
DICOM

Conformance Statement

Extended MR Workspace R2.5



PHILIPS

Issued by:

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1. DICOM CONFORMANCE STATEMENT OVERVIEW

The Extended MR Workspace is a comprehensive range of hardware and software modules that allow for tailored clinical solutions. The software applications are categorized in packages, for instance the Volume package for CT/MR images. It is also possible to calculate the volume of a segmented 3D object. The hardware consists of a PC Windows workstation.

The Extended MR Workspace provides the following DICOM data exchange features:

- It receives images sent to it by remote systems (e.g. workstations or imaging modalities) and stores them in a database.
- It allows the operator to copy images from the database to remote databases and vice versa. For this purpose the operator is able to query remote databases.
- It allows a remote system to query the Extended MR Workspace database and to retrieve images from it.
- It allows the operator to print images stored in the database on a DICOM printer.
- It is able to read DICOM DVD- and CD media.
- It is able to read and write DICOM DVD+R(W) and USB media.

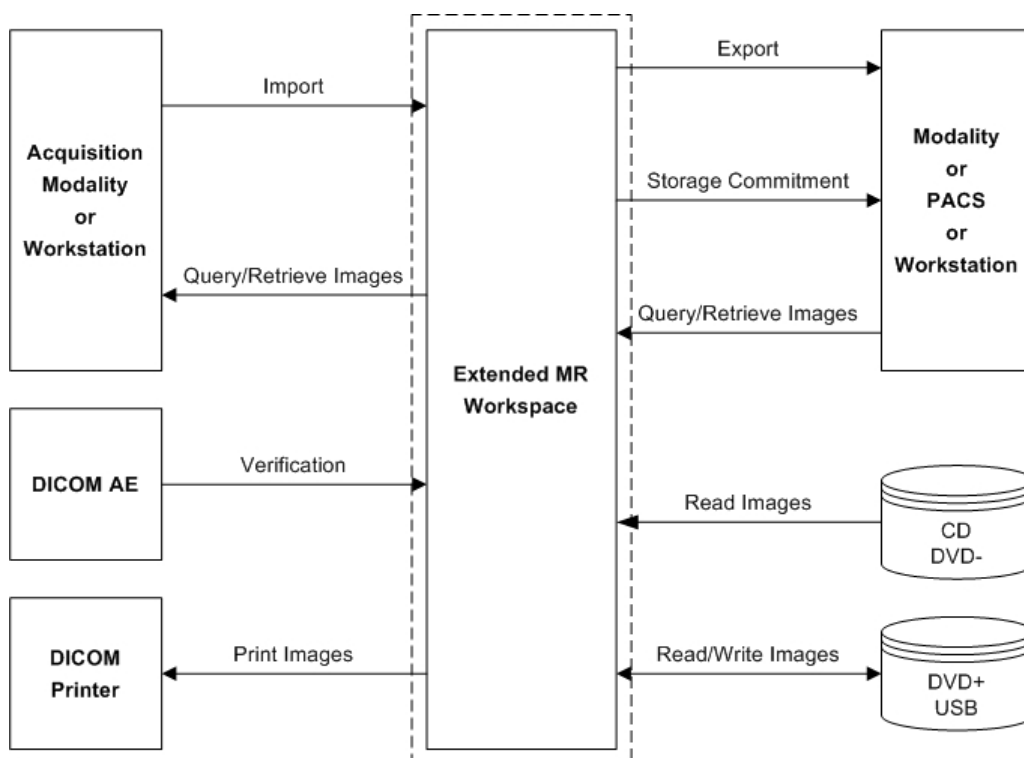


Figure 1: Extended MR Workspace in a DICOM Network

Extended MR Workspace allows the operator also to view, analyze and process the images stored in the database. Some advanced analysis and processing applications are primarily designed for images generated by Philips equipment when sent to the Extended MR Workspace.

This DICOM conformance statement describes the DICOM conformance of the Extended MR Workspace. Application package specific DICOM conformance is described in separate conformance statements.

Table 1 presents an overview of all network services and the applicable SOP classes as provided by Extended MR Workspace.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	UID		
Transfer			
3D Object new Storage (Private)	1.3.46.670589.5.0.2.1	Yes	Yes
3D Volume Storage new SOP Class (Private)	1.3.46.670589.5.0.1.1	Yes	Yes
Cardio Image Storage new SOP Class (Private)	1.3.46.670589.5.0.8.1	Yes	Yes
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
CT Synthetic Image Storage (Private)	1.3.46.670589.5.0.9	Yes	Yes
CX Synthetic Image Storage (Private)	1.3.46.670589.5.0.12	Yes	Yes
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	No*	Yes
MR Cardio Analysis new Storage (Private)	1.3.46.670589.5.0.11.1	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
MR Synthetic Image Storage (Private)	1.3.46.670589.5.0.10	Yes	Yes
Perfusion (Private)	1.3.46.670589.5.0.13	Yes	Yes
Perfusion Image Storage (Private)	1.3.46.670589.5.0.14	Yes	Yes
Private MR ExamCard Storage	1.3.46.670589.11.0.0.12.4	No*	Yes
Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	No*	Yes
Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	No*	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
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Specialized PMS X-Ray Image Store	1.3.46.670589.2.3.1.1	Yes	Yes
Surface Storage new (Private)	1.3.46.670589.5.0.3.1	Yes	Yes
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
XA reconstructed X-ray SOP Class (private)	1.3.46.670589.2.4.1.1	Yes	Yes
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
Workflow Management			
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No
Query/Retrieve			
Patient Root Query/Retrieve Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Yes	Yes
Patient Root Query/Retrieve Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Yes	Yes
Study Root Query/Retrieve Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root Query/Retrieve Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Print Management			
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	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
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	UID		
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	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
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No

* *Enhanced MR images shall be exported as standard MR SOP instances; Private SOP class images shall be exported as Raw Data SOP instances. This conversion is only intended for images created on the Extended MR Workspace.*

Table 2 presents an overview of all media services and their application profiles as provided by Extended MR Workspace.

Table 2: Media Services

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk – Recordable		
General Purpose CD-R Interchange	No	Yes
DVD		
General Purpose DVD Interchange with JPEG	Yes* **	Yes
USB		
General Purpose USB Media Interchange with JPEG	Yes**	Yes

* *DVD+ only;*

** *No JPEG support.*

2. TABLE OF CONTENTS

1.	DICOM CONFORMANCE STATEMENT OVERVIEW	3
2.	TABLE OF CONTENTS	6
3.	INTRODUCTION	8
3.1.	REVISION HISTORY	8
3.2.	AUDIENCE	8
3.3.	REMARKS	8
3.4.	DEFINITIONS, TERMS AND ABBREVIATIONS	9
3.5.	REFERENCES	10
4.	NETWORKING	11
4.1.	IMPLEMENTATION MODEL	11
4.1.1.	Application Data Flow	11
4.1.2.	Functional Definition of AE's	11
4.1.2.1.	Functional Definition of EWS AE	11
4.1.3.	Sequencing of Real World Activities	12
4.2.	AE SPECIFICATIONS	14
4.2.1.	EWS AE	14
4.2.1.1.	SOP Classes	14
4.2.1.2.	Association Policies	15
4.2.1.2.1.	General	15
4.2.1.2.2.	Number of Associations	15
4.2.1.2.3.	Asynchronous Nature	15
4.2.1.2.4.	Implementation Identifying Information	15
4.2.1.2.5.	Communication Failure Handling	15
4.2.1.3.	Association Initiation Policy	16
4.2.1.3.1.	(Real-World) Activity – Export Images	17
4.2.1.3.2.	(Real-World) Activity – Print Images	22
4.2.1.3.3.	(Real-World) Activity – Find Remote Images	33
4.2.1.3.4.	(Real-World) Activity – Move Remote Images	37
4.2.1.3.5.	(Real-World) Activity – Request Storage Commitment	40
4.2.1.4.	Association Acceptance Policy	44
4.2.1.4.1.	(Real-World) Activity – Import Images	46
4.2.1.4.2.	(Real-World) Activity – Query Local Images	49
4.2.1.4.3.	(Real-World) Activity – Retrieve Local Images	53
4.2.1.4.4.	(Real-World) Activity – Request Verification	56
4.3.	NETWORK INTERFACES	58
4.3.1.	Physical Network Interfaces	58
4.3.2.	Additional Protocols	58
4.4.	CONFIGURATION	58
4.4.1.	AE Title/Presentation Address Mapping	58
4.4.1.1.	Local AE Titles	58
4.4.1.2.	Remote AE Title/Presentation Address Mapping	58
4.4.1.2.1.	Remote Association Initiators	58
4.4.1.2.2.	Remote Association Acceptors	58
4.4.2.	Parameters	59
5.	MEDIA INTERCHANGE	61
5.1.	IMPLEMENTATION MODEL	61
5.1.1.	Application Data Flow Diagram	61
5.1.2.	Functional Definitions of AE's	62
5.1.2.1.	Functional Definition of EWS AE	62
5.1.3.	Sequencing of Real World Activities	62
5.1.4.	File Meta Information for Implementation Class and Version	63
5.2.	AE SPECIFICATIONS	63
5.2.1.	EWS AE - Specification	63
5.2.1.1.	File Meta Information for the EWS AE	64
5.2.1.2.	Real-World Activities	64
5.2.1.2.1.	Display Directory	64
5.2.1.2.2.	Read Image	64

5.2.1.2.3.	Write Image.....	64
5.3.	AUGMENTED AND PRIVATE APPLICATION PROFILES	64
5.4.	MEDIA CONFIGURATION	64
6.	SUPPORT OF CHARACTER SETS	65
7.	SECURITY	66
7.1.	SECURITY PROFILES	66
7.1.1.	Attribute Confidentiality Profiles	66
7.1.1.1.	The Basic Application Level Confidentiality Profile	66
7.2.	ASSOCIATION LEVEL SECURITY	66
7.3.	APPLICATION LEVEL SECURITY	66
8.	ANNEXES.....	67
8.1.	IOD CONTENTS	67
8.1.1.	Created SOP Instances	67
8.1.1.1.	Computed Radiography Image Storage SOP Class.....	72
8.1.1.2.	Digital X-Ray Image Storage - For Pres. SOP.....	74
8.1.1.3.	CT Image Storage SOP Class	77
8.1.1.4.	Ultrasound Multi-frame Image Storage SOP Class	79
8.1.1.5.	MR Image Storage SOP Class	80
8.1.1.6.	MR Spectroscopy Storage SOP Class	87
8.1.1.7.	Ultrasound Image Storage SOP Class	93
8.1.1.8.	Secondary Capture Image Storage SOP Class.....	94
8.1.1.9.	Grayscale Softcopy Presentation State Storage SOP Class.....	100
8.1.1.10.	X-Ray Angiographic Image Storage SOP Class	105
8.1.1.11.	X-Ray Radiofluoroscopic Image Storage SOP Class.....	107
8.1.1.12.	Raw Data Storage SOP Class.....	109
8.1.2.	Usage of Attributes from Received IOD.....	112
8.1.3.	Attribute Mapping.....	112
8.1.4.	Coerced/Modified fields.....	112
8.2.	DATA DICTIONARY OF PRIVATE ATTRIBUTES	116
8.3.	CODED TERMINOLOGY AND TEMPLATES.....	116
8.4.	GRAYSCALE IMAGE CONSISTENCY	116
8.5.	STANDARD EXTENDED/SPECIALIZED/PRIVATE SOPS.....	116
8.6.	PRIVATE TRANSFER SYNTAXES.....	117

3. INTRODUCTION

3.1. Revision History

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

Table 3: Revision History

Document Version	Date of Issue	Author	Description
00	26 November 2007	PMS HI/PII - IC2	Initial release version of the Extended MR Workspace R2.5.

3.2. Audience

This Conformance Statement is intended for:

- (Potential) customers
- System integrators of medical equipment
- Marketing staff interested in system functionality
- Software designers implementing DICOM interfaces

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

3.3. Remarks

The DICOM conformance statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2.

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

- **Interoperability**
Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment.
It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.
- **Validation**
Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.
- **New versions of the DICOM Standard**
The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its

products or to discontinue its delivery.

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

3.4. Definitions, Terms and Abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3 and PS 3.4. The word Philips in this document refers to Philips Medical Systems.

The following acronyms and abbreviations are used in this document.

AE	Application Entity
ANSI	American National Standard Institute
AP	Application Profile
BOT	Basic Offset Table
CD	Compact Disc
CR	Computed Radiography
CT	Computed Tomography
DCR	Dynamic Cardio Review
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DIMSE-Composite
DIMSE-N	DIMSE-Normalized
DVD	Digital Versatile Disc
DVD+R(W)	DVD recordable and rewritable (conforming to DVD+ specifications)
DX	Digital X-Ray
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
FSC	File-set Creator
FSR	File-set Reader
FSU	File-set Updater
GUI	Graphic User Interface
HIS	Hospital Information System
HL7	Health Level Seven
ILE	DICOM Implicit VR Little Endian
IOD	Information Object Definition
ISIS	Information System – Imaging System
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance
NEMA	National Electrical Manufacturers Association
NM	Nuclear Medicine
PDU	Protocol Data Unit
RF	X-Ray Radiofluoroscopic
RIS	Radiology Information System
RT	Radiotherapy
RWA	Real-World Activity
SC	Secondary Capture
SC	Service Class
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
US	Ultrasound
USMF	Ultrasound Multi-frame
WLM	Worklist Management

XA X-Ray Angiographic

3.5. References

[DICOM] Digital Imaging and Communications in Medicine, Part 1 – 18
(NEMA PS 3.1– PS 3.18),
National Electrical Manufacturers Association (NEMA)
Publication Sales 1300 N. 17th Street, Suite 1847
Rosslyn, Virginia. 22209, United States of America
Internet: <http://medical.nema.org/>

4. NETWORKING

4.1. Implementation model

4.1.1. Application Data Flow

The Extended MR Workspace consists of one single application entity only: the EWS AE.

Figure below shows the networking application data flow as a functional overview of the EWS AE.

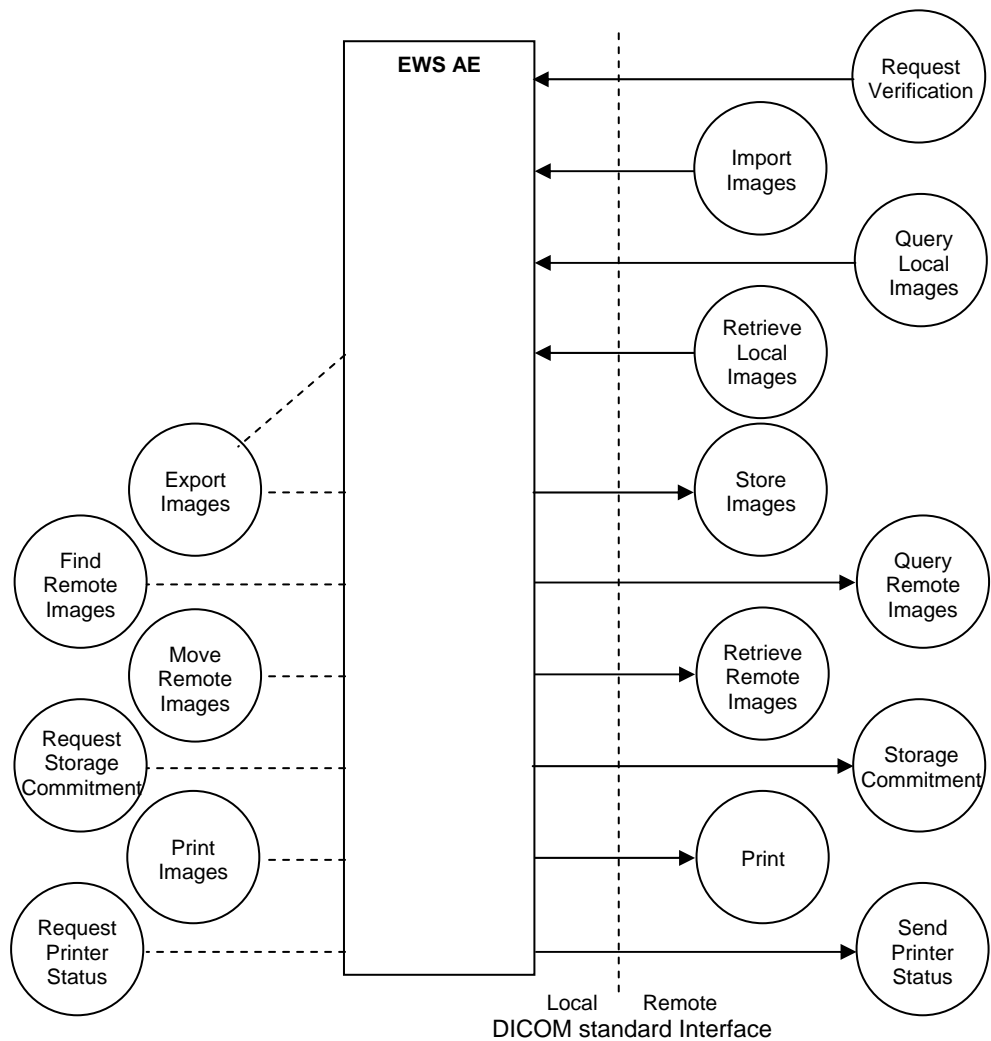


Figure 2: EWS AE Data Flow Diagram

4.1.2. Functional Definition of AE's

4.1.2.1. Functional Definition of EWS AE

The EWS AE is the one and only application entity within Extended MR Workspace.

As depicted in the data flow diagram, the EWS AE incorporates the following functionality.

- After RWA Request Verification, the EWS AE as SCP provides standard Verification Service Class functionality to the requesting SCU.
- After RWA Import Images, the EWS AE as SCP provides standard Storage Service Class functionality to the requesting SCU.
- After RWA Query Local Images/Retrieve Local Images, the EWS AE as SCP provides standard Query/Retrieve Service Class functionality to the requesting SCU.
- After RWA Export Images (triggered by either the operator or RWA Retrieve Local Images), the EWS AE as SCU uses the Remote SCP Storage Service Class functionality to store Local Images on a Remote Database.
- After operator RWA Find Remote Images, the EWS AE as SCU uses the remote SCP Query/Retrieve Service Class functionality to query remote images.
- After operator RWA Move Remote Images, the EWS AE as SCU uses the remote SCP Query/Retrieve Service Class functionality to retrieve remote images.
- After operator RWA Request Storage Commitment, the EWS AE as SCU uses the remote SCP Storage Commitment Service Class functionality to commit remote images.
- After operator RWA Print Images, the EWS AE as SCU uses the remote Print Management Service Class to print local images.
- After operator RWA Request Printer Status, the EWS AE as SCU uses the remote Print Management Service Class to request the printer status.

4.1.3. Sequencing of Real World Activities

This section shall contain a description of specific sequencing as well as potential constraints of Real-World Activities, including any applicable user interactions, as performed by the EWS AE.

