAP	AUTO	-
>>Receive Coil Manufacturer Name	0018,9041	LO		EMPTY	AUTO	-
>>Receive Coil Type	0018,9043	CS		ANAP	AUTO	-
>>Quadrature Receive Coil	0018,9044	CS		ANAP	AUTO	-
>>Multi-Coil Definition Sequence	0018,9045	SQ		ANAP	AUTO	-
>>>Multi-Coil Element Name	0018,9047	SH		ALWAYS	AUTO	-
>>>Multi-Coil Element Used	0018,9048	CS		ALWAYS	AUTO	-
>MR Transmit Coil Sequence	0018,9049	SQ		ANAP	AUTO	-
>>Transmit Coil Name	0018,1251	SH		ALWAYS	AUTO	-
>>Transmit Coil Manufacturer Name	0018,9050	LO		EMPTY	FIXED	-
>>Transmit Coil Type	0018,9051	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>MR Diffusion Sequence	0018,9117	SQ		ANAP	AUTO	-
>>Diffusion Directionality	0018,9075	CS		ANAP	AUTO	-
>>Diffusion Gradient Direction Sequence	0018,9076	SQ		ANAP	AUTO	-
>>>Diffusion Gradient Orientation	0018,9089	FD		ANAP	AUTO	-
>>Diffusion b-value	0018,9087	FD		ANAP	AUTO	-
>>Diffusion Anisotropy Type	0018,9147	CS		ANAP	AUTO	Applied value: FRACTIONAL
>>Diffusion b-matrix Sequence	0018,9601	SQ		ANAP	AUTO	-
>MR Averages Sequence	0018,9119	SQ		ALWAYS	AUTO	-
>>Number of Averages	0018,0083	DS		ANAP	AUTO	-
>MR Spatial Saturation Sequence	0018,9107	SQ		ANAP	AUTO	if slab information is present
>>Slab Thickness	0018,9104	FD		ALWAYS	AUTO	-
>>Slab Orientation	0018,9105	FD		ALWAYS	AUTO	-
>>Mid Slab Position	0018,9106	FD		ALWAYS	AUTO	-
>MR Velocity Encoding Sequence	0018,9197	SQ		ANAP	AUTO	-
>>Velocity Encoding Direction	0018,9090	FD		ANAP	AUTO	-
>>Velocity Encoding Minimum Value	0018,9091	FD		ANAP	AUTO	Applied value: 0.0
>>Velocity Encoding Maximum Value	0018,9217	FD		ANAP	AUTO	-
>Frame Anatomy Sequence	0020,9071	SQ		ANAP	AUTO	-
>>Frame Laterality	0020,9072	CS		ALWAYS	AUTO	Value from examcard.
>>Anatomic Region Sequence	0008,2218	SQ		ALWAYS	AUTO	-
>>>Code Value	0008,0100	SH		ALWAYS	COPY	-
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>>Code Meaning	0008,0104	LO		ALWAYS	COPY	Value from examcard from STANDARD table, possibly translated.
>>> Context UID	0008,0117	UI		ANAP	AUTO	-
Per-frame Functional Groups Sequence	5200,9230	SQ		ALWAYS	AUTO	Always present in combination with the Shared Functional Groups Sequence (5200,9229)
>Pixel Measures Sequence	0028,9110	SQ		ALWAYS	AUTO	-
>>Slice Thickness	0018,0050	DS		ANAP	AUTO	-
>>Pixel Spacing	0028,0030	DS		ANAP	AUTO	-
>Frame Content Sequence	0020,9111	SQ		ALWAYS	AUTO	-
>>Temporal Position	0020,9128	UL		ANAP	AUTO	-
>>Dimension Index	0020,9157	UL		ANAP	AUTO	-
>>Frame Acquisition Datetime	0018,9074	DT		ANAP	AUTO	-
>>Frame Reference Datetime	0018,9151	DT		ANAP	AUTO	-
>>Frame Acquisition Duration	0018,9220	FD		ANAP	AUTO	-
>>Stack ID	0020,9056	SH		ANAP	AUTO	-
>>In-Stack Position Number	0020,9057	UL		ANAP	AUTO	-
>Plane Position Sequence	0020,9113	SQ		ALWAYS	AUTO	-
>>Image Position (Patient)	0020,0032	DS		ANAP	AUTO	-
>Plane Orientation Sequence	0020,9116	SQ		ALWAYS	AUTO	-
>>Image Orientation (Patient)	0020,0037	DS		ANAP	AUTO	-
>Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	if scan was planned on another scan.

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Purpose of Reference Code Sequence	0040,A170	SQ		ALWAYS	AUTO	-
>>>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	-
>Cardiac Synchronization Sequence	0018,9118	SQ		ALWAYS	AUTO	-
>>Nominal Cardiac Trigger Delay Time	0020,9153	FD		ALWAYS	AUTO	-
>>R - R Interval Time Nominal	0020,9251	FD		ANAP	AUTO	-
>MR Timing and Related Parameters Sequence	0018,9112	SQ		ALWAYS	AUTO	-
>>Repetition Time	0018,0080	DS		ANAP	AUTO	-
>>Echo Train Length	0018,0091	IS		ANAP	AUTO	-
>>Flip Angle	0018,1314	DS		ANAP	AUTO	-
>>Operating Mode Sequence	0018,9176	SQ		ANAP	AUTO	-
>>>Operating Mode Type	0018,9177	CS		ALWAYS	AUTO	-
>>>Operating Mode	0018,9178	CS		ALWAYS	AUTO	-
>>Gradient Output Type	0018,9180	CS		ANAP	AUTO	-
>>Gradient Output	0018,9182	FD		ANAP	AUTO	-
>>Specific Absorption Rate Sequence	0018,9239	SQ		ANAP	AUTO	-
>>>Specific Absorption Rate Definition	0018,9179	CS		ALWAYS	AUTO	-
>>>Specific Absorption Rate Value	0018,9181	FD		ALWAYS	AUTO	-
>>RF Echo Train Length	0018,9240	US		ANAP	AUTO	-
>>Gradient Echo Train Length	0018,9241	US		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>MR Echo Sequence	0018,9114	SQ		ALWAYS	AUTO	-
>>Effective Echo Time	0018,9082	FD		ANAP	AUTO	-
>Respiratory Synchronization Sequence	0020,9253	SQ		ANAP	AUTO	-
>>Respiratory Interval Time	0020,9254	FD		ALWAYS	AUTO	-
>>Nominal Respiratory Trigger Delay Time	0020,9255	FD		ALWAYS	AUTO	-
>MR Modifier Sequence	0018,9115	SQ		ALWAYS	AUTO	-
>>Inversion Recovery	0018,9009	CS		ANAP	AUTO	-
>>Flow Compensation	0018,9010	CS		ANAP	AUTO	-
>>Spoiling	0018,9016	CS		ANAP	AUTO	-
>>T2 Preparation	0018,9021	CS		ANAP	AUTO	-
>>Spectrally Selected Excitation	0018,9026	CS		ANAP	AUTO	-
>>Spatial Pre-saturation	0018,9027	CS		ANAP	AUTO	-
>>Partial Fourier Direction	0018,9036	CS		ANAP	AUTO	-
>>Parallel Reduction Factor In-plane	0018,9069	FD		ANAP	AUTO	-
>>Parallel Acquisition	0018,9077	CS		ANAP	AUTO	-
>>Parallel Acquisition Technique	0018,9078	CS		ANAP	AUTO	-
>>Inversion Times	0018,9079	FD		ANAP	AUTO	-
>>Partial Fourier	0018,9081	CS		ANAP	AUTO	-
>>Parallel Reduction Factor out-of-plane	0018,9155	FD		ANAP	AUTO	-
>>Parallel Reduction Factor Second In-plane	0018,9168	FD		ANAP	AUTO	-
>>Flow Compensation Direction	0018,9183	CS		ANAP	AUTO	-
>MR Receive Coil Sequence	0018,9042	SQ		ANAP	AUTO	-
>>Receive Coil Name	0018,1250	SH		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Receive Coil Manufacturer Name	0018,9041	LO		EMPTY	FIXED	-
>>Receive Coil Type	0018,9043	CS		ANAP	AUTO	-
>>Quadrature Receive Coil	0018,9044	CS		ANAP	AUTO	-
>>Multi-Coil Definition Sequence	0018,9045	SQ		ANAP	AUTO	-
>>>Multi-Coil Element Name	0018,9047	SH		ALWAYS	AUTO	-
>>>Multi-Coil Element Used	0018,9048	CS		ALWAYS	AUTO	-
>MR Transmit Coil Sequence	0018,9049	SQ		ALWAYS	AUTO	-
>>Transmit Coil Name	0018,1251	SH		ALWAYS	AUTO	-
>>Transmit Coil Manufacturer Name	0018,9050	LO		EMPTY	FIXED	-
>>Transmit Coil Type	0018,9051	CS		ANAP	AUTO	-
>MR Diffusion Sequence	0018,9117	SQ		ANAP	AUTO	-
>>Diffusion Directionality	0018,9075	CS		ANAP	AUTO	-
>>Diffusion Gradient Direction Sequence	0018,9076	SQ		ANAP	AUTO	-
>>>Diffusion Gradient Orientation	0018,9089	FD		ANAP	AUTO	-
>>Diffusion b-value	0018,9087	FD		ANAP	AUTO	-
>>Diffusion Anisotropy Type	0018,9147	CS		ANAP	AUTO	-
>Frame Anatomy Sequence	0020,9071	SQ		ALWAYS	AUTO	-
>>Frame Laterality	0020,9072	CS		ALWAYS	AUTO	Value from examcard.
>>Anatomic Region Sequence	0008,2218	SQ		ALWAYS	COPY	-
>>>Code Value	0008,0100	SH		ALWAYS	COPY	-
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>>Code Meaning	0008,0104	LO		ALWAYS	COPY	Value from examcard from STANDARD table, possibly translated.
>MR Spectroscopy Frame Type Sequence	0018,9227	SQ		ALWAYS	AUTO	-
>>Frame Type	0008,9007	CS		ALWAYS	AUTO	-
>>Volumetric Properties	0008,9206	CS		ALWAYS	AUTO	-
>>Volume Based Calculation Technique	0008,9207	CS		ALWAYS	AUTO	-
>>Complex Image Component	0008,9208	CS		ALWAYS	AUTO	-
>>Acquisition Contrast	0008,9209	CS		ALWAYS	AUTO	-
>MR Spectroscopy FOV/Geometry Sequence	0018,9103	SQ		ALWAYS	AUTO	-
>>Percent Sampling	0018,0093	DS		ANAP	AUTO	-
>>Percent Phase Field of View	0018,0094	DS		ANAP	AUTO	-
>>Spectroscopy Acquisition Phase Rows	0018,9095	UL		ANAP	AUTO	-
>>Spectroscopy Acquisition Data Columns	0018,9127	UL		ANAP	AUTO	-
>>Spectroscopy Acquisition Out-of-plane Phase Steps	0018,9159	UL		ANAP	AUTO	-
>>Spectroscopy Acquisition Phase Columns	0018,9234	UL		ANAP	AUTO	-
>MR Averages Sequence	0018,9119	SQ		ALWAYS	AUTO	-
>>Number of Averages	0018,0083	DS		ANAP	AUTO	-
>MR Spatial Saturation Sequence	0018,9107	SQ		ANAP	AUTO	if slab information is present
>>Slab Thickness	0018,9104	FD		ALWAYS	AUTO	-
>>Slab Orientation	0018,9105	FD		ALWAYS	AUTO	-
>>Mid Slab Position	0018,9106	FD		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>MR Velocity Encoding Sequence	0018,9197	SQ		ANAP	AUTO	-
>>Velocity Encoding Direction	0018,9090	FD		ANAP	AUTO	-
>>Velocity Encoding Minimum Value	0018,9091	FD		ANAP	AUTO	Applied value: 0.0
>>Velocity Encoding Maximum Value	0018,9217	FD		ANAP	AUTO	-

Table 161: Multi-frame Dimension Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Dimension Organization Sequence	0020,9221	SQ		ALWAYS	AUTO	-
>Dimension Organization UID	0020,9164	UI		ALWAYS	AUTO	-
Dimension Index Sequence	0020,9222	SQ		VNAP	AUTO	-
>Dimension Organization UID	0020,9164	UI		ALWAYS	AUTO	-
>Dimension Index Pointer	0020,9165	AT		ALWAYS	AUTO	-
>Functional Group Pointer	0020,9167	AT		ANAP	AUTO	-
>Dimension Description Label	0020,9421	LO		ANAP	AUTO	-
>Dimension Index Private Creator	0020,9213	LO		ANAP	AUTO	-
>Functional Group Private Creator	0020,9238	LO		ANAP	AUTO	-

Table 162: Cardiac Synchronization Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Low R-R Value	0018,1081	IS		ANAP	AUTO	-
High R-R Value	0018,1082	IS		ANAP	AUTO	-
Intervals Acquired	0018,1083	IS		ANAP	AUTO	-
Intervals Rejected	0018,1084	IS		ANAP	AUTO	-
Cardiac Synchronization Technique	0018,9037	CS		ANAP	AUTO	-
Cardiac R-R Interval Specified	0018,9070	FD		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Cardiac Signal Source	0018,9085	CS		ANAP	AUTO	-
Cardiac Beat Rejection Technique	0018,9169	CS		ANAP	AUTO	-

Table 163: Respiratory Synchronization Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Respiratory Motion Compensation Technique	0018,9170	CS		ANAP	AUTO	-
Respiratory Signal Source	0018,9171	CS		ANAP	AUTO	-
Respiratory Trigger Delay Threshold	0020,9256	FD		ANAP	AUTO	-

Table 164: Bulk Motion Synchronization Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bulk Motion Compensation Technique	0018,9172	CS		ANAP	AUTO	Applied value: NONE

Table 165: MR Spectroscopy Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Spectral Width	0018,9052	FD		ANAP	AUTO	-
Chemical Shift Reference	0018,9053	FD		ANAP	AUTO	-
Volume Localization Technique	0018,9054	CS		ANAP	AUTO	-
De-coupling	0018,9059	CS		ANAP	AUTO	Enumerated Values: YES, NO
De-coupled Nucleus	0018,9060	CS		ANAP	AUTO	-
De-coupling Frequency	0018,9061	FD		ANAP	AUTO	-
De-coupling Method	0018,9062	CS		ANAP	AUTO	Defined Terms: MLEV, WALTZ, NARROWBAND. Required if De-coupling (0018,9059) equals YES.

