
DICOM

Conformance Statement

Extended MR Workspace R2.6.3.1



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.

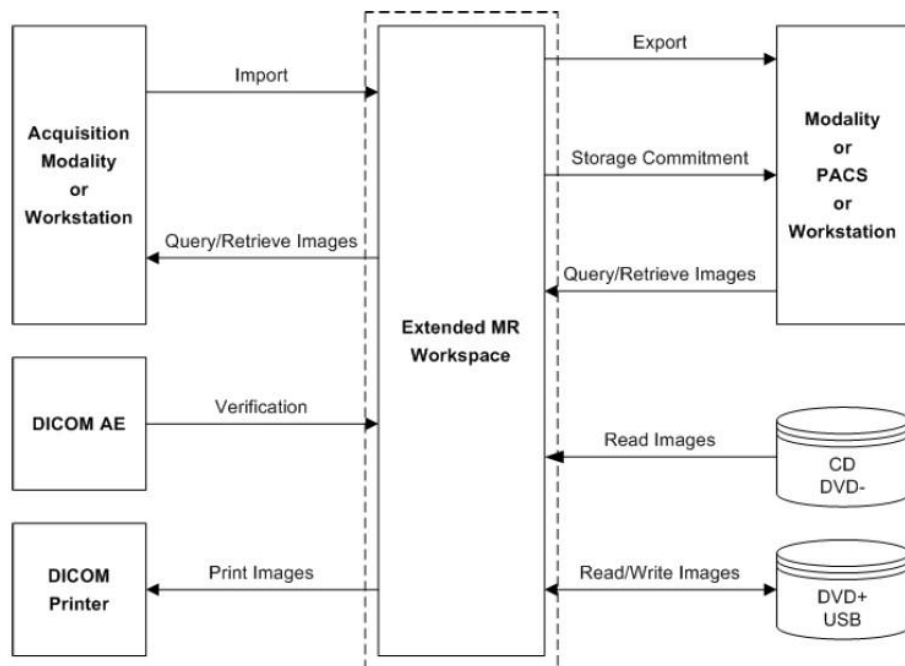


Figure 1: Extended MR Workspace in a DICOM Network

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: Network Services

| SOP Class | | User of Service (SCU) | Provider of Service (SCP) |
|---|-------------------------------|-----------------------|---------------------------|
| Name | UID | | |
| Other | | | |
| Verification SOP Class | 1.2.840.10008.1.1 | No | Yes |
| Print Management | | | |
| Presentation LUT SOP Class | 1.2.840.10008.5.1.1.23 | Yes | No |
| Basic Color Print Management Meta SOP Class | 1.2.840.10008.5.1.1.18 | Yes | No |
| >Basic 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 |
| 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 |
| Query/Retrieve | | | |
| Patient Root QR Information Model - FIND SOP Class | 1.2.840.10008.5.1.4.1.2.1.1 | Yes | Yes |
| Patient Root QR Information Model - MOVE SOP Class | 1.2.840.10008.5.1.4.1.2.1.2 | Yes | Yes |
| Study Root QR Information Model - FIND SOP Class | 1.2.840.10008.5.1.4.1.2.2.1 | Yes | Yes |
| Study Root QR Information Model - MOVE SOP Class | 1.2.840.10008.5.1.4.1.2.2.2 | Yes | Yes |
| Transfer | | | |
| 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 Mammography X-Ray Image Storage - Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.2 | Yes | Yes |
| Digital Mammography X-Ray Image Storage - Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.2.1 | 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 ExamCard Storage SOP Class (Private) | 1.3.46.670589.11.0.0.12.4 | No | Yes |
| MR Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.4 | Yes | Yes |
| MR Series Data Storage SOP Class (Private) | 1.3.46.670589.11.0.0.12.2 | No | Yes |
| MR Spectroscopy Storage SOP Class | 1.2.840.10008.5.1.4.1.1.4.2 | Yes | Yes |
| MR Spectrum Storage SOP Class (Private) | 1.3.46.670589.11.0.0.12.1 | No | 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 |
| Raw Data Storage SOP Class | 1.2.840.10008.5.1.4.1.1.66 | Yes | Yes |

| SOP Class | | User of Service (SCU) | Provider of Service (SCP) |
|---|------------------------------|-----------------------|---------------------------|
| Name | UID | | |
| Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7 | Yes | Yes |
| 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 (Private) | 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 |

Note: 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.

A table of Supported Media Storage Application Profiles (with roles) is provided below.

Note: DVD and USB have no JPEG support; DVD is DVD+ only.

Table 2: Media Services

| Media Storage Application Profile | File-set Creator (FSC) | File-set Updater (FSU) | File-set Reader (FSR) | Display Directory (DD) |
|---|------------------------|------------------------|-----------------------|------------------------|
| Compact Disk-Recordable | | | | |
| General Purpose CD-R Interchange | Yes | No | Yes | No |
| DVD | | | | |
| General Purpose DVD Interchange with JPEG | Yes | No | Yes | No |
| USB | | | | |
| General Purpose USB Media Interchange with JPEG | Yes | Yes | Yes | No |

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3. INTRODUCTION

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

3.1. Revision History

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

Table 3: Revision History

| Document Version | Date of Issue | Author | Description |
|------------------|----------------|-------------------|----------------------------|
| 00 | 27-May-2009 | PII – IOCC – BST | Updated version after test |
| 01 | 27-August-2009 | PII – IOCC – BST | Final version |
| 02 | 22-March-2012 | ICAP – IOCC – PIC | Final version |

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

Table 4: Definitions, Terms and Abbreviations

| Abbreviation/Term | Explanation |
|-------------------|--|
| AE | Application Entity |
| ANSI | American National Standard Institute |
| AP | Application Profile |
| BOT | Basic Offset Table |
| CD | Compact Disc |
| CD-R | CD-Recordable |
| CD-M | CD-Medical |
| 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 |
| 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 |

| Abbreviation/Term | Explanation |
|-------------------|---|
| IOD | Information Object Definition |
| ISIS | Information System - Imaging System |
| MOD | Magneto-Optical Disk |
| 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 |
| 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 1752
Rosslyn, Virginia. 22209, United States of America
Internet: <http://medical.nema.org/>

Note that at any point in time the official standard consists of the most recent yearly edition of the base standard (currently 2008) plus all the supplements and correction items that have been approved as Final Text.

4. NETWORKING

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

4.1. Implementation model

The implementation model consists of three sections:

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

4.1.1. Application Data Flow

The Extended MR Workspace consists of one single application entity only: the EWS AE. The figure below shows the networking application data flow as a functional overview of the EWS AE.

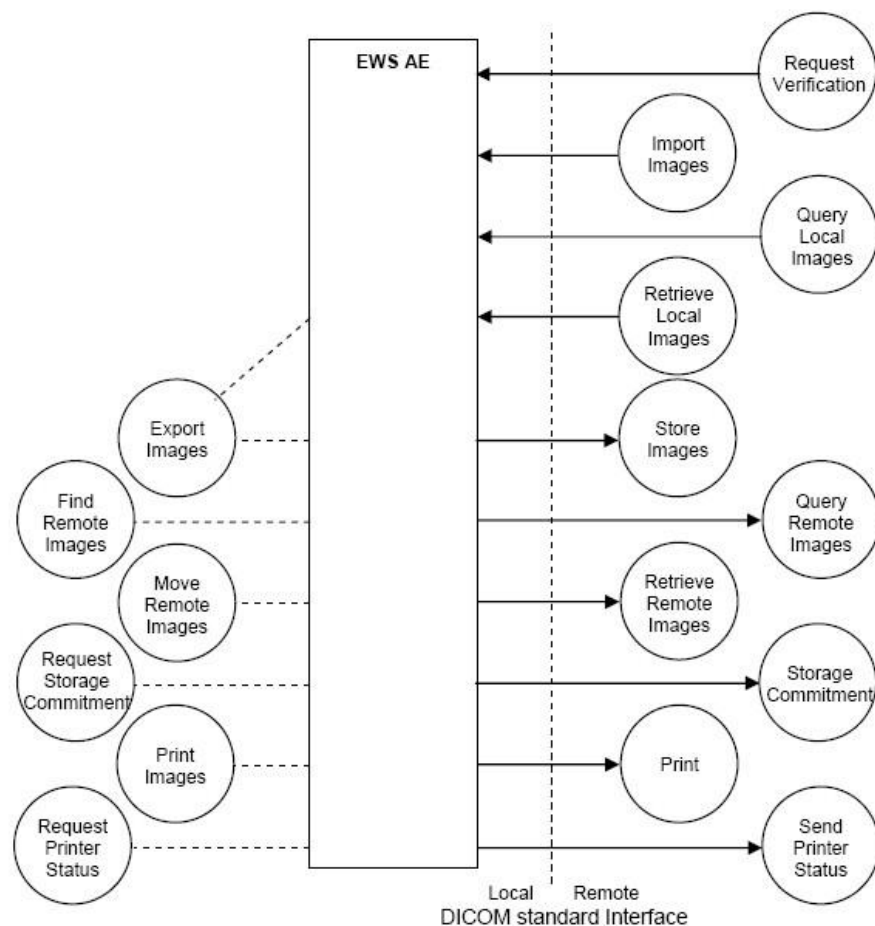


Figure 2: EWS AE Data Flow Diagram

4.1.2. Functional Definition of AE's

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

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.

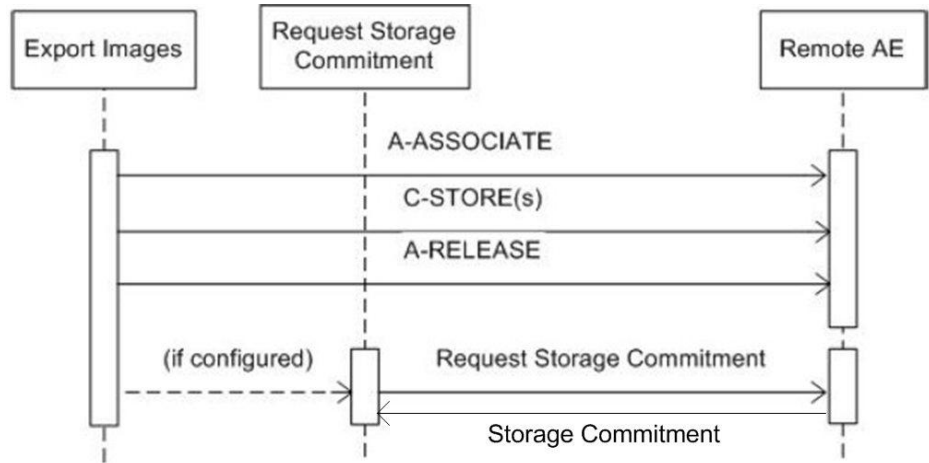


Figure 3: RWA Sequencing for Export Images

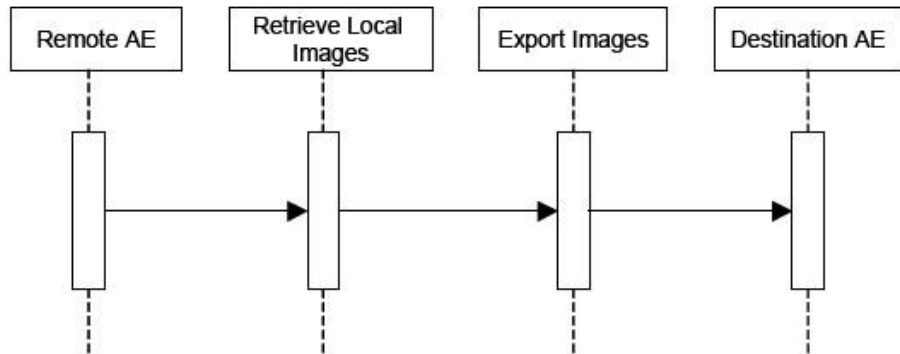


Figure 4: RWA Sequencing for Retrieve Local Images

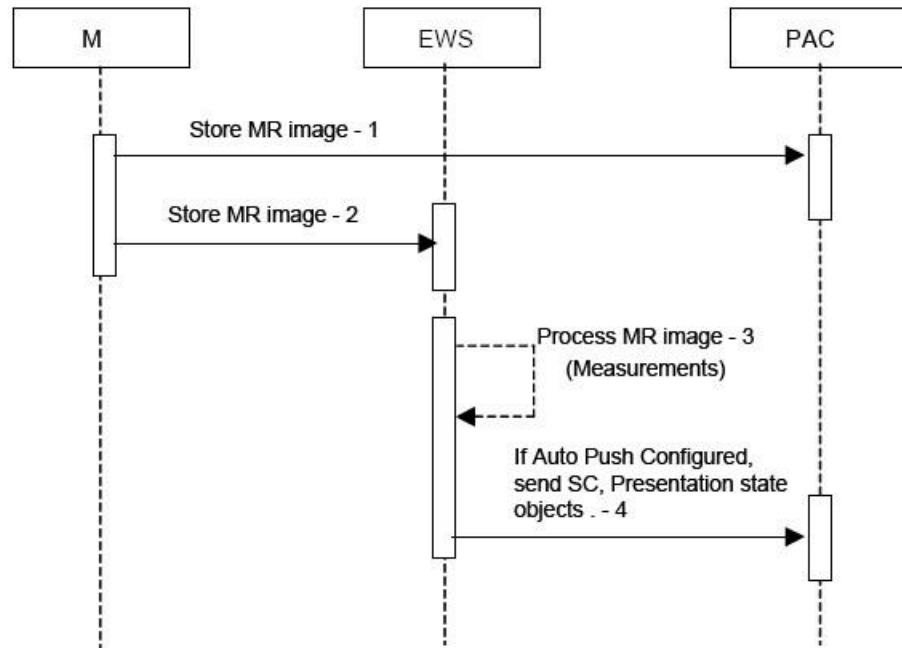


Figure 5: RWA Sequencing for Auto Push feature of Extended MR Workspace

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 object 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

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

4.2.1. EWS AE

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

4.2.1.1. SOP Classes

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

Table 5: 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 Mammography X-Ray Image Storage - Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.2 | Yes | Yes |
| Digital Mammography X-Ray Image Storage - Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.2.1 | 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 ExamCard Storage SOP Class (Private) | 1.3.46.670589.11.0.0.12.4 | No | Yes |
| MR Series Data Storage SOP Class (Private) | 1.3.46.670589.11.0.0.12.2 | No | Yes |
| MR Spectroscopy Storage SOP Class | 1.2.840.10008.5.1.4.1.1.4.2 | Yes | Yes |
| MR Spectrum Storage SOP Class (Private) | 1.3.46.670589.11.0.0.12.1 | No | Yes |
| MR Synthetic Image Storage (Private) | 1.3.46.670589.5.0.10 | Yes | Yes |
| Patient Root QR Information Model - FIND SOP Class | 1.2.840.10008.5.1.4.1.2.1.1 | Yes | Yes |
| Patient Root QR 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 |
| 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 |
| 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 (Private) | 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 QR Information Model - FIND SOP Class | 1.2.840.10008.5.1.4.1.2.2.1 | Yes | Yes |
| Study Root QR Information Model - MOVE SOP Class | 1.2.840.10008.5.1.4.1.2.2.2 | Yes | Yes |
| 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 |

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|------------------------------|-----|-----|
| 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 |
| 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 |

Notes:

- 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.
- Synthetic image storage SOP Classes can be sent and received, but are no longer created by the application.
- Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

4.2.1.2. Association Policies

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

4.2.1.2.1. General

The DICOM standard application context is specified below.

Table 6: DICOM Application Context

| Description | Value |
|--------------------------|-----------------------|
| Application Context Name | 1.2.840.10008.3.1.1.1 |

4.2.1.2.2. Number of Associations

The number of simultaneous associations that an Application Entity may support as an Initiator or Acceptor is specified here.

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

| Description | Value |
|---|-------|
| Maximum number of simultaneous associations | 3 |

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

| Description | Value |
|---|-------|
| 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.

Table 9: Asynchronous nature as an Association Initiator for this AE

| Description | Value |
|---|----------------|
| Maximum number of outstanding asynchronous transactions | Not applicable |

4.2.1.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID and version name are documented here.

Table 10: DICOM Implementation Class and Version for EWS AE

| | |
|-----------------------------|----------------------|
| Implementation Class UID | 1.3.46.670589.5.2.23 |
| Implementation Version Name | ViewForum R7.2 |

4.2.1.2.5. Communication Failure Handling

The behavior of the AE during communication failure is summarized in the next table.

Table 11: 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 Application Entity will respond on a received reject Association attempt as shown in next table.

Table 12: Association Rejection response

| 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. |

| Result | Source | Reason/Diagnosis | Behavior | |
|---|---|--|---|---|
| | | 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 the next table.