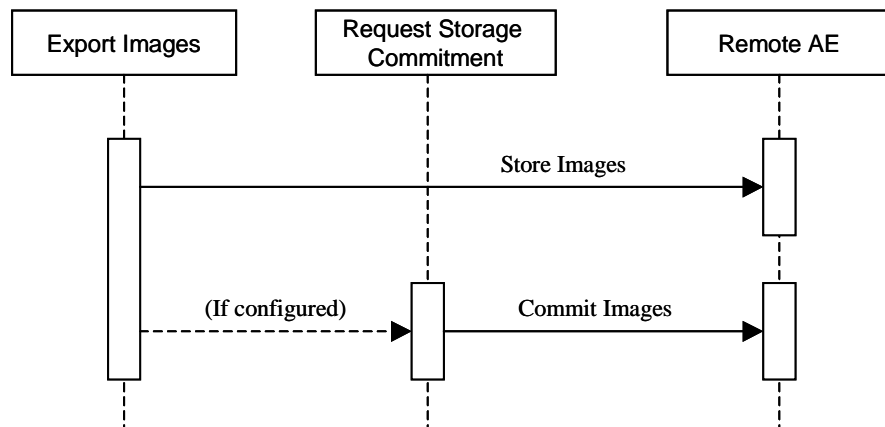


Figure 3: RWA Sequencing for Export Images

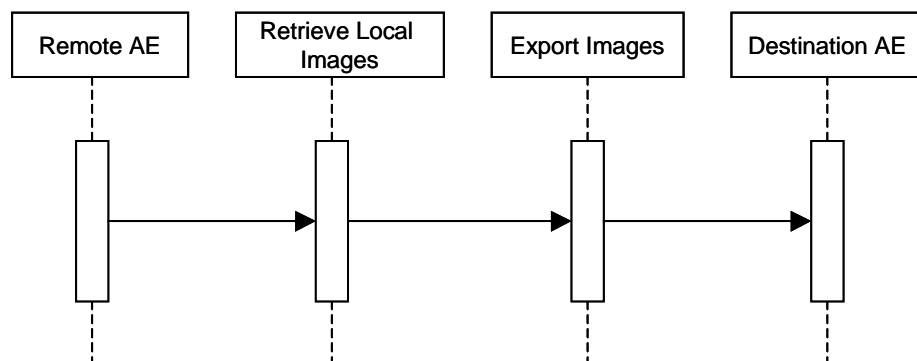


Figure 4: RWA Sequencing for Retrieve Local Images

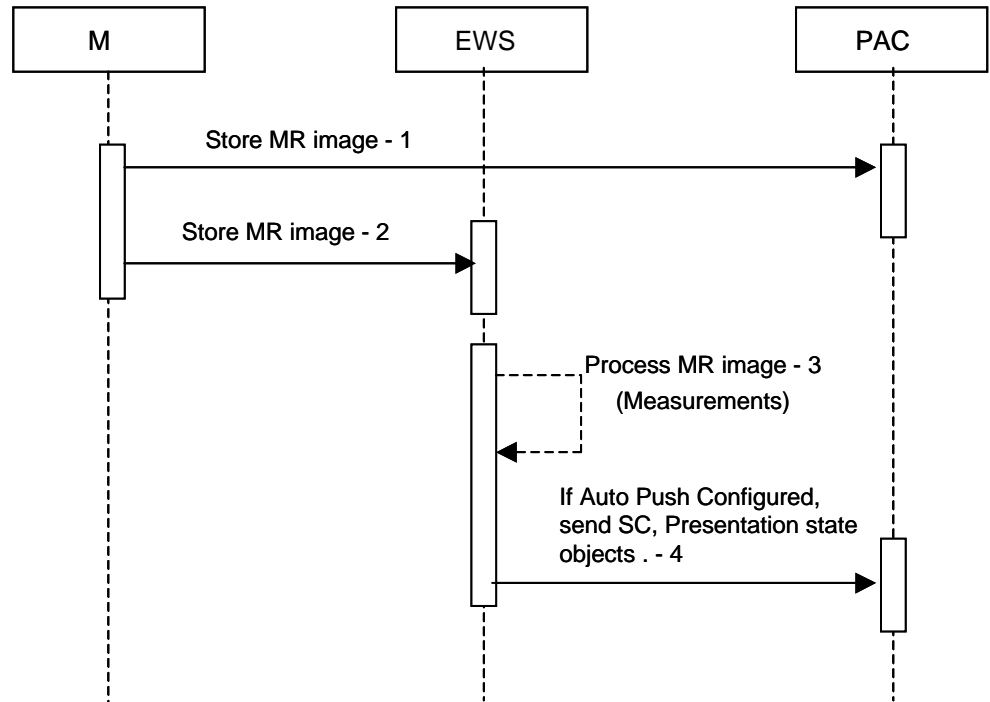


Figure 5: RWA Sequencing for Auto Push feature of Extended MR Workspace

Sequencing of Real World Activity of Auto Push feature of the Extended MR Workspace

1. Modality MR exports images of Patient A to a PACS for storage using DICOM Storage service
2. Modality MR exports images of Patient A to the Extended MR Workspace using DICOM storage service
3. The Extended MR Workspace processes the images of Patient A for measurement and analysis.
4. If Auto Push Configured, the Extended MR Workspace exports the new data (Secondary capture images, Presentation state objects) of Patient A to PACS, when clinical user closes the study of the patient A or when the Extended MR Workspace finishes the background processing of the images for Patient A

If the receiving PACS do not support the presentation state objects, then the Auto Push will not send the presentation state objects to the PACS; also not by sending new copies of the images with overlays.

4.2. AE Specifications

4.2.1. EWS AE

4.2.1.1. SOP Classes

The EWS AE provides standard conformance to the following SOP Classes.

Table 4: SOP Classes for EWS AE

SOP Class Name	SOP Class UID	SCU	SCP
3D Object new Storage (Private)	1.3.46.670589.5.0.2.1	Yes	Yes
3D Volume Storage new SOP Class (Private)	1.3.46.670589.5.0.1.1	Yes	Yes
Cardio Image Storage new SOP Class (Private)	1.3.46.670589.5.0.8.1	Yes	Yes
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
CT Synthetic Image Storage (Private)	1.3.46.670589.5.0.9	Yes	Yes
CX Synthetic Image Storage (Private)	1.3.46.670589.5.0.12	Yes	Yes
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	No*	Yes
MR Cardio Analysis new Storage (Private)	1.3.46.670589.5.0.11.1	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
MR Synthetic Image Storage (Private)	1.3.46.670589.5.0.10	Yes	Yes
Patient Root Query/Retrieve Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Yes	Yes
Patient Root Query/Retrieve Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Yes	Yes
Perfusion (Private)	1.3.46.670589.5.0.13	Yes	Yes
Perfusion Image Storage (Private)	1.3.46.670589.5.0.14	Yes	Yes
Presentation LUT SOP Class	1.2.840.10008.5.1.1.2.3	Yes	No
Private MR ExamCard Storage	1.3.46.670589.11.0.0.12.4	No*	Yes
Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	No*	Yes
Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	No*	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
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Specialized PMS X-Ray Image Store	1.3.46.670589.2.3.1.1	Yes	Yes
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No
Study Root Query/Retrieve Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root Query/Retrieve Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Surface Storage new (Private)	1.3.46.670589.5.0.3.1	Yes	Yes
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
Verification SOP Class	1.2.840.10008.1.1	No	Yes
XA reconstructed X-ray SOP Class (private)	1.3.46.670589.2.4.1.1	Yes	Yes
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	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

SOP Class Name	SOP Class UID	SCU	SCP
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	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

* Enhanced MR images shall be exported as standard MR SOP instances; Private SOP class images shall be exported as Raw Data SOP instances. This conversion is only intended for images created on the Extended MR Workspace.

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

4.2.1.2. Association Policies

4.2.1.2.1. General

The DICOM standard application context is as specified.

Table 5: DICOM Application Context

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

4.2.1.2.2. Number of Associations

The following tables specify the number of simultaneous associations as supported by the EWS AE as association initiator and acceptor.

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

Maximum number of simultaneous associations	3
---	---

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

Maximum number of simultaneous associations	9
---	---

4.2.1.2.3. Asynchronous Nature

The EWS AE does not support asynchronous operations, and will not perform asynchronous window negotiation.

4.2.1.2.4. Implementation Identifying Information

The EWS AE uses the following Implementation Class UID and Version Name.

Table 8: DICOM Implementation Class and Version for EWS AE

Implementation Class UID	1.3.46.670589.5.2.23
Implementation Version Name	ViewForum R6.1

4.2.1.2.5. Communication Failure Handling

During communication failures the EWS AE behaves as summarized in next table.

Table 9: Communication Failure Behavior

Exception	Behavior
ARTIM Timeout	Association is closed and reason logged.

4.2.1.3. Association Initiation Policy

The EWS AE initiates associations as a result of the following events.

- The operator or a remote (Query/Retrieve) application copies selected images from the Extended MR Workspace
- The operator requests to print selected images of the Extended MR Workspace database.
- The operator queries a remote database.
- The operator copies selected images from a remote database to another database.
- The operator requests storage commitment of images on a remote database.

The behavior of the AE during association rejection is summarized in next table.

Table 10: DICOM Association Rejection Handling

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

The behavior of the AE on receiving an association abort is summarized in next table

Table 11: DICOM Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	The user will be informed. The information is logged
2 – DICOM UL service-provider	0 – reason-not-specified	The user will be informed. The information is logged
	1 – unrecognized-PDU	The user will be informed. The information is logged
	2 – unexpected-PDU	The user will be informed. The information is logged

Source	Reason/Diagnosis	Behavior
	4 – unrecognized-PDU parameter	The user will be informed. The information is logged
	5 – unexpected-PDU parameter	The user will be informed. The information is logged
	6 – invalid-PDU-parameter value	The user will be informed. The information is logged

The behavior of the AE for sending an association abort is summarized in next table.

Table 12: DICOM Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	The user will be informed. The information is logged
2 – DICOM UL service-provider	0 – reason-not-specified	The user will be informed. The information is logged
	1 – unrecognized-PDU	The user will be informed. The information is logged
	2 – unexpected-PDU	The user will be informed. The information is logged
	4 – unrecognized-PDU parameter	The user will be informed. The information is logged
	5 – unexpected-PDU parameter	The user will be informed. The information is logged
	6 – invalid-PDU-parameter value	The user will be informed. The information is logged

4.2.1.3.1. (Real-World) Activity – Export Images

4.2.1.3.1.1. Description and Sequencing of Activities

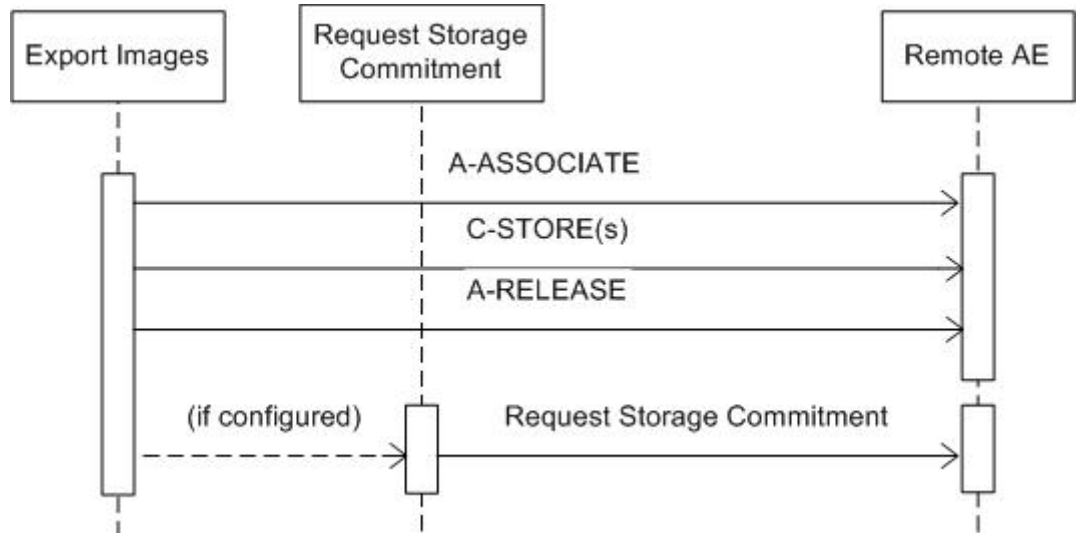


Figure 6: (Real World) Activity - Export Images

The RWA Export Images involves the storage of images from the local Extended MR Workspace database to a remote system.

There are two ways for the EWS AE to initiate Export Images.

- The operator is able to copy the images selected in a patient folder from the local Extended MR Workspace database to another database by means of the copy tool in the Extended MR Workspace data-handling tool. For each selected patient Extended MR Workspace initiates an association to the

selected peer entity, and uses it to send C-STORE requests and receive the associated C-STORE responses. The association is released when all selected images in the selected folder have been transmitted.

Extended MR Workspace handles operator copy requests one after another.

- A remote application copies images from the local Extended MR Workspace database to another database by sending a C-MOVE request to Extended MR Workspace. For each received retrieve request Extended MR Workspace initiates an association to the requested retrieve/move destination, and uses it to send C-STORE requests and receive associated C-STORE responses. The association is released when all instances, i.e. images and presentation states as selected by the retrieve request identifier, have been stored. Extended MR Workspace is able to simultaneously handle C-MOVE requests.

Along with the image data the EWS AE shall also export presentation state data. If the SCP supports the Grayscale Softcopy Presentation State storage SOP class then the applicable presentation state data will be transferred as such, otherwise the presentation state data will be merged with the image data before export. Please refer to section Coerced/Modified fields, for more information on presentation state storage.

If configured, the EWS AE shall also try and initiate a storage commitment of the stored image (after releasing the storage association). See section RWA Request Storage Commitment for a detailed specification of the storage commitment. The figure above shows the sequence of events after the operator or remote application initiates the RWA Export Images.

4.2.1.3.1.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. The presentation contexts proposed by the EWS AE for Export Images are defined in the following table.

Table 13: Proposed Presentation Contexts for (Real-World) Activity – Export Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
3D Object new Storage (Private)	1.3.46.670589.5.0.2.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
3D Volume Storage new SOP Class (Private)	1.3.46.670589.5.0.1.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Cardio Image Storage new SOP Class (Private)	1.3.46.670589.5.0.8.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
CT Synthetic Image Storage (Private)	1.3.46.670589.5.0.9	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
CX Synthetic Image Storage (Private)	1.3.46.670589.5.0.12	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
MR Cardio Analysis new Storage (Private)	1.3.46.670589.5.0.11.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
MR Synthetic Image Storage (Private)	1.3.46.670589.5.0.10	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Perfusion (Private)	1.3.46.670589.5.0.13	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Perfusion Image Storage (Private)	1.3.46.670589.5.0.14	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Private MR ExamCard Storage	1.3.46.670589.11.0.0.12.4	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Specialized PMS X-Ray Image Store	1.3.46.670589.2.3.1.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Surface Storage new (Private)	1.3.46.670589.5.0.3.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian JPEG Baseline (Process 1)	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2 1.2.840.10008.1.2.4.50	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian JPEG Baseline (Process 1)	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2 1.2.840.10008.1.2.4.50	SCU	None
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
XA reconstructed X-ray SOP Class (private)	1.3.46.670589.2.4.1.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

Note: For performance reasons the ELE transfer syntax is preferred.

The EWS AE does not support extended negotiations.

4.2.1.3.1.3. SOP Specific Conformance for Storage SOP Classes

Important remarks about the exported images:

- In case the remote system does not support modality specific image storage SOP class, the EWS AE will convert the images (if configured to do so) and send them via the Secondary Capture image storage SOP class. These Secondary Capture images and additional information (like graphics, text and important attribute information) are burnt-in (if configured). The original bit depth of the Secondary Capture image is kept. Note: only standard DICOM images can be converted, private SOP classes cannot be converted.
- In case of color images, all color-coding schemes are sent as they were received.
- Attributes e.g. Study Date and Study Time will be added to images to be exported (if not yet present). This is done because there are imaging systems relying on the existence of these attributes.
- On the export of an imported image the EWS AE adds private attributes to the image.
- The exported Extended MR Workspace images do not contain Instance Number if the original images received from modalities do not contain this attribute or provide information in other attributes for Extended MR Workspace to generate it.
- Exported CT/MR images relate Scanogram and Slice images in the following way: Attribute 'Referenced Image Sequence' is present in the slice images and points to the related Scanogram image. Note that Attribute 'Frame of Reference UID' in the Scanogram (Localiser image) and related image slices are not guaranteed to be equal; this depends on the source of the images.
- For Secondary Capture images only one Window Width and Window Centre value is exported.

Use of optional, private and retired attributes

The transmitted Storage SOP instances may include all optional elements specified in the DICOM standard, depending on the source of the images.

The transmitted Storage SOP instances may contain Retired and Private data elements, depending on the source of the images and of the Extended MR Workspace configuration.

When exporting images the EWS AE can convert the transfer syntax according to the following table.

Table 14: Transfer Syntax Conversion

Syntax	Source	ILE	ELE	EBE	JPEG Baseline
Destination					
ILE		+	+	+	-
ELE		+	+	+	-
EBE		+	+	+	-
JPEG Baseline	*	+	+	+	-

- JPEG Baseline is only supported for images with Photometric Interpretation of YBR_FULL_422.
- As Extended MR Workspace internally stores the images in uncompressed format, the image data shall be compressed to JPEG (RGB to YBR_FULL_422) before export.
- Note that JPEG Baseline transfer syntax may NOT be configured for SCU systems that are capable of handling storage of monochrome images too.

The store response status is saved in the log file; a user error will be displayed in the GUI.

The EWS AE will stop the transfer of the images and release the association as soon as it receives an unsuccessful store response status. In case that a remote application requested the transfer (by means of a C-MOVE request), a move response with status unsuccessful is sent to the retrieve requestor.

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 15: C-STORE-RQ Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Storage is complete	Continues with next store until completed thereafter the store job is marked as completed and the association is released.
Refused	A7xx	Out of Resources	The store job fails and the association is released. The reason is logged and reported to the user
Error	A9xx	Data set does not match SOP class	The store job fails and the association is released. The reason is logged and reported to the user
	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	Continues with next store until completed thereafter the store job is marked as completed and the association is released.
	B006	Elements discarded	Continues with next store until completed thereafter the store job is marked as completed and the association is released.
	B007	Data set does not match SOP class	Continues with next store until completed thereafter the store job is marked as completed and the association is released.

Table 16: DICOM Command Communication Failure Behavior

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 and association is aborted. The reason is logged and reported to the user

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

4.2.1.3.2. (Real-World) Activity – Print Images

4.2.1.3.2.1. Description and Sequencing of Activities

The RWA Print Images involves the printing of images by sending the selected images to a Print Management SCP (i.e. printer).

After selecting the print destination (out of choice list of configured printers) and some print parameters (depending on the configuration and the selected printer; these values can be configured too), the EWS AE shall initiate an association to the selected printer and use it to send the print job.

Extended MR Workspace also has an option for print preview.

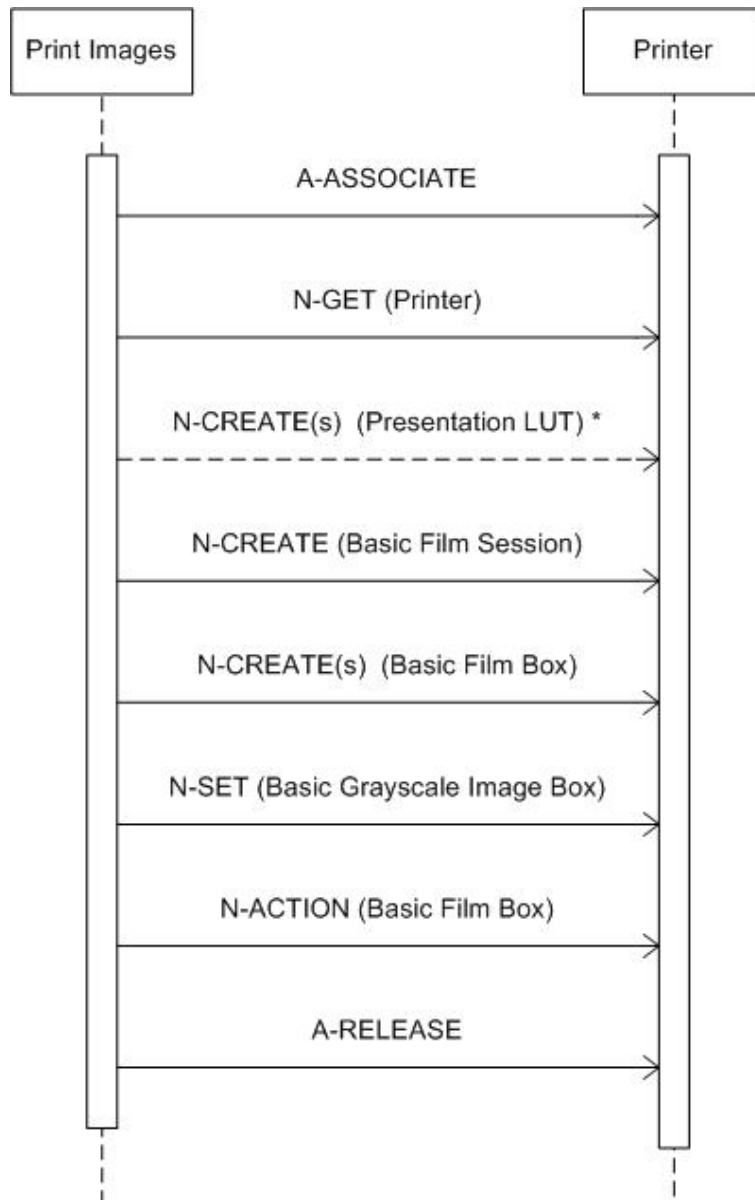


Figure 7: (Real World) Activity – Print Images

Note that the Presentation LUT SOP class is only supported for grayscale image printing

4.2.1.3.2.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by the EWS AE for Print Images are defined in the following table.

Table 17: Proposed Presentation Contexts for (Real-World) Activity – Print Images

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	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2				
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1				
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4				
>Printer SOP Class	1.2.840.10008.5.1.1.16				
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1				
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2				
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1				
>Printer SOP Class	1.2.840.10008.5.1.1.16				
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

Note: For performance reasons the ELE transfer syntax is preferred.

The EWS AE does not support extended negotiations.

4.2.1.3.2.3. SOP Specific Conformance for SOP Classes

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 – if present then it will always have a value
VNAPCV	The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
ANAPEV	The attribute is present under specified condition – if present then it will not have any value

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

4.2.1.3.2.3.1. SOP Specific Conformance for Basic Grayscale Print Management Meta SOP Class

Dataset Specific Conformance for the Basic Film Session SOP Class

The print process conforms to the Basic Film Session SOP class. The following DIMSE service element is supported.

N-CREATE

The following tables specify the implementation of the N-CREATE DIMSE.

Table 18: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Copies	2000,0010	IS	1 to 99	ALWAYS	USER	
Print Priority	2000,0020	CS	HIGH	ALWAYS	USER	
Medium Type	2000,0030	CS	BLUE FILM, CLEAR FILM, PAPER	ANAPEV	IMPLICIT	
Film Destination	2000,0040	CS	MAGAZINE, PROCESSOR	ANAPEV	USER	
Film Session Label	2000,0050	LO	Philips Medical Systems	ALWAYS	COPY	

Table 19: N-CREATE-RQ Status Response

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

Table 20: DICOM Command Communication Failure Behavior

Exception	Behavior
ARTIM Time-out	Print job Fails
Reply Time-out	The association is rejected

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

Dataset Specific Conformance for the Basic Film Box SOP Class

The print process conforms to the Basic Film Box SOP class.

The following DIMSE service elements are supported.

N-ACTION

N-CREATE

The following tables specify the implementation of the N-ACTION DIMSE.