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
De-coupling Chemical Shift Reference	0018,9063	FD		ANAP	AUTO	-
Referenced Image Evidence Sequence	0008,9092	SQ		ALWAYS	AUTO	-
>Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO	-
>> Referenced SOP Sequence	0008,1199	SQ		ALWAYS	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	-
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	-
Time Domain Filtering	0018,9065	CS		ANAP	AUTO	-
Number of Zero fills	0018,9066	US		ANAP	AUTO	-
Baseline Correction	0018,9067	CS		ANAP	AUTO	-
Transmitter Frequency	0018,9098	FD		ANAP	AUTO	-
Frequency Correction	0018,9101	CS		ANAP	AUTO	-
Volume Localization Sequence	0018,9126	SQ		ANAP	AUTO	-
>Slab Thickness	0018,9104	FD		ALWAYS	AUTO	-
>Slab Orientation	0018,9105	FD		ALWAYS	AUTO	-
>Mid Slab Position	0018,9106	FD		ANAP	AUTO	-
First Order Phase Correction	0018,9198	CS		ANAP	AUTO	-
Water Referenced Phase Correction	0018,9199	CS		ANAP	AUTO	-
Acquisition Datetime	0008,002A	DT		ANAP	AUTO	-
Source Image Evidence Sequence	0008,9154	SQ		ANAP	AUTO	-
>Referenced Series Sequence	0008,1115	SQ		ANAP	AUTO	-
>>Referenced SOP Sequence	0008,1199	SQ		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>>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	-
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	-
Magnetic Field Strength	0018,0087	DS		ANAP	AUTO	-
Content Qualification	0018,9004	CS		ALWAYS	AUTO	-
k-space Filtering	0018,9064	CS		ANAP	AUTO	-
Acquisition Duration	0018,9073	FD		ANAP	AUTO	-
Resonant Nucleus	0018,9100	CS		ANAP	AUTO	Applied values: 129XE, 13C, 19F, 1H, 23NA, 31P, 3HE, 7LI, 17O, OTHER
Applicable Safety Standard Agency	0018,9174	CS		ALWAYS	AUTO	-
Acquisition Number	0020,0012	IS		ANAP	AUTO	-
Image Comments	0020,4000	LT		ANAP	AUTO	-
Image Type	0008,0008	CS		ALWAYS	AUTO	
Volumetric Properties	0008,9206	CS		ALWAYS	AUTO	-
Volume Based Calculation Technique	0008,9207	CS		ALWAYS	AUTO	-
Complex Image Component	0008,9208	CS		ALWAYS	AUTO	-
Acquisition Contrast	0008,9209	CS		ALWAYS	AUTO	Applied values: MIXED, PROTON_DENSITY, SPECTROSCOPY, T1, T2, UNKNOWN
B1rms	0018,1320	FL		ANAP	AUTO	-

Table 166: MR Spectroscopy Pulse Sequence Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Pulse Sequence Name	0018,9005	SH		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Echo Pulse Sequence	0018,9008	CS		ANAP	AUTO	-
Multiple Spin Echo	0018,9011	CS		ANAP	AUTO	-
Multi-planar Excitation	0018,9012	CS		ANAP	AUTO	-
Steady State Pulse Sequence	0018,9017	CS		ANAP	AUTO	-
Echo Planar Pulse Sequence	0018,9018	CS		ANAP	AUTO	-
Spectrally Selected Suppression	0018,9025	CS		ANAP	AUTO	-
Geometry of k-Space Traversal	0018,9032	CS		ANAP	AUTO	-
Segmented k-Space Traversal	0018,9033	CS		ANAP	AUTO	-
Rectilinear Phase Encode Reordering	0018,9034	CS		ANAP	AUTO	-
Number of k-Space Trajectories	0018,9093	US		ANAP	AUTO	-
Coverage of k-Space	0018,9094	CS		ANAP	AUTO	-
MR Spectroscopy Acquisition Type	0018,9200	CS		ANAP	AUTO	-

Table 167: MR Spectroscopy Data Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rows	0028,0010	US		ALWAYS	AUTO	-
Columns	0028,0011	US		ALWAYS	AUTO	-
Data Point Rows	0028,9001	UL		ALWAYS	AUTO	-
Data Point Columns	0028,9002	UL		ALWAYS	AUTO	-
Signal Domain Columns	0028,9003	CS		ALWAYS	AUTO	-
Data Representation	0028,9108	CS		ALWAYS	AUTO	-
First Order Phase Correction Angle	5600,0010	OF		ANAP	AUTO	-
Spectroscopy Data	5600,0020	OF		ALWAYS	AUTO	-

Table 168: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	Default: ISO_IR 100. GB18030, ISO 2022 IR 100, ISO 2022 IR 101, ISO 2022 IR 109, ISO 2022 IR 110, ISO 2022 IR 126, ISO 2022 IR 127, ISO 2022 IR 13, ISO 2022 IR 138, ISO 2022 IR 144, ISO 2022 IR 148, ISO 2022 IR 149, ISO 2022 IR 166, ISO 2022 IR 6, ISO_IR 100, ISO_IR 101, ISO_IR 109, ISO_IR 110, ISO_IR 126, ISO_IR 127, ISO_IR 13, ISO 2022 IR 87, ISO_IR 138, ISO_IR 144, ISO_IR 148, ISO_IR 166, ISO_IR 192
Instance Creation Date	0008,0012	DA		ANAP	AUTO	-
Instance Creation Time	0008,0013	TM		ANAP	AUTO	-
Instance Creator UID	0008,0014	UI		ANAP	AUTO	-
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	-
SOP Instance UID	0008,0018	UI		ALWAYS	FIXED	-
Timezone Offset From UTC	0008,0201	SH		ALWAYS	AUTO	-
Content Qualification	0018,9004	CS		VNAP	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Instance Origin Status	0400,0600	CS		ANAP	AUTO	-

8.1.1.6. Secondary Capture Image Storage SOP Class

Table 169: IOD of Created Secondary Capture Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS

Information Entity	Module	Presence Of Module
Equipment	General Equipment Module	CONDITIONAL
Equipment	SC Equipment Module	ALWAYS
Acquisition	General Acquisition Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	SC Image Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 170: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	COPY	-
Patient ID	0010,0020	LO		ALWAYS	COPY	-
Patient's Birth Date	0010,0030	DA		ALWAYS	CONFIG	-
Patient’s Birth Time	0010,0032	TM		ANAP	COPY	-
Patient's Sex	0010,0040	CS		ALWAYS	COPY	-
Other Patient IDs	0010,1000	LO		ANAP	COPY	-
Ethnic Group	0010,2160	SH		ANAP	COPY	-
Patients Comments	0010,4000	LT		ANAP	COPY	-

Table 171: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	COPY	-
Study Time	0008,0030	TM		ALWAYS	COPY	-
Accession Number	0008,0050	SH		VNAP	COPY	-
Referring Physician's Name	0008,0090	PN		VNAP	COPY	-
Study Description	0008,1030	LO		VNAP	COPY	-
Physician(s) of Record	0008,1048	PN		ANAP	AUTO, MWL	-
Procedure Code Sequence	0008,1032	SQ		ANAP	COPY	-
>Code Value	0008,0100	SH		ALWAYS	COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>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 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	-
Requesting Service	0032,1033	LO		ANAP	AUTO, MWL	-

Table 172: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Age	0010,1010	AS		ANAP	COPY	-
Patient's Size	0010,1020	DS		ANAP	COPY	-
Patient's Weight	0010,1030	DS		ALWAYS	COPY	-
Medical Alerts	0010,2000	LO		ANAP	COPY	-
Allergies	0010,2110	LO		ANAP	COPY	-
Additional Patient History	0010,21B0	LT		ANAP	COPY	-
Pregnancy Status	0010,21C0	US		ANAP	MWL, USER	-

Table 173: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	-
Series Time	0008,0031	TM		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	FIXED	Applied Value: MR
Series Description	0008,103E	LO		ANAP	AUTO, USER	-
Performing Physician's Name	0008,1050	PN		ANAP	AUTO	-
Operators' Name	0008,1070	PN		ANAP	MWL, USER	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
Body Part Examined	0018,0015	CS		ANAP	COPY	-
Protocol Name	0018,1030	LO		ALWAYS	COPY	-
Patient Position	0018,5100	CS		ANAP	AUTO	-
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-
Series Number	0020,0011	IS		ALWAYS	AUTO	-
Laterality	0020,0060	CS		ANAP	COPY	-
Smallest Pixel Value in Series	0028,0108	US/ SS		ANAP	AUTO	-
Largest Pixel Value in Series	0028,0109	US/ SS		ANAP	AUTO	-
Request Attributes Sequence	0040,0275	SQ		ANAP	COPY	-
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	-
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	CONFIG	-
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	COPY	-
>>Code Value	0008,0100	SH		ALWAYS	COPY	-
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	-
>>Coding Scheme Version	0008,0103	SH		ANAP	COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Code Meaning	0008,0104	LO		ALWAYS	COPY	-
>>Mapping Resource	0008,0105	CS		ANAP	COPY	-
>>Context Group Version	0008,0106	DT		ANAP	COPY	-
>>Context Group Local Version	0008,0107	DT		ANAP	COPY	-
>>Context Group Extension Flag	0008,010B	CS		ANAP	COPY	-
>>Context Group Extension Creator UID	0008,010D	UI		ANAP	COPY	-
>>Context Identifier	0008,010F	CS		ANAP	COPY	-
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	COPY	-
>Requested Procedure ID	0040,1001	SH		ALWAYS	COPY	-
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	COPY	-
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	COPY	-
Performed Procedure Step End Date	0040,0250	DA		ANAP	COPY	-
Performed Procedure Step End Time	0040,0251	TM		ANAP	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		ANAP	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	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Context Group Extension Flag	0008,010B	CS		ALWAYS	COPY	-
>Context Group Extension Creator UID	0008,010D	UI		ANAP	COPY	-
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	COPY	Maximum of 64 characters

Table 174: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		ALWAYS	FIXED	Applied value: Philips
Institution Name	0008,0080	LO		ANAP	CONFIG	-
Institution Address	0008,0081	ST		ANAP	CONFIG	-
Station Name	0008,1010	SH		ANAP	CONFIG	-
Institutional Department Name	0008,1040	LO		ANAP	CONFIG	-
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	-
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	Inline to system software version

Table 175: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	-
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO		ANAP	AUTO	-
Secondary Capture Device Software Version(s)	0018,1019	LO		ANAP	AUTO	-

Table 176: General Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ANAP	AUTO	-
Acquisition Time	0008,0032	TM		ANAP	AUTO	-
Acquisition Number	0020,0012	IS		ANAP	AUTO	-

Table 177: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	DERIVED\SECONDARY
Content Date	0008,0023	DA		ALWAYS	AUTO	-
Content Time	0008,0033	TM		ALWAYS	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Patient Orientation	0020,0020	CS		EMPTY	AUTO	-
Burned In Annotation	0028,0301	CS		ANAP	AUTO	-

Table 178: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	Applied value: 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		ANAP	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		ANAP	AUTO	-
Pixel Data	7FE0,0010	OW/ OB		ALWAYS	AUTO	-

Table 179: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ANAP	AUTO	-
Time of Secondary Capture	0018,1014	TM		ANAP	AUTO	-

Table 180: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	Default: ISO_IR 100. GB18030, ISO 2022 IR 100, ISO 2022 IR 101, ISO 2022 IR 109, ISO 2022 IR 110, ISO 2022 IR 126, ISO 2022 IR 127, ISO 2022 IR 13, ISO 2022 IR 138, ISO 2022 IR 144, ISO 2022 IR 148, ISO 2022 IR 149, ISO 2022 IR 166, ISO 2022 IR 6, ISO_IR 100, ISO_IR 101, ISO_IR 109, ISO_IR 110, ISO_IR 126, ISO_IR 127, ISO_IR 13, ISO 2022 IR 87, ISO_IR 138, ISO_IR 144, ISO_IR 148, ISO_IR 166, ISO_IR 192
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	-
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	-
Instance Creator UID	0008,0014	UI		ANAP	AUTO	-
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Timezone Offset From UTC	0008,0201	SH		ANAP	AUTO	-
Instance Number	0020,0013	IS		ANAP	AUTO	-
Instance Origin Status	0400,0600	CS		ANAP	AUTO	-

8.1.1.7. Grayscale Softcopy Presentation State Storage SOP Class

Table 181: IOD of Created Grayscale Softcopy Presentation State Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Series	Presentation Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Presentation State	Presentation State Identification Module	ALWAYS
Presentation State	Presentation State Relationship Module	ALWAYS
Presentation State	Display Shutter Module	CONDITIONAL
Presentation State	Overlay Plane Module	CONDITIONAL
Presentation State	Overlay Activation Module	CONDITIONAL
Presentation State	Displayed Area Module	ALWAYS
Presentation State	Graphic Annotation Module	CONDITIONAL
Presentation State	Spatial Transformation Module	CONDITIONAL
Presentation State	Graphic Layer Module	CONDITIONAL
Presentation State	Modality LUT Module	CONDITIONAL
Presentation State	Softcopy VOI LUT Module	CONDITIONAL
Presentation State	Softcopy Presentation LUT Module	ALWAYS
Presentation State	SOP Common Module	ALWAYS