Table 13: Association Abort Handling

| Source | Reason/Diagnosis | Behavior |
|---|--------------------------------|---|
| 0 - DICOM UL service-user (initiated abort) | 0 - reason-not-specified | The user will be informed. The information is logged. |
| 2 - DICOM UL service-provider (initiated abort) | 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. |

| Source | Reason/Diagnosis | Behavior |
|--------|---------------------------------|---|
| | 6 - invalid-PDU-parameter-value | The user will be informed. The information is logged. |

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

4.2.1.3.1.1. Description and Sequencing of Activities

The RWA Find as SCU (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).

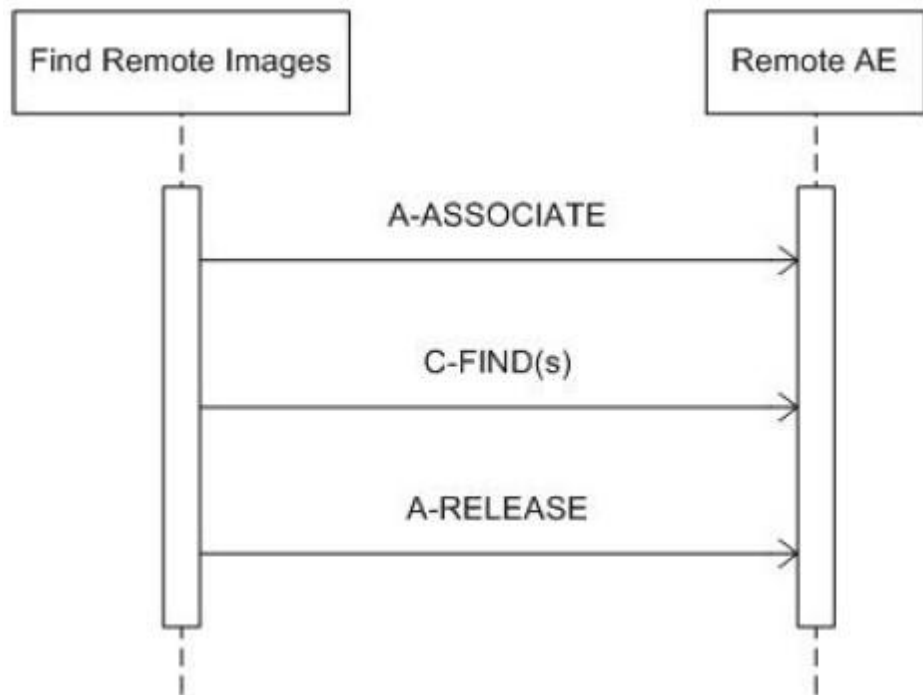


Figure 6: (Real World) Activity – Find Remote Images

4.2.1.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 14: Proposed Presentation Contexts for (Real-World) Activity – FIND As SCU

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

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 Patient Root QR Information Model - FIND SOP Class

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

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.

4.2.1.3.1.3.1. Dataset Specific Conformance for Patient Root QR Information Model - FIND SOP Class C-FIND-SCU

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

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

Table 15: Supported Query Keys for Patient Root Information Model

| Patient Root Information Model | | | | |
|--------------------------------|-----------|----|---------------------|---------|
| Attribute Name | Tag | VR | Type Of Matching | Comment |
| Q/R Image level | | | | |
| Content Date | 0008,0023 | DA | | |
| Content Time | 0008,0033 | TM | | |
| Instance Number | 0020,0013 | IS | | |
| SOP Class UID | 0008,0016 | UI | | |
| SOP Instance UID | 0008,0018 | UI | | |
| Q/R Patient level | | | | |
| Patient ID | 0010,0020 | LO | Universal, Wildcard | |
| Patient's Birth Date | 0010,0030 | DA | | |
| Patient's Name | 0010,0010 | PN | Universal, Wildcard | |
| Patient's Sex | 0010,0040 | CS | | |
| Q/R Series level | | | | |
| Body Part Examined | 0018,0015 | CS | | |
| Modality | 0008,0060 | CS | | |
| Performed Procedure Step ID | 0040,0253 | SH | | |
| Performed Procedure Step Start | 0040,0244 | DA | | |

| Date | | | | |
|----------------------------|-----------|----|--|--|
| Protocol Name | 0018,1030 | LO | | |
| Series Instance UID | 0020,000E | UI | | |
| Series Number | 0020,0011 | IS | | |
| Q/R Study level | | | | |
| Accession Number | 0008,0050 | SH | | |
| Modalities in Study | 0008,0061 | CS | | |
| Referring Physician's Name | 0008,0090 | PN | | |
| Study Date | 0008,0020 | DA | | |
| Study Description | 0008,1030 | LO | | |
| Study ID | 0020,0010 | SH | | |
| Study Instance UID | 0020,000D | UI | | |
| Study Time | 0008,0030 | TM | | |

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

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

Table 16: Status Response

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

Table 17: 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. |

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

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

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.

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

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

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

Table 18: Supported Query Keys for Study Root Information Model

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

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

Table 19: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|----------------------|---------------------------------|
| Success | 0000 | Matching is complete | The find results are displayed. |

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

Table 20: 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. |

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

4.2.1.3.2.1. Description and Sequencing of Activities

The RWA Move as SCU (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).

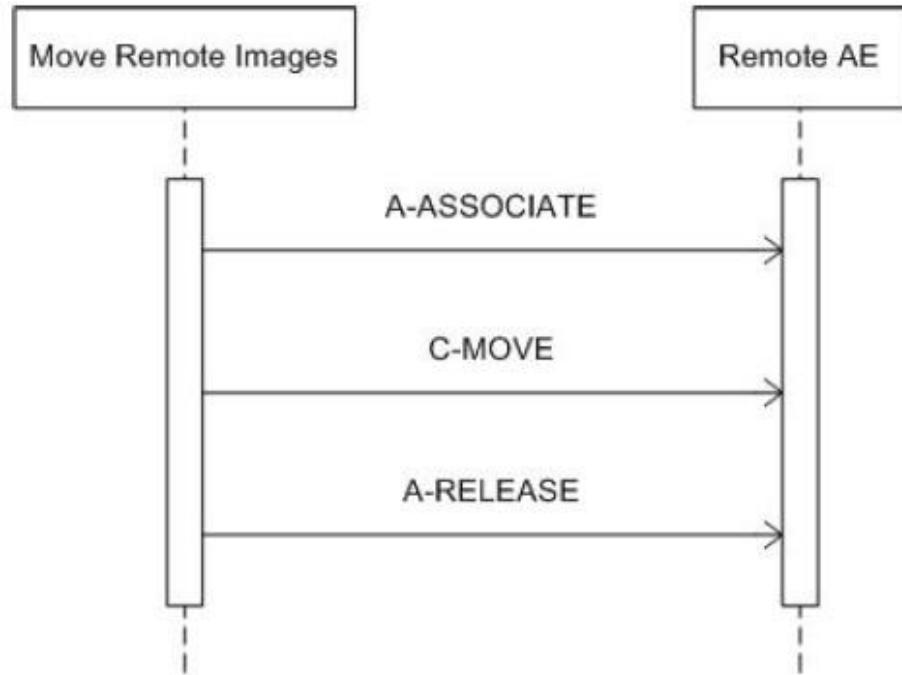


Figure 7: (Real World) Activity – Move Remote Images

4.2.1.3.2.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 21: Proposed Presentation Contexts for (Real-World) Activity – MOVE As SCU

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

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 Patient Root QR Information Model - MOVE SOP Class

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

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

4.2.1.3.2.3.1. Dataset Specific Conformance for Patient Root QR Information Model - MOVE SOP Class C-MOVE-SCU

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

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

Table 22: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|---|---|
| Success | 0000 | Sub-operations complete-No Failures | The move job is marked as completed. The association is released. |
| Refused | A701 | Out of Resources- Unable to calculate number of matches | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| | A702 | Out of Resources – Unable to perform sub-operations | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| | A801 | Move destination unknown | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| Failed | A900 | Identifier does not match SOP class | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| | Cxxx | Unable to process | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| Cancel | FE00 | Sub-operations terminated due to Cancel Indication | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| Warning | B000 | Sub-operations complete – One or more failures | The move job is marked as completed. The association is released. |
| Pending | FF00 | Sub-operations are continuing. | The move job continues. |

Table 23: 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 to the user. |
| Reply Time-out | The move job fails and the association is aborted. The reason is logged and reported to the user. |
| Association Time-out SCU | N/A |
| Association aborted | The move job fails. The reason is logged and reported to the user. |

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

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

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

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

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

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

Table 24: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|---|---|
| Success | 0000 | Sub-operations complete-No Failures | The move job is marked as completed. The association is released. |
| Refused | A701 | Out of Resources- Unable to calculate number of matches | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| | A702 | Out of Resources – Unable to perform sub-operations | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| | A801 | Move Destination unknown | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| Failed | A900 | Identifier does not match SOP class | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| | Cxxx | Unable to process | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| Cancel | FE00 | Sub-operations terminated due to Cancel Indication | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| Warning | B000 | Sub-operations complete – One or more Failures | The move job is marked as completed. The association is released. |
| Pending | FF00 | Sub-operations are continuing. | The move job continues. |

Table 25: 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 to the user. |
| Reply Time-out | The move job fails and the association is aborted. The reason is logged and reported to the user. |
| Association Time-out SCU | N/A |
| Association aborted | The move job fails. The reason is logged and reported to the user. |

4.2.1.3.3. (Real-World) Activity – Image Export

4.2.1.3.3.1. Description and Sequencing of Activities

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.

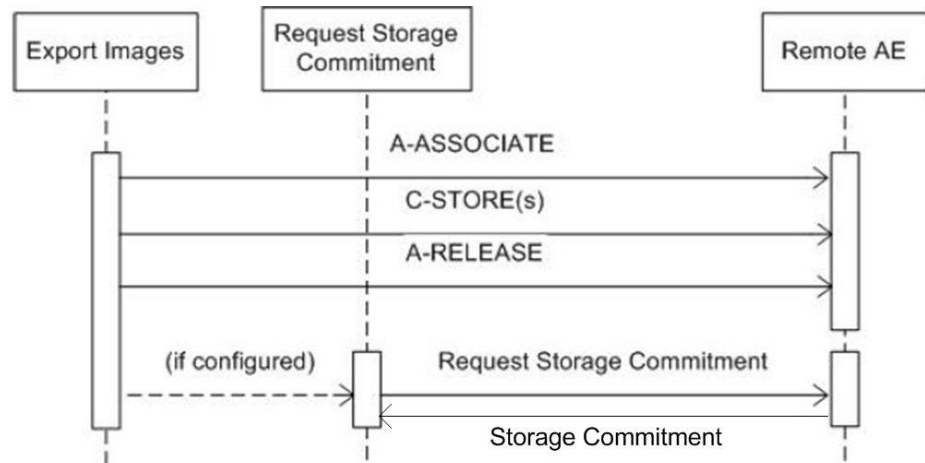


Figure 8: (Real World) Activity - Export Images

4.2.1.3.3.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 26: Proposed Presentation Contexts for (Real-World) Activity – Image Export

| Presentation Context Table | | | | | |
|--|-----------------------|---------------------------|---------------------|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| 3D Object new Storage (Private) | 1.3.46.670589.5.0.2.1 | 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 | | |
| 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 | SCU | 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 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |

| Presentation Context Table | | | | | |
|---|-------------------------------|---------------------------|---------------------|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| Computed Radiography Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | 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 | | |
| CT Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.2 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| CT Synthetic Image Storage (Private) | 1.3.46.670589.5.0.9 | 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 | | |
| CX Synthetic Image Storage (Private) | 1.3.46.670589.5.0.12 | 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 | | |
| Digital Mammography X-Ray Image Storage - Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.2 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Digital Mammography X-Ray Image Storage - Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.2.1 | 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 | | |
| 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 | SCU | 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 | SCU | 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 | SCU | 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 | SCU | 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 | SCU | 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 | SCU | 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 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Raw Data Storage SOP Class | 1.2.840.10008.5.1.4.1.1.66 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Softcopy Presentation State Storage SOP Class | 1.2.840.10008.5.1.4.1.1.11.1 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Specialized PMS X-Ray Image Store (Private) | 1.3.46.670589.2.3.1.1 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Surface Storage new (Private) | 1.3.46.670589.5.0.3.1 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |

| Presentation Context Table | | | | | |
|---|------------------------------|---------------------------|------------------------|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| 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 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | JPEG Baseline (Process 1) | 1.2.840.10008.1.2.4.50 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Ultrasound Multi-frame Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.3.1 | JPEG Baseline (Process 1) | 1.2.840.10008.1.2.4.50 | SCU | 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 | | |
| 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 | SCU | 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 | SCU | 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 | 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 Storage SOP Classes

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

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 (Localizer 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 27: Transfer Syntax Conversion

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

Notes:

- 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.

4.2.1.3.3.3.1. Dataset Specific Conformance for C-STORE-RQ

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

Table 28: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|--|--|
| Success | 0000 | Successful stored | Continues with next store until completed thereafter the store job is marked as completed and the association is released. |
| Failure | A7xx | Refused: Out of Resources | The store job fails and the association is released. The reason is logged and reported to the user. |
| | A9xx | Error: 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 | Error: cannot understand | The store job fails and the association is released. The reason is logged and reported to the user. |

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|-----------------------------------|--|
| 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. |
| | 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. |
| | B006 | Elements Discarded | Continues with next store until completed thereafter the store job is marked as completed and the association is released. |

Table 29: 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 in case of association setup. The reason is logged and reported to the user. |
| Association Time-out SCU | The association is released. |
| Association aborted | The store job fails. The reason is logged and reported to the user. |

4.2.1.3.4. (Real-World) Activity – Storage Commitment Push Model AS SCU

4.2.1.3.4.1. Description and Sequencing of Activities

The RWA Storage Commitment Push Model as SCU (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).

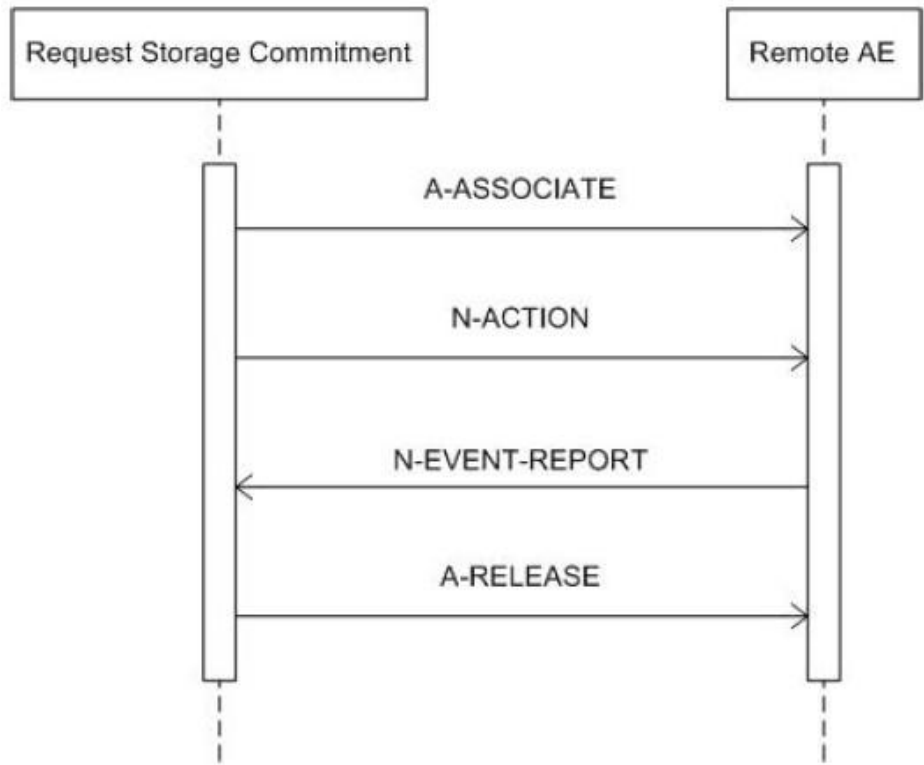


Figure 9: (Real World) Activity – Request Storage Commitment (synchronous)