Table 21: N-ACTION-RQ Status Response

Service Status	Further Meaning	Error Code	Behavior
Success	Film accepted for printing	0000	The print job continues.
Warning	Film Box SOP Instance Hierarchy does not contain Image Box SOP Instances	B603	The print job continues and the warning is logged and reported to the user.
	Image Size is larger than Image Box Size – The Image has been de-magnified	B604	The print job continues and the warning is logged and reported to the user.
	Image Size is larger than Image Box Size – The Image has been cropped to fit	B609	The print job continues and the warning is logged and reported to the user.
	Image Size or combined Print Image Size is larger than Image Box Size – The Image or combined Print Image has been decimated to fit	B60A	The print job continues and the warning is logged and reported to the user.
Failure	Unable to create Print Job SOP Instance – Print Queue is full	C602	The print job is marked as failed and the reason is logged and reported to the user.
	Image Size is larger than Image Box Size	C603	The print job is marked as failed and the reason is logged and reported to the user.
	Combined Print Image Size is larger than Image Box Size	C613	The print job is marked as failed and the reason is logged and reported to the user.

Table 22: DICOM Command Communication Failure Behavior

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

The following tables specify the implementation of the N-CREATE DIMSE.

Table 23: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Display Format	2010,0010	ST	CUSTOM, STANDARD	ALWAYS	AUTO	
Film Orientation	2010,0040	CS	LANDSCAPE, PORTRAIT	ALWAYS	CONFIG	
Film Size ID	2010,0050	CS	A, 10INX12IN, 10INX14IN, 11INX14IN, 11INX17IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, 8INX10IN, 8_5INX11IN, A3, A4	ALWAYS	CONFIG	
Magnification Type	2010,0060	CS		ANAPEV	AUTO	

Min Density	2010,0120	US		ANAPEV	AUTO	
Max Density	2010,0130	US		VNAP	CONFIG	
Trim	2010,0140	CS	NO, YES	ANAPEV	AUTO	
Configuration Information	2010,0150	ST	L	ANAPEV	AUTO	

Table 24: Basic Film Box Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 25: N-CREATE-RQ Status Response

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

Table 26: DICOM Command Communication Failure Behavior

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

Dataset Specific Conformance for the Basic Grayscale Image Box SOP Class

The print process conforms to the Basic Film Box SOP class.
The following DIMSE service element is supported.

N-SET

The following tables specify the implementation of the N-SET DIMSE.

Table 27: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Position	2020,0010	US		ALWAYS	AUTO	
Polarity	2020,0020	CS		ALWAYS	AUTO	
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	
>Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	
>Rows	0028,0010	US		ALWAYS	IMPLICIT	
>Columns	0028,0011	US		ALWAYS	IMPLICIT	
>Bits Allocated	0028,0100	US	16, 8	ALWAYS	AUTO	
>Bits Stored	0028,0101	US	12, 8	ALWAYS	IMPLICIT	
>High Bit	0028,0102	US	11, 7	ALWAYS	AUTO	

>Pixel Representation	0028,0103	US	0x0000	ALWAYS	AUTO	
>Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 28: N-SET-RQ Status Response

Service Status	Further Meaning	Error Code	Behavior
Success	Image successfully stored in Image Box	0000	The print job continues.
Warning	Image Size is larger than Image Box Size – The Image has been de-magnified	B604	The print job continues and the warning is logged and reported to the user.
	Requested Min Density or Max Density outside of Printer's operating Range	B605	The print job continues and the warning is logged and reported to the user.
	Image Size is larger than Image Box Size – The Image has been cropped to fit	B609	The print job continues and the warning is logged and reported to the user.
	Image Size or combined Print Image Size is larger than Image Box Size – The Image or combined Print Image has been decimated to fit	B60A	The print job continues and the warning is logged and reported to the user.
Error	Image Size is larger than Image Box Size	C603	The print job is marked as failed and the reason is logged and reported to the user
	Insufficient Memory in Printer to store the Image	C605	The print job is marked as failed and the reason is logged and reported to the user
	Combined Print Image Size is larger than Image Box Size	C613	The print job is marked as failed and the reason is logged and reported to the user

Table 29: DICOM Command Communication Failure Behavior

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

Dataset Specific Conformance for the Printer SOP Class

The print process conforms to the Printer SOP class.
The following DIMSE service elements are supported.

**N-EVENT-REPORT
N-GET**

The following tables specify the implementation of the N-EVENT-REPORT DIMSE.

Table 30: Printer Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Printer Status Info	2110,0020	CS		ALWAYS	AUTO	

Table 31: N-EVENT-REPORT-RSP Status Response

Service Status	Further Meaning	Error Code	Behavior
Normal	Successful operation	0000	The print job is marked as completed.
Warning	(any warning)	xxxx	The print job is marked as completed and the warning is logged and reported to the user.
Failure	(any failure)	xxxx	The print job is marked as failed and the reason is logged and reported to the user

Table 32: DICOM Command Communication Failure Behavior

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

The following tables specify the implementation of the N-GET DIMSE.

Table 33: Printer Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Printer Status	2110,0010	CS		ALWAYS	AUTO	
Printer Status Info	2110,0020	CS		ALWAYS	AUTO	

Table 34: N-GET-RQ Status Response

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

Table 35: DICOM Command Communication Failure Behavior

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

4.2.1.3.2.3.2. SOP Specific Conformance for Basic Color Print Management Meta SOP Class

Dataset Specific Conformance for the Basic Film Session SOP Class

The print process conforms to the Basic Film Session SOP class.
The following DIMSE service element is supported.

N-CREATE

The following tables specify the implementation of the N-CREATE DIMSE.

Table 36: N-CREATE-RQ Status Response

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

Table 37: DICOM Command Communication Failure Behavior

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

Dataset Specific Conformance for the Basic Film Box SOP Class

The print process conforms to the Basic Film Box SOP class.
The following DIMSE service elements are supported.

**N-ACTION
N-CREATE**

The following tables specify the implementation of the N-ACTION DIMSE.

Table 38: N-ACTION-RQ Status Response

Service Status	Further Meaning	Error Code	Behavior
Success	Film accepted for printing	0000	The print job continues.
Warning	Film Box SOP Instance Hierarchy does not contain Image Box SOP Instances	B603	The print job continues and the warning is logged and reported to the user.
	Image Size is larger than Image Box Size – The Image has been de-magnified	B604	The print job continues and the warning is logged and reported to the user.
	Image Size is larger than Image Box Size – The Image has been cropped to fit	B609	The print job continues and the warning is logged and reported to the user.
Failure	Image Size or combined Print Image Size is larger than Image Box Size – The Image or combined Print Image has been decimated to fit	B60A	The print job continues and the warning is logged and reported to the user.
	Unable to create Print Job SOP Instance – Print Queue is full	C602	The print job is marked as failed and the reason is logged and reported to the user.
	Image Size is larger than Image Box Size	C603	The print job is marked as failed and the reason is logged and reported to the user.
	Combined Print Image Size is larger than Image Box Size	C613	The print job is marked as failed and the reason is logged and reported to the user.

Table 39: DICOM Command Communication Failure Behavior

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

The following tables specify the implementation of the N-CREATE DIMSE.

Table 40: N-CREATE-RQ Status Response

Service Status	Further Meaning	Error Code	Behavior
Success	Film Box successfully created	0000	The print job continues.
Warning	Requested Min Density or Max Density outside of Printer's operating	B605	The print job continues and the warning is logged.

Service Status	Further Meaning	Error Code	Behavior
	Range		
Failure	There is an existing Film Box that has not been printed	C616	The print job is marked as failed and the reason is logged.

Table 41: DICOM Command Communication Failure Behavior

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

Dataset Specific Conformance for the Basic Color Image Box SOP Class

The print process conforms to the Basic Color Image Box SOP class. The following DIMSE service element is supported.

N-SET

The following tables specify the implementation of the N-SET DIMSE.

Table 42: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Position	2020,0010	US		ALWAYS	AUTO	
Polarity	2020,0020	CS		ALWAYS	AUTO	
Basic Color Image Sequence	2020,0111	SQ		ALWAYS	AUTO	
>Samples per Pixel	0028,0002	US	3	ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS	RGB	ALWAYS	AUTO	
>Planar Configuration	0028,0006	US	0x0001, 0x0000	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	AUTO	
>High Bit	0028,0102	US	7	ALWAYS	AUTO	
>Pixel Representation	0028,0103	US	0x0000	ALWAYS	IMPLICIT	
>Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

Table 43: N-SET-RQ Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Image successfully stored in Image Box	The print job continues.
Warning	B604	Image Size is larger than Image Box Size – The Image has been de-magnified	The print job continues and the warning is logged and reported to the user.
	B605	Requested Min Density or Max Density outside of Printer's operating Range	The print job continues and the warning is logged and reported to the user.
	B609	Image Size is larger than Image Box Size – The Image has been cropped to fit	The print job continues and the warning is logged and reported to the user.

Service Status	Code	Further Meaning	Description
	B60A	Image Size or combined Print Image Size is larger than Image Box Size – The Image or combined Print Image has been decimated to fit	The print job continues and the warning is logged and reported to the user.
Error	C603	Image Size is larger than Image Box Size	The print job is marked as failed and the reason is logged and reported to the user.
	C605	Insufficient Memory in Printer to store the Image	The print job is marked as failed and the reason is logged and reported to the user.
	C613	Combined Print Image Size is larger than Image Box Size	The print job is marked as failed and the reason is logged and reported to the user.

Table 44: DICOM Command Communication Failure Behavior

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

Dataset Specific Conformance for the Printer SOP Class

The print process conforms to the Printer SOP class.
The following DIMSE service elements are supported.

**N-EVENT-REPORT
N-GET**

The following tables specify the implementation of the N-EVENT-REPORT DIMSE.

Table 45: N-EVENT-REPORT-RSP Status Response

Service Status	Further Meaning	Error Code	Behavior
Normal	Successful operation	0000	The print job is marked as completed.
Warning	(any warning)	xxxx	The print job is marked as completed and the warning is logged and reported to the user.
Failure	(any failure)	xxxx	The print job is marked as failed and the reason is logged and reported to the user

Table 46: DICOM Command Communication Failure Behavior

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

The following tables specify the implementation of the N-GET DIMSE.

Table 47: N-GET-RQ Status Response

Service Status	Further Meaning	Error Code	Behavior
Success	Successful operation	0000	The print job continues.
Warning	(any warning)	xxxx	The print job continues and the warning is logged.

Service Status	Further Meaning	Error Code	Behavior
Failure	(any failure)	xxxx	The print job is marked as failed, the reason is logged and reported to the user.

Table 48: DICOM Command Communication Failure Behavior

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

4.2.1.3.2.3.3. SOP Specific Conformance for Presentation LUT SOP Class

Dataset Specific Conformance for the Presentation LUT SOP Class

The print process conforms to the Presentation LUT SOP Class.
The following DIMSE service element is supported.

N-CREATE

The following tables specify the implementation of the N-CREATE DIMSE.

Table 49: Presentation LUT Module

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

Table 50: N-CREATE-RQ Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Presentation LUT successfully created	The print job continues.
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 continues and the warning is logged.

Table 51: DICOM Command Response Status Handling Behavior for Presentation LUT N-CREATE

Service Status	Further Meaning	Error Code	Behavior
Normal	Successful operation	0000	The print job is marked as completed.
Warning	(any warning)	xxxx	The print job is marked as completed and the warning is logged and reported to the user.
Failure	(any failure)	xxxx	The print job is marked as failed and the reason is logged and reported to the user

Table 52: DICOM Command Communication Failure Behavior

Exception	Behavior
ARTIM Time-out	Print job Fails
Reply Time-out	The association is rejected

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

4.2.1.3.3. (Real-World) Activity – Find Remote Images

4.2.1.3.3.1. Description and Sequencing of Activities

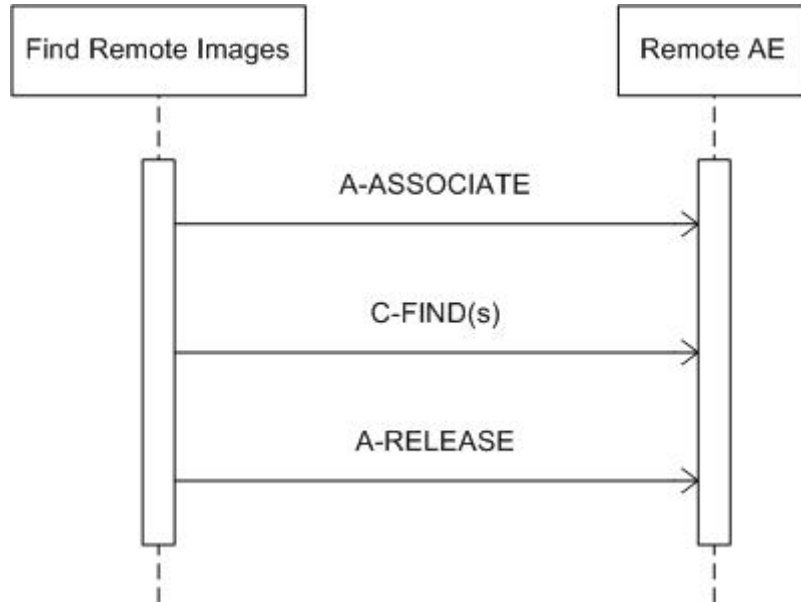


Figure 8: (Real World) Activity – Find Remote Images

The RWA Find Remote Images involves the query of a remote system to find matching images in the remote database.

The operator queries a remote database by means of the query tool in the Extended MR Workspace data handling facility. The EWS AE initiates an association to the selected peer entity and uses it to send Query (C-FIND) requests (and receive the associated responses). The association is released when the execution of the query completes (the Q/R dialog on the GUI is closed).

4.2.1.3.3.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by the EWS AE for Find Remote Images are defined in the following table.

Table 53: Proposed Presentation Contexts for (Real-World) Activity – Find Remote Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Big Endian Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root Query/Retrieve 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		

Note: For performance reasons the ELE transfer syntax is preferred.

The EWS AE does not support extended negotiations.

4.2.1.3.3.3. SOP Specific Conformance for Patient Root Query/Retrieve Information Model - FIND SOP Class

The Extended MR Workspace provides standard conformance to this SOP class. The EWS AE will not generate queries containing optional keys and it will not generate relational queries.

Specific Conformance for Patient Root Query/Retrieve Information Model – FIND SOP Class

In the following table the supported query keys for each query level are described. Universal matching shall be supported as default.

Table 54: Implemented Query Keys for Patient Root

Attribute Name	Tag	VR	Type Of Matching	Comment
Patient level				
Patient ID	0010,0020	LO	Universal, Wildcard	
Patient's Name	0010,0010	PN	Universal, Wildcard	
Patient's Birth Date	0010,0030	DA		
Patient's Sex	0010,0040	CS		
Study level				
Patient ID	0010,0020	LO	Universal, Wildcard	
Study Instance UID	0020,000D	UI		
Study Date	0008,0020	DA		
Study Time	0008,0030	TM		
Accession Number	0008,0050	SH		
Modalities in Study	0008,0061	CS		
Referring Physician's Name	0008,0090	PN		
Study Description	0008,1030	LO		
Study ID	0020,0010	SH		
Series level				
Patient ID	0010,0020	LO	Universal, Wildcard	
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
Modality	0008,0060	CS		
Series Number	0020,0011	IS		
Body Part Examined	0018,0015	CS		
Protocol Name	0018,1030	LO		
Performed Procedure Step Start Date	0040,0244	DA		
Performed Procedure Step ID	0040,0253	SH		
Composite Object Instance level				
Patient ID	0010,0020	LO	Universal, Wildcard	
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
SOP Instance UID	0008,0018	UI		

Attribute Name	Tag	VR	Type Of Matching	Comment
Instance Number	0020,0013	IS		
SOP Class UID	0008,0016	UI		
Content Date	0008,0023	DA		
Content Time	0008,0033	TM		

Do note that the query results screen will display all patients that have an empty patient ID as one patient entry.

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 55: C-FIND-RQ Status Response

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

Table 56: DICOM Command Communication Failure Behavior

Exception	Behavior
ARTIM Time-out	N/A
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.

4.2.1.3.3.4. SOP Specific Conformance for Study Root Query/Retrieve Information Model - FIND SOP Class

The Extended MR Workspace provides standard conformance to this SOP class. The EWS AE will not generate queries containing optional keys and it will not generate relational queries.

Specific Conformance for Study Root Query/Retrieve Information Model – FIND SOP Class

In the following table the supported query keys for each query level are described. Universal matching shall be supported as default.

Table 57: Implemented Query Keys for Study Root

Attribute Name	Tag	VR	Type Of Matching	Comment
Study level				
Study Instance UID	0020,000D	UI		
Study Date	0008,0020	DA		
Study Time	0008,0030	TM		
Accession Number	0008,0050	SH		
Modalities in Study	0008,0061	CS		
Referring Physician's Name	0008,0090	PN		
Study Description	0008,1030	LO		
Patient's Name	0010,0010	PN	Universal, WildCard	
Patient ID	0010,0020	LO	Universal, Wildcard	
Study ID	0020,0010	SH		
Series level				
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
Modality	0008,0060	CS		
Series Number	0020,0011	IS		
Body Part Examined	0018,0015	CS		
Protocol Name	0018,1030	LO		
Performed Procedure Step Start Date	0040,0244	DA		
Performed Procedure Step ID	0040,0253	SH		
Composite Object Instance level				
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
SOP Instance UID	0008,0018	UI		
Instance Number	0020,0013	IS		
SOP Class UID	0008,0016	UI		
Content Date	0008,0023	DA		
Content Time	0008,0033	TM		

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 58: C-FIND-RQ Status Response

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

Table 59: DICOM Command Communication Failure Behavior

Exception	Behavior
ARTIM Time-out	N/A
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.

4.2.1.3.4. (Real-World) Activity – Move Remote Images

4.2.1.3.4.1. Description and Sequencing of Activities

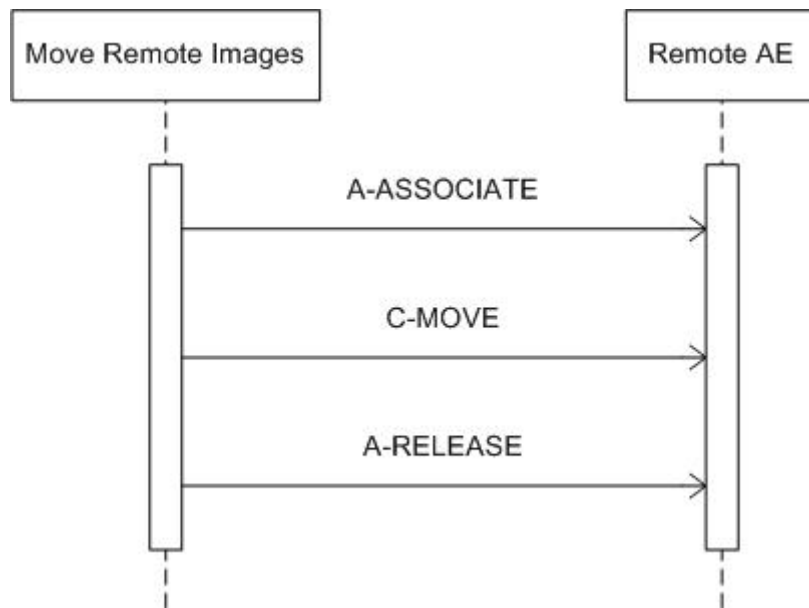


Figure 9: (Real World) Activity – Move Remote Images

The RWA Move Remote Images involves the retrieve of images on a remote system by moving matching images from the remote database to another database.

The operator is able to copy the selected images in a patient folder from a remote database to another, local or remote, database by means of the copy tool in the Extended MR Workspace data handling facility. The EWS AE initiates for each copy request an association to the selected peer entity (Remote AE) and uses it to send the Retrieve (C-MOVE) request (and receive the associated responses). An examination may contain both images and presentation states. The association is released after the final Retrieve (C-MOVE) response for the related request has been received (no more pending).

4.2.1.3.4.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the EWS AE for Move Remote Images are defined in the following table.

Table 60: Proposed Presentation Contexts for (Real-World) Activity – Move Remote Images

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

Note: For performance reasons the ELE transfer syntax is preferred.

The EWS AE does not support extended negotiations.

4.2.1.3.4.3. SOP Specific Conformance for Patient Root Query/Retrieve Information Model - MOVE SOP Class

The Extended MR Workspace provides standard conformance to this SOP class.

Specific Conformance for Patient Root Query/Retrieve Information Model – MOVE SCU

Following are the details regarding the specific conformance, including response behavior to all status codes, both from application level and communication errors.

Table 61: C-MOVE-RQ Status Response

Service Status	Code	Further Meaning	Description
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 o 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 o the user.
	A801	Move Destination unknown	The move job is marked as failed. The association is released. The reason is logged and reported o the user.
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 o the user.
	Cxxx	Unable to process	The move job is marked as failed. The association is released. The reason is logged and reported o 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 o 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.

Table 62: DICOM Command Communication Failure Behavior

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

4.2.1.3.4.4. SOP Specific Conformance for Study Root Query/Retrieve Information Model - MOVE SOP Class

The Extended MR Workspace provides standard conformance to this SOP class.

Specific Conformance for Study Root Query/Retrieve Information Model – MOVE SCU

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 63: C-MOVE-RQ Status Response

Service Status	Code	Further Meaning	Description
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 o 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 o the user.
	A801	Move Destination unknown	The move job is marked as failed. The association is released. The reason is logged and reported o the user.
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 o the user.
	Cxxx	Unable to process	The move job is marked as failed. The association is released. The reason is logged and reported o 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 o 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.