Table 182: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	COPY	-
Patient ID	0010,0020	LO		ALWAYS	COPY	-
Issuer of Patient ID	0010,0021	LO		ANAP	COPY	-
Patient's Birth Date	0010,0030	DA		ALWAYS	COPY	-
Patient’s Birth Time	0010,0032	TM		ANAP	COPY	-
Patient's Sex	0010,0040	CS		ALWAYS	COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Other Patient IDs	0010,1000	LO		ANAP	COPY	Only present when supplied by the RIS.
Ethnic Group	0010,2160	SH		ANAP	COPY	-
Patient Comments	0010,4000	LT		ANAP	COPY	-

Table 183: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	COPY	-
Study Time	0008,0030	TM		ALWAYS	COPY	-
Accession Number	0008,0050	SH		VNAP	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	-
>Mapping Resource	0008,0105	CS		ANAP	COPY	-
>Context Group Version	0008,0106	DT		ANAP	COPY	-
>Context Group Local Version	0008,0107	DT		ANAP	COPY	-
>Context Group Extension Flag	0008,010B	CS		ANAP	COPY	-
>Context Group Extension Creator UID	0008,010D	UI		ANAP	COPY	-
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO	If present in original study.
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	COPY	-
Study Instance UID	0020,000D	UI		ALWAYS	COPY	-
Study ID	0020,0010	SH		ALWAYS	COPY	-
Physician(s) of Record	0008,1048	PM		ANAP	MWL	-
Requesting Service	0032,1033	LO		ANAP	MWL	-

Table 184: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Size	0010,1020	DS		ANAP	COPY	-
Patient's Weight	0010,1030	DS		ALWAYS	COPY	-
Medical Alerts	0010,2000	LO		ANAP	MWL, USER	-
Occupation	0010,2180	SH		ANAP	COPY	-
Additional Patient History	0010,21B0	LT		ANAP	COPY	-
Patient's Age	0010,1010	AS		ALWAYS	MWL, USER	-
Allergies	0010,2110	LO		ANAP	MWL, USER	-
Pregnancy Status	0010,21C0	US		ALWAYS	AUTO	-

Table 185: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	FIXED	Applied value: PR
Performing Physician's Name	0008,1050	PN		ANAP	USER	-
Series Date	0008,0021	DA		ANAP	AUTO	-
Series Time	0008,0031	TM		ANAP	AUTO	-
Series Description	0008,103E	LO		ANAP	AUTO, USER	-
Operators' Name	0008,1070	PN		ANAP	AUTO	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		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		ANAP	COPY	-
Request Attributes Sequence	0040,0275	SQ		ANAP	COPY	-
> Requested Procedure Description	0032,1060	LO		ANAP	MWL	-
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	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	-
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	COPY	-
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	COPY	-
>Requested Procedure ID	0040,1001	SH		ALWAYS	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 End Date	0040,0250	DA		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Performed Procedure Step End Time	0040,0251	TM		ANAP	AUTO	-
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO	-
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	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	AUTO	-
>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	-
>Context Identifier	0008,010F	CS		ANAP	AUTO	-
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	COPY	Maximum of 64 characters, Comments added on MR

Table 186: Presentation Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	FIXED	Applied Value: PR

Table 187: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		ALWAYS	AUTO	Applied value: Philips
Institution Name	0008,0080	LO		ANAP	CONFIG	-
Institution Address	0008,0081	ST		ANAP	CONFIG	-
Station Name	0008,1010	SH		ANAP	CONFIG	Same as the host Name.
Institutional Department Name	0008,1040	LO		ANAP	CONFIG	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	-
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	Inline to system software version

Table 188: Presentation State Identification Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation Creation Date	0070,0082	DA		ALWAYS	AUTO	-
Presentation Creation Time	0070,0083	TM		ALWAYS	AUTO	-
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	-
Content Creator's Name	0070,0084	PN		ANAP	AUTO	-

Table 189: Presentation State Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO	-
>Referenced Image Sequence	0008,1140	SQ		ALWAYS	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	-

Table 190: Display Shutter Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Shutter Presentation Value	0018,1622	US		ANAP	AUTO	Applied value: 0

Table 191: Overlay Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Rows	6000,0010	US		ALWAYS	AUTO	-
Overlay Columns	6000,0011	US		ALWAYS	AUTO	-
Overlay Description	6000,0022	LO		ANAP	AUTO	-
Overlay Type	6000,0040	CS		ALWAYS	AUTO	-
Overlay Subtype	6000,0045	LO		ANAP	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		ANAP	AUTO	-
ROI Mean	6000,1302	DS		ANAP	AUTO	-
ROI Standard Deviation	6000,1303	DS		ANAP	AUTO	-
Overlay Label	6000,1500	LO		EMPTY	AUTO	-
Overlay Data	6000,3000	OW/ OB		ALWAYS	AUTO	-

Table 192: Overlay Activation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Activation Layer	6000,1001	CS		ANAP	AUTO	applied value: 1

Table 193: Displayed Area Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	-
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	IMPLICIT	-
>Displayed Area Top Left Hand Corner	0070,0052	SL		ALWAYS	IMPLICIT	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>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 values: (0.0, 0.0)
>Presentation Pixel Aspect Ratio	0070,0102	IS		ANAP	IMPLICIT	-
>Presentation Pixel Magnification Ratio	0070,0103	FL		ANAP	IMPLICIT	Applied value: 1.0
>Zoom Mode	2001,103F	CS		ANAP	IMPLICIT	-

Table 194: Graphic Annotation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	-
>>Bounding Box Annotation Units	0070,0003	CS		ANAP	USER	-
>>Anchor Point Annotation Units	0070,0004	CS		ALWAYS	IMPLICIT	-
>>Unformatted Text Value	0070,0006	ST		ALWAYS	IMPLICIT	-
>>Bounding Box Top Left Hand Corner	0070,0010	FL		ANAP	USER	-
>>Bounding Box Bottom Right Hand Corner	0070,0011	FL		ANAP	USER	-
>>Bounding Box Text Horizontal Justification	0070,0012	CS		ANAP	USER	-
>>Anchor Point	0070,0014	FL		ALWAYS	IMPLICIT	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Anchor Point Visibility	0070,0015	CS		ALWAYS	IMPLICIT	-
>Graphic Object Sequence	0070,0009	SQ		ANAP	AUTO	-
>>Graphic Annotation Units	0070,0005	CS		ALWAYS	IMPLICIT	-
>>Graphic Dimensions	0070,0020	US		ALWAYS	IMPLICIT	-
>>Number of Graphic 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	-

Table 195: Spatial Transformation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Horizontal Flip	0070,0041	CS		ALWAYS	IMPLICIT	-
Image Rotation	0070,0042	US		ALWAYS	IMPLICIT	-

Table 196: Graphic Layer Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Graphic Layer Sequence	0070,0060	SQ		ALWAYS	IMPLICIT	-
>Graphic Layer	0070,0002	CS		ALWAYS	IMPLICIT	-
>Graphic Layer Order	0070,0062	IS		ALWAYS	IMPLICIT	-

Table 197: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS		ALWAYS	COPY	-
Rescale Slope	0028,1053	DS		ALWAYS	COPY	-
Rescale Type	0028,1054	LO		ALWAYS	COPY	-

Table 198: Softcopy VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	-
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
>Window Center	0028,1050	DS		ALWAYS	AUTO	-
>Window Width	0028,1051	DS		ALWAYS	AUTO	-
>VOI LUT Function	0028,1056	CS		ALWAYS	AUTO	-

Table 199: Softcopy Presentation LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation LUT Sequence	2050,0010	SQ		ANAP	AUTO	Present if Presentation LUT Shape not present
>LUT Descriptor	0028,3002	US/SS		ALWAYS	AUTO	-
>LUT Data	0028,3006	US/OW		ALWAYS	AUTO	-
Presentation LUT Shape	2050,0020	CS		ALWAYS	AUTO	-

Table 200: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	Default: ISO_IR 100. GB18030, ISO 2022 IR 100, ISO 2022 IR 101, ISO 2022 IR 109, ISO 2022 IR 110, ISO 2022 IR 126, ISO 2022 IR 127, ISO 2022 IR 13, ISO 2022 IR 138, ISO 2022 IR 144, ISO 2022 IR 148, ISO 2022 IR 149, ISO 2022 IR 166, ISO 2022 IR 6, ISO_IR 100, ISO_IR 101, ISO_IR 109, ISO_IR 110, ISO_IR 126, ISO_IR 127, ISO_IR 13, ISO 2022 IR 87, ISO_IR 138, ISO_IR 144, ISO_IR 148, ISO_IR 166, ISO_IR 192
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	-
Instance Creator UID	0008,0014	UI		ANAP	AUTO	-
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.11.1	ALWAYS	AUTO	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Timezone Offset From UTC	0008,0201	SH		ANAP	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Instance Origin Status	0400,0600	CS		ALWAYS	AUTO	-

8.1.1.8. Raw Data Storage SOP Class

Table 201: IOD of Created Raw Data Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	CONDITIONAL
Frame of Reference	Synchronization Module	CONDITIONAL
Equipment	General Equipment Module	ALWAYS
Raw Data	Acquisition Context Module	ALWAYS
Raw Data	Raw Data Module	ALWAYS
Raw Data	SOP Common Module	ALWAYS

Table 202: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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 Birth Time	0010,0032	TM		ANAP	MWL, USER	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Sex	0010,0040	CS		ALWAYS	MWL, USER	-
Other Patient IDs	0010,1000	LO		ANAP	MWL, USER	-
Ethnic Group	0010,2160	SH		ANAP	MWL, USER	-
Patient Comments	0010,4000	LT		ANAP	MWL	-

Table 203: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO, MWL	If received from RIS
Study Time	0008,0030	TM		ALWAYS	AUTO, MWL	-
Accession Number	0008,0050	SH		ALWAYS	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	-
Referenced Study Sequence	0008,1110	SQ		ANAP	MWL	-
>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	-
Physician(s) of Record	0008,1048	PN		ANAP	AUTO, MWL	-
Requesting Service	0032,1033	LO		ANAP	AUTO, MWL	-

Table 204: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Size	0010,1020	DS		ANAP	MWL	-
Patient's Weight	0010,1030	DS		ALWAYS	MWL, USER	-
Medical Alerts	0010,2000	LO		ANAP	MWL, USER	-
Additional Patient History	0010,21B0	LT		ANAP	COPY	-
Patients Age	0010,1010	AS		ALWAYS	MWL, USER	-
Allergies	0010,2110	LO		ANAP	MWL, USER	-
Pregnancy Status	0010,21C0	US		ALWAYS	MWL, USER	-

Table 205: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	-
Series Time	0008,0031	TM		ALWAYS	AUTO	-
Modality	0008,0060	CS	MR	ALWAYS	FIXED	-
Series Description	0008,103E	LO		ANAP	AUTO, USER	-
Performing Physician's Name	0008,1050	PN		ANAP	AUTO	-
Operators' Name	0008,1070	PN		ANAP	USER, MWL	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		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		ANAP	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

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
						private reconstruction number.
Laterality	0020,0060	CS		ANAP	USER	-
Request Attributes Sequence	0040,0275	SQ		ANAP	MWL	-
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	MWL	-
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	-
>Scheduled Protocol Code Sequence	0040,0008	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	USER	-
>>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		ANAP	MWL	-
>>Context Group Extension Creator UID	0008,010D	UI		ANAP	MWL	-
>>Context Identifier	0008,010F	CS		ANAP	MWL	-
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	MWL	-
>Requested Procedure ID	0040,1001	SH		ALWAYS	MWL	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	0040,0244	DA		ALWAYS	MWL	-
Performed Procedure Step End Time	0040,0245	TM		ALWAYS	MWL	-
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		ANAP	MWL, USER	When retrieved from RIS, otherwise empty.
>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	-
>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		ANAP	MWL	-
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	COPY	Only present when patient demographics received from RIS. Maximum of 64 characters

Table 206: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	-
Position Reference Indicator	0020,1040	LO		EMPTY	AUTO	-

Table 207: Synchronization Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Synchronization Trigger	0018,106A	CS		ALWAYS	AUTO	-
Acquisition Time Synchronized	0018,1800	CS		ALWAYS	AUTO	-
Time Distribution Protocol	0018,1802	CS		ALWAYS	AUTO	-
Synchronization Frame of Reference UID	0020,0200	UI		ALWAYS	AUTO	-

Table 208: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	AUTO	-
Institution Name	0008,0080	LO		ANAP	CONFIG	Configured on the system.
Station Name	0008,1010	SH		ANAP	CONFIG	Same as the Host Name.
Institutional Department Name	0008,1040	LO		ANAP	CONFIG	-
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	System serial number.
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	Inline to system software version
Institution Address	0008,0081	ST		ANAP	CONFIG	-

Table 209: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		ALWAYS	AUTO	Empty

Table 210: Raw Data Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	-
Acquisition Datetime	0008,002A	DT		ANAP	AUTO	-
Content Time	0008,0033	TM		ALWAYS	AUTO	-
Creator-Version UID	0008,9123	UI		ALWAYS	AUTO	-
Instance Number	0020,0013	IS		VNAP	AUTO	-

Table 211: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	Default: ISO_IR 100. GB18030, ISO 2022 IR 100, ISO 2022 IR 101, ISO 2022 IR 109, ISO 2022 IR 110, ISO 2022 IR 126, ISO 2022 IR 127, ISO 2022 IR 13, ISO 2022 IR 138, ISO 2022 IR 144, ISO 2022 IR 148, ISO 2022 IR 149, ISO 2022 IR 166, ISO 2022 IR 6, ISO_IR 100, ISO_IR 101, ISO_IR 109, ISO_IR 110, ISO_IR 126, ISO_IR 127, ISO_IR 13, ISO 2022 IR 87, ISO_IR 138, ISO_IR 144, ISO_IR 148, ISO_IR 166, ISO_IR 192
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: 1.2.840.10008.5.1.4.1.1.66
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Timezone Offset From UTC	0008,0201	SH		ANAP	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Instance Origin Status	0400,0600	CS		ALWAYS	AUTO	-

8.1.1.9. RT Structure Set Storage SOP Class

Table 212: IOD of Created RT Structure Set Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	ALWAYS
Series	RT Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Frame of Reference	Frame of Reference Module	CONDITIONAL
Structure Set	Structure Set Module	ALWAYS
	ROI Contour Module	ALWAYS
	RT ROI Observations Module	ALWAYS
	SOP Common Module	ALWAYS