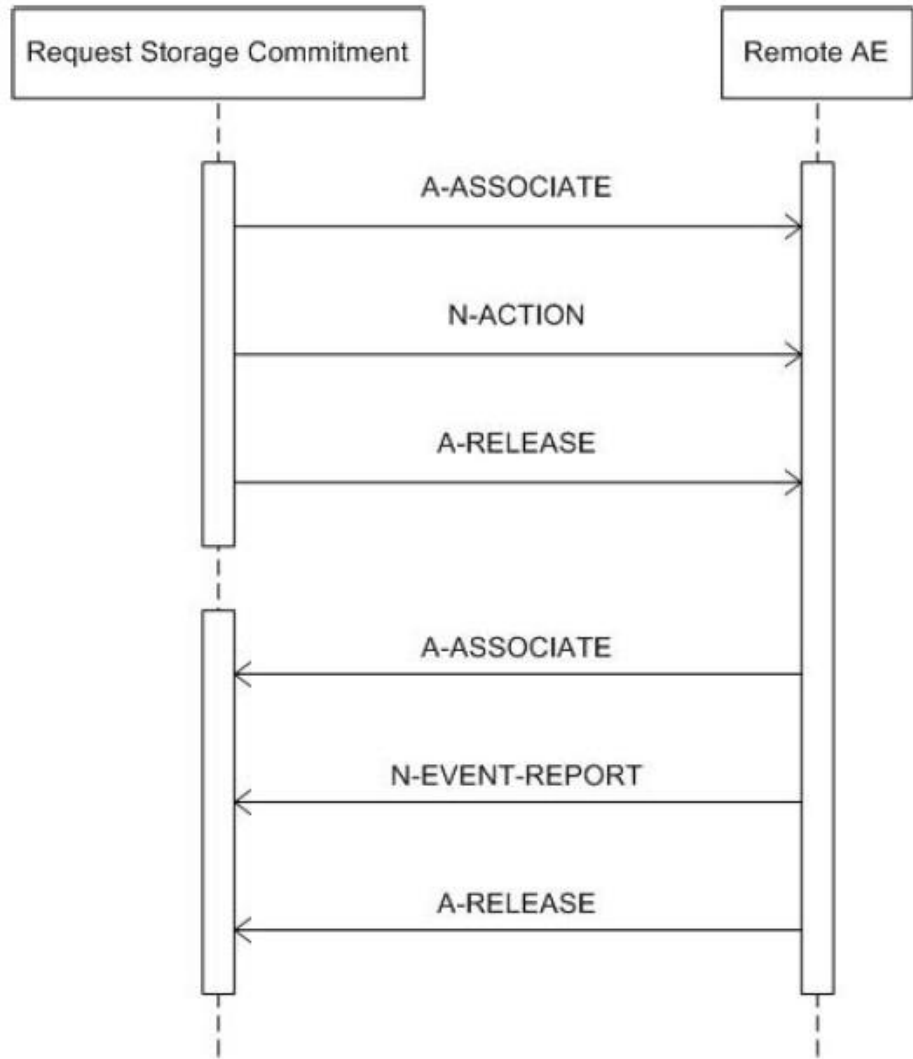


Figure 10: (Real World) Activity – Request Storage Commitment (asynchronous)

4.2.1.3.4.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 30: Proposed Presentation Contexts for (Real-World) Activity – Storage Commitment Push Model AS SCU

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

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 Storage Commitment Push Model SOP Class

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

Extended MR Workspace conforms to the standard Storage Commitment model.

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

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

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

Table 31: Status Response

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

Table 32: 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. |

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

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

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

Table 33: Status Response

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

Table 34: 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. |

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

4.2.1.3.5.1. Description and Sequencing of Activities

The RWA Print Management as SCU (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.

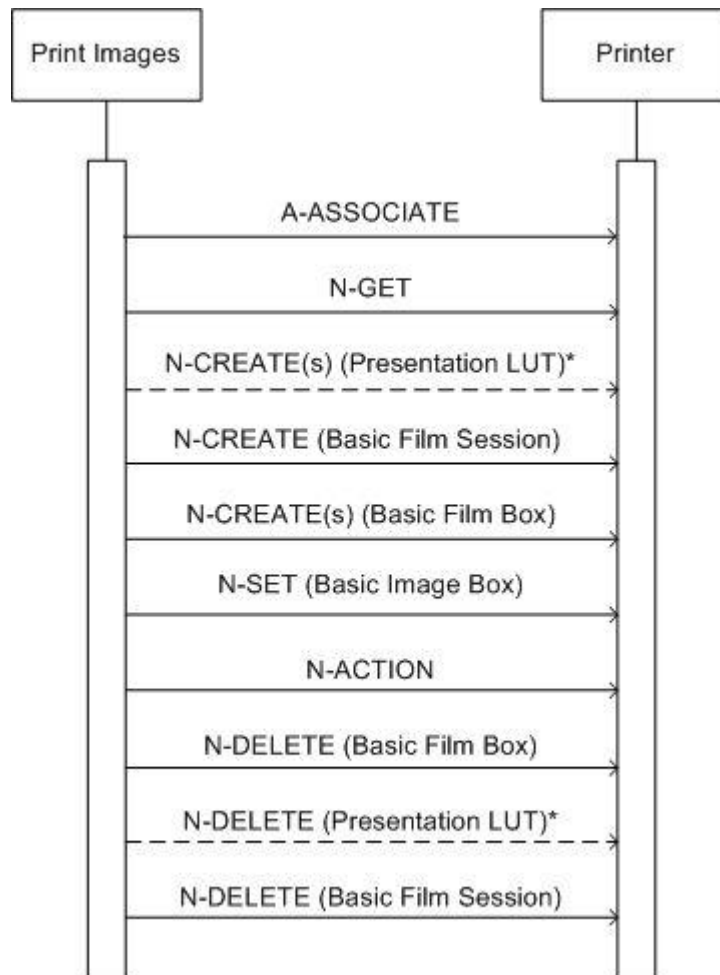


Figure 11: (Real World) Activity – Print Images

Note: The Presentation LUT SOP class is only supported for grayscale image printing.

4.2.1.3.5.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 35: Proposed Presentation Contexts for (Real-World) Activity – Print Management As SCU

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

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

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 |

4.2.1.3.5.3. SOP Specific Conformance for Presentation LUT SOP Class

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

The print process conforms to the Presentation LUT SOP Class.

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

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

Table 36: Presentation LUT Module

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

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

Table 37: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|--|--|
| 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 38: DICOM Command Response Status Handling Behavior for Presentation LUT N-CREATE

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

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

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

The print process conforms to the Basic Color Image Box SOP class.

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

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

Table 40: Image Box Pixel Presentation Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-----------------------------|-----------|---------------|-------|-------------------|----------|---------|
| Image Box Position | 2020,0010 | US | | ALWAYS | AUTO | |
| Polarity | 2020,0020 | CS | | ALWAYS | AUTO | |
| Basic Color Image Sequence | 2020,0111 | SQ | | ALWAYS | AUTO | |
| >Bits Allocated | 0028,0100 | US | 8 | ALWAYS | AUTO | |
| >Bits Stored | 0028,0101 | US | 8 | ALWAYS | AUTO | |
| >Columns | 0028,0011 | US | | ALWAYS | IMPLICIT | |
| >High Bit | 0028,0102 | US | 7 | ALWAYS | AUTO | |
| >Photometric Interpretation | 0028,0004 | CS | RGB | ALWAYS | AUTO | |
| >Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| >Pixel Representation | 0028,0103 | US | 0 | ALWAYS | IMPLICIT | |
| >Planar Configuration | 0028,0006 | US | 1, 0 | ALWAYS | IMPLICIT | |
| >Rows | 0028,0010 | US | | ALWAYS | IMPLICIT | |
| >Samples per Pixel | 0028,0002 | US | 3 | ALWAYS | AUTO | |

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

Table 41: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|--|---|
| 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 | Error Code | Further Meaning | Behavior |
|----------------|------------|--|--|
| | B60A | The print job continues and the warning is logged and reported to the user. | The print job continues and the warning is logged and reported to the user. |
| Error | C603 | The print job is marked as failed and the reason is logged and reported to the user. | 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 42: 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. |

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

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

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

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

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

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

Table 43: Status Response

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

Table 44: 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. |

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

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

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

Table 45: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|---|--|
| Success | 0000 | Film accepted for printing | The print job continues. |
| Warning | B603 | Film Box SOP Instance Hierarchy does not contain Image Box SOP Instances | The print job continues and the warning is logged and reported to the user. |
| | 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. |
| | 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. |
| | 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. |
| Failure | C602 | Unable to create Print Job SOP Instance – Print Queue is full | The print job is marked as failed and the reason is logged and reported to the user. |
| | 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. |
| | 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 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. |

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

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

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

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

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

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

Table 47: Status Response

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

Table 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. |

4.2.1.3.5.7. SOP Specific Conformance for Printer SOP Class of the Basic Color Print Management Meta SOP Class

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

The print process conforms to the Printer SOP class.

4.2.1.3.5.7.1. Dataset Specific Conformance for Printer SOP Class N-EVENT-REPORT-SCP

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

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

Table 49: Status Response

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

Table 50: 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. |

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

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

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

Table 51: Status Response

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

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

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

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

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

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

Table 53: Basic Film Box Presentation Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------|-----------|----|--|-------------------|--------|---------|
| Configuration Information | 2010,0150 | ST | L | ANAPEV | AUTO | |
| Film Orientation | 2010,0040 | CS | LANDSCAPE, PORTRAIT | ALWAYS | CONFIG | |
| Film Size ID | 2010,0050 | CS | 10INX12IN, 10INX14IN, 11INX14IN, 11INX17IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, 8_5INX11IN, 8INX10IN, A3, A4 | ALWAYS | CONFIG | |
| Image Display Format | 2010,0010 | ST | CUSTOM, STANDARD | ALWAYS | AUTO | |
| Magnification Type | 2010,0060 | CS | | ANAPEV | AUTO | |
| Max Density | 2010,0130 | US | | VNAP | CONFIG | |
| Reflected Ambient Light | 2010,0160 | US | | ANAPCV | | |
| Trim | 2010,0140 | CS | NO, YES | ANAPEV | AUTO | |

Table 54: 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 | |

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

Table 55: Status Response

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

Table 56: 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. |

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

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

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

Table 57: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|---|--|
| Success | 0000 | Film accepted for printing | The print job continues. |
| Warning | B603 | Film Box SOP Instance Hierarchy does not contain Image Box SOP Instances | The print job continues and the warning is logged and reported to the user. |
| | 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. |
| | 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. |
| | 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. |
| Failure | C602 | Unable to create Print Job SOP Instance – Print Queue is full | The print job is marked as failed and the reason is logged and reported to the user. |
| | 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. |
| | 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 58: 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. |

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

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

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

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

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

Table 59: Basic Film Session Presentation Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------|-----------|----|---------------------|-------------------|--------|---------|
| Film Destination | 2000,0040 | CS | MAGAZINE, PROCESSOR | ANAPEV | USER | |

| | | | | | | |
|--------------------|-----------|----|---------------------------------|--------|----------|---------|
| Film Session Label | 2000,0050 | LO | Philips Medical Systems | ALWAYS | COPY | |
| Medium Type | 2000,0030 | CS | BLUE FILM, CLEAR FILM, PAPER | ANAPEV | IMPLICIT | |
| Number of Copies | 2000,0010 | IS | | ALWAYS | USER | 1 to 99 |
| Print Priority | 2000,0020 | CS | HIGH | ALWAYS | USER | |

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

Table 60: Status Response

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

Table 61: 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. |

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

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

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

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

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

Table 62: Image Box Pixel Presentation Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--------------------------------|-----------|---------------|-------------|-------------------|----------|---------|
| Image Box Position | 2020,0010 | US | | ALWAYS | AUTO | |
| Polarity | 2020,0020 | CS | | ALWAYS | AUTO | |
| Basic Grayscale Image Sequence | 2020,0110 | SQ | | ALWAYS | AUTO | |
| >Bits Allocated | 0028,0100 | US | 8, 16 | ALWAYS | AUTO | |
| >Bits Stored | 0028,0101 | US | 8, 12 | ALWAYS | IMPLICIT | |
| >Columns | 0028,0011 | US | | ALWAYS | IMPLICIT | |
| >High Bit | 0028,0102 | US | 7, 11 | ALWAYS | AUTO | |
| >Photometric Interpretation | 0028,0004 | CS | MONOCHROME2 | ALWAYS | AUTO | |
| >Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |

| | | | | | | |
|-----------------------|-----------|----|---|--------|----------|--|
| >Pixel Representation | 0028,0103 | US | 0 | ALWAYS | AUTO | |
| >Rows | 0028,0010 | US | | ALWAYS | IMPLICIT | |
| >Samples per Pixel | 0028,0002 | US | 1 | ALWAYS | AUTO | |

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

Table 63: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|---|--|
| 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. |
| | 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 64: 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. |

4.2.1.3.5.11. SOP Specific Conformance for Printer SOP Class of the Basic Grayscale Print Management Meta SOP Class

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

The print process conforms to the Printer SOP class.

4.2.1.3.5.11.1. Dataset Specific Conformance for Printer SOP Class N-EVENT-REPORT-SCP

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

Table 65: Printer Module

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

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

Table 66: Status Response

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

Table 67: 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. |

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

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

Table 68: Printer Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------|-----------|----|-------|-------------------|--------|---------|
| Device Serial Number | 0018,1000 | LO | | ANAPCV | | |
| Manufacturer | 0008,0070 | LO | | ANAPCV | | |
| Manufacturer's Model Name | 0008,1090 | LO | | ANAPCV | | |
| Printer Name | 2110,0030 | LO | | ANAPCV | | |
| Printer Status | 2110,0010 | CS | | ALWAYS | AUTO | |
| Printer Status Info | 2110,0020 | CS | | ALWAYS | AUTO | |
| Software Version(s) | 0018,1020 | LO | | ANAPCV | | |

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

Table 69: Status Response

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

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

Table 70: 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. |

4.2.1.4. 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 EWS 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 Application Entity may reject Association attempts as shown in the table below.

Table 71: Association Reject Reasons

| 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. |

| Result | Source | Reason/Diagnosis | Behavior |
|--------|---|------------------------------------|---|
| | 2 - DICOM UL service provider (ACSE related function) | 1 - no-reason-given | The user will be informed. The information is logged. |
| | | 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 for sending an association abort is summarized in next table.

Table 72: Association Abort Policies

| Source | Reason/Diagnosis | Behavior |
|---|---------------------------------|---|
| 0 - DICOM UL service-user (initiated abort) | 0 - reason-not-specified | The user will be informed. The information is logged. |
| 2 - DICOM UL service-provider (initiated abort) | 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 – Verification as SCP

4.2.1.4.1.1. Description and Sequencing of Activities

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

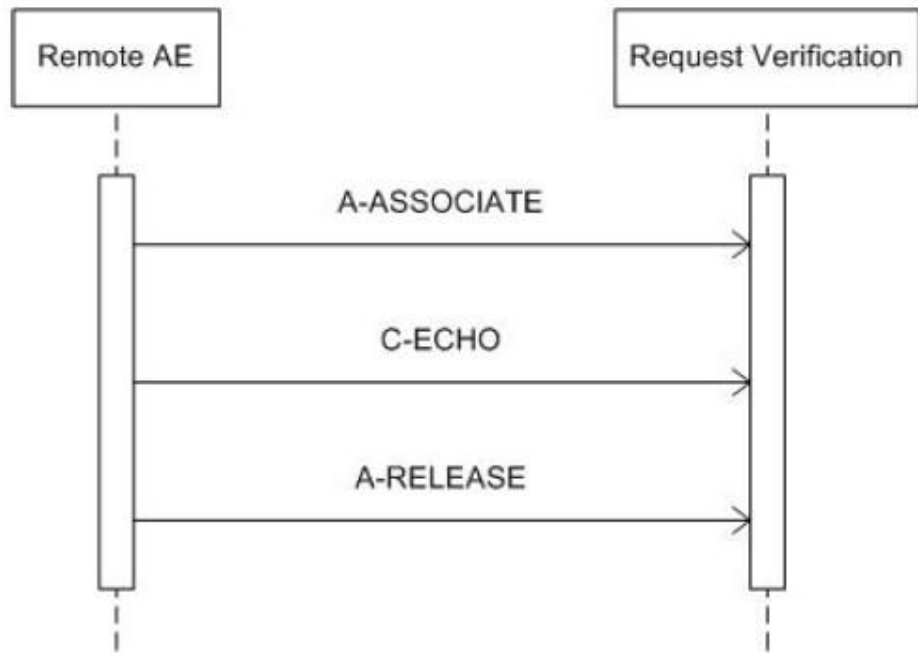


Figure 12: (Real World) Activity – Request Verification

4.2.1.4.1.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 73: Acceptable Presentation Contexts for (Real-World) Activity – Verification as SCP

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

The 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 EWS 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.