Table 64: DICOM Command Communication Failure Behavior

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

4.2.1.3.5. (Real-World) Activity – Request Storage Commitment

4.2.1.3.5.1. Description and Sequencing of Activities

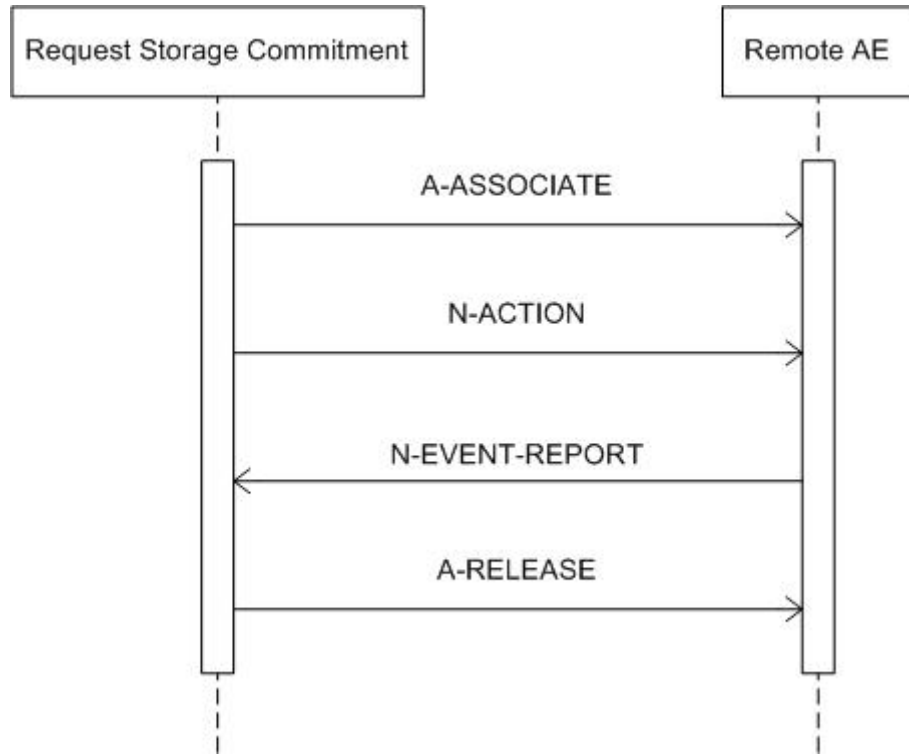


Figure 10: (Real World) Activity – Request Storage Commitment (synchronous)

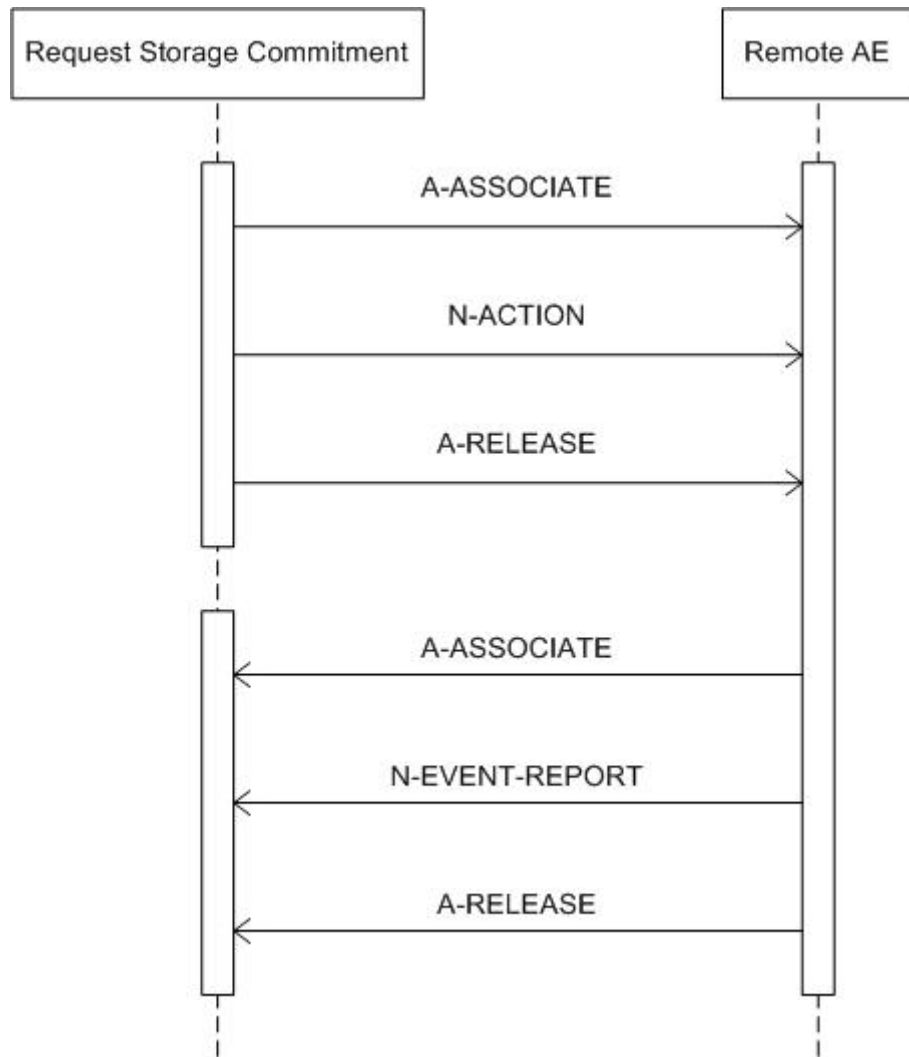


Figure 11: (Real World) Activity – Request Storage Commitment (asynchronous)

The RWA Request Storage Commitment involves the storage commitment of images on a remote system.

If configured, Storage Commitment will be initiated in a new association after closing the association of the related image storage (C-STORE). 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 Extended MR Workspace and send the storage commitment report (asynchronous).

4.2.1.3.5.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the EWS AE for Request Storage Commitment are defined in the following table.

Table 65: Proposed Presentation Contexts for (Real-World) Activity – Request Storage Commitment

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

Note: For performance reasons the ELE transfer syntax is preferred.

The EWS AE does not support extended negotiations.

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

Extended MR Workspace conforms to the standard Storage Commitment model.

Dataset Specific Conformance for Storage Commitment Push Model SOP Class

The following DIMSE service elements are supported.

**N-ACTION
N-EVENT-REPORT**

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors

The following tables specify the implementation of the N-ACTION DIMSE.

Table 66: N-ACTION-RQ Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Operation complete	Continues with waiting for storage commitment.
Failure	xxxx	(any failure)	The reason is logged.

Table 67: DICOM Command Communication Failure Behavior

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

The following tables specify the implementation of the N-EVENT-REPORT DIMSE.

Table 68: N-EVENT-REPORT-RSP Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Operation complete	Continues with waiting for storage commitment.
Failure	xxxx	(any failure)	The reason is logged.

Table 69: DICOM Command Communication Failure Behavior

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

4.2.1.4. Association Acceptance Policy

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

Extended MR Workspace shall accept associations for the following purposes:

- To allow remote applications to store images in the Extended MR Workspace database (i.e. image import).
- To allow remote applications to query the View Forum R6.1 database.
- To allow remote applications to retrieve images from the Extended MR Workspace database
- To allow remote applications to verify application level communication with Extended MR Workspace

The EWS AE shall reject association requests from unknown applications, i.e. applications that offer an unknown “calling AE title”. An application is known if – and only if – it is defined during configuration of the EWS AE.

The EWS AE shall reject association requests from applications that do not address the EWS AE, i.e. applications that offer a wrong “called AE title”.

The EWS AE title is defined during configuration of the EWS AE.

The behavior of the AE during association rejection is summarized in next table.

Table 70: DICOM Association Rejection Handling

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

The behavior of the AE on receiving an association abort is summarized in next table

Table 71: DICOM Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	The user will be informed. The information is logged
2 – DICOM UL service-provider	0 – reason-not-specified	The user will be informed. The information is logged
	1 – unrecognized-PDU	The user will be informed. The information is logged
	2 – unexpected-PDU	The user will be informed. The information is logged
	4 – unrecognized-PDU parameter	The user will be informed. The information is logged
	5 – unexpected-PDU parameter	The user will be informed. The information is logged
	6 – invalid-PDU-parameter value	The user will be informed. The information is logged

The behavior of the AE for sending an association abort is summarized in next table.

Table 72: DICOM Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	The user will be informed. The information is logged
2 – DICOM UL service-provider	0 – reason-not-specified	The user will be informed. The information is logged
	1 – unrecognized-PDU	The user will be informed. The information is logged
	2 – unexpected-PDU	The user will be informed. The information is logged
	4 – unrecognized-PDU parameter	The user will be informed. The information is logged
	5 – unexpected-PDU parameter	The user will be informed. The information is logged
	6 – invalid-PDU-parameter value	The user will be informed. The information is logged

4.2.1.4.1. (Real-World) Activity – Import Images

4.2.1.4.1.1. Description and Sequencing of Activities

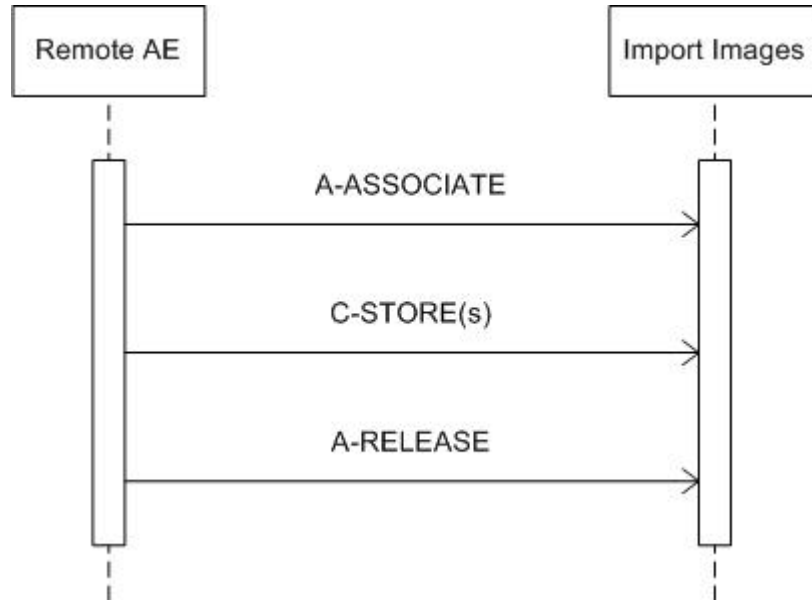


Figure 12: (Real World) Activity - Import Images

The EWS AE shall accept associations from systems that wish to store images in the Extended MR Workspace database using the C-STORE command.

4.2.1.4.1.2. Accepted Presentation Contexts

Table 73: Acceptable Presentation Contexts for (Real-World) Activity – Import Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
3D Object new Storage (Private)	1.3.46.670589.5.0.2.1	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		
3D Volume Storage new SOP Class (Private)	1.3.46.670589.5.0.1.1	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		
Cardio Image Storage new SOP Class (Private)	1.3.46.670589.5.0.8.1	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		
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	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		
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	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
CT Synthetic Image Storage (Private)	1.3.46.670589.5.0.9	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	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		
CX Synthetic Image Storage (Private)	1.3.46.670589.5.0.12	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	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		
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	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
MR Cardio Analysis new Storage (Private)	1.3.46.670589.5.0.11.1	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		
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		
MR Synthetic Image Storage (Private)	1.3.46.670589.5.0.10	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		
Perfusion (Private)	1.3.46.670589.5.0.13	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		
Perfusion Image Storage (Private)	1.3.46.670589.5.0.14	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		
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		
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		
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		
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		
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		
Specialized PMS X-Ray Image Store	1.3.46.670589.2.3.1.1	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		
Surface Storage new (Private)	1.3.46.670589.5.0.3.1	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		
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

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		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	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		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	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		
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	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		
XA reconstructed X-ray SOP Class (private)	1.3.46.670589.2.4.1.1	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 EWS AE is able to accept the presentation contexts as specified in the above table.

The EWS AE does not support extended negotiations.

4.2.1.4.1.3. SOP Specific Conformance for Storage SOP Classes

The Extended MR Workspace provides standard conformance to Storage Service as SCP.

Table 74: C-STORE-RSP Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Storage is complete	The image(s) will be stored in the Extended MR Workspace database
Refused	A700	Out of Resources	The Extended MR Workspace database is full. Extended MR Workspace shall send a notification, log the condition and abort association.
Error	A900	Data set does not match the SOP class	The SOP class of the image(s) does not match the negotiated abstract syntax. Extended MR Workspace shall send a notification. Log the condition and abort the association.
	C000	Cannot understand	The image(s) cannot be parsed. Extended MR Workspace shall send a notification, log the condition, and abort the association.
Warning	B000	Coercion of Data Elements	NA
	B006	Elements discarded	NA
	B007	Data set does not match SOP class	NA

Table 75: DICOM Command Communication Failure Behavior

Exception	Behavior
ARTIM Time-out	The store job fails in case of association setup. The reason is logged.

Exception	Behavior
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	The store job fails. The reason is logged.

4.2.1.4.2. (Real-World) Activity – Query Local Images

4.2.1.4.2.1. Description and Sequencing of Activities

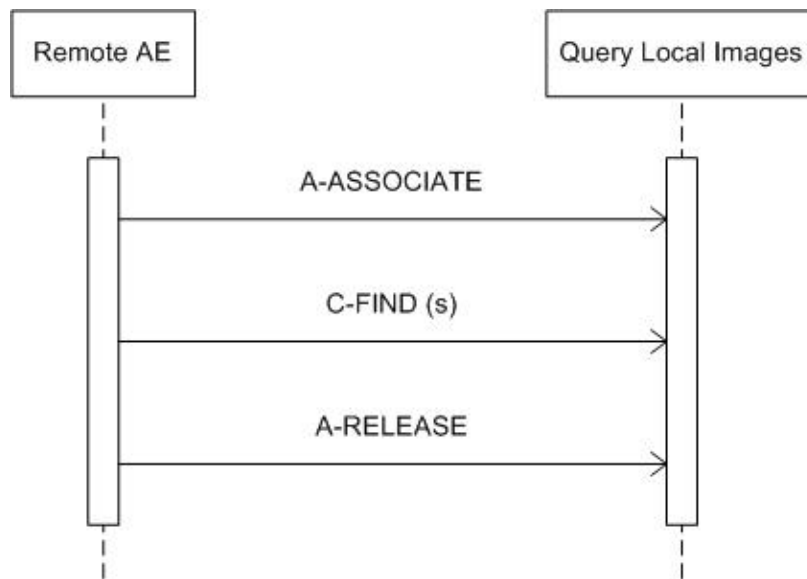


Figure 13: (Real World) Activity – Query Local Images

The EWS AE shall accept associations from systems that wish to query the Extended MR Workspace database using the C-FIND command.

4.2.1.4.2.2. Accepted Presentation Contexts

Table 76: Acceptable Presentation Contexts for (Real-World) Activity – Query Local Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	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		
Study Root Query/Retrieve 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 EWS AE is able to accept the presentation contexts as specified in the above table.

The EWS AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the EWS AE accepts 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 EWS AE does not support extended negotiations.

4.2.1.4.2.3. SOP Specific Conformance for Patient Root Query/Retrieve Information Model - FIND SOP Class

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

The Extended MR Workspace database distinguishes two patients with the same Patient ID but different Patient's Name or Patient's Birth Date. However, the DICOM Query/Retrieve service class has Patient ID as a unique key at Patient level, and thus two patients with the same Patient ID cannot be distinguished via a standard DICOM Query.

When querying optional keys, the Extended MR Workspace will respond successfully for available keys if queried for **universal matching**; otherwise it will respond with warning.

Note that when querying optional keys with **non-universal matching**, the Extended MR Workspace will return information using universal matching for those keys.

4.2.1.4.2.3.1. Specific Conformance for Patient Root Query/Retrieve Information Model – FIND SCP

The following query keys will be supported by Extended MR Workspace.

Table 77: Supported Patient Root Query Keys

Attribute Name	Tag	VR	Type Of Matching	Comment
Patient level				
Patient ID	0010,0020	LO		
Patient's Name	0010,0010	PN		
Study level				
Patient ID	0010,0020	LO		
Study Instance UID	0020,000D	UI		
Study Date	0008,0020	DA		
Study Time	0008,0030	TM		
Accession Number	0008,0050	SH		
Study ID	0020,0010	SH		
Series level				
Patient ID	0010,0020	LO		
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
Modality	0008,0060	CS		
Series Number	0020,0011	IS		
Specific Character Set	0008,0005	CS		
Composite Object Instance level				
SOP Instance UID	0008,0018	UI		
Patient ID	0010,0020	LO		
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
Instance Number	0020,0013	IS		

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 78: C-FIND-RSP Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Matching is complete	The C-FIND request handling is completed, no more C-FIND responses are sent.
Refused	A700	Out of Resources	N/A
Failed	A900	Identifier does not match SOP class	N/A
	C000	Unable to process	The C-FIND request cannot be parsed. Extended MR Workspace logs the reason.
Cancel	FE00	Matching terminated due to Cancel Request	The C-FIND request is canceled, no more C-FIND responses are sent.
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.

Table 79: 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 reason is logged.

4.2.1.4.2.4. SOP Specific Conformance for Study Root Query/Retrieve Information Model - FIND SOP Class

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

The Extended MR Workspace database distinguishes two patients with the same Patient ID but different Patient's Name or Patient's Birth Date. However, the DICOM Query/Retrieve service class has Patient ID as a unique key at Patient level, and thus two patients with the same Patient ID cannot be distinguished via a standard DICOM Query.

When querying optional keys, the Extended MR Workspace will respond successfully for available keys if queried for **universal matching**; otherwise it will respond with warning.

Note that when querying optional keys with **non-universal matching**, the Extended MR Workspace will return information using universal matching for those keys.

4.2.1.4.2.4.1. Specific Conformance for Study Root Query/Retrieve Information Model – FIND SCP

The following query keys will be supported by Extended MR Workspace.

Table 80: Supported Study Root Query Keys

Attribute Name	Tag	VR	Type Of Matching	Comment
Study level				
Study Instance UID	0020,000D	UI		
Study Date	0008,0020	DA		
Study Time	0008,0030	TM		
Accession Number	0008,0050	SH		
Patient's Name	0010,0010	PN		
Patient ID	0010,0020	LO		
Study ID	0020,0010	SH		
Specific Character Set	0008,0005	CS		
Series level				
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
Modality	0008,0060	CS		
Series Number	0020,0011	IS		
Composite Object Instance level				
SOP Instance UID	0008,0018	UI		
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
Instance Number	0020,0013	IS		

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 81: C-FIND-RSP Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Matching is complete	The C-FIND request handling is completed, no more C-FIND responses are sent.
Refused	A700	Out of Resources	N/A
Failed	A900	Identifier does not match SOP class	N/A
	C000	Unable to process	The C-FIND request cannot be parsed. Extended MR Workspace logs the reason.
Cancel	FE00	Matching terminated due to Cancel Request	The C-FIND request is canceled, no more C-FIND responses are sent.
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.

Table 82: 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 reason is logged.

4.2.1.4.3. (Real-World) Activity – Retrieve Local Images

4.2.1.4.3.1. Description and Sequencing of Activities

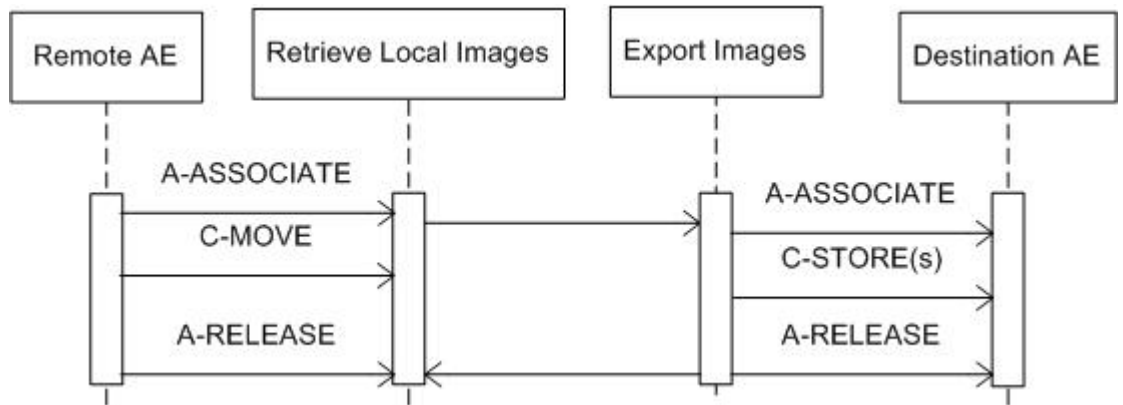


Figure 14: (Real World) Activity – Retrieve Local Images

The EWS AE shall accept associations from systems that wish to retrieve images from the View Forum R6.1 database using the C-MOVE command.

After RWA Retrieve Local Images the RWA Export Images is started.

4.2.1.4.3.2. Accepted Presentation Contexts

Table 83: Acceptable Presentation Contexts for (Real-World) Activity – Retrieve Local Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	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		
Study Root Query/Retrieve 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 EWS AE is able to accept the presentation contexts as specified in the above table.

The EWS AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the EWS AE accepts 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 EWS AE does not support extended negotiations.

4.2.1.4.3.3. SOP Specific Conformance for Patient Root Query/Retrieve Information Model - MOVE SOP Class

The Extended MR Workspace provides standard conformance to MOVE SOP class as an SCP.