Table 213: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	-
Other Patient IDs	0010,1000	LO		ANAP	COPY	Only present when received from RIS

Table 214: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	COPY	-
Study Time	0008,0030	TM		ALWAYS	COPY	-
Accession Number	0008,0050	SH		ANAP	COPY	-
Referring Physician's Name	0008,0090	PN		VNAP	COPY	-
Study Description	0008,1030	LO		VNAP	COPY	-
Study Instance UID	0020,000D	UI		ALWAYS	COPY	-
Study ID	0020,0010	SH		ALWAYS	COPY	-

Table 215: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Weight	0010,1030	DS		ALWAYS	COPY	-
Medical Alerts	0010,2000	LO		ANAP	COPY	-
Allergies	0010,2110	LO		ANAP	COPY	-

Table 216: RT Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP	AUTO	-
Series Time	0008,0031	TM		ANAP	AUTO	-
Modality	0008,0060	CS	RTSTRUCT	ALWAYS	FIXED	-
Series Description	0008,103E	LO		ANAP	AUTO	-
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-
Series Number	0020,0011	IS		ALWAYS	AUTO	-
Operators' Name	0008,1070	PN		ANAP	USER	-

Table 217: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	COPY	-
Institution Name	0008,0080	LO		ANAP	CONFIG	Configured on the system.
Institution Address	0008,0081	ST		ANAP	CONFIG	-
Station Name	0008,1010	SH		ANAP	CONFIG	Same as the Host Name.
Institutional Department Name	0008,1040	LO		ANAP	CONFIG	-
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	System serial number.
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	Inline to system software version

Table 218: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Of Reference UID	0020,0052	UI		ALWAYS	COPY	-

Table 219: Structure Set Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Structure Set Label	3006,0002	SH	MR-RT	ALWAYS	FIXED	-
Structure Set Name	3006,0004	LO	MR-RT	ALWAYS	FIXED	-
Structure Set Description	3006,0006	ST	MR-RT AutoContouring	ALWAYS	FIXED	-
Structure Set Date	3006,0008	DA		ALWAYS	AUTO	-
Structure Set Time	3006,0009	TM		ALWAYS	AUTO	-
Referenced Frame of Reference Sequence	3006,0010	SQ		ALWAYS	AUTO	-
>Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>RT Referenced Study Sequence	3006,0012	SQ		ALWAYS	AUTO, MWL	-
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
>>RT Referenced Series Sequence	3006,0014	SQ		ALWAYS	AUTO	-
>>>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-
>>>Contour Image Sequence	3006,0016	SQ		ALWAYS	AUTO	-
>>>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	Applied value: 1.2.840.10008.5.1.4.1.1.2
>>>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
Structure Set ROI Sequence	3006,0020	SQ		ALWAYS	AUTO	-
>ROI Number	3006,0022	IS		ALWAYS	AUTO	-
>Referenced Frame of Reference UID	3006,0024	UI		ALWAYS	AUTO	-
>ROI Name	3006,0026	LO		ALWAYS	CONFIG	-
>ROI Generation Algorithm	3006,0036	CS	AUTOMATIC	ALWAYS	FIXED	-

Table 220: ROI Contour Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
ROI Contour Sequence	3006,0039	SQ		ALWAYS	AUTO	-
>ROI Display Color	3006,002A	IS		ALWAYS	CONFIG	-
>Contour Sequence	3006,0040	SQ		VNAP	AUTO	Sequence may be empty if ROI does not contain any contours
>>Contour Image Sequence	3006,0016	SQ		ANAP	AUTO	-
>>>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	Applied value: 1.2.840.10008.5.1.4.1.1.2
>>>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	-
>>Contour Geometric Type	3006,0042	CS		ANAP	AUTO	-
>>Number of Contour Points	3006,0046	IS		ANAP	AUTO	-
>>Contour Data	3006,0050	DS		ANAP	AUTO	-
>Referenced ROI Number	3006,0084	IS		ALWAYS	AUTO	-

Table 221: RT ROI Observation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
RT ROI Observations Sequence	3006,0080	SQ		ALWAYS	AUTO	-
>Observation Number	3006,0082	IS		ALWAYS	AUTO	-
>Referenced ROI Number	3006,0084	IS		ALWAYS	AUTO	-
>RT ROI Interpreted Type	3006,00A4	CS		ALWAYS	AUTO	Value can be either EXTERNAL or ORGAN
>ROI Interpreter	3006,00A6	PN		ALWAYS	FIXED	AUTOMATIC

Table 222: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ALWAYS	COPY	Default: ISO_IR 100.
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	-
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	-
SOP Class UID	0008,0016	UI	1.2.840.1008.5.1.4.1.481.3	ALWAYS	FIXED	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-

8.1.1.10. Media Storage Directory SOP Class

Table 223: IOD of Created Media Storage Directory SOP Class Instances

Information Entity	Module	Presence Of Module
	File-set Identification Module	ALWAYS
	Directory Information Module	ALWAYS
	Extended DICOM and Private attributes	ALWAYS

Table 224: File-set Identification Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
File-set ID	0004,1130	CS		ALWAYS	AUTO	-
Specific Character Set of Fileset Descriptor File	0004,1142	CS		ANAP	AUTO, USER	Required to specify the expanded or replacement character set

Table 225: Directory Information Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	Default 0x0000=0
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		ANAP	AUTO	-
>Private Record UID	0004,1432	UI		ANAP	AUTO	-
>Referenced File ID	0004,1500	CS		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	-
>Specific Character Set	0008,0005	CS		ANAP	AUTO	-
>Image Type	0008,0008	CS		ANAP	AUTO	-
>SOP Instance UID	0008,0018	UI		ANAP	AUTO	-
>Study Date	0008,0020	DA		ALWAYS	AUTO	-
>Series Date	0008,0021	DA		VNAP	COPY	-
>Study Time	0008,0030	TM		ALWAYS	COPY	-
>Series Time	0008,0031	TM		VNAP	COPY	-
>Accession Number	0008,0050	SH		VNAP	COPY	-
>Modality	0008,0060	CS		ALWAYS	COPY	-
>Study Description	0008,1030	LO		VNAP	COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Referenced Series Sequence	0008,1115	SQ		VNAP	COPY	-
>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	-
>Protocol Name	0018,1030	LO		VNAP	COPY	-
>Study Instance UID	0020,000D	UI		ALWAYS	COPY	-
>Series Instance UID	0020,000E	UI		ALWAYS	COPY	-
>Study ID	0020,0010	SH		ALWAYS	COPY	-
>Series Number	0020,0011	IS		ALWAYS	COPY	-
>Instance Number	0020,0013	IS		ALWAYS	AUTO	-
>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	-
>Performed Procedure Step Start Date	0040,0244	DA		VNAP	COPY	-
>Performed Procedure Step Description	0040,0254	LO		VNAP	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	-
>Icon Image Sequence	0088,0200	SQ		ANAP	AUTO	-
>>Pixel Spacing	0028,0030	DS		VNAP	COPY	-
>>Samples per Pixel	0028,0002	US		VNAP	COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Photometric Interpretation	0028,0004	CS		VNAP	AUTO	-
>>Rows	0028,0010	US		VNAP	AUTO	-
>>Columns	0028,0011	US		VNAP	AUTO	-
>>Pixel Aspect Ratio	0028,0034	IS		ANAP	AUTO	-
>>Bits Allocated	0028,0100	US		VNAP	COPY	-
>>Bits Stored	0028,0101	US		VNAP	COPY	-
>>High Bit	0028,0102	US		VNAP	COPY	-
>>Pixel Representation	0028,0103	US		VNAP	COPY	-

8.1.2. Usage of Attributes from Received IOD

For import of MR Spectroscopy, MR image and Enhanced MR Image IODs these must be manufactured by Philips:

- (0008,0070) Manufacturer attribute value as “Philips”
- (0008,0060) Modality as “MR”

8.1.3. Attribute Mapping

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

Table 226: Attribute mapping during Modality Workflow

Nr	Level	Attribute Name	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		Scheduled Performing Physician’s Name	0040,0006	-	0040,0006	-
10		Request Procedure ID	0040,1001	0040,1001	0040,1001	-
11	Exam	Scheduled Procedure Step Start Date	0040,0002	0040,0244	0008,0020	-

Nr	Level	Attribute Name	MWL Find Tag	MPPS Create Tag	Related Store Tag	MPPS Set Tag
12				0040,0250		-
13		Scheduled Procedure Step Description	0040,0007	0040,0007	0040,0007	-
-		Performed Protocol Code Sequence	0040,0008	0040,0260	0040,0260 0040,0008	0040,0260
14		> Code Value	0008,0100	0008,0100	0008,0100	0008,0100
15		> Code Scheme Designator	0008,0102	0008,0102	0008,0102	0008,0102
16		> Coding Scheme Version	0008,0103	0008,0103	0008,0103	0008,0103
17		> Code Meaning	0008,0104	0008,0104	0008,0104	0040,0004
18		Scheduled Procedure Step ID	0040,0009	0040,0009	0040,0009	-
-		Scheduled Procedure Step Sequence	0040,0100	-	-	-
19		> Comments on the Scheduled Procedure Step	0040,0400	-	0032,4000	-
20			-	-	0040,0280	-
21		Performed Procedure Step ID	-	0040,0253	0040,0253	-
		Study ID	-	-	0020,0010	-
-	Series/ Image / Grayscale Softcopy	Performed Series Sequence	-	-	-	0040,0340
		> Referenced Image Sequence	-	-	-	0008,1140
22		>> Referenced SOP Class UID	-	-	0008,0016	0008,1150
23		>> Referenced SOP Instance UID	-	-	0008,0018	0008,1155
-		> Referenced Stand Alone SOP Inst. Seq for the grayscale softcopy presentation state objects	-	-	-	0040,0220
24		>> Referenced SOP Class UID	-	-	0008,0016	0008,1150
25		>> Referenced SOP Instance UID	-	-	0008,0018	0008,1155
26		> Series Protocol Name	-	-	0018,1030	0018,1030

Nr	Level	Attribute Name	MWL Find Tag	MPPS Create Tag	Related Store Tag	MPPS Set Tag
27		> Series Description	-	-	0008,103E	0008,103E
28		> 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 modified and are to be used for reference only; it is not the intention to export them again. Secondary capture images are always accepted.

8.2. Data Dictionary of Private Attributes

Not Applicable. Data Dictionary of Private attributes is not implemented by MR system.

8.3. Coded Terminology and Templates

Not Applicable. Coded Terminology and Templates are not implemented by MR system.

8.3.1. Context Groups

Not Applicable. Context Groups are not implemented by MR system.

8.3.2. Template Specifications

Not Applicable. Template Specifications are not implemented by MR system.

8.3.3. Private code definitions

Not Applicable. Private Code Definitions are not supported by MR system.

8.4. Grayscale Image consistency

The display monitor of the MR system is calibrated according to the Grayscale Standard Display Function (GSDF).
As described in the object definitions the Presentation LUT shape (2050, 0020) is always IDENTITY. Consequently, receiving stations must be calibrated according the GSDF and use the standard DICOM P-LUT.

8.5. Standard Extended/Specialized/Private SOPs

The MR supports the following standard Specialized SOP classes.

Table 227: List of Standard Specialized SOP Classes.

SOP Class Name	SOP Class UID
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2
Philips Private MR Examcard Storage	1.3.46.670589.11.0.0.12.4

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 228: 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.
All storage	General Study Module	Additional attribute: Scheduled Performing Physician's Name

The MR System supports private SOP classes; for the C-STORE services these private SOP classes are listed in Table 229.

Table 229: Supported Private SOP Classes as SCU and SCP.

SOP Class Name	UID
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2
Philips Private MR Examcard Storage	1.3.46.670589.11.0.0.12.4

Table 230: List of created SOP Classes

SOP Class Name	SOP Class UID
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2
Philips Private MR Examcard Storage	1.3.46.670589.11.0.0.12.4
Media Storage Directory SOP Class	1.2.840.10008.1.3.10

8.5.1. Standard Extended/Specialized/Private SOP Instance

8.5.1.1. CT Image Storage SOP Class

Table 231: Extended DICOM and Private Attributes for CT Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Requesting Physician	0032,1032	PN		VNAP	MWL	-
Requested Procedure Description	0032,1060	LO		VNAP	MWL	-
Requested Contrast Agent	0032,1070	LO		VNAP	MWL	-
Special Needs	0032,1050	LO		ANAP	MWL	-
Requested Procedure ID	0040,1001	SH		VNAP	MWL	-
Reason for the Requested Procedure	0040,1002	LO		ANAP	MWL	-
Requested Procedure Priority	0040,1003	SH		ANAP	MWL	-
Patient Transport Arrangements	0040,1004	LO		ANAP	MWL	-
Requested Procedure Location	0040,1005	LO		ANAP	MWL	-
Issue Date of Imaging Service Request	0040,2004	DA		ANAP	MWL	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Issue Time of Imaging Service Request	0040,2005	TM		ANAP	MWL	-
Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ANAP	AUTO	-
Image Plane Number	2001,100A	IS		ANAP	AUTO	-
Number of Slices	2001,1018	SL	00000078H / 120	ANAP	AUTO	-
MR Series Reconstruction Number	2001,101D	IS		ANAP	AUTO	-
Examination Source	2001,1063	CS		ANAP	AUTO	-
Exam Card Name	2001,10C8	LO		ANAP	AUTO	-
Series Derivation Description	2001,10CC	ST	Empty	ANAP	AUTO	-
Private Creator Group 2005	2005,0015	LO	Philips MR Imaging DD 006	ANAP	AUTO	-
RT Generated Series	2005,1588	LO		ANAP	AUTO	-
RT Blob Data	2005,1589	OB		ANAP	AUTO	-

8.5.1.2. MR Image Storage SOP Class

Table 232: Extended DICOM and private attributes for MR Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Creator-Version UID	0008,9123	UI		ALWAYS	AUTO	-
Scan Options	0018,0022	CS		VNAP	IMPLICIT	-
Number of Phase Encoding Steps	0018,0089	IS		VNAP	IMPLICIT, USER	-
Velocity Encoding Direction	0018,9090	FD		ALWAYS	AUTO	-
Velocity Encoding Minimum Value	0018,9091	FD		ALWAYS	AUTO	-
Respiratory Interval Time	0020,9254	FD		ALWAYS	AUTO	-
Special Needs	0038,0050	LO		ANAP	MWL	Only present when patient demographics received from RIS.