4.2.1.4.1.3. SOP Specific Conformance for Verification SOP Class

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

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

4.2.1.4.1.3.1. Dataset Specific Conformance for Verification C-ECHO SCP

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

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

Table 74: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|-----------------|-----------------------------------|
| Success | 0000 | Confirmation | Confirm the verification request. |

Table 75: 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. |

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

4.2.1.4.2.1. Description and Sequencing of Activities

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

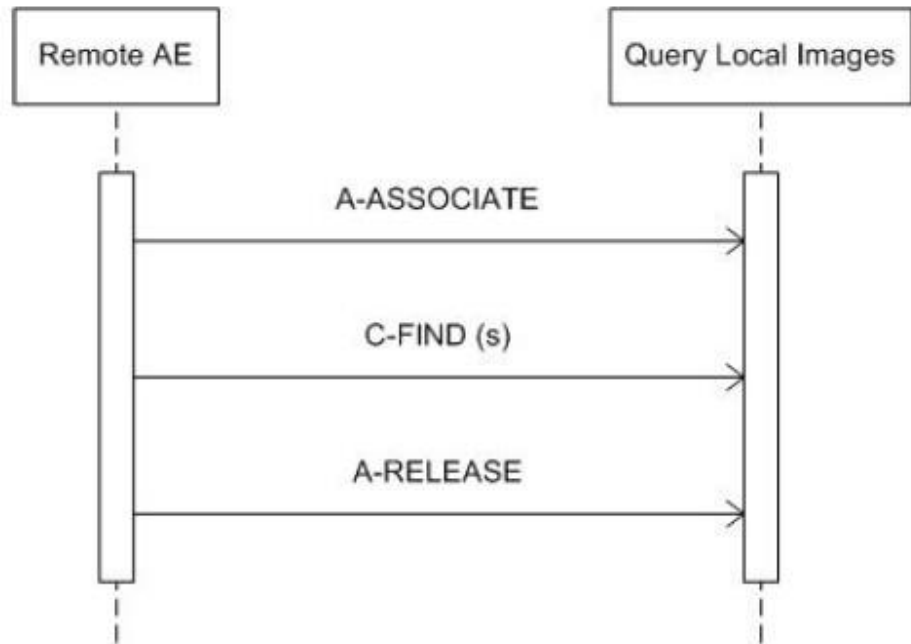


Figure 13: (Real World) Activity – Query Local Images

4.2.1.4.2.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 76: Acceptable Presentation Contexts for (Real-World) Activity – FIND As SCP

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

The 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 QR Information Model - FIND SOP Class

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

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.

Within the Extended MR Workspace database it is possible that two patients exist 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. In this case, both patients will be retrieved.

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. Dataset Specific Conformance for Patient Root QR Information Model - FIND SOP Class C-FIND-SCP

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

Table 77: Requested Query Keys for Patient Root Information Model

| Patient Root Information Model | | | | |
|--------------------------------|-----------|----|------------------|---------|
| Attribute Name | Tag | VR | Type Of Matching | Comment |
| Query/Retrieve Level | 0008,0052 | CS | | |
| Specific Character Set | 0008,0005 | CS | | |
| Q/R Image level | | | | |
| Instance Number | 0020,0013 | IS | | |
| SOP Instance UID | 0008,0018 | UI | | |
| Q/R Patient level | | | | |
| Patient ID | 0010,0020 | LO | | |
| Patient's Name | 0010,0010 | PN | | |
| Q/R Series level | | | | |
| Modality | 0008,0060 | CS | | |
| Series Instance UID | 0020,000E | UI | | |
| Series Number | 0020,0011 | IS | | |
| Q/R Study level | | | | |
| Accession Number | 0008,0050 | SH | | |
| Study Date | 0008,0020 | DA | | |
| Study ID | 0020,0010 | SH | | |
| Study Instance UID | 0020,000D | UI | | |
| Study Time | 0008,0030 | TM | | |

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

Table 78: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|--|--|
| Success | 0000 | Matching is complete | The C-FIND request handling is completed, no more C-FIND responses are sent. |
| 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 QR Information Model - FIND SOP Class

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

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.

Within the Extended MR Workspace database it is possible that two patients exist 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. In this case, both patients will be retrieved.

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

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

Table 80: Requested Query Keys for Study Root Information Model

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

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

Table 81: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|--|--|
| Success | 0000 | 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 – MOVE as SCP

4.2.1.4.3.1. Description and Sequencing of Activities

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

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

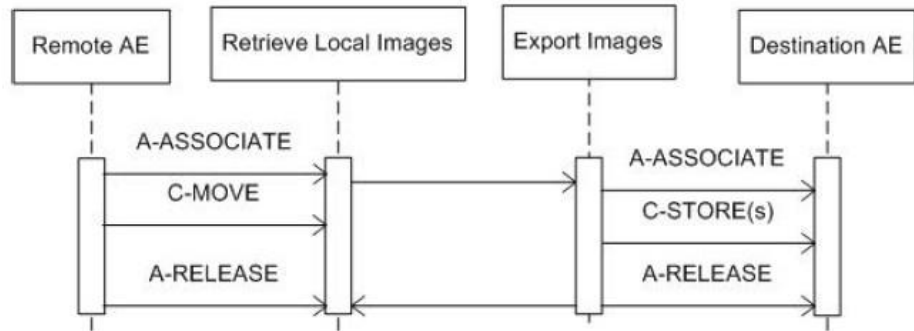


Figure 14: (Real World) Activity – Retrieve Local Images

4.2.1.4.3.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 83: Acceptable Presentation Contexts for (Real-World) Activity – MOVE As SCP

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

The 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 QR Information Model - MOVE SOP Class

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

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

4.2.1.4.3.3.1. Dataset Specific Conformance for Patient Root QR Information Model - MOVE SOP Class C-MOVE-SCP

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

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

Table 84: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|--|--|
| 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 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 QR Information Model - MOVE SOP Class

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

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

4.2.1.4.3.4.1. Dataset Specific Conformance for Study Root QR Information Model - MOVE SOP Class C-MOVE-SCP

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

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

Table 86: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|--|--|
| 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 – Image Import

4.2.1.4.4.1. Description and Sequencing of Activities

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

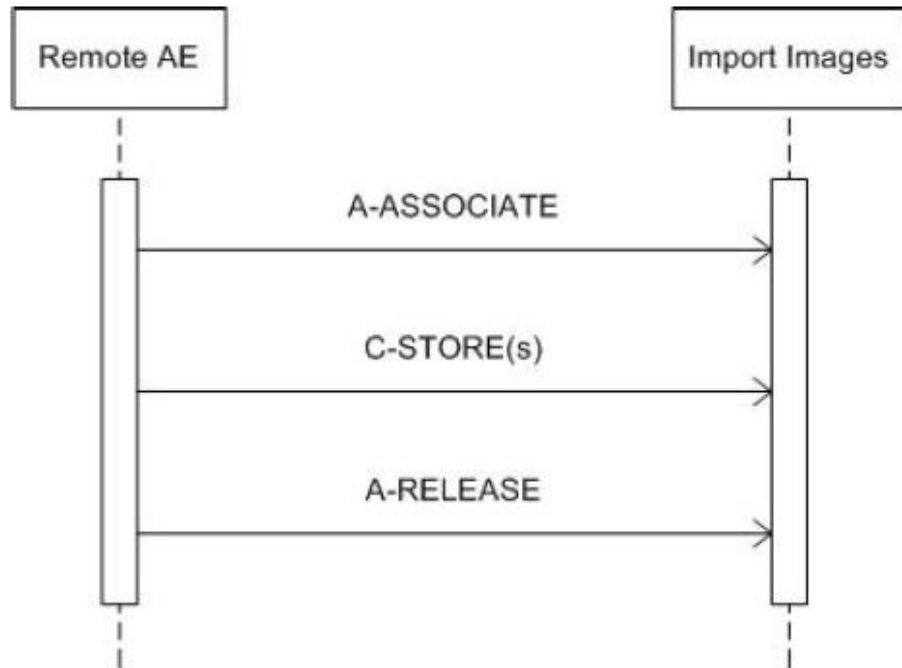


Figure 15: (Real World) Activity - Import Images

4.2.1.4.4.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 88: Acceptable Presentation Contexts for (Real-World) Activity – Image Import

| Presentation Context Table | | | | | |
|--|---------------------------|---------------------------|---------------------|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| 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 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| CX Synthetic Image Storage (Private) | 1.3.46.670589.5.0.12 | 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 | | |

| Presentation Context Table | | | | | |
|---|-------------------------------|---------------------------|---------------------|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| Digital Mammography X-Ray Image Storage - Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.2 | 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 | | |
| Digital Mammography X-Ray Image Storage - Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.2.1 | 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 | | |
| 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 ExamCard Storage SOP Class (Private) | 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 | | |
| 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 Series Data Storage SOP Class (Private) | 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 | | |
| 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 Spectrum Storage SOP Class (Private) | 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 | | |
| 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 | | |
| 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 | | |
| 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 (Private) | 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 | 1.2.840.10008.5.1.4.1.1.6.1 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCP | None |

| Presentation Context Table | | | | | |
|---|------------------------------|---------------------------|------------------------|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| Storage SOP Class | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | JPEG Baseline (Process 1) | 1.2.840.10008.1.2.4.50 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Ultrasound Multi-frame Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.3.1 | JPEG Baseline (Process 1) | 1.2.840.10008.1.2.4.50 | 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 | | |
| 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 does not support extended negotiations.

4.2.1.4.4.3. SOP Specific Conformance for Storage SOP Classes

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

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

4.2.1.4.4.3.1. Dataset Specific Conformance for C-STORE-RSP

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

Table 89: Status Response

| Service Status | Error Code | Further Meaning | Behavior |
|----------------|------------|--|--|
| Success | 0000 | Successful stored | The image(s) will be stored in the Extended MR Workspace database. |
| Failure | A700 | Refused: Out of Resources | The Extended MR Workspace database is full. Extended MR Workspace shall send a notification, log the condition and abort association. |
| | A900 | Error: Data Set does not match 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 | Error: 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 | N/A |
| | B007 | Data Set does not match SOP Class | N/A |
| | B006 | Elements Discarded | N/A |

Table 90: DICOM Command Communication Failure Behavior

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

4.3. Network Interfaces

4.3.1. Physical Network Interfaces

The System provides only DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the standard.

TCP/IP is the only protocol stack supported.

Supported physical medium include:

IEEE 802.3-1995, 10BASE-T

IEEE 802.3-1995, 100BASE-TX (Fast Ethernet)

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

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

The API is the WinSock 2 interface as supported by the underlying Operating System.

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 are 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 is described here.

4.4.1.1. Local AE Titles

The local AE title mapping and configuration are specified as:

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

The configuration of the remote application is specified here.

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.

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 specification of important operational parameters, their default value and range (if configurable) are specified here.

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 Parameter | | |
| 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 | | |
| Size constraint in maximum object size | 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 | | |
| 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 |

| Parameter | Configurable | Default Value |
|---|--------------|---------------|
| Support of overlays for DICOM node supporting Presentation State objects ² | Yes | disabled |
| Support of overlays for CD ² | Yes | disabled |
| General Print Parameters | | |
| The DICOM printers that may be selected by the operator | Yes | |
| Printer Specific Print Parameters³ | | |
| 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 |

Notes:

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

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

5.1.1. Application Data Flow Diagram

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.

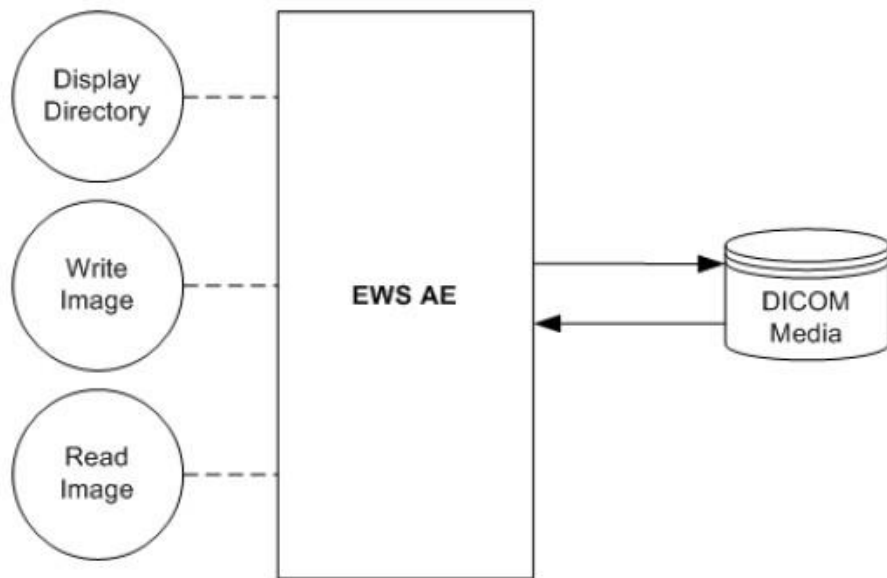


Figure 16: Media Interchange Application Data Flow Diagram

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 | YES / NO | YES |
| General Purpose DVD Interchange with JPEG | YES / NO | YES |
| General Purpose USB Media Interchange with JPEG | YES / YES | YES |

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 Name / UID | Transfer Syntax Name | Transfer Syntax UID | Role | Extended Negotiation |
|----------------------------|----------------------|---------------------|------|----------------------|
| See note | ILE | 1.2.840.10008.1.2 | SCU | None |
| | ELE | 1.2.840.10008.1.2.1 | | |
| | EBE | 1.2.840.10008.1.2.2 | | |

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

This section contains the functional definition of each individual local Media Application Entity.

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

This section contains a description of sequencing of Real-World Activities that the Media Application Entities require.

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.

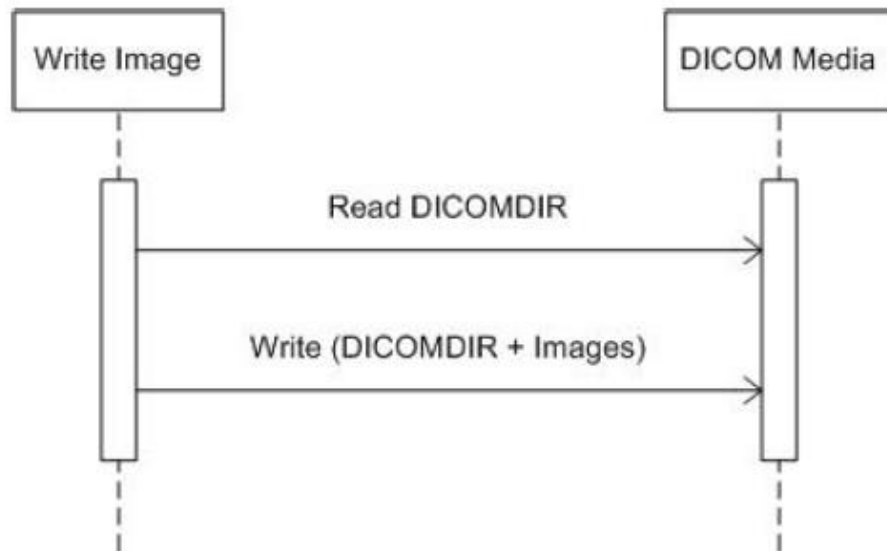


Figure 17: Sequencing of RWA Write Image

5.2. AE Specifications

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

5.2.1. EWS AE Media - Specification

This section contains general policies that apply to all of the Application Entities described in subsequent section.

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.

For one or more Application Profiles, the following table shows the Real-World Activities and the roles of each of these Real-World Activities.

Notes:

- Read File-set = Display Directory, Read Image
- Create File-set = Write Image (using ELE only)
- Update File-set = Write Image (using ELE only)
- Write Image for DVD is DVD+R (W) only

Table 97: AE EWS AE related Application Profiles, RWA activities and roles

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

5.2.1.1. File Meta Information for the EWS AE

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

The EWS AE has no specific file meta information.

Table 98: File Meta Information for the EWS AE

| | |
|-----------------------------|----------------------|
| Implementation Class UID | 1.3.46.670589.5.2.23 |
| Implementation Version Name | ViewForum R7.2 |

5.2.1.2. Real-World Activities

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

5.2.1.2.1. RWA - Read File-set

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

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

5.2.1.2.1.1. Media Storage Application Profile

The Application Profile that is used by this Media Application Entity is specified in this section.

Display Directory

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.

Read Image

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

5.2.1.2.1.1. Options

The options used in the Application Profile are specified in detail in this section.

Display Directory

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

Read Image

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

5.2.1.2.2. RWA - Create File-set

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

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

5.2.1.2.2.1. Media Storage Application Profile

The Application Profile that is used by this Media Application Entity is specified in this section.

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

5.2.1.2.2.1.1. Options

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

5.2.1.2.3. RWA - Update File-set

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

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

5.2.1.2.3.1. Media Storage Application Profile

The Application Profile that is used by this Media Application Entity is specified in this section.

The EWS AE will act as a 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

Any support for character sets beyond the default character repertoire in Network and Media services is described here.