Specific Conformance for Patient Root Query/Retrieve Information Model – MOVE SOP Class

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 84: C-MOVE-RSP Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Sub-operations complete – No Failures	The C-MOVE command has been completed.
Refused	A701	Out of Resources – Unable to calculate number of matches	N/A
	A702	Out of Resources – Unable to perform Sub-operations	N/A
Failed	A801	Move Destination unknown	No C-STORE command will be sent. Extended MR Workspacelogs 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. Extended MR Workspace 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

Table 85: DICOM Command Communication Failure Behavior

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.

4.2.1.4.3.4. SOP Specific Conformance for Study Root Query/Retrieve Information Model - MOVE SOP Class

The Extended MR Workspace provides standard conformance to FIND SOP class as an SCP.

Specific Conformance for Study Root Query/Retrieve Information Model – MOVE SOP Class

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 86: C-MOVE-RSP Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Sub-operations complete – No Failures	The C-MOVE command has been completed.
Refused	A701	Out of Resources – Unable to calculate number of matches	N/A
	A702	Out of Resources – Unable to perform Sub-operations	N/A
Failed	A801	Move Destination unknown	No C-STORE command will be sent. Extended MR Workspace 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. Extended MR Workspace 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

Table 87: DICOM Command Communication Failure Behavior

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 – Request Verification

4.2.1.4.4.1. Description and Sequencing of Activities

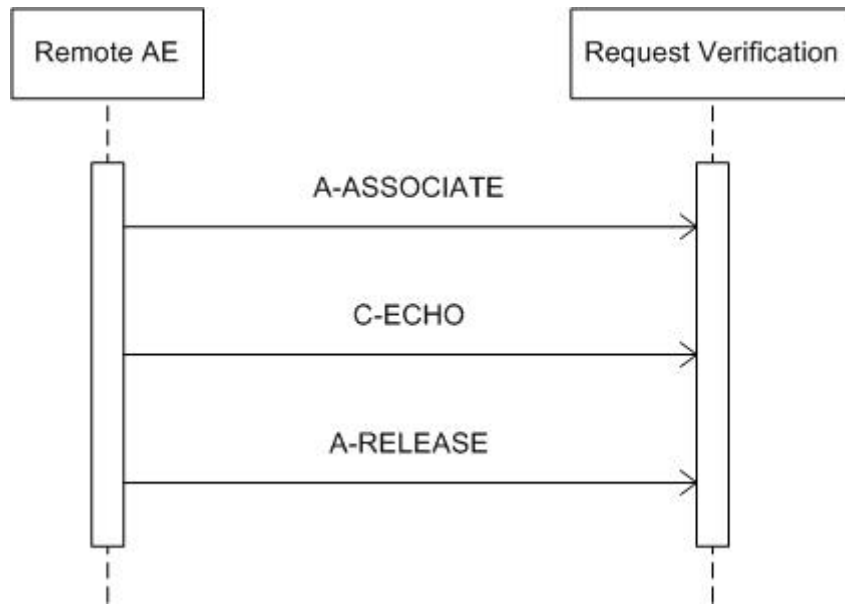


Figure 15: (Real World) Activity – Request Verification

The EWS AE shall accept associations from systems that wish to verify application level communication using the C-ECHO command.

4.2.1.4.4.2. Accepted Presentation Contexts

Table 88: Acceptable Presentation Contexts for (Real-World) Activity – Request Verification

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 EWS AE is able to accept the presentation contexts as specified in the above table.

For performance reasons the ELE transfer syntax is preferred and shall be chosen in case multiple Transfer Syntaxes are proposed in the Association Negotiation.

The EWS AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the View Forum Network accepts 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 EWS AE does not support extended negotiations.

4.2.1.4.4.3. SOP Specific Conformance for Verification SOP Class

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

Specific Conformance for Verification SOP Class

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors

Table 89: C-ECHO-RSP Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Confirmation	Confirm the verification request

Table 90: DICOM Command Communication Failure Behavior

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.

4.3. Network Interfaces

4.3.1. Physical Network Interfaces

The Extended MR Workspace provides DICOM V3.0 TCP/IP Network Communication Support as defined by the part 8 of the DICOM Standard. Extended MR Workspace uses DICOM V3.0 TCP/IP Network Communication installed on the Platform where EWS AE is running on.

Supported physical media include:

IEEE 802.3-1995 (Fast Ethernet) 100Base-TX

IEEE 802.3-1995 10Base-TX

IEEE 802.3 1000BASE-X (Fiber Optic Gigabit Ethernet)

4.3.2. Additional Protocols

Not applicable.

4.4. Configuration

Any implementation's DICOM conformance may be dependent upon configuration, which takes place at the time of installation. Issues concerning configuration is addressed in this section.

4.4.1. AE Title/Presentation Address Mapping

An important installation issue is the translation from AE title to presentation address. How this is to be performed shall be described in this section.

4.4.1.1. Local AE Titles

The local AE title mapping and configuration are as follows.

Table 91: AE Title Configuration Table

Application Entity	Default AE Title	Default TCP/IP Port
EWS AE		3010 *

* Note: Not Configurable

4.4.1.2. Remote AE Title/Presentation Address Mapping

4.4.1.2.1. Remote Association Initiators

All relevant remote applications able to setup a DICOM association towards Extended MR Workspace must be configured at Extended MR Workspace configuration time. The Customer Support Engineer must provide the following information for each remote application:

- The Application Entity Title.
- The SOP classes and transfer syntaxes for which the EWS AE accepts associations.

4.4.1.2.2. Remote Association Acceptors

The following information must be provided for all relevant remote applications that are able to accept DICOM associations from the EWS AE:

- The Application Entity Title.
- The host name/IP address on which the remote application resides.
- The port number at which the remote application accepts association requests.

4.4.2. Parameters

The configuration parameters are given in Table below, categorized in the following sections:

- General Parameters of EWS AE.
- Local Configurable Parameters of the EWS AE.
- Remote Configurable Parameters of the EWS AE.
- General Print Parameters.
- Printer Specific Print Parameters.

Table 92: Configuration Parameters table

Parameter	Configurable	Default Value
General Parameters of EWS AE		
Time-out waiting for acceptance or rejection response to an association Open request. (Application level time-out / ARTIM)	No	120 [s]
General DIMSE level time-out values	No	-
Time-out waiting for response to TCP/IP connect request. (Low-level timeout)	OS	-
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	OS	-
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	OS	-
Any changes to default TCP/IP settings, such as configurable stack parameters.	OS	-
Association Timeout SCU	No	150 [s]
Association Timeout SCP	No	0 [s]
Network Reply Timeout	No	0 [s]
Local Configurable Parameters of the EWS AE		
Size constraint in maximum object size (see note)	No	-
Maximum PDU size the AE can receive	Yes	32768
Maximum PDU size the AE can send	No	-
AE specific DIMSE level time-out values	No	-
Number of simultaneous associations by Service and/or SOP class	No	-
SOP class support	Yes	none
Transfer Syntax support ¹	Yes	ELE
Remote Configurable Parameters of the EWS AE		
Size constraint in maximum object size (see note)	No	-
Maximum PDU size the AE can receive	Yes	32768
Maximum PDU size the AE can send	No	-
AE specific DIMSE level time-out values	No	-
Number of simultaneous associations by Service and/or SOP class	No	-
SOP class support	Yes	none
Transfer Syntax support	Yes	ELE
Storage Commitment request must be sent after Storage request	Yes	not
Storage Commitment time-out (synchronous to asynchronous)	Yes	none
Automatic conversion of images of SOP classes not supported by remote systems into Secondary Capture Image Storage SOP instances	Yes	convert to SC
Export of pure DICOM images (i.e. only the standard DICOM attributes as defined in the related IOD) or extended DICOM images (with additional Standard DICOM, Private and Retired attributes)	Yes	allow all attributes
Support of overlays for DICOM node not supporting Presentation State objects ²	Yes	enabled
Support of overlays for DICOM node supporting Presentation State objects ²	Yes	disabled
Support of overlays for CD ²	Yes	disabled

Parameter	Configurable	Default Value
General Print Parameters		
The DICOM printers that may be selected by the operator	Yes	none
Printer Specific Print Parameters ³		
Medium type	Yes	all available
Film size ID (i.e. Media size)	Yes	all available
Resolution (300 / 600 dpi)	Yes	300
Color model (8 / 16 bits color)	Yes	8
Min Density	Yes	0
Max Density	Yes	0

Note 1: The JPEG Baseline transfer syntax is only supported for RGB and YBR_FULL_422 images; therefore JPEG Baseline may NOT be configured for systems that are capable of handling storage of monochrome images too.

Note 2: The Extended MR Workspace Copy-tool can override the configured setting of overlay support.

Note 3: These print parameters can be selected from choice lists. These choice lists are defined via so-called prototypes for each type of printer and print medium. These prototypes are also configurable.

5. MEDIA INTERCHANGE

5.1. Implementation Model

5.1.1. Application Data Flow Diagram

The Extended MR Workspace consists of one single application entity only: the EWS AE.

The figure below shows the Media Interchange Application Data Flow as a functional overview of the EWS AE.

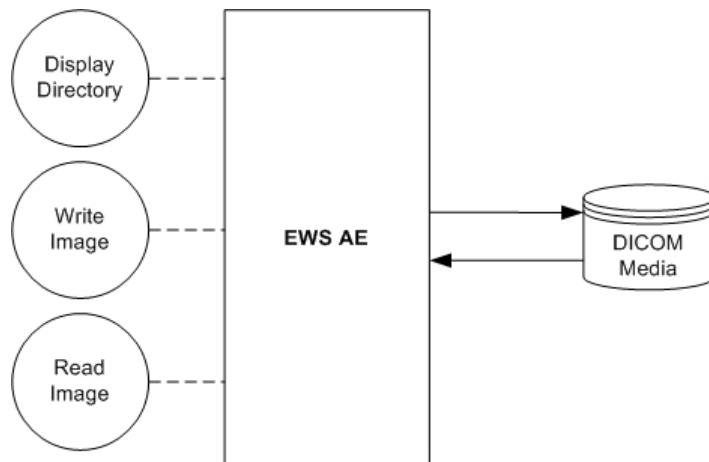


Figure 16: Media Interchange Application Data Flow Diagram

DICOM Media is as specified in the following table.

Table 93: Media Services

Media Storage Application	Write Files (FSC / FSU)	Read Files (FSR)
General Purpose CD-R Interchange	NO / NO	YES
General Purpose DVD Interchange with JPEG	YES / NO	YES
General Purpose USB Media Interchange with JPEG	YES / YES	YES

Supported Photometric Interpretations

The EWS AE supports images with the following DICOM photometric interpretations as shown in the table below.

Table 94: Photometric interpretations supported by the EWS AE

Photometric Interpretation	Import	Export	Viewing
MONOCHROME1	YES	YES	YES
MONOCHROME2	YES	YES	YES
PALETTE COLOR	YES	YES	NO
RGB	YES	YES	YES
YBR_FULL	YES	YES	NO
YBR_FULL_422 (see note)	YES	YES	NO
YBR_PARTIAL_422	YES	YES	NO
YBR_RCT	YES	YES	NO
YBR_ICT	YES	YES	NO

Note: If the photometric interpretation YBR_FULL_422 is used in combination with transfer syntax JPEG-Lossy then the pixel data is converted to RGB on import.

The system proposes the transfer syntaxes mentioned in the table below.

Table 95: Transfer Syntaxes of Media supported by the EWS AE

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
See Note	See Note	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Note: Any of the standard image storage and private SOP classes mentioned before. The preferred transfer syntax is ELE.

The EWS AE supports images with lossy image compression via JPEG as described in the table below.

Table 96: JPEG coding supported by the EWS AE

DICOM Transfer Syntax UID	JPEG coding process	JPEG description
1.2.840.10008.1.2.4.50	1	Lossy, Baseline (JPEG 8 Bit Image Compression)

Note: Lossy compression is only supported for images with photometric interpretation RGB and YBR_FULL_422, and therefore the EWS AE supports this only for Ultrasound images.

5.1.2. Functional Definitions of AE's

5.1.2.1. Functional Definition of EWS AE

The EWS AE is the one and only application entity within Extended MR Workspace. It includes the following service class.

Media Storage Service Class

For CD and DVD- the EWS AE can perform the media storage service as SCU with capabilities for:

- RWA Display Directory (as FSR);
- RWA Read Image (as FSR).

For DVD+ the EWS AE can perform the media storage service as SCU with capabilities for:

- RWA Display Directory (as FSR);
- RWA Read Image (as FSR);
- RWA Write Image (as FSC).

For USB the EWS AE can perform the media storage service as SCU with capabilities for:

- RWA Display Directory (as FSR);
- RWA Read Image (as FSR);
- RWA Write Image (as FSC and FSU).

5.1.3. Sequencing of Real World Activities

Whenever a DICOM media has to be written the EWS AE first tries to read the DICOMDIR. The EWS AE will compile the updated DICOMDIR and any required DICOM images into a media session image; this media session image will be written to the applicable DICOM media.

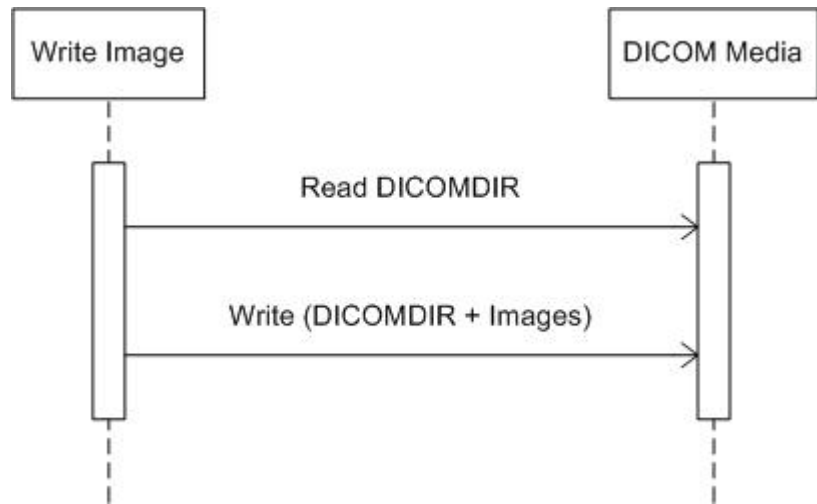


Figure 17: Sequencing of RWA Write Image

5.1.4. File Meta Information for Implementation Class and Version

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

Table 97: DICOM Implementation Class and Version for EWS AE

File Meta Information Version	00, 01
Implementation Class UID	1.3.46.670589.5.2.23
Implementation Version Name	ViewForum R6.1

5.2. AE Specifications

5.2.1. EWS AE - Specification

The EWS AE provides standard conformance to the DICOM Media Storage Service and File Format ([DICOM] PS 3.10), the Media Storage Application Profiles STD-GEN-CD ([DICOM] PS 3.11), the Media Storage Application Profiles STD-GEN-DVD-JPEG ([DICOM] PS 3.11), and the Media Storage Application Profiles STD-GEN-USB-JPEG ([DICOM] PS 3.11) for reading and writing.

The EWS AE supports multi-patient and multi-session media for reading and writing.

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

Table 98: AE Related Application Profiles, Real-World Activities, and Roles

Supported Application Profile	Real-World Activity	Roles	SC Option
STD-GEN-CD	Display Directory	FSR	Interchange
	Read Image	FSR	Interchange
STD-GEN-DVD-JPEG	Display Directory	FSR	Interchange
	Read Image	FSR	Interchange
	Write Image* **	FSC	Interchange
STD-GEN-USB-JPEG	Display Directory	FSR	Interchange
	Read Image	FSR	Interchange
	Write Image**	FSC, FSU	Interchange

* DVD+R(W) only;

** Using ELE only.

5.2.1.1. File Meta Information for the EWS AE

The EWS AE has no specific file meta information.

5.2.1.2. Real-World Activities

5.2.1.2.1. Display Directory

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

5.2.1.2.1.1. Media Storage Application Profile

When a database open action is initiated on the media then the EWS AE acts as an FSR using the interchange option to read the DICOMDIR of the medium.

This will result in an overview of the patients, studies, series and images on the Extended MR Workspace screen.

5.2.1.2.1.1.1. Options

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.

5.2.1.2.2. Read Image

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

5.2.1.2.2.1. Media Storage Application Profile

The EWS AE will act as a FSR when reading all images of the selected Examinations from DICOM media.

5.2.1.2.2.1.1. Options

The mandatory DICOM attributes are required for successful import of SOP instances.

5.2.1.2.3. Write Image

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

5.2.1.2.3.1. Media Storage Application Profile

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

5.2.1.2.3.1.1. Options

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

5.3. Augmented and Private Application Profiles

Not applicable.

5.4. Media Configuration

Not applicable.

6. SUPPORT OF CHARACTER SETS

The Extended MR Workspace supports the following specific character sets.

Table 99: Supported DICOM Character Sets of the Extended MR Workspace

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Latin alphabet No. 1	ISO_IR 100	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 100	G1	Supplementary set of ISO 8859
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
Japanese	ISO 2022 IR 87	-	ISO-IR 87	G0	JIS X 0208: Kanji
		-	-	-	-

The default character set shall be ISO-IR 100.

When an unsupported character set is received it shall be tried and decoded according the default character set. Otherwise unsupported characters shall be displayed as “?”.

7. SECURITY

7.1. Security Profiles

7.1.1. Attribute Confidentiality Profiles

7.1.1.1. The Basic Application Level Confidentiality Profile

No instances of the Encrypted Attributes Data Set are created. No Transfer Syntaxes are supported for encoding/decoding of Encrypted Attributes Data Sets.

The table below lists the protected attributes. The terms used to describe the replacement value can be read as below

Empty The attribute will have a value of zero length.

Table 100: Basic Application Level Confidentiality Profile Attributes

Attribute Name	Tag	VR	Replacement Value
Patient's Name	0010,0010	PN	Empty
Patient's Birth Date	0010,0030	DA	Empty
Patient's Sex	0010,0040	CS	Empty
Patient's Age	0010,1010	AS	Empty
Patient ID	0010,0020	LO	After anonymizing, when an image is written on DVD, the Patient ID in the DIRECTORY RECORD: 0 (PATIENT) will have a unique ID and in the image, the Patient Module will have empty value for the Patient ID.
Referring Physician's Name	0008,0090	PN	Empty
Performing Physician's Name	0008,1050	PN	Empty
Institution Name	0008,0080	LO	Empty
Study ID	0020, 0010	SH	Empty
Accession Number	0008,0050	SH	Empty

7.2. Association Level Security

Any calling AE title and/or IP address may open an association shall be specified here.

7.3. Application Level Security

The Extended MR Workspace supports the HIPAA Audit trail profile.

The Extended MR Workspace 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.

8. ANNEXES

8.1. IOD Contents

8.1.1. Created SOP Instances

This section specifies each IOD created by the Extended MR Workspace.

Used abbreviations are:

For module and macro Usage

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

For attribute Definition

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

Presence

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

Source

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

Following tables specify the contents of the Enhanced MR Multi-frame Functional Groups module.