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Scheduled Performing Physician's Name	0040,0006	PN		ANAP	MWL	-
Performed Procedure Step Status	0040,0252	CS		ALWAYS	AUTO	-
DateTime	0040,A120	DT		ANAP	AUTO	-
Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ALWAYS	FIXED	-
MR Series Diffusion Echo Time	2001,1011	FL		ANAP	IMPLICIT	-
MR Series Dynamic Series	2001,1012	CS		VNAP	USER	-
MR Series EPI Factor	2001,1013	SL		ALWAYS	IMPLICIT, USER	-
MR Series Number of Echoes	2001,1014	SL		VNAP	USER	-
MR Series Number of Locations	2001,1015	SS		VNAP	IMPLICIT, USER	-
MR Series Number of Phase Contrast Directions	2001,1016	SS		VNAP	USER	-
MR Series Number of Phases	2001,1017	SL		VNAP	IMPLICIT, USER	-
MR Series Number of Slices	2001,1018	SL		VNAP	IMPLICIT, USER	-
MR Series Partial Matrix Scanned	2001,1019	CS		VNAP	IMPLICIT, USER	-
MR Series Phase Contrast Velocity	2001,101A	FL		ALWAYS	IMPLICIT, USER	-
MR Series Prepulse Delay	2001,101B	FL		VNAP	IMPLICIT, USER	-
MR Series Prepulse Type	2001,101C	CS		VNAP	USER	-
MR Series Reconstruction Number	2001,101D	IS		VNAP	IMPLICIT	-
MR Series Reformat Accuracy	2001,101E	CS		VNAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MR Series Respiration Sync	2001,101F	CS		VNAP	USER	-
MR Series Scanning Technique Desc	2001,1020	LO		ALWAYS	AUTO	-
MR Series Sel Part inversion Recovery	2001,1021	CS		VNAP	USER	-
MR Series Water Fat Shift	2001,1022	FL		VNAP	IMPLICIT, USER	-
MR Series Flip Angle	2001,1023	DS		ALWAYS	IMPLICIT, USER	-
MR Series Is Interactive is Interactive	2001,1024	CS		VNAP	USER	-
MR Series ECHO Time Display	2001,1025	SH		VNAP	USER	-
Stack Sequence	2001,105F	SQ		VNAP	COPY	-
>Stack Number Of Slices	2001,102D	FL		VNAP	COPY	-
>Stack Radial Angle	2001,1032	CS		VNAP	COPY	-
>Stack Radial Axis	2001,1033	SS		VNAP	COPY	-
>Stack Slice Number	2001,1035	CS		VNAP	COPY	-
>StackType	2001,1036	SS		VNAP	COPY	-
MR Series Number of stacks	2001,1060	SL		VNAP	USER	-
Series Transmitted	2001,1061	CS		VNAP	AUTO	-
Series Committed	2001,1062	CS		ANAP	AUTO	-
Series Type	2001,106E	SH		VNAP	AUTO	-
MR Series Acquisition Number	2001,107B	IS		ALWAYS	IMPLICIT	-
MR Series Number Of Dynamic Scans	2001,1081	IS		VNAP	IMPLICIT, USER	-
MR Series ECHO Train Length	2001,1082	IS		VNAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MR Series Imaging Frequency	2001,1083	DS		VNAP	AUTO	-
MR Series Inversion Time	2001,1084	DS		VNAP	AUTO	-
MR Series Magnetic Field Strength	2001,1085	DS		ALWAYS	CONFIG	-
MR Series Number OF Phase Encoding Steps	2001,1086	IS		VNAP	IMPLICIT, USER	-
MR Series Nucleus	2001,1087	SH		VNAP	IMPLICIT, USER	-
MR Series Number of Averages	2001,1088	DS		VNAP	IMPLICIT, USER	-
MR Series Percent Phase Field of View	2001,1089	DS		VNAP	IMPLICIT, USER	-
MR Series Percent Sampling	2001,108A	DS		VNAP	IMPLICIT, USER	-
MR Series Transmitting Coil	2001,108B	SH		VNAP	IMPLICIT, USER	-
Series Derivation Description	2001,10CC	ST		VNAP	AUTO	-
Private Creator Group 2001	2001,0011	LO		VNAP	IMPLICIT, USER	Philips Imaging DD 002
Suitable For	2001,116B	LO		ANAP	IMPLICIT, USER	
CDWI selected algorithm	2001,1189	LO		ANAP	IMPLICIT, USER	-
CDWI selected B values	2001,118A	FL		ANAP	IMPLICIT, USER	-
Private Creator Group 2005	2005,0014	LO	Philips MR Imaging DD 005	ANAP	FIXED	-
Specific Energy Dose	2005,1492	FL		ALWAYS	AUTO	-
Private Creator Group 2005	2005,0015	LO	Philips MR Imaging DD 006	ALWAYS	AUTO	-
MRE Frequency	2005,1553	FL		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MRE Amplitude	2005,1554	FL		ANAP	AUTO	-
MREMEG Frequency	2005,1555	FL		ANAP	AUTO	-
MREMEG Pairs	2005,1556	FL		ANAP	AUTO	-
MREMEG Direction	2005,1557	CS		ANAP	AUTO	-
MREMEG Amplitude	2005,1558	FL		ANAP	AUTO	-
MRE Number of Phase Delays	2005,1559	FL		ANAP	AUTO	This parameter should be used as Integer although VR is specified and stored as Float
MRE Number of Motion Cycles	2005,1560	IS		ANAP	AUTO	-
MRE Motion Meg Phase Delay	2005,1561	FL		ANAP	AUTO	-
MRE Inversion Algorithm Version	2005,1562	LT		ANAP	AUTO	-
Sagittal Slice Order	2005,1563	CS		ANAP	AUTO, COPY	-
Coronal Slice Order	2005,1564	CS		ANAP	AUTO, COPY	-
Transversal Slice Order	2005,1565	CS		ANAP	AUTO, COPY	-
Series Orientation	2005,1566	CS		ANAP	AUTO, COPY	-
MR Stack Reverse	2005,1567	IS		ANAP	AUTO, COPY	-
MRE Phase Delay Number	2005,1568	IS		ANAP	AUTO	-
Number Of Inversion Delays	2005,1571	IS		ANAP	AUTO, COPY	-
Inversion Delay Time	2005,1572	FL		ANAP	AUTO, COPY	-
Inversion Delay Number	2005,1573	IS		ANAP	AUTO, COPY	-
Max DB DT	2005,1574	DS		ANAP	AUTO, COPY	-
Max SAR	2005,1575	DS		ANAP	AUTO, COPY	-
SAR Type	2005,1576	LT		ANAP	AUTO, COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Metal Implant Status	2005,1578	CS		ANAP	AUTO, COPY	-
Orientation Mirror Flip	2005,1579	CS		ANAP	AUTO, COPY	-
SAR Operation Mode	2005,1581	CS		ANAP	AUTO, COPY	-
Spatial Gradient	2005,1582	IS		ANAP	AUTO, COPY	-
Additional Constraints	2005,1583	LT		ANAP	AUTO, COPY	-
Gradient Slew Rate	2005,1585	DS		ANAP	USER	-
MR Study B1rms	2005,1587	DS		ANAP	USER	-
Contrast Information Sequence	2005,1592	SQ		ANAP	USER	-
Private Creator Group 2005	2005,0016	LO	Philips MR Imaging DD 007	ANAP	AUTO	-
SencEnable	2005,1600	SL		VNAP	AUTO	-
SencLowTuningFreq	2005,1601	SL		VNAP	AUTO	-
SencHighTuningFreq	2005,1602	SL		VNAP	AUTO	-
SencModulationFreq	2005,1603	SL		VNAP	AUTO	-
> Contrast/Bolus Agent	0018,0010	LO		ANAP	USER, IMPLICIT	Will have value only if contrast is applied for scans Present if contrast bolus is present in the image, values: Gadolinium, Iodamide meglumine, Iodipamide, Iodixanol, Iodized oil, Iodoalphionic acid, Iodophthalein, Iodopyracet, Iohexol, Ionic iodinated contrast agent, Iopamidol, Iopanoic acid, Iophendylate, Iophenoxic acid,

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
						Iothalamate, Ioversol, Ioxaglate, Ipodate, Mangafodipir trisodium, Meglumine diatrizoate, Meglumine iodipamide, Metrizamide, Metrizoate, Non radiopaque medium, Non-ionic iodinated contrast agent, Oxygen, Propyliodone, Radiopaque medium, Sodium acetriozate, Sodium diatrizoate, Sodium diprotrizoate, Sodium iodipamide, Sodium iodomethamate, Sodium tyropanate, Water not present when no contrast agent is present in the image.
>Contrast/Bolus Route	0018,1040	LO		ANAP	AUTO	Applied Values:(Intravenous route, Intra-arterial route, Intramuscular route, Subcutaneous route, Intracutaneous route, Intraperitoneal route,

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
						Intramedullary route, Intrathecal route, Intra-articular route, Intraepithelial route, Topical route, Oral route, Transluminal route, Intraluminal route, Extraluminal route, By inhalation, Per rectum, Vaginal route)
>Contrast/Bolus Volume	0018,1041	DS		ANAP	IMPLICIT	-
>Contrast/Bolus Start Time	0018,1042	TM		ANAP	IMPLICIT	-
>Contrast/Bolus Total Dose	0018,1044	DS		ANAP	IMPLICIT	-
>Contrast/Bolus Ingredient	0018,1048	CS		ANAP	AUTO	Applied Values:(AIR, BARIUM, CARBON DIOXIDE, GADOLINIUM, IODINE, IRON, OXYGEN, WATER, XENON.)
>Contrast/Bolus Ingredient Concentration	0018,1049	DS		ANAP	IMPLICIT	-
>Bulk Motion Compensation Technique	0018,9172	CS		ANAP	AUTO	Applied technique to reduce bulk or other physiology motion artifacts.
RTAlgorithmsTarget	2005,1604	ST		ANAP	USER, AUTO	-
Private Creator Group 2005	2005,0017	LO	Philips MR Imaging DD 008	ALWAYS	AUTO	-
Series Level Contrast Flag	2005,1705	CS		ANAP	AUTO	-
Series Geo Name	2005,1706	LO		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Level Breath Hold Flag	2005,1707	CS		ANAP	AUTO	-
Study Level Contrast Flag	2005,1708	CS		ANAP	AUTO	-
Parallel Reconstruction Technique	2005,1710	CS		VNAP	AUTO	Indicates Parallel reconstruction technique
T2 Preparation Time	2005,1712	FL		ANAP	AUTO	T2 preparation time for 3D Syntac scans
Syntac3d Enable	2005,1713	CS		ALWAYS	AUTO	Indicates if 3D Syntac scan was performed
RF polarization choice	2005,1714	LO		VNAP	AUTO	Applied values: (CircularPolarized, MultiChannel2)
Private Creator Group 2029	2029,0010	LO	Philips DINxGen DD 001	ANAP	AUTO	-
Study Creation Time	2029,1001	DT		ANAP	AUTO	-
Study Level Modification Flag	2029,1002	CS		ANAP	AUTO	-
Study Suspended Time	2029,1003	DT		ANAP	AUTO	-
Merged Accession Number	2029,1004	ST		ANAP	AUTO	-
Work ItemId	2029,1005	ST		ANAP	AUTO	-
Study Contrast State	2029,1007	CS		ANAP	AUTO	-
Merged Study Description	2029,1009	LT		ANAP	AUTO	-
Auto Voice Information	2029,1011	LT		ANAP	AUTO	-
Study Operator Notes	2029,1012	LT		ANAP	AUTO	-