Table 99: Supported DICOM Character Sets

| Character Set Description | Defined Term | ESC Sequence | ISO Registration Number | Code Element | Character Set |
|---------------------------|-----------------|-----------------|-------------------------|--------------|-------------------------------|
| 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 |
| | | - | - | - | - |
| Latin alphabet No. 1 | ISO_IR 100 | - | ISO-IR 6 | G0 | ISO 646 |
| | | - | ISO-IR 100 | G1 | Supplementary set of ISO 8859 |

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. Security use Profiles

Not applicable

7.1.2. Security Transport Connection Profiles

Not applicable

7.1.3. Digital Signature Profiles

Not applicable

7.1.4. Media Storage Security Profiles

Not applicable

7.1.5. Attribute Confidentiality Profiles

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 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 |

7.1.6. Network Address Management Profiles

Not applicable

7.1.7. Time Synchronization Profiles

Not applicable

7.1.8. Application Configuration Management Profiles

Not applicable

7.1.9. Audit Trail Profiles

The Extended MR Workspace supports the HIPAA Audit trail profile.

7.2. Association Level Security

Not applicable.

7.3. Application Level Security

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 OF APPLICATION "EXTENDED MR WORKSPACE"

8.1. IOD Contents

8.1.1. Created SOP Instance

This section specifies each IOD created by this application.

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

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

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

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

ALWAYS The attribute is always present with a value
 EMPTY The attribute is always present without any value (attribute sent zero length)
 VNAP The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
 ANAP The attribute is present under specified condition – 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

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

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

8.1.1.1. List of created SOP Classes

Table 101: List of created SOP Classes

| SOP Class Name | SOP Class UID |
|--|-----------------------------|
| 3D Object new Storage (Private) | 1.3.46.670589.5.0.2.1 |
| 3D Volume Storage new SOP Class (Private) | 1.3.46.670589.5.0.1.1 |
| Cardio Image Storage new SOP Class (Private) | 1.3.46.670589.5.0.8.1 |
| Color MR Image Storage SOP Class (Private) | 1.3.46.670589.11.0.0.12.3 |
| Computed Radiography Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.1 |
| CT Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.2 |
| CT Synthetic Image Storage (Private) | 1.3.46.670589.5.0.9 |
| CX Synthetic Image Storage (Private) | 1.3.46.670589.5.0.12 |
| Digital X-Ray Image Storage - For Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.1 |

| | |
|---|------------------------------|
| MR Cardio Analysis new Storage (Private) | 1.3.46.670589.5.0.11.1 |
| MR ExamCard Storage SOP Class (Private) | 1.3.46.670589.11.0.0.12.4 |
| MR Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.4 |
| MR Series Data Storage SOP Class (Private) | 1.3.46.670589.11.0.0.12.2 |
| MR Spectroscopy Storage SOP Class | 1.2.840.10008.5.1.4.1.1.4.2 |
| MR Synthetic Image Storage (Private) | 1.3.46.670589.5.0.10 |
| Perfusion (Private) | 1.3.46.670589.5.0.13 |
| Perfusion Image Storage (Private) | 1.3.46.670589.5.0.14 |
| Raw Data Storage SOP Class | 1.2.840.10008.5.1.4.1.1.66 |
| Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7 |
| Softcopy Presentation State Storage SOP Class | 1.2.840.10008.5.1.4.1.1.11.1 |
| Surface Storage new (Private) | 1.3.46.670589.5.0.3.1 |
| Ultrasound Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.6.1 |
| Ultrasound Multi-frame Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.3.1 |
| 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 |

Note: MR dedicated clinical applications copy the series date and series time of the original dataset to new created series. Others clinical applications use the actual date and time of series creation.

8.1.1.2. Computed Radiography Image Storage SOP Class

Table 102: 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 |
| Equipment | General Equipment Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |
| Series | CR Series Module | ALWAYS |
| Image | CR Image Module | ALWAYS |
| Image | SOP Common Module | ALWAYS |

Table 103: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Patient ID | 0010,0020 | LO | | VNAP | AUTO | |
| Patient's Name | 0010,0010 | PN | | VNAP | AUTO | |
| Patient's Sex | 0010,0040 | CS | | VNAP | AUTO | |
| 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 | |

Table 104: General Study Module

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

Table 105: 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 106: General Equipment Module

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

Table 107: General Image Module

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

Table 108: Image Pixel Module

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

Table 109: Contrast/Bolus Module

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

Table 110: 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 111: CR Image Module

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

Table 112: SOP Common Module

| 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 | |
| Specific Character Set | 0008,0005 | CS | | ANAP | AUTO | |

8.1.1.3. CT Image Storage SOP Class

Table 113: 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 | Image Plane Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |
| Image | CT Image Module | ALWAYS |
| Image | SOP Common Module | ALWAYS |

Table 114: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Patient's Birth Date | 0010,0030 | DA | | VNAP | AUTO | |
| Patient's Name | 0010,0010 | PN | | VNAP | AUTO | |
| Patient's Sex | 0010,0040 | CS | | VNAP | AUTO | |
| 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 | |

Table 115: General Study Module

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

Table 116: 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 117: 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 118: General Equipment Module

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

Table 119: General Image Module

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

Table 120: Image Plane Module

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

Table 121: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------|-----------|---------------|-------|-------------------|--------|---------|
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Pixel Representation | 0028,0103 | US | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |

Table 122: Contrast/Bolus Module

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

Table 123: CT Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|----|-------|-------------------|--------|---------|
| Acquisition Number | 0020,0012 | IS | | VNAP | AUTO | |
| Bits Allocated | 0028,0100 | US | | ALWAYS | AUTO | |
| Bits Stored | 0028,0101 | US | | ALWAYS | AUTO | |
| High Bit | 0028,0102 | US | | ALWAYS | AUTO | |
| Image Type | 0008,0008 | CS | | ALWAYS | AUTO | |
| KVP | 0018,0060 | DS | | VNAP | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | | ALWAYS | AUTO | |
| Rescale Intercept | 0028,1052 | DS | | ALWAYS | AUTO | |
| Rescale Slope | 0028,1053 | DS | | ALWAYS | AUTO | |

Table 124: SOP Common Module

| 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 | |
| Specific Character Set | 0008,0005 | CS | | ANAP | AUTO | |

8.1.1.4. Digital X-Ray Image Storage - For Pres. SOP**Table 125: 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 |
| Equipment | General Equipment Module | ALWAYS |

| | | |
|--------|----------------------------|-------------|
| Image | General Image Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Image | Acquisition Context Module | ALWAYS |
| Series | DX Series Module | ALWAYS |
| Image | DX Anatomy Imaged Module | ALWAYS |
| Image | DX Image Module | ALWAYS |
| Image | DX Detector Module | ALWAYS |
| Image | Overlay Plane Module | CONDITIONAL |
| Image | VOI LUT Module | CONDITIONAL |
| Image | SOP Common Module | ALWAYS |

Table 126: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Patient ID | 0010,0020 | LO | | VNAP | AUTO | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | AUTO | |
| Patient's Name | 0010,0010 | PN | | VNAP | AUTO | |
| Patient's Sex | 0010,0040 | CS | | VNAP | AUTO | |
| 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 | |

Table 127: General Study Module

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

Table 128: 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 129: General Equipment Module

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

Table 130: General Image Module

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

Table 131: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|---------------|-------|-------------------|--------|---------|
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |

Table 132: Acquisition Context Module

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

Table 133: 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 134: DX Anatomy Imaged Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Image Laterality | 0020,0062 | CS | | ALWAYS | AUTO | |
| Anatomic Region Sequence | 0008,2218 | SQ | | VNAP | AUTO | |
| >Anatomic Region Modifier Sequence | 0008,2220 | SQ | | ANAP | AUTO | |
| >>Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |

Table 135: DX Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-----------------------------------|-----------|----|-------|-------------------|--------|---------|
| Bits Allocated | 0028,0100 | US | | ALWAYS | AUTO | |
| Bits Stored | 0028,0101 | US | | ALWAYS | AUTO | |
| Burned In Annotation | 0028,0301 | CS | | ALWAYS | AUTO | |
| High Bit | 0028,0102 | US | | ALWAYS | AUTO | |
| Image Type | 0008,0008 | CS | | ALWAYS | AUTO | |
| Lossy Image Compression | 0028,2110 | CS | | ALWAYS | AUTO | |
| Patient Orientation | 0020,0020 | CS | | ALWAYS | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | | ALWAYS | AUTO | |
| Pixel Intensity Relationship | 0028,1040 | CS | | ALWAYS | AUTO | |
| Pixel Intensity Relationship Sign | 0028,1041 | SS | | ALWAYS | AUTO | |
| Pixel Representation | 0028,0103 | US | | ALWAYS | AUTO | |
| Presentation LUT Shape | 2050,0020 | CS | | ALWAYS | AUTO | |

| | | | | | | |
|-------------------|-----------|----|--|--------|------|--|
| Rescale Intercept | 0028,1052 | DS | | ALWAYS | AUTO | |
| Rescale Slope | 0028,1053 | DS | | ALWAYS | AUTO | |
| Rescale Type | 0028,1054 | LO | | ALWAYS | AUTO | |
| Samples per Pixel | 0028,0002 | US | | ALWAYS | AUTO | |

Table 136: 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 137: Overlay Plane Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------|-----------|---------------|-------|-------------------|--------|---------|
| Overlay Bit Position | 6000,0102 | US | | ALWAYS | AUTO | |
| Overlay Bits Allocated | 6000,0100 | US | | ALWAYS | AUTO | |
| Overlay Columns | 6000,0011 | US | | ALWAYS | AUTO | |
| Overlay Data | 6000,3000 | O W/ OB | | VNAP | AUTO | |
| Overlay Origin | 6000,0050 | SS | | ALWAYS | AUTO | |
| Overlay Rows | 6000,0010 | US | | ALWAYS | AUTO | |
| Overlay Type | 6000,0040 | CS | | ALWAYS | AUTO | |

Table 138: 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 | |
| >LUT Data | 0028,3006 | US /SS | | ALWAYS | | |
| >LUT Descriptor | 0028,3002 | US /SS | | ALWAYS | | |

Table 139: SOP Common Module

| 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 | |
| Specific Character Set | 0008,0005 | CS | | ANAP | AUTO | |

8.1.1.5. MR Image Storage SOP Class**Table 140: IOD of Created MR Image Storage SOP Class Instances**

| Information Entity | Module | Presence Of Module |
|--------------------|---------------------------|--------------------|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Study | Patient Study Module | 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 | Image Plane Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |
| Image | MR Image Module | ALWAYS |

| | | |
|-------|----------------------|-------------|
| Image | Overlay Plane Module | CONDITIONAL |
| Image | VOI LUT Module | CONDITIONAL |
| Image | SOP Common Module | ALWAYS |
| | Additional Module | CONDITIONAL |

Table 141: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|----------|---------|
| Ethnic Group | 0010,2160 | SH | | ANAPCV | COPY | |
| Issuer of Patient ID | 0010,0021 | LO | | ANAP | COPY | |
| Other Patient IDs | 0010,1000 | LO | | ANAP | COPY | |
| Other Patient Names | 0010,1001 | PN | | ANAP | COPY | |
| Patient Comments | 0010,4000 | LT | | ANAPCV | COPY | |
| Patient ID | 0010,0020 | LO | | VNAP | COPY | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | COPY | |
| Patient's Birth Time | 0010,0032 | TM | | ANAP | COPY | |
| Patient's Name | 0010,0010 | PN | | VNAP | COPY | |
| Patient's Sex | 0010,0040 | CS | | VNAP | COPY | |
| 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 | |

Table 142: General Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Accession Number | 0008,0050 | SH | | VNAP | AUTO | |
| Name of Physician(s) Reading Study | 0008,1060 | PN | | ANAP | AUTO | |
| Physician(s) of Record | 0008,1048 | PN | | ANAP | AUTO | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | AUTO | |
| Study Date | 0008,0020 | DA | | VNAP | AUTO | |
| Study Description | 0008,1030 | LO | | ANAPCV | AUTO | |
| Study ID | 0020,0010 | SH | | VNAP | AUTO | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO | |
| Study Time | 0008,0030 | TM | | VNAP | AUTO | |
| Procedure Code Sequence | 0008,1032 | SQ | | ANAP | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | AUTO | |
| >Context Group Extension Creator UID | 0008,010D | UI | | ANAP | AUTO | |
| >Context Group Extension Flag | 0008,010B | CS | | ANAP | AUTO | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | AUTO | |
| >Context Group Version | 0008,0106 | DT | | ANAP | AUTO | |
| >Context Identifier | 0008,010F | CS | | ANAP | AUTO | |
| >Mapping Resource | 0008,0105 | 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 | |

Table 143: Patient Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------------|-----------|----|-------|-------------------|--------|---------|
| Additional Patient History | 0010,21B0 | LT | | ANAPCV | COPY | |
| Admitting Diagnoses Description | 0008,1080 | LO | | ANAPCV | COPY | |
| Occupation | 0010,2180 | SH | | 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 | |

Table 144: General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--|-----------|--------|-------|-------------------|--------|---------|
| Body Part Examined | 0018,0015 | CS | | ANAP | AUTO | |
| Largest Pixel Value in Series | 0028,0109 | US /SS | | ANAP | AUTO | |
| Laterality | 0020,0060 | CS | | ANAPCV | AUTO | |
| Modality | 0008,0060 | CS | | ALWAYS | FIXED | |
| Operators' Name | 0008,1070 | PN | | ANAPCV | AUTO | |
| Patient Position | 0018,5100 | CS | | VNAP | AUTO | |
| Performing Physician's Name | 0008,1050 | PN | | ANAP | AUTO | |
| Protocol Name | 0018,1030 | LO | | ANAP | AUTO | |
| Series Date | 0008,0021 | DA | | ANAP | AUTO | |
| Series Description | 0008,103E | LO | | ANAP | AUTO | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO | |
| Series Time | 0008,0031 | TM | | ANAP | AUTO | |
| Smallest Pixel Value in Series | 0028,0108 | US /SS | | ANAP | AUTO | |
| Referenced Performed Procedure Step Sequence | 0008,1111 | SQ | | ANAP | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO | |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAPCV | AUTO | |
| >Requested Procedure ID | 0040,1001 | SH | | ALWAYS | AUTO | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | VNAP | AUTO | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | ALWAYS | AUTO | |
| Comments on the Performed Procedure Step | 0040,0280 | ST | | ANAP | AUTO | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAPCV | AUTO | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAPCV | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| >Context Group Extension Creator UID | 0008,010D | UI | | ANAP | AUTO | |
| >Context Group Extension Flag | 0008,010B | CS | | ANAP | AUTO | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | AUTO | |
| >Context Group Version | 0008,0106 | DT | | ANAP | AUTO | |
| >Context Identifier | 0008,010F | CS | | ANAPCV | AUTO | |
| >Mapping Resource | 0008,0105 | CS | | ANAP | AUTO | |

Table 145: 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 146: General Equipment Module

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

Table 147: General Image Module

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

Table 148: Image Plane Module

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

Table 149: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--------------------------------------|-----------|--------|-------|-------------------|----------|---------|
| Bits Stored | 0028,0101 | US | | ALWAYS | IMPLICIT | |
| Blue Palette Color Lookup Table Data | 0028,1203 | O W | | ANAP | AUTO | |

| | | | | | | |
|---|-----------|---------|--|--------|----------|--|
| Blue Palette Color Lookup Table Descriptor | 0028,1103 | US /SS | | ANAP | AUTO | |
| Columns | 0028,0011 | US | | ALWAYS | IMPLICIT | |
| Green Palette Color Lookup Table Data | 0028,1202 | O W | | ANAP | AUTO | |
| Green Palette Color Lookup Table Descriptor | 0028,1102 | US /SS | | ANAP | AUTO | |
| High Bit | 0028,0102 | US | | ALWAYS | IMPLICIT | |
| Largest Image Pixel Value | 0028,0107 | US /SS | | ANAP | AUTO | |
| Pixel Aspect Ratio | 0028,0034 | IS | | ANAP | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | IMPLICIT | |
| Pixel Representation | 0028,0103 | US | | ALWAYS | AUTO | |
| Planar Configuration | 0028,0006 | US | | ANAP | AUTO | |
| Red Palette Color Lookup Table Data | 0028,1201 | O W | | ANAP | AUTO | |
| Red Palette Color Lookup Table Descriptor | 0028,1101 | US /SS | | ANAP | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | IMPLICIT | |
| Smallest Image Pixel Value | 0028,0106 | US /SS | | ANAP | AUTO | |