Table 101: Usage of Enhanced MR Multi-frame Functional Group Macros

Macro	Usage
Pixel Measures	ALWAYS
Frame Content	ALWAYS
Plane Position	ALWAYS
Plane Orientation	ALWAYS
Cardiac Trigger	CONDITIONAL
Frame Anatomy	ALWAYS
Respiratory Trigger	CONDITIONAL
MR Timing and Related Parameters	ALWAYS
MR Echo	ALWAYS
MR Modifier	ALWAYS
MR Receive Coil	ALWAYS
MR Transmit Coil	ALWAYS
MR Diffusion	CONDITIONAL
MR Averages	ALWAYS
MR Spatial Saturation	CONDITIONAL
MR Velocity Encoding	CONDITIONAL
MR Spectroscopy FOV/Geometry	ALWAYS
MR Spectroscopy Frame Type	ALWAYS

Table 102: Created Enhanced MR Multi-frame Functional Group Macro Attributes

Name	Tag	VR	Definition	Comment
Pixel Measures Macro				
>Pixel Measures Sequence	0028,9110	SQ	ALWAYS, AUTO	-
>>Slice Thickness	0018,0050	DS	ANAP, AUTO	-
>>Pixel Spacing	0028,0030	DS	ANAP, AUTO	-
Frame Content Macro				
>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	If scan contains stacks.
>>In-Stack Position Number	0020,9057	UL	ANAP, AUTO	-
>>Dimension Index Values	0020,9157	UL	ANAP, AUTO	-
Plane Position Macro				
>Plane Position Sequence	0020,9113	SQ	ALWAYS, AUTO	-
>>Image Position (Patient)	0020,0032	DS	ANAP, AUTO	-
Plane Orientation Macro				
>Plane Orientation Sequence	0020,9116	SQ	ALWAYS, AUTO	-
>>Image Orientation (Patient)	0020,0037	DS	ANAP, AUTO	-
Cardiac Trigger Macro				
>Cardiac Trigger Sequence	0018,9118	SQ	ANAP, AUTO	-

Name	Tag	VR	Definition	Comment
>>Trigger Delay Time	0020,9153	FD	ALWAYS, AUTO	-
>>R-R Interval Time Measured	0020,9251	FD	ANAP, AUTO	-
Frame Anatomy Macro				
>Frame Anatomy Sequence	0020,9071	SQ	ALWAYS, AUTO	-
>>Anatomic Region Sequence	0008,2218	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	-
>>Frame Laterality	0020,9072	CS	ALWAYS, AUTO	-
Respiratory Trigger Macro				
>Respiratory Trigger Sequence	0020,9253	SQ	ANAP, AUTO	-
>>Respiratory Interval Time	0020,9254	FD	ALWAYS, AUTO	-
>>Respiratory Trigger Delay Time	0020,9255	FD	ALWAYS, AUTO	-
MR Timing and Related Parameters Macro				
>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	-
>>Operation 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 Macro				
>MR Echo Sequence	0018,9114	SQ	ALWAYS, AUTO	-
>>Effective Echo Time	0018,9082	FD	ANAP, AUTO	-
MR Modifier Macro				
>MR Modifier Sequence	0018,9115	SQ	ALWAYS, AUTO	-
>>Inversion Recovery	0018,9009	CS	ANAP, AUTO	-

Name	Tag	VR	Definition	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 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 Macro				
>MR Receive Coil Sequence	0018,9042	SQ	ALWAYS, AUTO	-
>>Receiving Coil Name	0018,1250	SH	ANAP, AUTO	-
>>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 Macro				
>MR Transmit Coil Sequence	0018,9049	SQ	ALWAYS, AUTO	-
>>Transmitting Coil Name	0018,1251	SH	ANAP, AUTO	-
>>Transmit Coil Manufacturer Name	0018,9050	LO	EMPTY, FIXED	-
>>Transmit Coil Type	0018,9051	CS	ANAP, AUTO	-
MR Diffusion Macro				
>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	-

Name	Tag	VR	Definition	Comment
>>Diffusion b-value	0018,9087	FD	ANAP, AUTO	-
>>Diffusion Anisotropy Type	0018,9147	CS	ANAP, AUTO	Applied value: FRACTIONAL
MR Averages Macro				
>MR Averages Sequence	0018,9119	SQ	ALWAYS, AUTO	-
>>Number of Averages	0018,0083	DS	ANAP, AUTO	-
MR Spatial Saturation Macro				
>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 Macro				
>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	-
MR Spectroscopy FOV/Geometry Macro				
>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 Spectroscopy Frame Type Macro				
>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	Applied values: MIXED, PROTON_DENSITY, SPECTROSCOPY, T1, T2, UNKNOWN

Table 103: List of created SOP Classes

SOP Class Name	SOP Class UID
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1

SOP Class Name	SOP Class UID
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1
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
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1
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
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66
3D Volume Storage new SOP Class (Private)	1.3.46.670589.5.0.1.1
3D Object new Storage (Private)	1.3.46.670589.5.0.2.1
Surface Storage new (Private)	1.3.46.670589.5.0.3.1
Cardio Image Storage new SOP Class (Private)	1.3.46.670589.5.0.8.1
CT Synthetic Image Storage (Private)	1.3.46.670589.5.0.9
MR Synthetic Image Storage (Private)	1.3.46.670589.5.0.10
MR Cardio Analysis new Storage (Private)	1.3.46.670589.5.0.11.1
CX Synthetic Image Storage (Private)	1.3.46.670589.5.0.12
Perfusion (Private)	1.3.46.670589.5.0.13
Perfusion Image Storage (Private)	1.3.46.670589.5.0.14

8.1.1.1. Computed Radiography Image Storage SOP Class

Table 104: IOD of Created Computed Radiography Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
	CR Series Module	ALWAYS
Equipment Image	General Equipment Module	ALWAYS
	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Contrast/Bolus Module	CONDITIONAL
	CR Image Module	ALWAYS
	SOP Common Module	ALWAYS

Table 105: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAPEV	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAPEV	AUTO	
Patient's Name	0010,0010	PN		VNAP	AUTO	
Patient ID	0010,0020	LO		VNAP	AUTO	
Patient's Sex	0010,0040	CS		VNAP	AUTO	

Table 106: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	

Table 107: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Patient Position	0018,5100	CS		VNAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	

Table 108: CR Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Body Part Examined	0018,0015	CS		VNAP	AUTO	
View Position	0018,5101	CS		VNAP	AUTO	

Table 109: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	

Table 110: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 111: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 112: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		VNAP	AUTO	

Table 113: CR Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	

Table 114: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.1.2. Digital X-Ray Image Storage - For Pres. SOP**Table 115: IOD of Created Digital X-Ray Image Storage - For Pres. SOP Instances**

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
	DX Series	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Acquisition Context Module	ALWAYS
	DX Anatomy Imaged Module	ALWAYS
	DX Image Module	ALWAYS
	DX Detector Module	ALWAYS
	Overlay Plane Module	CONDITIONAL
	VOI LUT Module	CONDITIONAL
	SOP Common Module	ALWAYS

Table 116: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAPEV	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAPEV	AUTO	
Patient's Name	0010,0010	PN		VNAP	AUTO	
Patient ID	0010,0020	LO		VNAP	AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		VNAP	AUTO	

Table 117: General Study Module

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

Table 118: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	

Table 119: DX Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Presentation Intent Type	0008,0068	CS		ALWAYS	FIXED	

Table 120: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	

Table 121: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 122: 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 Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 123: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		VNAP	AUTO	
>Measurement Units Code Sequence	0040,08EA	SQ		ANAPEV	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Concept Name Code Sequence	0040,A043	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	
>Date	0040,A121	DA		ANAPEV	AUTO	
>Time	0040,A122	TM		ANAPEV	AUTO	
>Person Name	0040,A123	PN		ANAPEV	AUTO	
>Referenced Frame Numbers	0040,A136	US		ANAPEV	AUTO	
>Concept Code Sequence	0040,A168	SQ		ANAPEV	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	

Table 124: DX Anatomy Imaged Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Anatomic Region Sequence	0008,2218	SQ		VNAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Anatomic Region Modifier Sequence	0008,2220	SQ		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Image Laterality	0020,0062	CS		ALWAYS	AUTO	

Table 125: DX Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	
Patient Orientation	0020,0020	CS		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	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS		ALWAYS	AUTO	
Pixel Intensity Relationship	0028,1040	CS		ALWAYS	AUTO	
Pixel Intensity Relationship Sign	0028,1041	SS		ALWAYS	AUTO	
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	
Rescale Type	0028,1054	LO		ALWAYS	AUTO	
Lossy Image Compression	0028,2110	CS		ALWAYS	AUTO	
Presentation LUT Shape	2050,0020	CS		ALWAYS	AUTO	

Table 126: DX Detector Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Imager Pixel Spacing	0018,1164	DS		ALWAYS	AUTO	
Detector Type	0018,7004	CS		VNAP	AUTO	

Table 127: 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 Type	6000,0040	CS		ALWAYS	AUTO	
Overlay Origin	6000,0050	SS		ALWAYS	AUTO	
Overlay Bits Allocated	6000,0100	US		ALWAYS	AUTO	
Overlay Bit Position	6000,0102	US		ALWAYS	AUTO	
Overlay Data	6000,3000	O W/ OB		VNAP	AUTO	

Table 128: 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	
VOI LUT Sequence	0028,3010	SQ		VNAP	AUTO	

Table 129: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI		ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.1.3. CT Image Storage SOP Class

Table 130: IOD of Created CT Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Plane Module	ALWAYS
	Image Pixel Module	ALWAYS
	Contrast/Bolus Module	CONDITIONAL
	CT Image Module	ALWAYS
	SOP Common Module	ALWAYS

Table 131: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
Patient's Name	0010,0010	PN		VNAP	AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		VNAP	AUTO	

Table 132: General Study Module

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

Table 133: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	

Table 134: 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		VNAP	AUTO	

Table 135: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	

Table 136: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 137: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Slice Thickness	0018,0050	DS		VNAP	AUTO	
Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO	
Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO	

Table 138: 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 Spacing	0028,0030	DS		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 139: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		VNAP	AUTO	

Table 140: CT Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	
KVP	0018,0060	DS		VNAP	AUTO	
Acquisition Number	0020,0012	IS		VNAP	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	
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	

Table 141: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.1.4. Ultrasound Multi-frame Image Storage SOP Class

Table 142: IOD of Created Ultrasound Multi-frame Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	CONDITIONAL
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Contrast/Bolus Module	CONDITIONAL
	Cine Module	ALWAYS
	Multi-frame Module	ALWAYS
	US Image Module	ALWAYS
	SOP Common Module	ALWAYS

Table 143: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAPEV	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAPEV	AUTO	
Patient's Name	0010,0010	PN		VNAP	AUTO	
Patient ID	0010,0020	LO		VNAP	AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		VNAP	AUTO	

Table 144: General Study Module

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

Table 145: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	

Table 146: 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		VNAP	AUTO	

Table 147: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	

Table 148: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 149: 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 Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 150: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		VNAP	AUTO	

Table 151: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time	0018,1063	DS		ANAPEV	AUTO	
Frame Time Vector	0018,1065	DS		ANAPEV	AUTO	

Table 152: Multi-frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT		ALWAYS	AUTO	

Table 153: US Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		VNAP	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	

Table 154: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.1.5. MR Image Storage SOP Class

Table 155: IOD of Created MR Image Storage SOP Class Instances

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

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

Table 156: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	IMPLICIT	
>Referenced SOP Class UID	0008,1150	UI		ANAPEV	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAPEV	AUTO	
Patient's Name	0010,0010	PN		VNAP	COPY	
Patient ID	0010,0020	LO		VNAP	COPY	
Issuer of Patient ID	0010,0021	LO		ANAP	COPY	
Patient's Birth Date	0010,0030	DA		VNAP	COPY	
Patient's Birth Time	0010,0032	TM		ANAP	COPY	
Patient's Sex	0010,0040	CS		VNAP	COPY	
Other Patient IDs	0010,1000	LO		ANAP	COPY	
Other Patient Names	0010,1001	PN		ANAP	COPY	
Ethnic Group	0010,2160	SH		ANAPCV	COPY	
Patient Comments	0010,4000	LT		ANAPCV	COPY	

Table 157: Patient Medical Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAPCV	COPY	
Contrast Allergies	0010,2110	LO		ANAPCV	COPY	
Pregnancy Status	0010,21C0	US		VNAP	COPY	
Special Needs	0038,0050	LO		ANAPCV	COPY	
Patient State	0038,0500	LO		ANAPCV	COPY	

Table 158: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Description	0008,1030	LO		ANAPCV	AUTO	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>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	
>Context Identifier	0008,010F	CS		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	
>Referenced SOP Class UID	0008,1150	UI		ANAPCV	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAPCV	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	
Requesting Physician	0032,1032	PN		ANAPCV	AUTO	
Requesting Service	0032,1033	LO		ANAPCV	AUTO	
Requested Procedure Description	0032,1060	LO		ANAPCV	AUTO	
Requested Contrast Agent	0032,1070	LO		ANAPCV	AUTO	
Study Comments	0032,4000	LT		ANAPCV	AUTO	
Scheduled Performing Physician's Name	0040,0006	PN		ANAPCV	AUTO	
Performed Station AE Title	0040,0241	AE		ANAP	AUTO	
Performed Station Name	0040,0242	SH		ANAPCV	AUTO	
Performed Location	0040,0243	SH		ANAPCV	AUTO	
Performed Procedure Step End Date	0040,0250	DA		ANAPCV	AUTO	
Performed Procedure Step End Time	0040,0251	TM		ANAPCV	AUTO	
Performed Procedure Step Status	0040,0252	CS		ANAP	AUTO	
Requested Procedure ID	0040,1001	SH		ANAPCV	AUTO	
Reason for the Requested Procedure	0040,1002	LO		ANAPCV	AUTO	
Requested Procedure Priority	0040,1003	SH		ANAPCV	AUTO	
Patient Transport Arrangements	0040,1004	LO		ANAPCV	AUTO	
Requested Procedure Location	0040,1005	LO		ANAPCV	AUTO	
Requested Procedure Comments	0040,1400	LT		ANAPCV	AUTO	
Reason for the Imaging Service Request	0040,2001	LO		ANAPCV	AUTO	
Issue Date of Imaging Service Request	0040,2004	DA		ANAPCV	AUTO	
Issue Time of Imaging Service Request	0040,2005	TM		ANAPCV	AUTO	
Order Enterer's Location	0040,2009	SH		ANAPCV	AUTO	
Order Callback Phone Number	0040,2010	SH		ANAPCV	AUTO	
Imaging Service Request Comments	0040,2400	LT		ANAPCV	AUTO	

Table 159: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Admitting Diagnoses Description	0008,1080	LO		ANAPCV	COPY	
Patient's Age	0010,1010	AS		ANAP	COPY	
Patient's Size	0010,1020	DS		ANAP	COPY	
Patient's Weight	0010,1030	DS		ANAP	COPY	
Occupation	0010,2180	SH		ANAPCV	COPY	
Additional Patient History	0010,21B0	LT		ANAPCV	COPY	

Table 160: General 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		ALWAYS	FIXED	
Series Description	0008,103E	LO		ANAP	AUTO	
Performing Physician's Name	0008,1050	PN		ANAP	AUTO	
Operators' Name	0008,1070	PN		ANAPCV	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Instance Creation Date	0008,0012	DA		ANAP	AUTO	
>Instance Creation Time	0008,0013	TM		ANAP	AUTO	
>Instance Creator UID	0008,0014	UI		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>Instance Number	0020,0013	IS		ANAP	AUTO	
Body Part Examined	0018,0015	CS		ANAP	AUTO	
Protocol Name	0018,1030	LO		ANAP	AUTO	
Patient Position	0018,5100	CS		VNAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	
Laterality	0020,0060	CS		ANAPCV	AUTO	
Smallest Pixel Value in Series	0028,0108	US /SS		ANAP	AUTO	
Largest Pixel Value in Series	0028,0109	US /SS		ANAP	AUTO	
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		ANAPCV	AUTO	
Performed Protocol Code Sequence	0040,0260	SQ		ANAPCV	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>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	
>Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	
>Context Identifier	0008,010F	CS		ANAPCV	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAPCV	AUTO	
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	
>Requested Procedure ID	0040,1001	SH		ALWAYS	AUTO	
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	AUTO	

Table 161: 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		VNAP	AUTO	

Table 162: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		ALWAYS	FIXED	
Institution Name	0008,0080	LO		ANAP	AUTO	
Institution Address	0008,0081	ST		ANAP	AUTO	
Station Name	0008,1010	SH		ANAP	AUTO	
Institutional Department Name	0008,1040	LO		ANAP	AUTO	
Manufacturer's Model Name	0008,1090	LO		ANAP	AUTO	
Device Serial Number	0018,1000	LO		ANAP	AUTO	
Software Version(s)	0018,1020	LO		ANAP	AUTO	
Spatial Resolution	0018,1050	DS		ANAP	AUTO	
Date of Last Calibration	0018,1200	DA		ANAP	AUTO	
Time of Last Calibration	0018,1201	TM		ANAP	AUTO	
Pixel Padding Value	0028,0120	US /SS		ANAP	AUTO	

Table 163: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ANAP	AUTO, COPY	
Content Date	0008,0023	DA		VNAP	AUTO	
Acquisition Datetime	0008,002A	DT		ANAP	AUTO	
Acquisition Time	0008,0032	TM		ANAP	AUTO, COPY	
Content Time	0008,0033	TM		VNAP	AUTO	
Referenced Image Sequence	0008,1140	SQ		ANAPCV	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	IMPLICIT	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	IMPLICIT	
Derivation Description	0008,2111	ST		ANAP	AUTO	
Acquisition Number	0020,0012	IS		ANAP	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	
Patient Orientation	0020,0020	CS		ANAPCV	AUTO	
Images in Acquisition	0020,1002	IS		ANAP	AUTO	
Image Comments	0020,4000	LT		ANAP	AUTO	
Quality Control Image	0028,0300	CS		ANAP	AUTO	
Burned In Annotation	0028,0301	CS		ANAP	AUTO	
Lossy Image Compression	0028,2110	CS		ANAP	AUTO	
Lossy Image Compression Ratio	0028,2112	DS		ANAP	AUTO	
Presentation LUT Shape	2050,0020	CS		ANAP	AUTO	

Table 164: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Slice Thickness	0018,0050	DS		VNAP	AUTO	
Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO	
Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO	
Slice Location	0020,1041	DS		ANAP	AUTO	
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	

Table 165: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Planar Configuration	0028,0006	US		ANAP	AUTO	
Rows	0028,0010	US		ALWAYS	IMPLICIT	
Columns	0028,0011	US		ALWAYS	IMPLICIT	
Pixel Aspect Ratio	0028,0034	IS		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Stored	0028,0101	US		ALWAYS	IMPLICIT	
High Bit	0028,0102	US		ALWAYS	IMPLICIT	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Smallest Image Pixel Value	0028,0106	US /SS		ANAP	AUTO	
Largest Image Pixel Value	0028,0107	US /SS		ANAP	AUTO	
Red Palette Color Lookup Table Descriptor	0028,1101	US /SS		ANAP	AUTO	
Green Palette Color Lookup Table Descriptor	0028,1102	US /SS		ANAP	AUTO	
Blue Palette Color Lookup Table Descriptor	0028,1103	US /SS		ANAP	AUTO	
Red Palette Color Lookup Table Data	0028,1201	O W		ANAP	AUTO	
Green Palette Color Lookup Table Data	0028,1202	O W		ANAP	AUTO	
Blue Palette Color Lookup Table Data	0028,1203	O W		ANAP	AUTO	
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	IMPLICIT	

Table 166: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		VNAP	AUTO	
Contrast/Bolus Route	0018,1040	LO		ANAP	AUTO	
Contrast/Bolus Volume	0018,1041	DS		ANAP	AUTO	
Contrast/Bolus Start Time	0018,1042	TM		ANAP	AUTO	
Contrast/Bolus Stop Time	0018,1043	TM		ANAP	AUTO	
Contrast/Bolus Total Dose	0018,1044	DS		ANAP	AUTO	
Contrast Flow Rate	0018,1046	DS		ANAP	AUTO	
Contrast Flow Duration	0018,1047	DS		ANAP	AUTO	
Contrast/Bolus Ingredient	0018,1048	CS		ANAP	AUTO	
Contrast/Bolus Ingredient Concentration	0018,1049	DS		ANAP	AUTO	

Table 167: MR Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	
Scanning Sequence	0018,0020	CS		ALWAYS	AUTO	
Sequence Variant	0018,0021	CS		ALWAYS	AUTO	
Scan Options	0018,0022	CS		VNAP	AUTO	
MR Acquisition Type	0018,0023	CS		VNAP	AUTO	
Sequence Name	0018,0024	SH		ANAP	AUTO	
Angio Flag	0018,0025	CS		ANAP	AUTO	
Repetition Time	0018,0080	DS		ANAPCV	AUTO	
Echo Time	0018,0081	DS		VNAP	AUTO	
Inversion Time	0018,0082	DS		ANAPCV	AUTO	
Number of Averages	0018,0083	DS		ANAP	AUTO	
Imaging Frequency	0018,0084	DS		ANAP	AUTO	
Imaged Nucleus	0018,0085	SH		ANAP	AUTO	
Echo Number(s)	0018,0086	IS		ANAPCV	AUTO	
Magnetic Field Strength	0018,0087	DS		ANAPCV	AUTO	
Spacing Between Slices	0018,0088	DS		ANAP	AUTO	
Number of Phase Encoding Steps	0018,0089	IS		ANAPCV	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Echo Train Length	0018,0091	IS		VNAP	AUTO	
Percent Sampling	0018,0093	DS		ANAPCV	AUTO	
Percent Phase Field of View	0018,0094	DS		ANAPCV	AUTO	
Pixel Bandwidth	0018,0095	DS		ANAP	AUTO	
Trigger Time	0018,1060	DS		ANAPCV	AUTO	
Nominal Interval	0018,1062	IS		ANAP	AUTO	
Beat Rejection Flag	0018,1080	CS		ANAP	AUTO	
Low R-R Value	0018,1081	IS		ANAPCV	AUTO	
High R-R Value	0018,1082	IS		ANAPCV	AUTO	
Intervals Acquired	0018,1083	IS		ANAP	AUTO	
Intervals Rejected	0018,1084	IS		ANAPCV	AUTO	
PVC Rejection	0018,1085	LO		ANAP	AUTO	
Skip Beats	0018,1086	IS		ANAP	AUTO	
Heart Rate	0018,1088	IS		ANAPCV	AUTO	
Cardiac Number of Images	0018,1090	IS		ANAP	AUTO	
Trigger Window	0018,1094	IS		ANAPCV	AUTO	
Reconstruction Diameter	0018,1100	DS		ANAPCV	AUTO	
Receiving Coil Name	0018,1250	SH		ANAP	AUTO	
Transmitting Coil Name	0018,1251	SH		ANAP	AUTO	
Acquisition Matrix	0018,1310	US		ANAPCV	AUTO	
In-plane Phase Encoding Direction	0018,1312	CS		ANAPCV	AUTO	
Flip Angle	0018,1314	DS		ANAPCV	AUTO	
Variable Flip Angle Flag	0018,1315	CS		ANAP	AUTO	
SAR	0018,1316	DS		ANAP	AUTO	
dB/dt	0018,1318	DS		ANAP	AUTO	
Temporal Position Identifier	0020,0100	IS		ANAPCV	AUTO	
Number of Temporal Positions	0020,0105	IS		ANAPCV	AUTO	
Temporal Resolution	0020,0110	DS		ANAP	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	FIXED	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Bits Allocated	0028,0100	US		ALWAYS	FIXED	

Table 168: 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		ANAPCV	AUTO	
Overlay Type	6000,0040	CS		ALWAYS	AUTO	
Overlay Subtype	6000,0045	LO		ANAPCV	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		ANAPCV	AUTO	
ROI Mean	6000,1302	DS		ANAPCV	AUTO	
ROI Standard Deviation	6000,1303	DS		ANAPCV	AUTO	
Overlay Label	6000,1500	LO		ANAPCV	AUTO	
Overlay Data	6000,3000	O W/ OB		ALWAYS	AUTO	