8.5.1.3. Enhanced MR Image Storage SOP Class

Table 233: Extended DICOM and private attributes for Enhanced MR Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Creator-Version UID	0008,9123	UI		ALWAYS	AUTO	-
Scan Options	0018,0022	CS		VNAP	IMPLICIT	-
Number of Phase Encoding Steps	0018,0089	IS		VNAP	IMPLICIT, USER	-
Velocity Encoding Direction	0018,9090	FD		ALWAYS	AUTO	-
Velocity Encoding Minimum Value	0018,9091	FD		ALWAYS	AUTO	-
Respiratory Interval Time	0020,9254	FD		ALWAYS	AUTO	-
Special Needs	0038,0050	LO		ANAP	MWL	Only present when patient demographics received from RIS.
Scheduled Performing Physician's Name	0040,0006	PN		ANAP	MWL	-
Performed Procedure Step Status	0040,0252	CS		ALWAYS	AUTO	-
DateTime	0040,A120	DT		ANAP	AUTO	-
Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ALWAYS	FIXED	-
MR Series Diffusion Echo Time	2001,1011	FL		ANAP	IMPLICIT	-
MR Series Dynamic Series	2001,1012	CS		VNAP	USER	-
MR Series EPI Factor	2001,1013	SL		ALWAYS	IMPLICIT, USER	-
MR Series Number of Echoes	2001,1014	SL		VNAP	USER	-
MR Series Number of Locations	2001,1015	SS		VNAP	IMPLICIT, USER	-
MR Series Number of Phase Contrast Directions	2001,1016	SS		VNAP	USER	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MR Series Number of Phases	2001,1017	SL		VNAP	IMPLICIT, USER	-
MR Series Number of Slices	2001,1018	SL		VNAP	IMPLICIT, USER	-
MR Series Partial Matrix Scanned	2001,1019	CS		VNAP	IMPLICIT, USER	-
MR Series Phase Contrast Velocity	2001,101A	FL		ALWAYS	IMPLICIT, USER	-
MR Series Prepulse Delay	2001,101B	FL		VNAP	IMPLICIT, USER	-
MR Series Prepulse Type	2001,101C	CS		VNAP	USER	-
MR Series Reconstruction Number	2001,101D	IS		VNAP	IMPLICIT	-
MR Series Reformat Accuracy	2001,101E	CS		VNAP	AUTO	-
MR Series Respiration Sync	2001,101F	CS		VNAP	USER	-
MR Series Scanning Technique Desc	2001,1020	LO		ALWAYS	AUTO	-
MR Series Sel Part inversion Recovery	2001,1021	CS		VNAP	USER	-
MR Series Water Fat Shift	2001,1022	FL		VNAP	IMPLICIT, USER	-
MR Series Flip Angle	2001,1023	DS		ALWAYS	IMPLICIT, USER	-
MR Series Is Interactive is Interactive	2001,1024	CS		VNAP	USER	-
MR Series ECHO Time Display	2001,1025	SH		VNAP	USER	-
Stack Sequence	2001,105F	SQ		VNAP	COPY	-
>Stack Number Of Slices	2001,102D	FL		VNAP	COPY	-
>Stack Radial Angle	2001,1032	CS		VNAP	COPY	-
>Stack Radial Axis	2001,1033	SS		VNAP	COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Stack Slice Number	2001,1035	CS		VNAP	COPY	-
>StackType	2001,1036	SS		VNAP	COPY	-
MR Series Number of stacks	2001,1060	SL		VNAP	USER	-
Series Transmitted	2001,1061	CS		VNAP	AUTO	-
Series Committed	2001,1062	CS		ANAP	AUTO	-
Series Type	2001,106E	SH		VNAP	AUTO	-
MR Series Acquisition Number	2001,107B	IS		ALWAYS	IMPLICIT	-
MR Series Number Of Dynamic Scans	2001,1081	IS		VNAP	IMPLICIT, USER	-
MR Series ECHO Train Length	2001,1082	IS		VNAP	AUTO	-
MR Series Imaging Frequency	2001,1083	DS		VNAP	AUTO	-
MR Series Inversion Time	2001,1084	DS		VNAP	AUTO	-
MR Series Magnetic Field Strength	2001,1085	DS		ALWAYS	CONFIG	-
MR Series Number OF Phase Encoding Steps	2001,1086	IS		VNAP	IMPLICIT, USER	-
MR Series Nucleus	2001,1087	SH		VNAP	IMPLICIT, USER	-
MR Series Number of Averages	2001,1088	DS		VNAP	IMPLICIT, USER	-
MR Series Percent Phase Field of View	2001,1089	DS		VNAP	IMPLICIT, USER	-
MR Series Percent Sampling	2001,108A	DS		VNAP	IMPLICIT, USER	-
MR Series Transmitting Coil	2001,108B	SH		VNAP	IMPLICIT, USER	-
Series Derivation Description	2001,10CC	ST		VNAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Private Creator Group 2001	2001,0011	LO		VNAP	IMPLICIT, USER	Philips Imaging DD 002
Suitable For	2001,116B	LO		ANAP	IMPLICIT, USER	
CDWI selected algorithm	2001,1189	LO		ANAP	IMPLICIT, USER	-
CDWI selected B values	2001,118A	FL		ANAP	IMPLICIT, USER	-
Private Creator Group 2005	2005,0014	LO	Philips MR Imaging DD 005	ANAP	FIXED	-
Specific Energy Dose	2005,1492	FL		ALWAYS	AUTO	-
Private Creator Group 2005	2005,0015	LO	Philips MR Imaging DD 006	ALWAYS	AUTO	-
MRE Frequency	2005,1553	FL		ANAP	AUTO	-
MRE Amplitude	2005,1554	FL		ANAP	AUTO	-
MREMEG Frequency	2005,1555	FL		ANAP	AUTO	-
MREMEG Pairs	2005,1556	FL		ANAP	AUTO	-
MREMEG Direction	2005,1557	CS		ANAP	AUTO	-
MREMEG Amplitude	2005,1558	FL		ANAP	AUTO	-
MRE Number of Phase Delays	2005,1559	FL		ANAP	AUTO	This parameter should be used as Integer although VR is specified and stored as Float
MRE Number of Motion Cycles	2005,1560	IS		ANAP	AUTO	-
MRE Motion Meg Phase Delay	2005,1561	FL		ANAP	AUTO	-
MRE Inversion Algorithm Version	2005,1562	LT		ANAP	AUTO	-
Sagittal Slice Order	2005,1563	CS		ANAP	AUTO, COPY	-
Coronal Slice Order	2005,1564	CS		ANAP	AUTO, COPY	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Transversal Slice Order	2005,1565	CS		ANAP	AUTO, COPY	-
Series Orientation	2005,1566	CS		ANAP	AUTO, COPY	-
MR Stack Reverse	2005,1567	IS		ANAP	AUTO, COPY	-
MRE Phase Delay Number	2005,1568	IS		ANAP	AUTO	-
Number Of Inversion Delays	2005,1571	IS		ANAP	AUTO, COPY	-
Inversion Delay Time	2005,1572	FL		ANAP	AUTO, COPY	-
Inversion Delay Number	2005,1573	IS		ANAP	AUTO, COPY	-
Max DB DT	2005,1574	DS		ANAP	AUTO, COPY	-
Max SAR	2005,1575	DS		ANAP	AUTO, COPY	-
SAR Type	2005,1576	LT		ANAP	AUTO, COPY	-
Metal Implant Status	2005,1578	CS		ANAP	AUTO, COPY	-
Orientation Mirror Flip	2005,1579	CS		ANAP	AUTO, COPY	-
SAR Operation Mode	2005,1581	CS		ANAP	AUTO, COPY	-
Spatial Gradient	2005,1582	IS		ANAP	AUTO, COPY	-
Additional Constraints	2005,1583	LT		ANAP	AUTO, COPY	-
Gradient Slew Rate	2005,1585	DS		ANAP	USER	-
MR Study B1rms	2005,1587	DS		ANAP	USER	-
Contrast Information Sequence	2005,1592	SQ		ANAP	USER	-
Private Creator Group 2005	2005,0016	LO	Philips MR Imaging DD 007	ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SencEnable	2005,1600	SL		VNAP	AUTO	-
SencLowTuningFreq	2005,1601	SL		VNAP	AUTO	-
SencHighTuningFreq	2005,1602	SL		VNAP	AUTO	-
SencModulationFreq	2005,1603	SL		VNAP	AUTO	-
> Contrast/Bolus Agent	0018,0010	LO		ANAP	USER, IMPLICIT	Will have value only if contrast is applied for scans Present if contrast bolus is present in the image, values: Gadolinium, Iodamide meglumine, Iodipamide, Iodixanol, Iodized oil, Iodoalphionic acid, Iodophthalein, Iodopyracet, Iohexol, Ionic iodinated contrast agent, Iopamidol, Iopanoic acid, Iophendylate, Iophenoxic acid, Iothalamate, Ioversol, Ioxaglate, Ipodate, Mangafodipir trisodium, Meglumine diatrizoate, Meglumine iodipamide, Metrizamide, Metrizoate, Non radiopaque medium, Non-ionic iodinated contrast agent, Oxygen, Propyliodone, Radiopaque medium, Sodium acetriozate, Sodium diatrizoate, Sodium diprotrizoate, Sodium iodipamide, Sodium iodomethamate, Sodium tyropanate, Water not present when no contrast agent is present in the image.
>Contrast/Bolus Route	0018,1040	LO		ANAP	AUTO	Applied Values: (Intravenous route,

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
						Intra-arterial route, Intramuscular route, Subcutaneous route, Intracutaneous route, Intraperitoneal route, Intramedullary route, Intrathecal route, Intra-articular route, Intraepithelial route, Topical route, Oral route, Transluminal route, Intraluminal route, Extraluminal route, By inhalation, Per rectum, Vaginal route)
>Contrast/Bolus Volume	0018,1041	DS		ANAP	IMPLICIT	-
>Contrast/Bolus Start Time	0018,1042	TM		ANAP	IMPLICIT	-
>Contrast/Bolus Total Dose	0018,1044	DS		ANAP	IMPLICIT	-
>Contrast/Bolus Ingredient	0018,1048	CS		ANAP	AUTO	Applied Values:(AIR, BARIUM, CARBON DIOXIDE, GADOLINIUM, IODINE, IRON, OXYGEN, WATER, XENON.)
>Contrast/Bolus Ingredient Concentration	0018,1049	DS		ANAP	IMPLICIT	-
>Bulk Motion Compensation Technique	0018,9172	CS		ANAP	AUTO	Applied technique to reduce bulk or other physiology motion artifacts.
RTAlgorithmsTarget	2005,1604	ST		ANAP	USER, AUTO	-
Private Creator Group 2005	2005,0017	LO	Philips MR Imaging DD 008	ALWAYS	AUTO	-
Series Level Contrast Flag	2005,1705	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Geo Name	2005,1706	LO		ANAP	AUTO	-
Study Level Breath Hold Flag	2005,1707	CS		ANAP	AUTO	-
Study Level Contrast Flag	2005,1708	CS		ANAP	AUTO	-
Parallel Reconstruction Technique	2005,1710	CS		VNAP	AUTO	Indicates Parallel reconstruction technique
T2 Preparation Time	2005,1712	FL		ANAP	AUTO	T2 preparation time for 3D Syntac scans
Syntac3d Enable	2005,1713	CS		ALWAYS	AUTO	Indicates if 3D Syntac scan was performed
RF polarization choice	2005,1714	LO		VNAP	AUTO	Applied values: (CircularPolarized, MultiChannel2)
Private Creator Group 2029	2029,0010	LO	Philips DINxGen DD 001	ANAP	AUTO	-
Study Creation Time	2029,1001	DT		ANAP	AUTO	-
Study Level Modification Flag	2029,1002	CS		ANAP	AUTO	-
Study Suspended Time	2029,1003	DT		ANAP	AUTO	-
Merged Accession Number	2029,1004	ST		ANAP	AUTO	-
Work ItemId	2029,1005	ST		ANAP	AUTO	-
Study Contrast State	2029,1007	CS		ANAP	AUTO	-
Merged Study Description	2029,1009	LT		ANAP	AUTO	-
Auto Voice Information	2029,1011	LT		ANAP	AUTO	-
Study Operator Notes	2029,1012	LT		ANAP	AUTO	-