Table 150: Contrast/Bolus Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|-----------|----|-------|-------------------|--------|---------|
| Contrast Flow Duration | 0018,1047 | DS | | ANAP | AUTO | |
| Contrast Flow Rate | 0018,1046 | DS | | ANAP | AUTO | |
| Contrast/Bolus Agent | 0018,0010 | LO | | VNAP | AUTO | |
| Contrast/Bolus Ingredient | 0018,1048 | CS | | ANAP | AUTO | |
| Contrast/Bolus Ingredient Concentration | 0018,1049 | DS | | ANAP | AUTO | |
| Contrast/Bolus Route | 0018,1040 | LO | | 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/Bolus Volume | 0018,1041 | DS | | ANAP | AUTO | |

Table 151: MR Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-----------------------------------|-----------|----|-------|-------------------|--------|---------|
| Acquisition Matrix | 0018,1310 | US | | ANAPCV | AUTO | |
| Angio Flag | 0018,0025 | CS | | ANAP | AUTO | |
| Beat Rejection Flag | 0018,1080 | CS | | ANAP | AUTO | |
| Bits Allocated | 0028,0100 | US | | ALWAYS | FIXED | |
| Cardiac Number of Images | 0018,1090 | IS | | ANAP | AUTO | |
| dB/dt | 0018,1318 | DS | | ANAP | AUTO | |
| Echo Number(s) | 0018,0086 | IS | | ANAPCV | AUTO | |
| Echo Time | 0018,0081 | DS | | ANAP | AUTO | |
| Echo Train Length | 0018,0091 | IS | | VNAP | AUTO | |
| Flip Angle | 0018,1314 | DS | | ANAPCV | AUTO | |
| Heart Rate | 0018,1088 | IS | | ANAPCV | AUTO | |
| High R-R Value | 0018,1082 | IS | | ANAPCV | AUTO | |
| Image Type | 0008,0008 | CS | | ALWAYS | AUTO | |
| Imaged Nucleus | 0018,0085 | SH | | ANAP | AUTO | |
| Imaging Frequency | 0018,0084 | DS | | ANAP | AUTO | |
| In-plane Phase Encoding Direction | 0018,1312 | CS | | ANAPCV | AUTO | |
| Intervals Acquired | 0018,1083 | IS | | ANAP | AUTO | |
| Intervals Rejected | 0018,1084 | IS | | ANAPCV | AUTO | |

| | | | | | | |
|--------------------------------|-----------|----|--|--------|-------|--|
| Inversion Time | 0018,0082 | DS | | ANAPCV | AUTO | |
| Low R-R Value | 0018,1081 | IS | | ANAPCV | AUTO | |
| Magnetic Field Strength | 0018,0087 | DS | | ANAPCV | AUTO | |
| MR Acquisition Type | 0018,0023 | CS | | VNAP | AUTO | |
| Nominal Interval | 0018,1062 | IS | | ANAP | AUTO | |
| Number of Averages | 0018,0083 | DS | | ANAP | AUTO | |
| Number of Phase Encoding Steps | 0018,0089 | IS | | ANAPCV | AUTO | |
| Number of Temporal Positions | 0020,0105 | IS | | ANAPCV | AUTO | |
| Percent Phase Field of View | 0018,0094 | DS | | ANAPCV | AUTO | |
| Percent Sampling | 0018,0093 | DS | | ANAPCV | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | | ALWAYS | AUTO | |
| Pixel Bandwidth | 0018,0095 | DS | | ANAP | AUTO | |
| PVC Rejection | 0018,1085 | LO | | ANAP | AUTO | |
| Receive Coil Name | 0018,1250 | SH | | ANAP | AUTO | |
| Reconstruction Diameter | 0018,1100 | DS | | ANAPCV | AUTO | |
| Repetition Time | 0018,0080 | DS | | ANAPCV | AUTO | |
| Samples per Pixel | 0028,0002 | US | | ALWAYS | FIXED | |
| SAR | 0018,1316 | DS | | ANAP | AUTO | |
| Scan Options | 0018,0022 | CS | | VNAP | AUTO | |
| Scanning Sequence | 0018,0020 | CS | | ALWAYS | AUTO | |
| Sequence Name | 0018,0024 | SH | | ANAP | AUTO | |
| Sequence Variant | 0018,0021 | CS | | ALWAYS | AUTO | |
| Skip Beats | 0018,1086 | IS | | ANAP | AUTO | |
| Spacing Between Slices | 0018,0088 | DS | | ANAP | AUTO | |
| Temporal Position Identifier | 0020,0100 | IS | | ANAPCV | AUTO | |
| Temporal Resolution | 0020,0110 | DS | | ANAP | AUTO | |
| Transmit Coil Name | 0018,1251 | SH | | ANAP | AUTO | |
| Trigger Time | 0018,1060 | DS | | ANAPCV | AUTO | |
| Trigger Window | 0018,1094 | IS | | ANAPCV | AUTO | |
| Variable Flip Angle Flag | 0018,1315 | CS | | ANAP | AUTO | |

Table 152: Overlay Plane Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------|-----------|---------------|-------|-------------------|--------|---------|
| Overlay Bit Position | 6000,0102 | US | | ALWAYS | AUTO | |
| Overlay Bits Allocated | 6000,0100 | US | | ALWAYS | AUTO | |
| Overlay Columns | 6000,0011 | US | | ALWAYS | AUTO | |
| Overlay Data | 6000,3000 | O W/ OB | | ALWAYS | AUTO | |
| Overlay Description | 6000,0022 | LO | | ANAPCV | AUTO | |
| Overlay Label | 6000,1500 | LO | | ANAPCV | AUTO | |
| Overlay Origin | 6000,0050 | SS | | ALWAYS | AUTO | |
| Overlay Rows | 6000,0010 | US | | ALWAYS | AUTO | |
| Overlay Subtype | 6000,0045 | LO | | ANAPCV | AUTO | |
| Overlay Type | 6000,0040 | CS | | ALWAYS | AUTO | |
| ROI Area | 6000,1301 | IS | | ANAPCV | AUTO | |
| ROI Mean | 6000,1302 | DS | | ANAPCV | AUTO | |
| ROI Standard Deviation | 6000,1303 | DS | | ANAPCV | AUTO | |

Table 153: VOI LUT Module

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

| | | | | | | |
|------------------|-----------|--------|--|--------|-------|--|
| >LUT Data | 0028,3006 | US /SS | Value 1: 0 | ALWAYS | AUTO | |
| >LUT Descriptor | 0028,3002 | US /SS | Value 1: 0, Value 2: 0, Value 3: 0 | ALWAYS | AUTO | |
| >LUT Explanation | 0028,3003 | LO | | EMPTY | FIXED | |

Table 154: SOP Common Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--|-----------|----|-------|-------------------|--------|---------|
| Authorization Equipment Certification Number | 0100,0426 | LO | | 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 Authorization Comment | 0100,0424 | LT | | ANAP | AUTO | |
| SOP Authorization Date and Time | 0100,0420 | DT | | ANAP | AUTO | |
| SOP Class UID | 0008,0016 | UI | | ALWAYS | FIXED | |
| SOP Instance Status | 0100,0410 | CS | | ANAP | AUTO | |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | AUTO | |
| Specific Character Set | 0008,0005 | CS | | ANAP | AUTO | |
| Timezone Offset From UTC | 0008,0201 | SH | | ANAP | AUTO | |

Table 155: Additional Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|----|------------------------|-------------------|----------------|---|
| Medical Alerts | 0010,2000 | LO | | ANAPCV | COPY | Patient Medical Module |
| Allergies | 0010,2110 | LO | | ANAPCV | COPY | Patient Medical Module |
| Pregnancy Status | 0010,21C0 | US | | VNAP | COPY | Patient Medical Module |
| Special Needs | 0038,0050 | LO | | ANAPCV | COPY | Patient Medical Module |
| Patient State | 0038,0500 | LO | | ANAPCV | COPY | Patient Medical Module |
| Private Creator Group 2001 | 2001,0010 | LO | Philips Imaging DD 001 | ALWAYS | FIXED | |
| Chemical Shift | 2001,1001 | FL | | ANAPCV | USER | Only applicable for spectro 2dsi. |
| Chemical Shift Number MR | 2001,1002 | IS | | ANAPCV | IMPLICIT | Only applicable for spectro 2dsi. |
| Diffusion B-Factor | 2001,1003 | FL | | ANAPCV | USER | Only applicable for diffusion scans. |
| Diffusion Direction | 2001,1004 | CS | P, M, S, O, I | ANAPCV | USER | Possible values: P (Preparation Direction), M (Measurement Direction), S (Selection Direction), O (Oblique Direction), I (Isotropic). |
| Image Enhanced | 2001,1006 | CS | | VNAP | IMPLICIT, USER | |
| Image Type ED ES | 2001,1007 | CS | | VNAP | IMPLICIT, USER | |
| Phase Number | 2001,1008 | IS | | ALWAYS | IMPLICIT | When cardiac synchronization used. |
| Slice Number MR | 2001,100A | IS | | ALWAYS | IMPLICIT | |
| Diffusion Echo Time | 2001,1011 | FL | | ANAPCV | IMPLICIT | Only applicable for diffusion scans. |
| Dynamic Series | 2001,1012 | CS | | VNAP | USER | |
| EPI Factor | 2001,1013 | SL | | ALWAYS | IMPLICIT, USER | |
| Number of Echoes | 2001,1014 | SL | | VNAP | USER | |
| Number of Locations | 2001,1015 | SS | | VNAP | IMPLICIT, USER | |
| Number of PC Directions | 2001,1016 | SS | | VNAP | USER | |
| Number of Phases MR | 2001,1017 | SL | | VNAP | IMPLICIT, USER | |

| | | | | | | |
|---------------------------------|-----------|----|------------------------------|--------|----------------|--|
| Number of Slices MR | 2001,1018 | SL | | VNAP | IMPLICIT, USER | |
| Partial Matrix Scanned | 2001,1019 | CS | | VNAP | IMPLICIT, USER | |
| PC Velocity | 2001,101A | FL | | ALWAYS | IMPLICIT, USER | |
| Prepulse Delay | 2001,101B | FL | | VNAP | IMPLICIT, USER | |
| Prepulse Type | 2001,101C | CS | | VNAP | USER | |
| Reconstruction Number MR | 2001,101D | IS | | VNAP | IMPLICIT | |
| Respiration Sync | 2001,101F | CS | | VNAP | USER | |
| SPIR | 2001,1021 | CS | | VNAP | USER | |
| Water Fat Shift | 2001,1022 | FL | | VNAP | IMPLICIT, USER | |
| Flip Angle Philips | 2001,1023 | DS | | ALWAYS | IMPLICIT, USER | |
| Number of Stacks | 2001,1060 | SL | | VNAP | USER | |
| acquisition_no | 2001,107B | IS | | ALWAYS | IMPLICIT | |
| no_dynamic_scans | 2001,1081 | IS | | VNAP | IMPLICIT, USER | |
| Prospective Motion Correction | 2001,10F1 | FL | | ANAP | AUTO | Only applicable if prospective correction is done on the data. |
| Retrospective Motion Correction | 2001,10F2 | FL | | ANAP | AUTO | Only applicable if retrospective correction is done on the data. |
| Private Creator Group 2005 | 2005,0010 | LO | Philips MR Imaging DD 001 | ALWAYS | FIXED | |
| Number of Chemical Shift | 2005,1020 | SL | | ANAPCV | USER | Only applicable for spectro 2dsi. |
| Syncra Scan Type | 2005,10A1 | CS | SENSE, SYN_CLASSIC, SYN_COCA | ANAPCV | USER | If syncra scan. |
| Diffusion Direction RL | 2005,10B0 | FL | | ANAP | AUTO | Only applicable if Diffusion Direction is Oblique. |
| Diffusion Direction AP | 2005,10B1 | FL | | ANAP | AUTO | Only applicable if Diffusion Direction is Oblique. |
| Diffusion Direction FH | 2005,10B2 | FL | | ANAP | AUTO | Only applicable if Diffusion Direction is Oblique. |

8.1.1.6. MR Spectroscopy Storage SOP Class

Table 156: IOD of Created MR Spectroscopy Storage SOP Class Instances

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

| | | |
|-----------------|---------------------------------------|-------------|
| MR Spectroscopy | MR Spectroscopy Pulse Sequence Module | CONDITIONAL |
| MR Spectroscopy | MR Spectroscopy Data Module | ALWAYS |
| MR Spectroscopy | SOP Common Module | ALWAYS |
| | Additional Module | CONDITIONAL |

Table 157: Patient Module

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

Table 158: General Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Accession Number | 0008,0050 | SH | | VNAP | AUTO | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | AUTO | |
| Study Date | 0008,0020 | DA | | VNAP | AUTO | |
| Study Description | 0008,1030 | LO | | ANAPCV | AUTO | |
| Study ID | 0020,0010 | SH | | VNAP | AUTO | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO | |
| Study Time | 0008,0030 | TM | | VNAP | AUTO | |
| Procedure Code Sequence | 0008,1032 | SQ | | ANAP | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | AUTO | |
| >Context Group Extension Creator UID | 0008,010D | UI | | ANAP | AUTO | |
| >Context Group Extension Flag | 0008,010B | CS | | ANAP | AUTO | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | AUTO | |
| >Context Group Version | 0008,0106 | DT | | ANAP | AUTO | |
| >Context Identifier | 0008,010F | CS | | ANAP | AUTO | |
| >Mapping Resource | 0008,0105 | 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 | |

Table 159: Patient Study Module

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

Table 160: General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--------------------|-----------|----|-------|-------------------|--------|---------|
| Body Part Examined | 0018,0015 | CS | | ANAP | AUTO | |
| Laterality | 0020,0060 | CS | | ANAPCV | AUTO | |

| | | | | | | |
|--|-----------|----|--|--------|------|--|
| Operators' Name | 0008,1070 | PN | | ANAPEV | AUTO | |
| Patient Position | 0018,5100 | CS | | ANAP | AUTO | |
| Protocol Name | 0018,1030 | LO | | ANAP | AUTO | |
| Series Date | 0008,0021 | DA | | ANAP | AUTO | |
| Series Description | 0008,103E | LO | | ANAP | AUTO | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO | |
| Series Time | 0008,0031 | TM | | ANAP | AUTO | |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAPCV | AUTO | |
| >Requested Procedure ID | 0040,1001 | SH | | ALWAYS | AUTO | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | VNAP | AUTO | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | ALWAYS | AUTO | |
| Comments on the Performed Procedure Step | 0040,0280 | ST | | ANAPCV | AUTO | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAPCV | AUTO | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAPCV | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | AUTO | |
| >Context Group Extension Creator UID | 0008,010D | UI | | ANAP | AUTO | |
| >Context Group Extension Flag | 0008,010B | CS | | ANAP | AUTO | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | AUTO | |
| >Context Group Version | 0008,0106 | DT | | ANAP | AUTO | |
| >Context Identifier | 0008,010F | CS | | ANAPCV | AUTO | |
| >Mapping Resource | 0008,0105 | CS | | 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: Synchronization Module

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

Table 163: General Equipment Module

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

Table 164: Enhanced General Equipment Module

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

Table 165: Acquisition Context Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------------|-----------|----|-------|-------------------|--------|---------|
| Acquisition Context Sequence | 0040,0555 | SQ | | VNAP | AUTO | |
| >Concept Code Sequence | 0040,A168 | SQ | | ANAP | | |
| >>Code Meaning | 0008,0104 | LO | | ALWAYS | | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | | |
| >Concept Name Code Sequence | 0040,A043 | SQ | | ALWAYS | | |
| >>Code Meaning | 0008,0104 | LO | | ALWAYS | | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | | |
| >Measurement Units Code Sequence | 0040,08EA | SQ | | ANAP | | |
| >>Code Meaning | 0008,0104 | LO | | ALWAYS | | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | | |

Table 166: Multi-frame Functional Groups Module (MR Spectroscopy)