Table 169: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Type	0028,1054	LO	cm/sec, milliradials, milliseconds, mm ² /sec, normalized, seconds, US	ALWAYS	AUTO	

Table 170: 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	
Window Center & Width Explanation	0028,1055	LO		ANAP	AUTO	
VOI LUT Sequence	0028,3010	SQ		ANAP	AUTO	
>LUT Descriptor	0028,3002	US /SS	(0,0,0)	ALWAYS	AUTO	
>LUT Explanation	0028,3003	LO		EMPTY	FIXED	
>LUT Data	0028,3006	US /SS /O W	0	ALWAYS	AUTO	

Table 171: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
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	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Timezone Offset From UTC	0008,0201	SH		ANAP	AUTO	
SOP Instance Status	0100,0410	CS		ANAP	AUTO	
SOP Authorization Date and Time	0100,0420	DT		ANAP	AUTO	
SOP Authorization Comment	0100,0424	LT		ANAP	AUTO	
Authorization Equipment Certification Number	0100,0426	LO		ANAP	AUTO	

8.1.1.6. MR Spectroscopy Storage SOP Class

Table 172: IOD of Created MR Spectroscopy Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
	Patient Medical Module	CONDITIONAL
Study	General Study Module	ALWAYS
	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
	MR Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
	Synchronization Module	CONDITIONAL
Equipment	General Equipment Module	ALWAYS
	Enhanced General Equipment Module	ALWAYS
MR Spectroscopy	Acquisition Context Module	ALWAYS
	Multi-frame Functional Groups Module	ALWAYS
	Multi-frame Dimension Module	ALWAYS
	Cardiac Synchronization Module	CONDITIONAL
	Respiratory Synchronization Module	CONDITIONAL
	Bulk Motion Synchronization Module	CONDITIONAL

Information Entity	Module	Presence Of Module
	MR Spectroscopy Module	ALWAYS
	MR Spectroscopy Pulse Sequence Module	CONDITIONAL
	MR Spectroscopy Data Module	ALWAYS
	SOP Common Module	ALWAYS

Table 173: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAPEV	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAPEV	AUTO	
Patient's Name	0010,0010	PN		VNAP	COPY	
Patient ID	0010,0020	LO		VNAP	COPY	
Patient's Birth Date	0010,0030	DA		VNAP	COPY	
Patient's Sex	0010,0040	CS		VNAP	COPY	
Ethnic Group	0010,2160	SH		ANAPCV	COPY	
Patient Comments	0010,4000	LT		ANAPCV	COPY	

Table 174: Patient Medical Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAPCV	COPY	
Contrast Allergies	0010,2110	LO		ANAPCV	COPY	
Pregnancy Status	0010,21C0	US		VNAP	COPY	
Special Needs	0038,0050	LO		ANAPCV	COPY	
Patient State	0038,0500	LO		ANAPCV	COPY	

Table 175: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Description	0008,1030	LO		ANAPCV	AUTO	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>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	
>Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	
>Context Identifier	0008,010F	CS		ANAP	AUTO	
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAPCV	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAPCV	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	
Scheduled Performing Physician's Name	0040,0006	PN		ANAPCV	AUTO	

Table 176: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Admitting Diagnoses Description	0008,1080	LO		VNAP	COPY	
Patient's Weight	0010,1030	DS		ALWAYS	COPY	
Occupation	0010,2180	SH		ANAPCV	COPY	
Additional Patient History	0010,21B0	LT		VNAP	COPY	

Table 177: General 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	
Series Description	0008,103E	LO		ANAP	AUTO	
Operators' Name	0008,1070	PN		ANAPEV	AUTO	
Body Part Examined	0018,0015	CS		ANAP	AUTO	
Protocol Name	0018,1030	LO		ANAP	AUTO	
Patient Position	0018,5100	CS		ANAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	
Laterality	0020,0060	CS		ANAPCV	AUTO	
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		ANAPCV	AUTO	
Performed Protocol Code Sequence	0040,0260	SQ		ANAPCV	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>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	
>Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	
>Context Identifier	0008,010F	CS		ANAPCV	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAPCV	AUTO	
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	
>Requested Procedure ID	0040,1001	SH		ALWAYS	AUTO	
Comments on the Performed Procedure Step	0040,0280	ST		ANAPCV	AUTO	

Table 178: MR Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	FIXED	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
>Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
>Instance Creator UID	0008,0014	UI		ALWAYS	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	FIXED	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 179: 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		VNAP	AUTO	

Table 180: 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	
Synchronization Frame of Reference UID	0020,0200	UI		ALWAYS	AUTO	

Table 181: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Name	0008,0080	LO		ANAP	AUTO	
Station Name	0008,1010	SH		ANAP	AUTO	
Institutional Department Name	0008,1040	LO		ANAP	AUTO	

Table 182: Enhanced General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	
Manufacturer's Model Name	0008,1090	LO		ANAP	AUTO	
Device Serial Number	0018,1000	LO		ANAP	AUTO	
Software Version(s)	0018,1020	LO		ANAP	AUTO	

Table 183: Acquisition Context Module

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

Table 184: Multi-frame Functional Groups Module

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	Ref. table 103.	VNAP	AUTO	
Shared Functional Groups Sequence	5200,9230	SQ	Ref. table 103.	ALWAYS	AUTO	

Table 185: 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	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Dimension Organization UID	0020,9164	UI		ANAP	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	

Table 186: Cardiac Synchronization Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Low R-R Value	0018,1081	IS		ANAPCV	AUTO	
High R-R Value	0018,1082	IS		ANAPCV	AUTO	
Intervals Acquired	0018,1083	IS		ANAPCV	AUTO	
Intervals Rejected	0018,1084	IS		ANAPCV	AUTO	
Cardiac Synchronization Technique	0018,9037	CS		ANAP	AUTO	
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 187: 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 188: Bulk Motion Synchronization Module

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

Table 189: MR Spectroscopy Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	
Acquisition Datetime	0008,002A	DT		ANAP	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	
Magnetic Field Strength	0018,0087	DS		ANAP	AUTO	
Content Qualification	0018,9004	CS		ANAP	AUTO	
Spectral Width	0018,9052	FD		ANAP	AUTO	
Chemical Shift Reference	0018,9053	FD	4.67	ANAP	AUTO	
Volume Localization Technique	0018,9054	CS		ANAP	AUTO	
De-coupling	0018,9059	CS		ANAP	AUTO	
De-coupled Nucleus	0018,9060	CS		ANAP	AUTO	
De-coupling Frequency	0018,9061	FD		ANAP	AUTO	
De-coupling Method	0018,9062	CS		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
De-coupling Chemical Shift Reference	0018,9063	FD	4.67	ANAP	AUTO	
k-space Filtering	0018,9064	CS		ANAP	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	
Acquisition Duration	0018,9073	FD		ANAP	AUTO	
Transmitter Frequency	0018,9098	FD		ANAP	AUTO	
Resonant Nucleus	0018,9100	CS	129XE, 13C, 19F, 1H, 23NA, 31P, 3HE, 7LI, OTHER	ANAP	AUTO	
Frequency Correction	0018,9101	CS		ANAP	AUTO	
Volume Localization Sequence	0018,9126	SQ		ANAP	AUTO	
>Slab Thickness	0018,9104	FD		ANAP	AUTO	
>Slab Orientation	0018,9105	FD		ANAP	AUTO	
>Mid Slab Position	0018,9106	FD		ANAP	AUTO	
Applicable Safety Standard Agency	0018,9174	CS		ANAP	AUTO	
First Order Phase Correction	0018,9198	CS		ANAP	AUTO	
Water Referenced Phase Correction	0018,9199	CS		ANAP	AUTO	
Acquisition Number	0020,0012	IS		ANAPCV	AUTO	
Image Comments	0020,4000	LT		ANAPCV	AUTO	

Table 190: MR Spectroscopy Pulse Sequence Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Pulse Sequence Name	0018,9005	SH		ANAPCV	AUTO	
Echo Pulse Sequence	0018,9008	CS		ANAPCV	AUTO	
Multiple Spin Echo	0018,9011	CS		ANAPCV	AUTO	
Multi-planar Excitation	0018,9012	CS		ANAPCV	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		ANAPCV	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		ANAPCV	AUTO	

Table 191: 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 192: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
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	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.1.7. Ultrasound Image Storage SOP Class**Table 193: IOD of Created Ultrasound Image Storage SOP Class Instances**

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Contrast/Bolus Module	CONDITIONAL
	US Image Module	ALWAYS
	SOP Common Module	ALWAYS

Table 194: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAPEV	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAPEV	AUTO	
Patient's Name	0010,0010	PN		VNAP	AUTO	
Patient ID	0010,0020	LO		VNAP	AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		VNAP	AUTO	

Table 195: General Study Module

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

Table 196: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	

Table 197: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	

Table 198: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 199: 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 Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 200: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		VNAP	AUTO	

Table 201: US Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		VNAP	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	

Table 202: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.1.8. Secondary Capture Image Storage SOP Class**Table 203: IOD of Created Secondary Capture Image Storage SOP Class Instances**

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
	Patient Medical Module	CONDITIONAL
Study	General Study Module	ALWAYS
	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
	Equipment	General Equipment Module
Image	SC Equipment Module	ALWAYS
	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SC Image Module	ALWAYS

Information Entity	Module	Presence Of Module
	Overlay Plane Module	CONDITIONAL
	Modality LUT Module	CONDITIONAL
	VOI LUT Module	CONDITIONAL
	SOP Common Module	ALWAYS

Table 204: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
Patient's Name	0010,0010	PN		VNAP	COPY	
Patient ID	0010,0020	LO		VNAP	COPY	
Patient's Birth Date	0010,0030	DA		VNAP	COPY	
Patient's Birth Time	0010,0032	TM		ANAPCV	COPY	
Patient's Sex	0010,0040	CS		VNAP	COPY	
Other Patient IDs	0010,1000	LO		ANAP	COPY	
Other Patient Names	0010,1001	PN		ANAP	COPY	
Ethnic Group	0010,2160	SH		ANAP	COPY	
Patient Comments	0010,4000	LT		ANAP	COPY	

Table 205: Patient Medical Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAPCV	COPY	
Contrast Allergies	0010,2110	LO		ANAPCV	COPY	
Pregnancy Status	0010,21C0	US		VNAP	COPY	
Special Needs	0038,0050	LO		ANAPCV	COPY	
Patient State	0038,0500	LO		ANAPCV	COPY	

Table 206: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Description	0008,1030	LO		ANAPCV	AUTO	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>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	
>Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	
>Context Identifier	0008,010F	CS		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	
>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	
Scheduled Performing Physician's Name	0040,0006	PN		ANAPCV	AUTO	

Table 207: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Admitting Diagnoses Description	0008,1080	LO		ANAPCV	COPY	
Admitting Diagnosis Code Sequence	0008,1084	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	
>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	
Patient's Age	0010,1010	AS		ANAP	COPY	
Patient's Size	0010,1020	DS		ANAP	COPY	
Patient's Weight	0010,1030	DS		ANAP	COPY	
Occupation	0010,2180	SH		ANAP	COPY	
Additional Patient History	0010,21B0	LT		ANAP	COPY	

Table 208: General 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	
Series Description	0008,103E	LO		ANAP	AUTO	
Performing Physician's Name	0008,1050	PN		ANAP	AUTO	
Operators' Name	0008,1070	PN		ANAPCV	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Instance Creation Date	0008,0012	DA		ANAP	AUTO	
>Instance Creation Time	0008,0013	TM		ANAP	AUTO	
>Instance Creator UID	0008,0014	UI		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>Instance Number	0020,0013	IS		ANAP	AUTO	
Body Part Examined	0018,0015	CS		ANAP	AUTO	
Protocol Name	0018,1030	LO		ANAP	AUTO	
Patient Position	0018,5100	CS		ANAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	
Laterality	0020,0060	CS		ANAPCV	AUTO	
Smallest Pixel Value in Series	0028,0108	US /SS		ANAP	AUTO	
Largest Pixel Value in Series	0028,0109	US /SS		ANAP	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	
Performed Procedure Step Description	0040,0254	LO		ANAPCV	AUTO	
Performed Protocol Code Sequence	0040,0260	SQ		ANAPCV	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>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	
>Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	
>Context Identifier	0008,010F	CS		ANAP	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAPCV	AUTO	
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	
>Requested Procedure ID	0040,1001	SH		ALWAYS	AUTO	
Comments on the Performed Procedure Step	0040,0280	ST		ANAPCV	AUTO	

Table 209: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	
Institution Name	0008,0080	LO		ANAP	AUTO	
Institution Address	0008,0081	ST		ANAPCV	AUTO	
Station Name	0008,1010	SH		ANAP	AUTO	
Institutional Department Name	0008,1040	LO		ANAP	AUTO	
Manufacturer's Model Name	0008,1090	LO		ANAP	AUTO	
Device Serial Number	0018,1000	LO		ANAP	AUTO	
Software Version(s)	0018,1020	LO		ANAP	AUTO	
Spatial Resolution	0018,1050	DS		ANAP	AUTO	
Date of Last Calibration	0018,1200	DA		ANAP	AUTO	
Time of Last Calibration	0018,1201	TM		ANAP	AUTO	
Pixel Padding Value	0028,0120	US /SS		ANAP	AUTO	

Table 210: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ANAP	AUTO	
Conversion Type	0008,0064	CS		ALWAYS	AUTO	
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 211: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ANAP	AUTO	
Acquisition Date	0008,0022	DA		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ANAP	AUTO	
Acquisition Datetime	0008,002A	DT		ANAP	AUTO	
Acquisition Time	0008,0032	TM		ANAP	AUTO	
Content Time	0008,0033	TM		ANAP	AUTO	
Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		ANAP	AUTO	
Derivation Description	0008,2111	ST		ANAP	AUTO	
Source Image Sequence	0008,2112	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		ANAP	AUTO	
Derivation Code Sequence	0008,9215	SQ		ANAP	AUTO	
Acquisition Number	0020,0012	IS		ANAP	AUTO	
Instance Number	0020,0013	IS		ANAPCV	AUTO	
Patient Orientation	0020,0020	CS		ANAP	AUTO	
Images in Acquisition	0020,1002	IS		ANAP	AUTO	
Image Comments	0020,4000	LT		ANAPCV	AUTO	
Quality Control Image	0028,0300	CS		ANAP	AUTO	
Burned In Annotation	0028,0301	CS		ANAP	AUTO	
Lossy Image Compression	0028,2110	CS		ANAP	AUTO	
Lossy Image Compression Ratio	0028,2112	DS		ANAP	AUTO	
Icon Image Sequence	0088,0200	SQ		ANAP	AUTO	
>Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
>Rows	0028,0010	US		ALWAYS	AUTO	
>Columns	0028,0011	US		ALWAYS	AUTO	
>Bits Allocated	0028,0100	US		ALWAYS	AUTO	
>Bits Stored	0028,0101	US		ALWAYS	AUTO	
>High Bit	0028,0102	US		ALWAYS	AUTO	
>Pixel Representation	0028,0103	US		ALWAYS	AUTO	
>Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	
Presentation LUT Shape	2050,0020	CS		ANAP	AUTO	

Table 212: 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	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Aspect Ratio	0028,0034	IS		ANAP	AUTO	
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Smallest Image Pixel Value	0028,0106	US /SS		ANAP	AUTO	
Largest Image Pixel Value	0028,0107	US /SS		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Red Palette Color Lookup Table Descriptor	0028,1101	US/SS		ANAP	AUTO	
Green Palette Color Lookup Table Descriptor	0028,1102	US/SS		ANAP	AUTO	
Blue Palette Color Lookup Table Descriptor	0028,1103	US/SS		ANAP	AUTO	
Red Palette Color Lookup Table Data	0028,1201	OW		ANAP	AUTO	
Green Palette Color Lookup Table Data	0028,1202	OW		ANAP	AUTO	
Blue Palette Color Lookup Table Data	0028,1203	OW		ANAP	AUTO	
Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

Table 213: 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 214: 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 Type	6000,0040	CS		ALWAYS	AUTO	
Overlay Origin	6000,0050	SS		ALWAYS	AUTO	
Overlay Bits Allocated	6000,0100	US		ALWAYS	AUTO	
Overlay Bit Position	6000,0102	US		ALWAYS	AUTO	
Overlay Data	6000,3000	OW/OB		ANAP	AUTO	
Overlay Description	6000,0022	LO		ANAP	AUTO	
Overlay Subtype	6000,0045	LO		ANAP	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		ANAP	AUTO	

Table 215: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS		ANAP	AUTO	
Rescale Slope	0028,1053	DS		ANAP	AUTO	
Rescale Type	0028,1054	LO		ANAP	AUTO	
Modality LUT Sequence	0028,3000	SQ		ANAP	AUTO	
>LUT Descriptor	0028,3002	US/SS		ANAP	AUTO	
>Modality LUT Type	0028,3004	LO	HU, OD, US	ANAP	AUTO	
>LUT Data	0028,3006	US/SS		ANAP	AUTO	
>LUT Explanation	0028,3003	LO		ANAP	AUTO	

Table 216: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Width	0028,1051	DS		ANAP	AUTO	
Window Center	0028,1050	DS		ANAP	AUTO	
Window Center & Width Explanation	0028,1055	LO		ANAP	AUTO	
VOI LUT Sequence	0028,3010	SQ		ANAP	AUTO	

Table 217: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
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	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.1.9. Grayscale Softcopy Presentation State Storage SOP Class**Table 218: IOD of Created Grayscale Softcopy Presentation State Storage SOP Class Instances**

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

Table 219: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP	COPY	
Patient ID	0010,0020	LO		ALWAYS	COPY	
Patient's Birth Date	0010,0030	DA		VNAP	COPY	
Patient's Sex	0010,0040	CS		VNAP	COPY	
Ethnic Group	0010,2160	SH		ANAPCV	COPY	
Patient Comments	0010,4000	LT		ANAPCV	COPY	

Table 220: Patient Medical Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAPCV	COPY	
Contrast Allergies	0010,2110	LO		ANAPCV	COPY	
Pregnancy Status	0010,21C0	US		VNAP	COPY	
Special Needs	0038,0050	LO		ANAPCV	COPY	
Patient State	0038,0500	LO		ANAPCV	COPY	

Table 221: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Description	0008,1030	LO		ANAPCV	AUTO	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>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	
>Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	
>Context Identifier	0008,010F	CS		ANAP	AUTO	
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	
Scheduled Performing Physician's Name	0040,0006	PN		ANAPCV	AUTO	

Table 222: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Admitting Diagnoses Description	0008,1080	LO		VNAP	COPY	
Patient's Weight	0010,1030	DS		ALWAYS	COPY	
Occupation	0010,2180	SH		ANAPCV	COPY	
Additional Patient History	0010,21B0	LT		ANAPCV	COPY	

Table 223: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		VNAP	AUTO	
Series Time	0008,0031	TM		VNAP	AUTO	
Series Description	0008,103E	LO		ANAP	AUTO	
Operators' Name	0008,1070	PN		ANAPEV	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Instance Creation Date	0008,0012	DA		ANAP	AUTO	
>Instance Creation Time	0008,0013	TM		ANAP	AUTO	
>Instance Creator UID	0008,0014	UI		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>Instance Number	0020,0013	IS		ANAP	AUTO	
Body Part Examined	0018,0015	CS		ANAP	AUTO	
Protocol Name	0018,1030	LO		ANAP	AUTO	
Patient Position	0018,5100	CS		ANAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	
Laterality	0020,0060	CS		ANAPCV	AUTO	
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		ANAPCV	AUTO	
Performed Protocol Code Sequence	0040,0260	SQ		ANAPCV	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>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	
>Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	
>Context Identifier	0008,010F	CS		ANAPCV	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAPCV	AUTO	
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	
>Requested Procedure ID	0040,1001	SH		ALWAYS	AUTO	
Comments on the Performed Procedure Step	0040,0280	ST		ANAPCV	AUTO	

Table 224: Presentation Series Module

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

Table 225: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	
Institution Name	0008,0080	LO		ANAP	AUTO	
Station Name	0008,1010	SH		ANAP	AUTO	
Institutional Department Name	0008,1040	LO		ANAP	AUTO	
Manufacturer's Model Name	0008,1090	LO		ANAPCV	AUTO	
Device Serial Number	0018,1000	LO		ANAP	AUTO	
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	

Table 226: 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	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Description	6000,0022	LO		ANAPEV	AUTO	
Overlay Type	6000,0040	CS		ALWAYS	AUTO	
Overlay Subtype	6000,0045	LO		ANAPEV	AUTO	
Overlay Origin	6000,0050	SS		ALWAYS	AUTO	
Overlay Bits Allocated	6000,0100	US		ALWAYS	AUTO	
Overlay Bit Position	6000,0102	US		ALWAYS	AUTO	
ROI Area	6000,1301	IS		ANAPEV	AUTO	
ROI Mean	6000,1302	DS		ANAPEV	AUTO	
ROI Standard Deviation	6000,1303	DS		ANAPEV	AUTO	
Overlay Label	6000,1500	LO		EMPTY	FIXED	
Overlay Data	6000,3000	O W		ALWAYS	AUTO	