8.5.1.4. MR Spectroscopy Storage SOP Class

Table 234: Extended DICOM and private attributes for MR Spectroscopy Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Creator-Version UID	0008,9123	UI		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Derivation Image Sequence	0008,9124	SQ		ANAP	AUTO	-
>Source Image Sequence	0008,2112	SQ		ALWAYS	AUTO	-
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
>Derivation Code Sequence	0008,9215	SQ		ALWAYS	AUTO	-
>>Code Value	0008,0100	SH		ALWAYS	AUTO	from CID 7203
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	from CID 7203
>>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	from CID 7203
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	from CID 7203
Pixel Presentation	0008,9205	CS		ALWAYS	AUTO	-
Scan Options	0018,0022	CS		VNAP	IMPLICIT	-
Slice Thickness	0018,0050	DS		ANAP	AUTO	-
Inversion Time	0018,0082	DS		ANAP	IMPLICIT, USER	-
Number of Phase Encoding Steps	0018,0089	IS		VNAP	IMPLICIT, USER	-
Pixel Bandwidth	0018,0095	DS		ALWAYS	AUTO	-
Phase Contrast	0018,9014	CS		ALWAYS	AUTO	-
Time of Flight Contrast	0018,9015	CS		ALWAYS	AUTO	-
Spoiling	0018,9016	CS		ALWAYS	AUTO	-
Tag Angle First Axis	0018,9019	FD		ANAP	AUTO	-
Blood Signal Nulling	0018,9022	CS		ALWAYS	AUTO	-
Saturation Recovery	0018,9024	CS		ALWAYS	AUTO	-
Tag Spacing First Dimension	0018,9030	FD		ANAP	AUTO	-
Partial Fourier Direction	0018,9036	CS		ALWAYS	AUTO	-
MR Acquisition Frequency Encoding Steps	0018,9058	US		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MR Acquisition Phase Encoding Steps in-plane	0018,9231	US		ANAP	AUTO	-
Special Needs	0038,0050	LO		ANAP	MWL	Only present when patient demographics received from RIS.
Scheduled Performing Physician's Name	0040,0006	PN		ANAP	AUTO, MWL	-
Performed Procedure Step Status	0040,0252	CS		ALWAYS	AUTO	-
DateTime	0040,A120	DT		ANAP	AUTO	-
Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ALWAYS	FIXED	-
MR Series Diffusion Echo Time	2001,1011	FL		ANAP	IMPLICIT	-
MR Series Dynamic Series	2001,1012	CS		VNAP	USER	-
MR Series EPI Factor	2001,1013	SL		ALWAYS	IMPLICIT, USER	-
MR Series Number of Echoes	2001,1014	SL		VNAP	USER	-
MR Series Number of Locations	2001,1015	SS		VNAP	IMPLICIT, USER	-
MR Series Number of Phase Contrast Directions	2001,1016	SS		VNAP	USER	-
MR Series Number of Phases	2001,1017	SL		VNAP	IMPLICIT, USER	-
MR Series Number of Slices	2001,1018	SL		VNAP	IMPLICIT, USER	-
MR Series Partial Matrix Scanned	2001,1019	CS		VNAP	IMPLICIT, USER	-
MR Series Phase Contrast Velocity	2001,101A	FL		ALWAYS	IMPLICIT, USER	-
MR Series Prepulse Delay	2001,101B	FL		VNAP	IMPLICIT, USER	-
MR Series Prepulse Type	2001,101C	CS		VNAP	USER	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MR Series Reconstruction Number	2001,101D	IS		VNAP	IMPLICIT	-
MR Series Reformat Accuracy	2001,101E	CS		VNAP	AUTO	-
MR Series Respiration Sync	2001,101F	CS		VNAP	USER	-
MR Series Scanning Technique Desc	2001,1020	LO		ALWAYS	AUTO	-
MR Series Sel Part inversion Recovery	2001,1021	CS		VNAP	USER	-
MR Series Water Fat Shift	2001,1022	FL		VNAP	IMPLICIT, USER	-
MR Series Flip Angle	2001,1023	DS		ALWAYS	IMPLICIT, USER	-
MR Series Is Interactive is Interactive	2001,1024	CS		VNAP	USER	-
MR Series ECHO Time Display	2001,1025	SH		VNAP	USER	-
Stack Sequence	2001,105F	SQ		VNAP	COPY	-
>Stack Number Of Slices	2001,102D	FL		VNAP	COPY	-
>Stack Radial Angle	2001,1032	CS		VNAP	COPY	-
>Stack Radial Axis	2001,1033	SS		VNAP	COPY	-
>Stack Slice Number	2001,1035	CS		VNAP	COPY	-
>StackType	2001,1036	SS		VNAP	COPY	-
MR Series Number of stacks	2001,1060	SL		VNAP	USER	-
Series Transmitted	2001,1061	CS		VNAP	AUTO	-
Series Committed	2001,1062	CS		ANAP	AUTO	-
Series Type	2001,106E	SH		VNAP	AUTO	-
MR Series Acquisition Number	2001,107B	IS		ALWAYS	IMPLICIT	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MR Series Number Of Dynamic Scans	2001,1081	IS		VNAP	IMPLICIT, USER	-
MR Series ECHO Train Length	2001,1082	IS		VNAP	AUTO	-
MR Series Imaging Frequency	2001,1083	DS		VNAP	AUTO	-
MR Series Inversion Time	2001,1084	DS		VNAP	AUTO	-
MR Series Magnetic Field Strength	2001,1085	DS		ALWAYS	CONFIG	-
MR Series Number OF Phase Encoding Steps	2001,1086	IS		VNAP	IMPLICIT, USER	-
MR Series Nucleus	2001,1087	SH		VNAP	IMPLICIT, USER	-
MR Series Number of Averages	2001,1088	DS		VNAP	IMPLICIT, USER	-
MR Series Percent Phase Field of View	2001,1089	DS		VNAP	IMPLICIT, USER	-
MR Series Percent Sampling	2001,108A	DS		VNAP	IMPLICIT, USER	-
MR Series Transmitting Coil	2001,108B	SH		VNAP	IMPLICIT, USER	-
Series Derivation Description	2001,10CC	ST		VNAP	AUTO	-
Private Creator Group 2001	2001,0011	LO		VNAP	IMPLICIT, USER	Philips Imaging DD 002
Suitable For	2001,116B	LO		ANAP	IMPLICIT, USER	
CDWI selected algorithm	2001,1189	LO		ANAP	IMPLICIT, USER	-
CDWI selected B values	2001,118A	FL		ANAP	IMPLICIT, USER	-
Private Creator Group 2005	2005,0015	LO	Philips MR Imaging DD 006	ALWAYS	AUTO	-
MRE Frequency	2005,1553	FL		ANAP	AUTO	-
MRE Amplitude	2005,1554	FL		ANAP	AUTO	-
MREMEG Frequency	2005,1555	FL		ANAP	AUTO	-
MREMEG Pairs	2005,1556	FL		ANAP	AUTO	-
MREMEG Direction	2005,1557	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MREMEG Amplitude	2005,1558	FL		ANAP	AUTO	-
MRE Number of Phase Delays	2005,1559	FL		ANAP	AUTO	This parameter should be used as Integer although VR is specified and stored as Float
MRE Number of Motion Cycles	2005,1560	IS		ANAP	AUTO	-
MRE Motion Meg Phase Delay	2005,1561	FL		ANAP	AUTO	-
MRE Inversion Algorithm Version	2005,1562	LT		ANAP	AUTO	-
Sagittal Slice Order	2005,1563	CS		ANAP	AUTO, COPY	-
Coronal Slice Order	2005,1564	CS		ANAP	AUTO, COPY	-
Transversal Slice Order	2005,1565	CS		ANAP	AUTO, COPY	-
Series Orientation	2005,1566	CS		ANAP	AUTO, COPY	-
MR Stack Reverse	2005,1567	IS		ANAP	AUTO, COPY	-
MRE Phase Delay Number	2005,1568	IS		ANAP	AUTO	-
Number Of Inversion Delays	2005,1571	IS		ANAP	AUTO, COPY	-
Inversion Delay Time	2005,1572	FL		ANAP	AUTO, COPY	-
Inversion Delay Number	2005,1573	IS		ANAP	AUTO, COPY	-
Max DB DT	2005,1574	DS		ANAP	AUTO, COPY	-
Max SAR	2005,1575	DS		ANAP	AUTO, COPY	-
SAR Type	2005,1576	LT		ANAP	AUTO, COPY	-
Metal Implant Status	2005,1578	CS		ANAP	AUTO, COPY	-
Orientation Mirror Flip	2005,1579	CS		ANAP	AUTO, COPY	-
SAR Operation Mode	2005,1581	CS		ANAP	AUTO, COPY	-
Spatial Gradient	2005,1582	IS		ANAP	AUTO, COPY	-
Additional Constraints	2005,1583	LT		ANAP	AUTO, COPY	-
Gradient Slew Rate	2005,1585	DS		ANAP	USER	-
MR Study B1rms	2005,1587	DS		ANAP	USER	-
IsJEditingSeries	2005,1597	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MRSpectrumEditingType	2005,1598	SS		ANAP	AUTO	-
MRSeriesNrOfDiffOrder	2005,1599	SL		VNAP	AUTO	-
Private Creator Group 2005	2005,0016	LO	Philips MR Imaging DD 007	ANAP	AUTO	-
SencEnable	2005,1600	SL		VNAP	AUTO	-
SencLowTuningFreq	2005,1601	SL		VNAP	AUTO	-
SencHighTuningFreq	2005,1602	SL		VNAP	AUTO	-
SencModulationFreq	2005,1603	SL		VNAP	AUTO	-
RTAlgorithmsTarget	2005,1604	ST		ANAP	USER, AUTO	-
Private Creator Group 2005	2005,0017	LO	Philips MR Imaging DD 008	ALWAYS	AUTO	-
Study Level Breath Hold Flag	2005,1707	CS		ANAP	AUTO	-
Study Level Contrast Flag	2005,1708	CS		ANAP	AUTO	-
RF polarization choice	2005,1714	LO		VNAP	AUTO	Applied values: (CircularPolarized, MultiChannel2)
Study Creation Time	2029,1001	DT		ANAP	AUTO	-
Private Creator Group 2029	2029,0010	LO	Philips DINxGen DD 001	ANAP	AUTO	-
Study Level Modification Flag	2029,1002	CS		ANAP	AUTO	-
Study Suspended Time	2029,1003	DT		ANAP	AUTO	-
Merged Accession Number	2029,1004	ST		ANAP	AUTO	-
Work ItemId	2029,1005	ST		ANAP	AUTO	-
Study Contrast State	2029,1007	CS		ANAP	AUTO	-
Merged Study Description	2029,1009	LT		ANAP	AUTO	-
Auto Voice Information	2029,1011	LT		ANAP	AUTO	-
Study Operator Notes	2029,1012	LT		ANAP	AUTO	-

8.5.1.5. Secondary Capture Image Storage SOP Class

Table 235: Extended DICOM and private attributes for Secondary Capture Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Scanning Sequence	0018,0020	CS		ANAP	AUTO	-
Sequence Variant	0018,0021	CS		ANAP	AUTO	-
Scan Options	0018,0022	CS		ANAP	IMPLICIT	-
MR Acquisition Type	0018,0023	CS		ANAP	AUTO	-
Slice Thickness	0018,0050	DS		ANAP	AUTO	-
Repetition Time	0018,0080	DS		ANAP	IMPLICIT, USER	-
Echo Time	0018,0081	DS		ANAP	IMPLICIT, USER	-
Number of Averages	0018,0083	DS		ANAP	IMPLICIT, USER	-
Imaging Frequency	0018,0084	DS		ANAP	IMPLICIT	-
Imaged Nucleus	0018,0085	SH		ANAP	IMPLICIT	-
Echo Number(s)	0018,0086	IS		ANAP	IMPLICIT	-
Magnetic Field Strength	0018,0087	DS		ANAP	CONFIG	-
Spacing Between Slices	0018,0088	DS		ANAP	IMPLICIT, USER	
Number of Phase Encoding Steps	0018,0089	IS		ANAP	IMPLICIT, USER	-
Echo Train Length	0018,0091	IS		ANAP	IMPLICIT, USER	-
Percent Sampling	0018,0093	DS		ANAP	IMPLICIT, USER	-
Percent Phase Field of View	0018,0094	DS		ANAP	IMPLICIT, USER	-
Pixel Bandwidth	0018,0095	DS		ANAP	AUTO	-
Reconstruction Diameter	0018,1100	DS		ANAP	CONFIG	Value is a copy of the largest value of the Field of View
Receive Coil Name	0018,1250	SH		ANAP	IMPLICIT, USER	-
Transmit Coil Name	0018,1251	SH		ANAP	IMPLICIT, USER	-
Acquisition Matrix	0018,1310	US		ANAP	IMPLICIT	-
In-plane Phase Encoding Direction	0018,1312	CS		ANAP	IMPLICIT	-
Flip Angle	0018,1314	DS		ANAP	IMPLICIT, USER	-
SAR	0018,1316	DS		ANAP	IMPLICIT, USER	-
dB/dt	0018,1318	DS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
B1rms	0018,1320	FL		ANAP	AUTO	-
Diffusion b-value	0018,9087	FD		ANAP	AUTO	
Diffusion Gradient Orientation	0018,9089	FD		ANAP	AUTO	
Image Position (Patient)	0020,0032	DS		ANAP	COPY	-
Image Orientation (Patient)	0020,0037	DS		ANAP	COPY	-
Frame of Reference UID	0020,0052	UI		ANAP	COPY	-
Temporal Position Identifier	0020,0100	IS		ANAP	IMPLICIT	-
Number of Temporal Positions	0020,0105	IS		ANAP	IMPLICIT, USER	-
Position Reference Indicator	0020,1040	LO		ANAP	FIXED	-
Slice Location	0020,1041	DS		ANAP	AUTO	
Performed Procedure Step Status	0040,0252	CS		ALWAYS	AUTO	-
DateTime	0040,A120	DT		ALWAYS	AUTO	-
Special Needs	0038,0050	LO		ANAP	COPY	-
Scheduled Performing Physician's Name	0040,0006	PN		ANAP	MWL	-
Performed Station AE Title	0040,0241	AE		ANAP	AUTO	-
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	COPY	-
Film Consumption Sequence	0040,0321	SQ		ANAP	AUTO	-
Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ALWAYS	AUTO	-
MR Image Chemical Shift	2001,1001	FL		ANAP	USER	-
Chemical Shift Number MR	2001,1002	IS		ANAP	IMPLICIT	-
Diffusion B-Factor	2001,1003	FL		ANAP	USER	-
Diffusion Direction	2001,1004	CS		ANAP	USER	-
Image Type ED ES	2001,1007	CS		VNAP	IMPLICIT, USER	-
Diffusion Echo Time	2001,1011	FL		ANAP	IMPLICIT	-
Dynamic Series	2001,1012	CS		VNAP	USER	-
EPI Factor	2001,1013	SL		ALWAYS	IMPLICIT, USER	-
Number of Echoes	2001,1014	SL		VNAP	USER	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	-
MR Series Reconstruction Number	2001,101D	IS		VNAP	IMPLICIT	-
MR Series Reformat Accuracy	2001,101E	CS		VNAP	AUTO	-
Respiration Sync	2001,101F	CS		VNAP	USER	-
MR Series Scanning Technique Desc	2001,1020	LO		ALWAYS	AUTO	-
MR Series Sel Part inversion Recovery	2001,1021	CS		VNAP	USER	-
MR Series Water Fat Shift	2001,1022	FL		VNAP	IMPLICIT, USER	-
MR Series Flip Angle	2001,1023	DS		ALWAYS	IMPLICIT, USER	-
MR Series Is Interactive is Interactive	2001,1024	CS		VNAP	USER	-
MR Series ECHO Time Display	2001,1025	SH		VNAP	USER	-
Stack Sequence	2001,105F	SQ		VNAP	COPY	-
Phase Number	2001,1008	IS		VNAP	IMPLICIT	-
Image Prepulse Delay	2001,1009	FL		ALWAYS	AUTO	-
Image Plane Number	2001,100A	IS		ANAP	AUTO	-
Image Enhanced	2001,1006	CS		VNAP	IMPLICIT, USER	
MR Series Number of stacks	2001,1060	SL		VNAP	USER	-
Series Transmitted	2001,1061	CS		VNAP	AUTO	-
Series Committed	2001,1062	CS		ANAP	AUTO	
Series Type	2001,106E	SH		VNAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MR Series Reconstruction Number	2001,101D	IS		VNAP	IMPLICIT	-
MR Series Acquisition Number	2001,107B	IS		ALWAYS	IMPLICIT	-
Series Transmitted	2001,1061	CS		ANAP	AUTO	-
no_dynamic_scans	2001,1081	IS		VNAP	IMPLICIT, USER	-
MR Series ECHO Train Length	2001,1082	IS		VNAP	AUTO	-
MR Series Imaging Frequency	2001,1083	DS		VNAP	AUTO	-
MR Series Inversion Time	2001,1084	DS		VNAP	AUTO	-
MR Series Magnetic Field Strength	2001,1085	DS		ALWAYS	CONFIG	-
MR Series Number OF Phase Encoding Steps	2001,1086	IS		VNAP	IMPLICIT, USER	-
MR Series Nucleus	2001,1087	SH		VNAP	IMPLICIT, USER	-
MR Series Number of Averages	2001,1088	DS		VNAP	IMPLICIT, USER	-
MR Series Percent Phase Field of View	2001,1089	DS		VNAP	IMPLICIT, USER	-
MR Series Percent Sampling	2001,108A	DS		VNAP	IMPLICIT, USER	-
MR Series Transmitting Coil	2001,108B	SH		VNAP	IMPLICIT, USER	-
Series Derivation Description	2001,10CC	ST		VNAP	AUTO	-
Prospective Motion Correction	2001,10F1	FL		ANAP	AUTO	-
Retrospective Motion Correction	2001,10F2	FL		ANAP	AUTO	-
Private Creator Group 2001	2001,0011	LO		VNAP	IMPLICIT, USER	Philips Imaging DD 002
Suitable For	2001,116B	LO		ANAP	IMPLICIT, USER	
CDWI selected algorithm	2001,1189	LO		ANAP	IMPLICIT, USER	-
CDWI selected B values	2001,118A	FL		ANAP	IMPLICIT, USER	-
Private Creator Group 2005	2005,0017	LO	Philips MR Imaging DD 008	ALWAYS	AUTO	-
Study Level Breath Hold Flag	2005,1707	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Level Contrast Flag	2005,1708	CS		ANAP	AUTO	-
RF polarization choice	2005,1714	LO		VNAP	AUTO	Applied values: (CircularPolarized, MultiChannel2)
Private Creator Group 2029	2029,0010	LO		ANAP	AUTO	Philips DINxGen DD 001
Study Creation Time	2029,1001	DT		ANAP	AUTO	-
Study Level Modification Flag	2029,1002	CS		ANAP	AUTO	-
Study Suspended Time	2029,1003	DT		ANAP	AUTO	-
Merged Accession Number	2029,1004	ST		ANAP	AUTO	-
Work ItemId	2029,1005	ST		ANAP	AUTO	-
Study Contrast State	2029,1007	CS		ANAP	AUTO	-
Merged Study Description	2029,1009	LT		ANAP	AUTO	-
Auto Voice Information	2029,1011	LT		ANAP	AUTO	-
Study Operator Notes	2029,1012	LT		ANAP	AUTO	-