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--------------------------------------|-----------|----|-------|-------------------|--------|--------------------------|
| Content Date | 0008,0023 | DA | | ALWAYS | AUTO | |
| Content Time | 0008,0033 | TM | | ALWAYS | AUTO | |
| Instance Number | 0020,0013 | IS | | ALWAYS | AUTO | |
| Number of Frames | 0028,0008 | IS | | ALWAYS | AUTO | |
| Per-frame Functional Groups Sequence | 5200,9230 | SQ | | ALWAYS | AUTO | |
| >Pixel Measures Sequence | 0028,9110 | SQ | | ALWAYS | AUTO | |
| >>Pixel Spacing | 0028,0030 | DS | | ANAP | AUTO | |
| >>Slice Thickness | 0018,0050 | DS | | ANAP | AUTO | |
| >Frame Content Sequence | 0020,9111 | SQ | | ALWAYS | AUTO | |
| >>Dimension Index Values | 0020,9157 | UL | | ANAP | AUTO | |
| >>Frame Acquisition Datetime | 0018,9074 | DT | | ANAP | AUTO | |
| >>Frame Acquisition Duration | 0018,9220 | FD | | ANAP | AUTO | |
| >>Frame Reference Datetime | 0018,9151 | DT | | ANAP | AUTO | |
| >>In-Stack Position Number | 0020,9057 | UL | | ANAP | AUTO | |
| >>Stack ID | 0020,9056 | SH | | ANAP | AUTO | If scan contains stacks. |
| >Plane Position Sequence | 0020,9113 | SQ | | ALWAYS | AUTO | |
| >>Image Position (Patient) | 0020,0032 | DS | | ANAP | AUTO | |
| >Plane Orientation Sequence | 0020,9116 | SQ | | ALWAYS | AUTO | |
| >>Image Orientation (Patient) | 0020,0037 | DS | | ANAP | AUTO | |
| >Cardiac Synchronization Sequence | 0018,9118 | SQ | | ANAP | AUTO | |
| >>Nominal Cardiac Trigger Delay Time | 0020,9153 | FD | | ALWAYS | AUTO | |
| >>R - R Interval Time Nominal | 0020,9251 | FD | | ANAP | AUTO | |
| >Frame Anatomy Sequence | 0020,9071 | SQ | | ALWAYS | AUTO | |
| >>Frame Laterality | 0020,9072 | CS | | ALWAYS | AUTO | |
| >>Anatomic Region Sequence | 0008,2218 | SQ | | ALWAYS | AUTO | |
| >>>Code Meaning | 0008,0104 | LO | | ALWAYS | COPY | |

| | | | | | | |
|---|-----------|----|---|--------|------|--|
| >>>Code Value | 0008,0100 | SH | | ALWAYS | COPY | |
| >>>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | COPY | |
| >MR Spectroscopy Frame Type Sequence | 0018,9227 | SQ | | ALWAYS | AUTO | |
| >>Frame Type | 0008,9007 | CS | | ALWAYS | AUTO | |
| >>Acquisition Contrast | 0008,9209 | CS | SPECTROSCOPY, MIXED, PROTON_DENSITY, T1, T2, UNKNOWN | ALWAYS | AUTO | |
| >>Complex Image Component | 0008,9208 | CS | | ALWAYS | AUTO | |
| >>Volume Based Calculation Technique | 0008,9207 | CS | | ALWAYS | AUTO | |
| >>Volumetric Properties | 0008,9206 | CS | | ALWAYS | AUTO | |
| >MR Timing and Related Parameters Sequence | 0018,9112 | SQ | | ALWAYS | AUTO | |
| >>Echo Train Length | 0018,0091 | IS | | ANAP | AUTO | |
| >>Flip Angle | 0018,1314 | DS | | ANAP | AUTO | |
| >>Gradient Echo Train Length | 0018,9241 | US | | ANAP | AUTO | |
| >>Gradient Output | 0018,9182 | FD | | ANAP | AUTO | |
| >>Gradient Output Type | 0018,9180 | CS | | ANAP | AUTO | |
| >>Repetition Time | 0018,0080 | DS | | ANAP | AUTO | |
| >>RF Echo Train Length | 0018,9240 | US | | ANAP | AUTO | |
| >>Operating Mode Sequence | 0018,9176 | SQ | | ANAP | AUTO | |
| >>>Operating Mode | 0018,9178 | CS | | ALWAYS | AUTO | |
| >>>Operating Mode Type | 0018,9177 | CS | | ALWAYS | 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 | |
| >MR Echo Sequence | 0018,9114 | SQ | | ALWAYS | AUTO | |
| >>Effective Echo Time | 0018,9082 | FD | | ANAP | AUTO | |
| >Respiratory Synchronization Sequence | 0020,9253 | SQ | | ANAP | AUTO | |
| >>Nominal Respiratory Trigger Delay Time | 0020,9255 | FD | | ALWAYS | AUTO | |
| >>Respiratory Interval Time | 0020,9254 | FD | | ALWAYS | AUTO | |
| >MR Spectroscopy FOV/Geometry Sequence | 0018,9103 | SQ | | ALWAYS | AUTO | |
| >>Percent Phase Field of View | 0018,0094 | DS | | ANAP | AUTO | |
| >>Percent Sampling | 0018,0093 | DS | | 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 | |
| >>Spectroscopy Acquisition Phase Rows | 0018,9095 | UL | | ANAP | AUTO | |
| >MR Modifier Sequence | 0018,9115 | SQ | | ALWAYS | AUTO | |
| >>Flow Compensation | 0018,9010 | CS | | ANAP | AUTO | |
| >>Flow Compensation Direction | 0018,9183 | CS | | ANAP | AUTO | |
| >>Inversion Recovery | 0018,9009 | CS | | ANAP | AUTO | |
| >>Inversion Times | 0018,9079 | FD | | ANAP | AUTO | |
| >>Parallel Acquisition | 0018,9077 | CS | | ANAP | AUTO | |
| >>Parallel Acquisition Technique | 0018,9078 | CS | | ANAP | AUTO | |
| >>Parallel Reduction Factor In-plane | 0018,9069 | FD | | ANAP | AUTO | |
| >>Parallel Reduction Factor out-of-plane | 0018,9155 | FD | | ANAP | AUTO | |
| >>Parallel Reduction Factor Second In-plane | 0018,9168 | FD | | ANAP | AUTO | |

| | | | | | | |
|---|-----------|----|------------|--------|-------|---------------------------------|
| >>Partial Fourier | 0018,9081 | CS | | ANAP | AUTO | |
| >>Partial Fourier Direction | 0018,9036 | CS | | ANAP | AUTO | |
| >>Spatial Pre-saturation | 0018,9027 | CS | | ANAP | AUTO | |
| >>Spectrally Selected Excitation | 0018,9026 | CS | | ANAP | AUTO | |
| >>Spoiling | 0018,9016 | CS | | ANAP | AUTO | |
| >>T2 Preparation | 0018,9021 | CS | | ANAP | AUTO | |
| >MR Receive Coil Sequence | 0018,9042 | SQ | | ALWAYS | AUTO | |
| >>Quadrature Receive Coil | 0018,9044 | CS | | ANAP | AUTO | |
| >>Receive Coil Manufacturer Name | 0018,9041 | LO | | EMPTY | FIXED | |
| >>Receive Coil Name | 0018,1250 | SH | | ANAP | AUTO | |
| >>Receive Coil Type | 0018,9043 | CS | | ANAP | AUTO | |
| >>Multi-Coil Definition Sequence | 0018,9045 | SQ | | ANAP | AUTO | |
| >>>Multi-Coil Element Name | 0018,9047 | SH | | ALWAYS | AUTO | |
| >>>Multi-Coil Element Used | 0018,9048 | CS | | ALWAYS | AUTO | |
| >MR Transmit Coil Sequence | 0018,9049 | SQ | | ALWAYS | AUTO | |
| >>Transmit Coil Manufacturer Name | 0018,9050 | LO | | EMPTY | FIXED | |
| >>Transmit Coil Name | 0018,1251 | SH | | ANAP | AUTO | |
| >>Transmit Coil Type | 0018,9051 | CS | | ANAP | AUTO | |
| >MR Diffusion Sequence | 0018,9117 | SQ | | ANAP | AUTO | |
| >>Diffusion Anisotropy Type | 0018,9147 | CS | FRACTIONAL | ANAP | AUTO | |
| >>Diffusion b-value | 0018,9087 | FD | | 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 | |
| >MR Averages Sequence | 0018,9119 | SQ | | ALWAYS | AUTO | |
| >>Number of Averages | 0018,0083 | DS | | ANAP | AUTO | |
| >MR Spatial Saturation Sequence | 0018,9107 | SQ | | ANAP | AUTO | If slab information is present. |
| >>Mid Slab Position | 0018,9106 | FD | | ALWAYS | AUTO | |
| >>Slab Orientation | 0018,9105 | FD | | ALWAYS | AUTO | |
| >>Slab Thickness | 0018,9104 | FD | | ALWAYS | AUTO | |
| >MR Velocity Encoding Sequence | 0018,9197 | SQ | | ANAP | AUTO | |
| >>Velocity Encoding Direction | 0018,9090 | FD | | ANAP | AUTO | |
| >>Velocity Encoding Maximum Value | 0018,9217 | FD | | ANAP | AUTO | |
| >>Velocity Encoding Minimum Value | 0018,9091 | FD | 0.0 | ANAP | AUTO | |
| Shared Functional Groups Sequence | 5200,9229 | SQ | | VNAP | AUTO | |
| >Pixel Measures Sequence | 0028,9110 | SQ | | ALWAYS | AUTO | |
| >>Pixel Spacing | 0028,0030 | DS | | ANAP | AUTO | |
| >>Slice Thickness | 0018,0050 | DS | | ANAP | AUTO | |
| >Plane Position Sequence | 0020,9113 | SQ | | ALWAYS | AUTO | |
| >>Image Position (Patient) | 0020,0032 | DS | | ANAP | AUTO | |
| >Plane Orientation Sequence | 0020,9116 | SQ | | ALWAYS | AUTO | |
| >>Image Orientation (Patient) | 0020,0037 | DS | | ANAP | AUTO | |
| >Cardiac Synchronization Sequence | 0018,9118 | SQ | | ANAP | AUTO | |
| >>Nominal Cardiac Trigger Delay Time | 0020,9153 | FD | | ALWAYS | AUTO | |
| >>R - R Interval Time Nominal | 0020,9251 | FD | | ANAP | AUTO | |
| >Frame Anatomy Sequence | 0020,9071 | SQ | | ALWAYS | AUTO | |
| >>Frame Laterality | 0020,9072 | CS | | ALWAYS | AUTO | |
| >>Anatomic Region Sequence | 0008,2218 | SQ | | ALWAYS | AUTO | |
| >>>Code Meaning | 0008,0104 | LO | | ALWAYS | COPY | |
| >>>Code Value | 0008,0100 | SH | | ALWAYS | COPY | |
| >>>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | COPY | |

| | | | | | | |
|---|-----------|----|---|--------|------|--|
| >Respiratory Synchronization Sequence | 0020,9253 | SQ | | ANAP | AUTO | |
| >>Nominal Respiratory Trigger Delay Time | 0020,9255 | FD | | ALWAYS | AUTO | |
| >>Respiratory Interval Time | 0020,9254 | FD | | ALWAYS | AUTO | |
| >MR Spectroscopy Frame Type Sequence | 0018,9227 | SQ | | ALWAYS | AUTO | |
| >>Frame Type | 0008,9007 | CS | | ALWAYS | AUTO | |
| >>Acquisition Contrast | 0008,9209 | CS | SPECTROSCOPY, MIXED, PROTON_DENSITY, T1, T2, UNKNOWN | ALWAYS | AUTO | |
| >>Complex Image Component | 0008,9208 | CS | | ALWAYS | AUTO | |
| >>Volume Based Calculation Technique | 0008,9207 | CS | | ALWAYS | AUTO | |
| >>Volumetric Properties | 0008,9206 | CS | | ALWAYS | AUTO | |
| >MR Timing and Related Parameters Sequence | 0018,9112 | SQ | | ALWAYS | AUTO | |
| >>Echo Train Length | 0018,0091 | IS | | ANAP | AUTO | |
| >>Flip Angle | 0018,1314 | DS | | ANAP | AUTO | |
| >>Gradient Echo Train Length | 0018,9241 | US | | ANAP | AUTO | |
| >>Gradient Output | 0018,9182 | FD | | ANAP | AUTO | |
| >>Gradient Output Type | 0018,9180 | CS | | ANAP | AUTO | |
| >>Repetition Time | 0018,0080 | DS | | ANAP | AUTO | |
| >>RF Echo Train Length | 0018,9240 | US | | ANAP | AUTO | |
| >>Operating Mode Sequence | 0018,9176 | SQ | | ANAP | AUTO | |
| >>>Operating Mode | 0018,9178 | CS | | ALWAYS | AUTO | |
| >>>Operating Mode Type | 0018,9177 | CS | | ALWAYS | 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 | |
| >MR Spectroscopy FOV/Geometry Sequence | 0018,9103 | SQ | | ALWAYS | AUTO | |
| >>Percent Phase Field of View | 0018,0094 | DS | | ANAP | AUTO | |
| >>Percent Sampling | 0018,0093 | DS | | 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 | |
| >>Spectroscopy Acquisition Phase Rows | 0018,9095 | UL | | ANAP | AUTO | |
| >MR Echo Sequence | 0018,9114 | SQ | | ALWAYS | AUTO | |
| >>Effective Echo Time | 0018,9082 | FD | | ANAP | AUTO | |
| >MR Modifier Sequence | 0018,9115 | SQ | | ALWAYS | AUTO | |
| >>Flow Compensation | 0018,9010 | CS | | ANAP | AUTO | |
| >>Flow Compensation Direction | 0018,9183 | CS | | ANAP | AUTO | |
| >>Inversion Recovery | 0018,9009 | CS | | ANAP | AUTO | |
| >>Inversion Times | 0018,9079 | FD | | ANAP | AUTO | |
| >>Parallel Acquisition | 0018,9077 | CS | | ANAP | AUTO | |
| >>Parallel Acquisition Technique | 0018,9078 | CS | | ANAP | AUTO | |
| >>Parallel Reduction Factor In-plane | 0018,9069 | FD | | ANAP | AUTO | |
| >>Parallel Reduction Factor out-of-plane | 0018,9155 | FD | | ANAP | AUTO | |
| >>Parallel Reduction Factor Second In-plane | 0018,9168 | FD | | ANAP | AUTO | |
| >>Partial Fourier | 0018,9081 | CS | | ANAP | AUTO | |
| >>Partial Fourier Direction | 0018,9036 | CS | | ANAP | AUTO | |

| | | | | | | |
|---|-----------|----|------------|--------|-------|---------------------------------|
| >>Spatial Pre-saturation | 0018,9027 | CS | | ANAP | AUTO | |
| >>Spectrally Selected Excitation | 0018,9026 | CS | | ANAP | AUTO | |
| >>Spoiling | 0018,9016 | CS | | ANAP | AUTO | |
| >>T2 Preparation | 0018,9021 | CS | | ANAP | AUTO | |
| >MR Receive Coil Sequence | 0018,9042 | SQ | | ALWAYS | AUTO | |
| >>Quadrature Receive Coil | 0018,9044 | CS | | ANAP | AUTO | |
| >>Receive Coil Manufacturer Name | 0018,9041 | LO | | EMPTY | FIXED | |
| >>Receive Coil Name | 0018,1250 | SH | | ANAP | AUTO | |
| >>Receive Coil Type | 0018,9043 | CS | | ANAP | AUTO | |
| >>Multi-Coil Definition Sequence | 0018,9045 | SQ | | ANAP | AUTO | |
| >>>Multi-Coil Element Name | 0018,9047 | SH | | ALWAYS | AUTO | |
| >>>Multi-Coil Element Used | 0018,9048 | CS | | ALWAYS | AUTO | |
| >MR Transmit Coil Sequence | 0018,9049 | SQ | | ALWAYS | AUTO | |
| >>Transmit Coil Manufacturer Name | 0018,9050 | LO | | EMPTY | FIXED | |
| >>Transmit Coil Name | 0018,1251 | SH | | ANAP | AUTO | |
| >>Transmit Coil Type | 0018,9051 | CS | | ANAP | AUTO | |
| >MR Diffusion Sequence | 0018,9117 | SQ | | ANAP | AUTO | |
| >>Diffusion Anisotropy Type | 0018,9147 | CS | FRACTIONAL | ANAP | AUTO | |
| >>Diffusion b-value | 0018,9087 | FD | | 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 | |
| >MR Averages Sequence | 0018,9119 | SQ | | ALWAYS | AUTO | |
| >>Number of Averages | 0018,0083 | DS | | ANAP | AUTO | |
| >MR Spatial Saturation Sequence | 0018,9107 | SQ | | ANAP | AUTO | If slab information is present. |
| >>Mid Slab Position | 0018,9106 | FD | | ALWAYS | AUTO | |
| >>Slab Orientation | 0018,9105 | FD | | ALWAYS | AUTO | |
| >>Slab Thickness | 0018,9104 | FD | | ALWAYS | AUTO | |
| >MR Velocity Encoding Sequence | 0018,9197 | SQ | | ANAP | AUTO | |
| >>Velocity Encoding Direction | 0018,9090 | FD | | ANAP | AUTO | |
| >>Velocity Encoding Maximum Value | 0018,9217 | FD | | ANAP | AUTO | |
| >>Velocity Encoding Minimum Value | 0018,9091 | FD | 0.0 | ANAP | AUTO | |