Table 227: Displayed Area Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Displayed Area Selection Sequence	0070,005A	SQ		ALWAYS	AUTO	
>Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>Displayed Area Top Left Hand Corner	0070,0052	SL		ALWAYS	AUTO	
>Displayed Area Bottom Right Hand Corner	0070,0053	SL		ALWAYS	AUTO	
>Presentation Size Mode	0070,0100	CS	MAGNIFY, SCALE TO FIT	ALWAYS	AUTO	
>Presentation Pixel Spacing	0070,0101	DS		ANAPCV	AUTO	
>Presentation Pixel Aspect Ratio	0070,0102	IS		ANAPCV	AUTO	
>Presentation Pixel Magnification Ratio	0070,0103	FL		ANAPCV	AUTO	
>Zoom Mode	2001,103F	CS		ANAPCV	AUTO	

Table 228: Graphic Annotation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Graphic Annotation Sequence	0070,0001	SQ		ALWAYS	AUTO	
>Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>Graphic Layer	0070,0002	CS		ALWAYS	AUTO	
>Text Object Sequence	0070,0008	SQ		ANAP	AUTO	
>>Anchor Point Annotation Units	0070,0004	CS		ALWAYS	AUTO	
>>Unformatted Text Value	0070,0006	ST		ALWAYS	AUTO	
>>Anchor Point	0070,0014	FL		ALWAYS	AUTO	
>>Anchor Point Visibility	0070,0015	CS		ALWAYS	AUTO	
>Graphic Object Sequence	0070,0009	SQ		ANAP	AUTO	
>>Graphic Annotation Units	0070,0005	CS		ALWAYS	AUTO	
>>Graphic Dimensions	0070,0020	US		ALWAYS	AUTO	
>>Number of Graphics Points	0070,0021	US		ALWAYS	AUTO	
>>Graphic Data	0070,0022	FL		ALWAYS	AUTO	
>>Graphic Type	0070,0023	CS		ALWAYS	AUTO	
>>Graphic Filled	0070,0024	CS		ANAP	AUTO	

Table 229: Spatial Transformation Module

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

Table 230: Graphic Layer Module

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

Table 231: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	
Rescale Type	0028,1054	LO	cm/sec, milliradians, milliseconds, mm ² /sec, normalized, seconds, US	ALWAYS	AUTO	

Table 232: Softcopy Presentation LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation LUT Sequence	2050,0010	SQ		ANAP	AUTO	
>LUT Descriptor	0028,3002	US /SS		ALWAYS	AUTO	
>LUT Data	0028,3006	US /SS		ALWAYS	AUTO	
Presentation LUT Shape	2050,0020	CS		ANAP	AUTO	

Table 233: Overlay Activation Module

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

Table 234: 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	
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>Window Center	0028,1050	DS		ALWAYS	AUTO	
>Window Width	0028,1051	DS		ALWAYS	AUTO	

Table 235: Presentation State Identification Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS	1	ALWAYS	AUTO	
Content Label	0070,0080	CS		ALWAYS	AUTO	
Content Description	0070,0081	LO		VNAP	AUTO	
Presentation Creation Date	0070,0082	DA		ALWAYS	AUTO	
Presentation Creation Time	0070,0083	TM		ALWAYS	AUTO	
Content Creator's Name	0070,0084	PN		VNAP	AUTO	

Table 236: 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		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	

Table 237: Presentation State Shutter Module

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

Table 238: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
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	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.1.10. X-Ray Angiographic Image Storage SOP Class**Table 239: IOD of Created X-Ray Angiographic Image Storage SOP Class Instances**

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Cine Module	CONDITIONAL
	X-Ray Image Module	ALWAYS
	X-Ray Acquisition Module	ALWAYS
	XA Positioner Module	ALWAYS
	SOP Common Module	ALWAYS

Table 240: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAPEV	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAPEV	AUTO	
Patient's Name	0010,0010	PN		VNAP	AUTO	
Patient ID	0010,0020	LO		VNAP	AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		VNAP	AUTO	

Table 241: General Study Module

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

Table 242: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	

Table 243: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	

Table 244: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 245: 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 Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 246: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time	0018,1063	DS		ANAPEV	AUTO	
Frame Time Vector	0018,1065	DS		ANAPEV	AUTO	

Table 247: X-Ray Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	

Table 248: X-Ray Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
KVP	0018,0060	DS		VNAP	AUTO	

Table 249: XA Positioner Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Positioner Primary Angle	0018,1510	DS		VNAP	AUTO	
Positioner Secondary Angle	0018,1511	DS		VNAP	AUTO	

Table 250: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.1.11. X-Ray Radiofluoroscopic Image Storage SOP Class

Table 251: IOD of Created X-Ray Radiofluoroscopic Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Contrast/Bolus Module	CONDITIONAL
	Cine Module	CONDITIONAL
	Multi-Frame Module	ALWAYS
	Mask Module	CONDITIONAL
	X-Ray Image Module	ALWAYS
	X-Ray Acquisition Module	ALWAYS
	X-Ray Tomography Acquisition Module	CONDITIONAL
	Multi-frame Overlay Module	CONDITIONAL
	SOP Common Module	ALWAYS

Table 252: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAPEV	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAPEV	AUTO	
Patient's Name	0010,0010	PN		VNAP	AUTO	
Patient ID	0010,0020	LO		VNAP	AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		VNAP	AUTO	

Table 253: General Study Module

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

Table 254: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	

Table 255: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	

Table 256: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 257: 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 Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 258: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		VNAP	AUTO	

Table 259: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time	0018,1063	DS		ANAPEV	AUTO	
Frame Time Vector	0018,1065	DS		ANAPEV	AUTO	

Table 260: Multi-Frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT		ALWAYS	AUTO	

Table 261: Mask Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Recommended Viewing Mode	0028,1090	CS		VNAP	AUTO	
Mask Subtraction Sequence	0028,6100	SQ		ALWAYS	AUTO	
>Mask Operation	0028,6101	CS		ALWAYS	AUTO	

Table 262: X-Ray Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Pixel Intensity Relationship	0028,1040	CS		ALWAYS	AUTO	

Table 263: X-Ray Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
KVP	0018,0060	DS		VNAP	AUTO	
Radiation Setting	0018,1155	CS		ALWAYS	AUTO	

Table 264: X-Ray Tomography Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Tomo Layer Height	0018,1460	DS		ALWAYS	AUTO	

Table 265: Multi-frame Overlay Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames in Overlay	6000,0015	IS		ALWAYS	AUTO	

Table 266: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.1.12. Raw Data Storage SOP Class

Table 267: IOD of Created Raw Data Storage SOP Class Instances

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

Table 268: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
Patient's Name	0010,0010	PN		VNAP	COPY	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		VNAP	COPY	
Patient's Birth Date	0010,0030	DA		VNAP	COPY	
Patient's Sex	0010,0040	CS		VNAP	COPY	
Ethnic Group	0010,2160	SH		ANAPCV	COPY	
Patient Comments	0010,4000	LT		ANAPCV	COPY	

Table 269: Patient Medical Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAPCV	COPY	
Contrast Allergies	0010,2110	LO		ANAPCV	COPY	
Pregnancy Status	0010,21C0	US		VNAP	COPY	
Special Needs	0038,0050	LO		ANAPCV	COPY	
Patient State	0038,0500	LO		ANAPCV	COPY	

Table 270: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	AUTO	
Referring Physician's Name	0008,0090	PN		ANAPCV	AUTO	
Study Description	0008,1030	LO		ANAPCV	AUTO	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>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	
>Context Group Extension	0008,010D	UI		ANAP	AUTO	
Creator UID						
>Context Identifier	0008,010F	CS		ANAP	AUTO	
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	
Scheduled Performing Physician's Name	0040,0006	PN		ANAPCV	AUTO	

Table 271: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Admitting Diagnoses Description	0008,1080	LO		VNAP	COPY	
Patient's Weight	0010,1030	DS		ALWAYS	COPY	
Occupation	0010,2180	SH		ANAPCV	COPY	
Additional Patient History	0010,21B0	LT		VNAP	COPY	

Table 272: General 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	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Description	0008,103E	LO		ANAP	AUTO	
Performing Physician's Name	0008,1050	PN		ANAP	AUTO	
Operators' Name	0008,1070	PN		ANAPEV	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Instance Creation Date	0008,0012	DA		ANAP	AUTO	
>Instance Creation Time	0008,0013	TM		ANAP	AUTO	
>Instance Creator UID	0008,0014	UI		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>Instance Number	0020,0013	IS		ANAP	AUTO	
Body Part Examined	0018,0015	CS		ANAP	AUTO	
Protocol Name	0018,1030	LO		ANAP	AUTO	
Patient Position	0018,5100	CS		ANAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	
Laterality	0020,0060	CS		ANAPCV	AUTO	
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		ANAPCV	AUTO	
Performed Protocol Code Sequence	0040,0260	SQ		ANAPCV	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>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	
>Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	
>Context Identifier	0008,010F	CS		ANAPCV	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAPCV	AUTO	
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	
>Requested Procedure ID	0040,1001	SH		ALWAYS	AUTO	
Comments on the Performed Procedure Step	0040,0280	ST		ANAPCV	AUTO	

Table 273: 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 274: 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	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Synchronization Frame of Reference UID	0020,0200	UI		ALWAYS	AUTO	

Table 275: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP	AUTO	
Institution Name	0008,0080	LO		ANAP	AUTO	
Station Name	0008,1010	SH		ANAP	AUTO	
Institutional Department Name	0008,1040	LO		ANAP	AUTO	
Manufacturer's Model Name	0008,1090	LO		ANAP	AUTO	
Device Serial Number	0018,1000	LO		ANAP	AUTO	
Software Version(s)	0018,1020	LO		ANAP	AUTO	

Table 276: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Description	0040,0556	ST		ANAP	AUTO	
Acquisition Context Sequence	0040,0555	SQ		VNAP	AUTO	
>Concept Name Code Sequence	0040,A043	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	

Table 277: 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		ANAPCV	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Creator-Version UID	0008,9123	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 278: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
Instance Creation UID	0008,0014	UI		ANAP	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

8.1.2. Usage of Attributes from Received IOD

Not Applicable.

8.1.3. Attribute Mapping

Not Applicable.

8.1.4. Coerced/Modified fields

In general, Extended MR Workspace will try and optimize the imported image data. This may involve the removal of redundant data, either or not due to the creation of a Presentation State object for the image data. This may also involve the creation of

extra attributes. As it is not the intention of Extended MR Workspace to export this data as such, the SOP Instance UID shall not be changed.

If not available at import then Extended MR Workspace will create the additional attributes as listed in the table below.

Table 279: Additional Attributes for Image Imports

Attribute Name	Tag	VR	Generated Value
Performed Procedure Step Start Date	0040,0244	DA	Copied from (0008,0020) Study Date.
Performed Procedure Step Start Time	0040,0245	TM	Copied from (0008,0030) Study Time.
Performed Procedure Step ID	0040,0253	SH	Copied from (0020,0010) Study ID.
Performed Procedure Step Description	0040,0254	LO	Copied from (0008,1030) Study Description.

If the SCU does not propose a presentation context for the Grayscale Softcopy Presentation State storage SOP class, then Extended MR Workspace will derive Presentation State data from the imported image data and store this data in a new series within the examination of the imported image.

However, if during import the image is accompanied by Presentation State data, the Extended MR Workspace database shall avoid data overlap by only storing the relevant data from the first object received; either the first image or its Presentation State!

Thus it will omit data received by succeeding objects concerning the optional attributes (VT=3) listed in table below.

Table 280: Omitted Attributes for Image Imports

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient Module					
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO
Patient's Birth Time	0010,0032	TM		ANAP	AUTO
Other Patient Ids	0010,1000	LO		ANAP	AUTO
Other Patient Names	0010,1001	PN		ANAP	AUTO
Ethnic Group	0010,2160	SH		ANAP	AUTO
Patient Comments	0010,4000	LT		ANAP	AUTO
General Study Module					
Referring Physician Identification Sequence	0008,0096	SQ		ANAP	AUTO
Study Description	0008,1030	LO		ANAP	AUTO
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO
Physician(s) of Record	0008,1048	PN		ANAP	AUTO
Physician(s) of Record Identification Sequence	0008,1049	SQ		ANAP	AUTO
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	AUTO
Physician(s) Reading Study Identification Sequence	0008,1062	SQ		ANAP	AUTO
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO
Patient Study Module					
Admitting Diagnoses Description	0008,1080	UI		ANAP	AUTO
Admitting Diagnoses Code Sequence	0008,1084	SQ		ANAP	AUTO
Patient's Age	0010,1010	AS		ANAP	AUTO
Patient's Size	0010,1020	DS		ANAP	AUTO
Patient's Weight	0010,1030	DS		ANAP	AUTO
Occupation	0010,2180	SH		ANAP	AUTO
Additional Patient History	0010,21B0	LT		ANAP	AUTO
Clinical Trial Study Module					
Clinical Trial Time Point Description	0012,0051	ST		ANAP	AUTO
General Series Module					
Series Date	0008,0021	DA		ANAP	AUTO
Series Time	0008,0031	TM		ANAP	AUTO
Series Description	0008,103E	LO		ANAP	AUTO
Performing Physicians' Name	0008,1050	PN		ANAP	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Performing Physician Identification Sequence	0008,1052	SQ		ANAP	AUTO
Operators' Name	0008,1070	PN		ANAP	AUTO
Operators Identification Sequence	0008,1072	SQ		ANAP	AUTO
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO
Body Part Examined	0018,0015	CS		ANAP	AUTO
Protocol Name	0018,1030	LO		ANAP	AUTO
Smallest Pixel Value in Series	0028.0108	US / SS		ANAP	AUTO
Largest Pixel Value in Series	0028.0109	US / SS		ANAP	AUTO
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		ANAP	AUTO
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	AUTO
General Equipment Module					
Institution Name	0008,0080	LO		ANAP	AUTO
Institution Address	0008,0081	ST		ANAP	AUTO
Station Name	0008,1010	SH		ANAP	AUTO
Institutional Department Name	0008,1040	LO		ANAP	AUTO
Manufacturer's Model Name	0008,1090	LO		ANAP	AUTO
Device Serial Number	0018,1000	LO		ANAP	AUTO
Software Versions	0018,1020	LO		ANAP	AUTO
Spatial Resolution	0018,1050	DS		ANAP	AUTO
Date of Last Calibration	0018,1200	DA		ANAP	AUTO
Time of Last Calibration	0018,1201	TM		ANAP	AUTO
Pixel Padding Value	0028,0120	US / SS		ANAP	AUTO
Display Shutter Module					
Shutter Presentation Value	0018,1622	US		ANAP	AUTO
Overlay Plane Module					
Overlay Description	60xx,0022	LO		ANAP	AUTO
Overlay Subtype	60xx,0045	LO		ANAP	AUTO
ROI Area	60xx,1301	IS		ANAP	AUTO
ROI Mean	60xx,1302	DS		ANAP	AUTO
ROI Standard Deviation	60xx,1303	DS		ANAP	AUTO
Overlay Label	60xx,1500	LO		ANAP	AUTO
SOP Common Module					
Instance Creation Date	0008,0012	DA		ANAP	AUTO
Instance Creation Time	0008,0013	TM		ANAP	AUTO
Instance Creator UID	0008,0014	UI		ANAP	AUTO
Coding Scheme Identification Sequence	0008,0110	SQ		ANAP	AUTO
Timezone Offset From UTC	0008,0201	SH		ANAP	AUTO
Contributing Equipment Sequence	0018,A001	SQ		ANAP	AUTO
Instance Number	0020,0013	IS		ANAP	AUTO
SOP Authorization Date and Time	0100,0420	DT		ANAP	AUTO
SOP Authorization Comment	0100,0424	LT		ANAP	AUTO
Authorization Equipment Certification Number	0100,0426	LO		ANAP	AUTO
MAC Parameters Sequence	4FFE,0001	SQ		ANAP	AUTO
Digital Signatures Sequence	FFFA,FFFA	SQ		ANAP	AUTO

And clear all mandatory attributes (VT=2) listed in table below.

Table 281: Cleared Attributes for Image Imports

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient Module					
Patient's Name	0010,0010	PN		VNAP	AUTO
Patient ID	0010,0020	LO		VNAP	AUTO
Patient's Birth Date	0010,0030	DA		VNAP	AUTO
Patient's Sex	0010,0040	CS		VNAP	AUTO
Clinical Trial Subject Module					
Clinical Trial Protocol Name	0012,0021	LO		VNAP	AUTO
Clinical Trial Site ID	0012,0030	LO		VNAP	AUTO
Clinical Trial Site Name	0012,0031	LO		VNAP	AUTO
General Study Module					
Study Date	0008,0020	DA		VNAP	AUTO
Study Time	0008,0030	TM		VNAP	AUTO
Accession Number	0008,0050	SH		VNAP	AUTO
Referring Physician's Name	0008,0090	PN		VNAP	AUTO
Study ID	0020,0010	SH		VNAP	AUTO
Clinical Trial Study Module					
Clinical Trial Time Point ID	0012,0050	LO		VNAP	AUTO
General Series Module					
Patient Position	0018,5100	CS		ANAP	AUTO
Series Number	0020,0011	IS		VNAP	AUTO
Laterality	0020,0060	CS		ANAP	AUTO
Clinical Trial Series Module					
Clinical Trial Coordinating Center Name	0012,0060	LO		VNAP	AUTO
General Equipment Module					
Manufacturer	0008,0070	LO		VNAP	AUTO
Mask Module					
Recommended Viewing Mode	0028,1090	CS		VNAP	AUTO
Overlay/Curve Activation Module					
Curve Activation Layer	50xx,1001	CS		ANAP	AUTO
Overlay Activation Layer	60xx,1001	CS		ANAP	AUTO

Extended MR Workspace allows the operator to modify attributes of the stored images; see the table below. Extended MR Workspace does not modify the pixel values of the stored images. Modified images retain their original Study, Series and Image UID.

Table 282: Modifiable Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient					
Patient's Name	0010,0010	PN		VNAP	USER
Patient ID	0010,0020	LO		VNAP	USER
Patient's Birth Date	0010,0030	DA		VNAP	USER
Patient's Sex	0010,0040	CS		VNAP	USER
Medical Alerts	0010,2000	LO	1-N	VNAP	USER
Contrast Allergies	0010,2110	LO	1-N	VNAP	USER
Patient Comments	0010,4000	LT		ANAP	USER
Study					
Accession Number	0008,0050	SH		VNAP	USER
Referring Physician's Name	0008,0090	PN		VNAP	USER
Study Description	0008,1030	LO		ANAP	USER
Physician(s) of Record	0008,1048	PN	1-N	ANAP	USER
Name of Physician(s) Reading Study	0008,1060	PN	1-N	ANAP	USER
Admitting Diagnoses Description	0008,1080	LO	1-N	ANAP	USER

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Age	0010,1010	AS		ANAP	USER
Occupation	0010,2180	SH		ANAP	USER
Additional Patient History	0010,21B0	LT		ANAP	USER
Examination					
Performed Station Name	0040,0242	SH	An institution defined name for the modality on which the Performed Procedure Step was performed.	ANAP, VNAP	CONF / MPPS
Performed Location	0040,0243	SH	Description of the location at which the Performed Procedure Step was performed.	ANAP, VNAP	USER / MPPS
Performed Procedure Step Description	0040,0254	LO	From Modality Worklist or user input. The user can modify the description provided via Modality Worklist.	ANAP, VNAP	USER / MPPS
Performed Procedure Type Description	0040,0255	LO	A description of the type of procedure performed.	ANAP, VNAP	USER / MPPS
Comments on the Performed Procedure Step	0040,0280	ST	User-defined comments on the Performed Procedure Step.	ANAP, VNAP	USER / MPPS
Series					
-					

Extended MR Workspace adds additional to exported new created images of the plug in some attributes. Some of the attributes are added for the connection to the created Presentation State. These attributes are listed in table below.

Table 283: Additional Attributes for Export Images

Attribute Name	Tag	VR	Value	Presence of Value	Source
General Image Module					
Presentation LUT Shape	2050,0020	SQ		ANAP	AUTO
VOI LUT Module					
Window Width	0028,1051	DS		ANAPEV	AUTO
Window Center	0028,1050	DS		ANAP	AUTO

8.2. Data Dictionary of Private Attributes

Not applicable.

8.3. Coded Terminology and Templates

Not applicable.

8.4. Grayscale Image consistency

The high-resolution display monitor attached to the product can be calibrated by using the service tool together with a light probe. .

8.5. Standard Extended/Specialized/Private SOPs

The Extended MR Workspace supports the following standard specialized SOP classes.

Table 284: List of Standard Specialized SOP Classes

SOP Class Name	SOP Class UID
Specialized PMS X-Ray Image Store	1.3.46.670589.2.3.1.1
XA reconstructed X-ray SOP Class (private)	1.3.46.670589.2.4.1.1

SOP Class Name	SOP Class UID
3D Volume Storage new SOP Class (Private)	1.3.46.670589.5.0.1.1
3D Object new Storage (Private)	1.3.46.670589.5.0.2.1
Surface Storage new (Private)	1.3.46.670589.5.0.3.1
Cardio Image Storage new SOP Class (Private)	1.3.46.670589.5.0.8.1
CT Synthetic Image Storage (Private)	1.3.46.670589.5.0.9
MR Synthetic Image Storage (Private)	1.3.46.670589.5.0.10
MR Cardio Analysis new Storage (Private)	1.3.46.670589.5.0.11.1
CX Synthetic Image Storage (Private)	1.3.46.670589.5.0.12
Perfusion (Private)	1.3.46.670589.5.0.13
Perfusion Image Storage (Private)	1.3.46.670589.5.0.14
Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1
Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2
Private MR ExamCard Storage	1.3.46.670589.11.0.0.12.4

8.6. Private Transfer Syntaxes

None.