8.5.1.6. Grayscale Softcopy Presentation State Storage SOP Class

Table 236: Extended DICOM and private attributes for Grayscale Softcopy Presentation State Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Requesting Physician	0032,1032	PN		ANAP	COPY	-
Requesting Service	0032,1033	LO		ANAP	COPY	-
Requested Procedure Description	0032,1060	LO		ANAP	AUTO	-
Study Comments (retired)	0032,4000	LT		ANAP	AUTO, USER	Comments added on MR
Special Needs	0038,0050	LO		ANAP	COPY	-
Scheduled Performing Physician's Name	0040,0006	PN		ANAP	AUTO	-
Performed Procedure Step End Time	0040,0251	TM		ANAP	AUTO	-
Performed Procedure Step Status	0040,0252	CS		ALWAYS	AUTO	-
Requested Procedure ID	0040,1001	SH		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Requested Procedure Comments	0040,1400	LT		ANAP	MWL, USER	-
Imaging Service Request Comments	0040,2400	LT		ANAP	MWL, USER	-
Private Creator Group 2001	2001,0010	LO	Philips Imaging DD 001	ALWAYS	AUTO	-
Presentation State Subtraction Active	2001,1026	CS		ANAP	AUTO	-
Series Transmitted	2001,1061	CS		ANAP	AUTO	-
Series Committed	2001,1062	CS		ANAP	AUTO	-
Examination Source	2001,1063	CS		ANAP	AUTO	-
LinearPresentationGLTrafoshapesub	2001,1067	CS		ANAP	AUTO	-
GL TrafoType	2001,1077	CS		ANAP	AUTO	-
Pixel Processing Kernel Size	2001,109F	US		ANAP	AUTO	-
Private Creator Group 2001 (90)	2001,0090	LO		ANAP	AUTO	-
Private Creator Group 2005	2005,0017	LO	Philips MR Imaging DD 008	ALWAYS	AUTO	-
Study Level Breath Hold Flag	2005,1707	CS		ANAP	AUTO	-
Study Level Contrast Flag	2005,1708	CS		ANAP	AUTO	-
RF polarization choice	2005,1714	LO		VNAP	AUTO	Applied values: (CircularPolarized, MultiChannel2)
Private Creator Group 2029	2029,0010	LO	Philips DINxGen DD 001	ANAP	AUTO	-
Study Creation Time	2029,1001	DT		ANAP	AUTO	-
Study Level Modification Flag	2029,1002	CS		ANAP	AUTO	-
Study Suspended Time	2029,1003	DT		ANAP	AUTO	-
Merged Accession Number	2029,1004	ST		ANAP	AUTO	-
Work ItemId	2029,1005	ST		ANAP	AUTO	-
Study Contrast State	2029,1007	CS		ANAP	AUTO	-
Merged Study Description	2029,1009	LT		ANAP	AUTO	-
Auto Voice Information	2029,1011	LT		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Operator Notes	2029,1012	LT		ANAP	AUTO	-

8.5.1.7. Raw Data Storage SOP Class

Table 237: Extended DICOM and private attributes for Raw Data Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Pixel Presentation	0008,9205	CS		ALWAYS	AUTO	-
Volumetric Properties	0008,9206	CS		ALWAYS	AUTO	-
Volume Based Calculation Technique	0008,9207	CS		ALWAYS	AUTO	-
Pixel Bandwidth	0018,0095	DS		ALWAYS	AUTO	-
Pulse Sequence Name	0018,9005	SH		ALWAYS	AUTO	-
Echo Pulse Sequence	0018,9008	CS		ALWAYS	AUTO	-
Multiple Spin Echo	0018,9011	CS		ALWAYS	AUTO	-
Multi-planar Excitation	0018,9012	CS		ALWAYS	AUTO	-
Phase Contrast	0018,9014	CS		ALWAYS	AUTO	-
Time of Flight Contrast	0018,9015	CS		ALWAYS	AUTO	-
Spoiling	0018,9016	CS		ALWAYS	AUTO	-
Steady State Pulse Sequence	0018,9017	CS		ALWAYS	AUTO	-
Echo Planar Pulse Sequence	0018,9018	CS		ALWAYS	AUTO	-
Magnetization Transfer	0018,9020	CS		ANAP	AUTO	-
T2 Preparation	0018,9021	CS		ALWAYS	AUTO	-
Blood Signal Nulling	0018,9022	CS		ALWAYS	AUTO	-
Saturation Recovery	0018,9024	CS		ALWAYS	AUTO	-
Spectrally Selected Suppression	0018,9025	CS		ALWAYS	AUTO	-
Spatial Pre-saturation	0018,9027	CS		ALWAYS	AUTO	-
Tagging	0018,9028	CS		ANAP	AUTO	-
Oversampling Phase	0018,9029	CS		ANAP	AUTO	-
Geometry of k-Space Traversal	0018,9032	CS		ALWAYS	AUTO	-
Segmented k-Space Traversal	0018,9033	CS		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rectilinear Phase Encode Reordering	0018,9034	CS		ALWAYS	AUTO	-
Tag Thickness	0018,9035	FD		ANAP	AUTO	-
Partial Fourier Direction	0018,9036	CS		ALWAYS	AUTO	-
Cardiac Synchronization Technique	0018,9037	CS		ALWAYS	AUTO	-
Transmit Coil Type	0018,9051	CS		ALWAYS	AUTO	-
Chemical Shift Reference	0018,9053	FD		ALWAYS	AUTO	-
MR Acquisition Frequency Encoding Steps	0018,9058	US		ALWAYS	AUTO	-
Velocity Encoding Direction	0018,9090	FD		ALWAYS	AUTO	-
Velocity Encoding Minimum Value	0018,9091	FD		ALWAYS	AUTO	-
Number of k-Space Trajectories	0018,9093	US		ALWAYS	AUTO	-
Frequency Correction	0018,9101	CS		ALWAYS	AUTO	-
Parallel Reduction Factor out-ofplane	0018,9155	FD		ALWAYS	AUTO	-
Parallel Reduction Factor Second In-plane	0018,9168	FD		ALWAYS	AUTO	-
Respiratory Motion Compensation Technique	0018,9170	CS		ALWAYS	AUTO	-
Respiratory Signal Source	0018,9171	CS		ANAP	AUTO	-
Bulk Motion Compensation Technique	0018,9172	CS		ALWAYS	AUTO	-
Applicable Safety Standard Agency	0018,9174	CS		ALWAYS	AUTO	-
Specific Absorption Rate Definition	0018,9179	CS		ALWAYS	AUTO	-
Gradient Output Type	0018,9180	CS		ALWAYS	AUTO	-
Specific Absorption Rate Value	0018,9181	FD		ALWAYS	AUTO	-
Gradient Output	0018,9182	FD		ALWAYS	AUTO	-
Water Referenced Phase Correction	0018,9199	CS		ALWAYS	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
MR Spectroscopy Acquisition Type	0018,9200	CS		ANAP	AUTO	-
MR Acquisition Phase Encoding Steps in-plane	0018,9231	US		ALWAYS	AUTO	-
RF Echo Train Length	0018,9240	US		ALWAYS	AUTO	-
Gradient Echo Train Length	0018,9241	US		ALWAYS	AUTO	-
Frame Laterality	0020,9072	CS		ALWAYS	AUTO	-
Respiratory Interval Time	0020,9254	FD		ALWAYS	AUTO	-
Nominal Respiratory Trigger Delay Time	0020,9255	FD		ALWAYS	AUTO	-
Number of Frames	0028,0008	IS		ALWAYS	AUTO	-
LUT Explanation	0028,3003	LO		ANAP	AUTO	Philips Real World Value Mapping
Data Point Rows	0028,9001	UL		ALWAYS	AUTO	-
Data Point Columns	0028,9002	UL		ALWAYS	AUTO	-
Requesting Physician	0032,1032	PN		ALWAYS	AUTO	-
Requesting Service	0032,1033	LO		ANAP	AUTO	-
Requested Procedure Description	0032,1060	LO		ALWAYS	AUTO	-
Study Comments (retired)	0032,4000	LT		ALWAYS	AUTO	Comments added on MR
Special Needs	0038,0050	LO		ANAP	AUTO	-
Scheduled Performing Physician's Name	0040,0006	PN		ANAP	AUTO	-
Performed Station AE Title	0040,0241	AE		ANAP	AUTO	-
Performed Procedure Step End Date	0040,0250	DA		ANAP	AUTO	-
Performed Procedure Step End Time	0040,0251	TM		ANAP	AUTO	-
Performed Procedure Step Status	0040,0252	CS		ALWAYS	AUTO	-
Film Consumption Sequence	0040,0321	SQ		EMPTY	AUTO	-
Requested Procedure ID	0040,1001	SH		ALWAYS	AUTO	-
Requested Procedure Comments	0040,1400	LT		VNAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Imaging Service Request Comments	0040,2400	LT		ANAP	AUTO	-
LUT Label	0040,9210	SH		ANAP	AUTO	-
Private Creator Group 2001	2001,0010	LO		ALWAYS	AUTO	-
Private Creator Group 2005	2005,0013	LO		ALWAYS	AUTO	-
Private Creator Group 2005	2005,0014	LO		ALWAYS	AUTO	-
Private Creator Group 2005	2005,0015	LO	Philips MR Imaging DD 006	ALWAYS	AUTO	-
Private Creator Group 2005	2005,0010	LO	Philips MR Imaging DD 001	ALWAYS	FIXED	-
MIP protocol	2005,101E	SH		ALWAYS	AUTO	-
MPR Protocol	2005,101F	SH		ALWAYS	AUTO	-
Private Creator Group 2005	2005,0017	LO	Philips MR Imaging DD 008	ALWAYS	AUTO	-
Series Level Contrast Flag	2005,1705	CS		ANAP	AUTO	-
Series Geo Name	2005,1706	LO		ANAP	AUTO	-
Study Level Breath Hold Flag	2005,1707	CS		ANAP	AUTO	-
Study Level Contrast Flag	2005,1708	CS		ANAP	AUTO	-
Parallel Reconstruction Technique	2005,1710	CS		VNAP	AUTO	Indicates Parallel reconstruction technique
Syntac3d Enable	2005,1713	CS		ALWAYS	AUTO	Indicates if 3D Syntac scan was performed
RF polarization choice	2005,1714	LO		VNAP	AUTO	Applied values: (CircularPolarized, MultiChannel2)
Private Creator Group 2029	2029,0010	LO	Philips DINxGen DD 001	ANAP	AUTO	-
Study Creation Time	2029,1001	DT		ANAP	AUTO	-
Study Level Modification Flag	2029,1002	CS		ANAP	AUTO	-
Study Suspended Time	2029,1003	DT		ANAP	AUTO	-
Merged Accession Number	2029,1004	ST		ANAP	AUTO	-
Work ItemId	2029,1005	ST		ANAP	AUTO	-
Study Contrast State	2029,1007	CS		ANAP	AUTO	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Merged Study Description	2029,1009	LT		ANAP	AUTO	-
Auto Voice Information	2029,1011	LT		ANAP	AUTO	-
Study Operator Notes	2029,1012	LT		ANAP	AUTO	-

8.5.1.8. RT Structure Set Storage SOP Class

Table 238: Extended DICOM and Private Attributes for RT Structure Set Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Private Creator Group 2005	2005,0010	LO	Philips MR Imaging DD 006	ANAP	AUTO	-
RT Generated Series	2005,1088	LO		ANAP	AUTO	-

8.5.1.9. Media Storage Directory SOP Class

Table 239: Extended DICOM and private attributes for Media Storage Directory SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	-
MR Series Reconstruction Number	2001,101D	IS		VNAP	COPY	-
Scanning Technique	2001,1020	LO		VNAP	COPY	-
Echo Time Display	2001,1025	SH		VNAP	COPY	-
Stack Sequence	2001,105F	SQ		VNAP	COPY	-
>Number of Stack 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	-

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Syncra Scan Type	2005,10A1	CS		VNAP	COPY	-

8.6. Private Transfer Syntaxes

The MR System does not support any private transfer syntaxes.

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