Table 167: Multi-frame Dimension Module

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

Table 168: Cardiac Synchronization Module

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

| | | | | | | |
|-----------------------------------|-----------|----|--|--------|------|--|
| Cardiac R-R Interval Specified | 0018,9070 | FD | | ANAP | AUTO | |
| Cardiac Signal Source | 0018,9085 | CS | | ANAP | AUTO | |
| Cardiac Synchronization Technique | 0018,9037 | CS | | ANAP | AUTO | |
| High R-R Value | 0018,1082 | IS | | ANAPCV | AUTO | |
| Intervals Acquired | 0018,1083 | IS | | ANAPCV | AUTO | |
| Intervals Rejected | 0018,1084 | IS | | ANAPCV | AUTO | |
| Low R-R Value | 0018,1081 | IS | | ANAPCV | AUTO | |

Table 169: 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 170: 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 171: 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 | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | FIXED | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO | |

Table 172: MR Spectroscopy Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--------------------------------------|-----------|----|--------------------|-------------------|--------|---------|
| Baseline Correction | 0018,9067 | CS | | ANAP | AUTO | |
| Chemical Shift Reference | 0018,9053 | FD | Value 1: 4.68 | ALWAYS | FIXED | |
| De-coupled Nucleus | 0018,9060 | CS | | ANAP | AUTO | |
| De-coupling | 0018,9059 | CS | | ANAP | AUTO | |
| De-coupling Chemical Shift Reference | 0018,9063 | FD | Value 1: 4.67, 0.0 | ANAP | AUTO | |
| De-coupling Frequency | 0018,9061 | FD | | ANAP | AUTO | |
| De-coupling Method | 0018,9062 | CS | | ANAP | AUTO | |
| First Order Phase Correction | 0018,9198 | CS | | ANAP | AUTO | |
| Frequency Correction | 0018,9101 | CS | | ANAP | AUTO | |
| Image Type | 0008,0008 | CS | | ALWAYS | AUTO | |
| Number of Zero fills | 0018,9066 | US | | ANAP | AUTO | |
| Spectral Width | 0018,9052 | FD | | ANAP | AUTO | |
| Time Domain Filtering | 0018,9065 | CS | | ANAP | AUTO | |
| Transmitter Frequency | 0018,9098 | FD | | ANAP | AUTO | |
| Volume Localization Technique | 0018,9054 | CS | | ANAP | AUTO | |
| Water Referenced Phase Correction | 0018,9199 | CS | | ANAP | AUTO | |
| Volume Localization Sequence | 0018,9126 | SQ | | ANAP | AUTO | |
| >Mid Slab Position | 0018,9106 | FD | | ANAP | AUTO | |
| >Slab Orientation | 0018,9105 | FD | | ANAP | AUTO | |
| >Slab Thickness | 0018,9104 | FD | | ANAP | AUTO | |
| Acquisition Datetime | 0008,002A | DT | | ANAP | AUTO | |

| | | | | | | |
|------------------------------------|-----------|----|--|--------|------|--|
| Acquisition Duration | 0018,9073 | FD | | ANAP | AUTO | |
| Acquisition Number | 0020,0012 | IS | | ANAPCV | AUTO | |
| Applicable Safety Standard Agency | 0018,9174 | CS | | ANAP | AUTO | |
| Content Qualification | 0018,9004 | CS | | ANAP | AUTO | |
| Image Comments | 0020,4000 | LT | | ANAPCV | AUTO | |
| k-space Filtering | 0018,9064 | CS | | ANAP | AUTO | |
| Magnetic Field Strength | 0018,0087 | DS | | ANAP | AUTO | |
| Resonant Nucleus | 0018,9100 | CS | Value 1: OTHER, 129XE, 13C, 19F, 1H, 23NA, 31P, 3HE, 7LI | ANAP | AUTO | |
| Acquisition Contrast | 0008,9209 | CS | | ALWAYS | AUTO | |
| Complex Image Component | 0008,9208 | CS | | ALWAYS | AUTO | |
| Volume Based Calculation Technique | 0008,9207 | CS | | ALWAYS | AUTO | |
| Volumetric Properties | 0008,9206 | CS | | ALWAYS | AUTO | |

Table 173: MR Spectroscopy Pulse Sequence Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Coverage of k-Space | 0018,9094 | CS | | ANAP | AUTO | |
| Echo Planar Pulse Sequence | 0018,9018 | CS | | ANAP | AUTO | |
| Echo Pulse Sequence | 0018,9008 | CS | | ANAPCV | AUTO | |
| Geometry of k-Space Traversal | 0018,9032 | CS | | ANAP | AUTO | |
| MR Spectroscopy Acquisition Type | 0018,9200 | CS | | ANAPCV | AUTO | |
| Multi-planar Excitation | 0018,9012 | CS | | ANAPCV | AUTO | |
| Multiple Spin Echo | 0018,9011 | CS | | ANAPCV | AUTO | |
| Number of k-Space Trajectories | 0018,9093 | US | | ANAP | AUTO | |
| Pulse Sequence Name | 0018,9005 | SH | | ANAPCV | AUTO | |
| Rectilinear Phase Encode Reordering | 0018,9034 | CS | | ANAP | AUTO | |
| Segmented k-Space Traversal | 0018,9033 | CS | | ANAP | AUTO | |
| Spectrally Selected Suppression | 0018,9025 | CS | | ANAPCV | AUTO | |
| Steady State Pulse Sequence | 0018,9017 | CS | | ANAP | AUTO | |

Table 174: MR Spectroscopy Data Module

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

Table 175: SOP Common Module

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

Table 176: Additional Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------------------|-----------|----|-------|-------------------|--------|------------------------|
| Medical Alerts | 0010,2000 | LO | | ANAPCV | COPY | Patient Medical Module |
| Allergies | 0010,2110 | LO | | ANAPCV | COPY | Patient Medical Module |
| Pregnancy Status | 0010,21C0 | US | | VNAP | COPY | Patient Medical Module |
| Special Needs | 0038,0050 | LO | | ANAPCV | COPY | Patient Medical Module |
| Patient State | 0038,0500 | LO | | ANAPCV | COPY | Patient Medical Module |
| Scheduled Performing Physician's Name | 0040,0006 | PN | | ANAPCV | AUTO | |

8.1.1.7. Raw Data Storage SOP Class**Table 177: IOD of Created Raw Data Storage SOP Class Instances**

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

Table 178: Patient Module

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

Table 179: General Study Module

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

| | | | | | | |
|-------------------------------|-----------|----|--|------|------|--|
| >Context Group Extension Flag | 0008,010B | CS | | ANAP | AUTO | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | AUTO | |
| >Context Group Version | 0008,0106 | DT | | ANAP | AUTO | |
| >Context Identifier | 0008,010F | CS | | ANAP | AUTO | |
| >Mapping Resource | 0008,0105 | 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 | |

Table 180: Patient Study Module

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

Table 181: General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--|-----------|----|-------|-------------------|--------|---------|
| Body Part Examined | 0018,0015 | CS | | ANAP | AUTO | |
| Laterality | 0020,0060 | CS | | ANAPCV | AUTO | |
| Modality | 0008,0060 | CS | | ALWAYS | AUTO | |
| Operators' Name | 0008,1070 | PN | | ANAPEV | AUTO | |
| Patient Position | 0018,5100 | CS | | ANAP | AUTO | |
| Performing Physician's Name | 0008,1050 | PN | | ANAP | AUTO | |
| Protocol Name | 0018,1030 | LO | | ANAP | AUTO | |
| Series Date | 0008,0021 | DA | | ANAP | AUTO | |
| Series Description | 0008,103E | LO | | ANAP | AUTO | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO | |
| Series Time | 0008,0031 | TM | | ANAP | AUTO | |
| Referenced Performed Procedure Step Sequence | 0008,1111 | SQ | | ANAP | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO | |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAPCV | AUTO | |
| >Requested Procedure ID | 0040,1001 | SH | | ALWAYS | AUTO | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | VNAP | AUTO | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | ALWAYS | AUTO | |
| Comments on the Performed Procedure Step | 0040,0280 | ST | | ANAPCV | AUTO | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAPCV | AUTO | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAPCV | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | AUTO | |
| >Context Group Extension Creator UID | 0008,010D | UI | | ANAP | AUTO | |
| >Context Group Extension Flag | 0008,010B | CS | | ANAP | AUTO | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | AUTO | |

| | | | | | | |
|------------------------|-----------|----|--|--------|------|--|
| >Context Group Version | 0008,0106 | DT | | ANAP | AUTO | |
| >Context Identifier | 0008,010F | CS | | ANAPCV | AUTO | |
| >Mapping Resource | 0008,0105 | CS | | ANAP | AUTO | |

Table 182: 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 183: Synchronization Module

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

Table 184: General Equipment Module

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

Table 185: 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 Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |

Table 186: SOP Common Module

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

Table 187: Raw Data Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------|-----------|----|-------|-------------------|--------|---------|
| Acquisition Datetime | 0008,002A | DT | | ANAPCV | AUTO | |
| Content Date | 0008,0023 | DA | | ALWAYS | AUTO | |
| Content Time | 0008,0033 | TM | | ALWAYS | AUTO | |
| Creator-Version UID | 0008,9123 | UI | | ALWAYS | AUTO | |

| | | | | | | |
|-----------------|-----------|----|--|------|------|--|
| Instance Number | 0020,0013 | IS | | VNAP | AUTO | |
|-----------------|-----------|----|--|------|------|--|

Table 188: Additional Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------------------|-----------|----|-------|-------------------|--------|------------------------|
| Medical Alerts | 0010,2000 | LO | | ANAPCV | COPY | Patient Medical Module |
| Allergies | 0010,2110 | LO | | ANAPCV | COPY | Patient Medical Module |
| Pregnancy Status | 0010,21C0 | US | | VNAP | COPY | Patient Medical Module |
| Special Needs | 0038,0050 | LO | | ANAPCV | COPY | Patient Medical Module |
| Patient State | 0038,0500 | LO | | ANAPCV | COPY | Patient Medical Module |
| Scheduled Performing Physician's Name | 0040,0006 | PN | | ANAPCV | AUTO | |

8.1.1.8. Secondary Capture Image Storage SOP Class**Table 189: IOD of Created Secondary Capture Image Storage SOP Class Instances**

| Information Entity | Module | Presence Of Module |
|--------------------|--------------------------|--------------------|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Study | Patient Study Module | CONDITIONAL |
| Series | General Series Module | ALWAYS |
| Equipment | General Equipment Module | CONDITIONAL |
| Image | General Image Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Equipment | SC Equipment Module | ALWAYS |
| Image | SC Image Module | ALWAYS |
| Image | Overlay Plane Module | CONDITIONAL |
| Image | Modality LUT Module | CONDITIONAL |
| Image | VOI LUT Module | CONDITIONAL |
| Image | SOP Common Module | ALWAYS |
| | Additional Module | CONDITIONAL |

Table 190: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Ethnic Group | 0010,2160 | SH | | ANAP | COPY | |
| Other Patient IDs | 0010,1000 | LO | | ANAP | COPY | |
| Other Patient Names | 0010,1001 | PN | | ANAP | COPY | |
| Patient Comments | 0010,4000 | LT | | ANAP | 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 Name | 0010,0010 | PN | | VNAP | COPY | |
| Patient's Sex | 0010,0040 | CS | | VNAP | COPY | |
| 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 | |

Table 191: General Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Accession Number | 0008,0050 | SH | | VNAP | AUTO | |
| Name of Physician(s) Reading Study | 0008,1060 | PN | | ANAP | AUTO | |
| Physician(s) of Record | 0008,1048 | PN | | ANAP | AUTO | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | AUTO | |

| | | | | | | |
|--------------------------------------|-----------|----|--|--------|------|--|
| Study Date | 0008,0020 | DA | | VNAP | AUTO | |
| Study Description | 0008,1030 | LO | | ANAPCV | AUTO | |
| Study ID | 0020,0010 | SH | | VNAP | AUTO | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO | |
| Study Time | 0008,0030 | TM | | VNAP | AUTO | |
| Procedure Code Sequence | 0008,1032 | SQ | | ANAP | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | AUTO | |
| >Context Group Extension Creator UID | 0008,010D | UI | | ANAP | AUTO | |
| >Context Group Extension Flag | 0008,010B | CS | | ANAP | AUTO | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | AUTO | |
| >Context Group Version | 0008,0106 | DT | | ANAP | AUTO | |
| >Context Identifier | 0008,010F | CS | | ANAP | AUTO | |
| >Mapping Resource | 0008,0105 | 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 | |

Table 192: Patient Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Additional Patient History | 0010,21B0 | LT | | ANAP | COPY | |
| Admitting Diagnoses Description | 0008,1080 | LO | | ANAPCV | COPY | |
| Occupation | 0010,2180 | SH | | 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 | |
| Admitting Diagnoses Code Sequence | 0008,1084 | SQ | | ANAP | COPY | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | COPY | |
| >Code Value | 0008,0100 | SH | | ALWAYS | COPY | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | COPY | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | COPY | |
| >Context Group Extension Creator UID | 0008,010D | UI | | ANAP | COPY | |
| >Context Group Extension Flag | 0008,010B | CS | | ANAP | COPY | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | COPY | |
| >Context Group Version | 0008,0106 | DT | | ANAP | COPY | |
| >Context Identifier | 0008,010F | CS | | ANAP | COPY | |
| >Mapping Resource | 0008,0105 | CS | | ANAP | COPY | |

Table 193: General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-------------------------------|-----------|--------|-------|-------------------|--------|---------|
| Body Part Examined | 0018,0015 | CS | | ANAP | AUTO | |
| Largest Pixel Value in Series | 0028,0109 | US /SS | | ANAP | AUTO | |
| Laterality | 0020,0060 | CS | | ANAPCV | AUTO | |
| Operators' Name | 0008,1070 | PN | | ANAPCV | AUTO | |
| Patient Position | 0018,5100 | CS | | ANAP | AUTO | |
| Performing Physician's Name | 0008,1050 | PN | | ANAP | AUTO | |
| Protocol Name | 0018,1030 | LO | | ANAP | AUTO | |
| Series Date | 0008,0021 | DA | | ANAP | AUTO | |
| Series Description | 0008,103E | LO | | ANAP | COPY | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO | |

| | | | | | | |
|---|-----------|-----------|--|--------|------|--|
| Series Time | 0008,0031 | TM | | ANAP | AUTO | |
| Smallest Pixel Value in Series | 0028,0108 | US /SS | | ANAP | AUTO | |
| Referenced Performed Procedure Step Sequence | 0008,1111 | SQ | | ANAP | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO | |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAPCV | AUTO | |
| >Requested Procedure ID | 0040,1001 | SH | | ALWAYS | AUTO | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | VNAP | AUTO | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | ALWAYS | AUTO | |
| Comments on the Performed Procedure Step | 0040,0280 | ST | | ANAPCV | AUTO | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAPCV | AUTO | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAPCV | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | AUTO | |
| >Context Group Extension Creator UID | 0008,010D | UI | | ANAP | AUTO | |
| >Context Group Extension Flag | 0008,010B | CS | | ANAP | AUTO | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | AUTO | |
| >Context Group Version | 0008,0106 | DT | | ANAP | AUTO | |
| >Context Identifier | 0008,010F | CS | | ANAP | AUTO | |
| >Mapping Resource | 0008,0105 | CS | | ANAP | AUTO | |

Table 194: General Equipment Module

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

Table 195: General Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------|-----------|----|-------|----------------------|--------|---------|
| Acquisition Date | 0008,0022 | DA | | ANAP | AUTO | |
| Acquisition Datetime | 0008,002A | DT | | ANAP | AUTO | |
| Acquisition Number | 0020,0012 | IS | | ANAP | AUTO | |
| Acquisition Time | 0008,0032 | TM | | ANAP | AUTO | |
| Burned In Annotation | 0028,0301 | CS | | ANAP | AUTO | |
| Content Date | 0008,0023 | DA | | ANAP | AUTO | |

| | | | | | | |
|-------------------------------------|-----------|---------------|--|--------|------|--|
| Content Time | 0008,0033 | TM | | ANAP | AUTO | |
| Derivation Description | 0008,2111 | ST | | ANAP | AUTO | |
| Image Comments | 0020,4000 | LT | | ANAPCV | AUTO | |
| Image Type | 0008,0008 | CS | | ANAP | AUTO | |
| Images in Acquisition | 0020,1002 | IS | | ANAP | AUTO | |
| Instance Number | 0020,0013 | IS | | ANAPCV | AUTO | |
| Lossy Image Compression | 0028,2110 | CS | | ANAP | AUTO | |
| Lossy Image Compression Ratio | 0028,2112 | DS | | ANAP | AUTO | |
| Patient Orientation | 0020,0020 | CS | | ANAP | AUTO | |
| Presentation LUT Shape | 2050,0020 | CS | | ANAP | AUTO | |
| Quality Control Image | 0028,0300 | CS | | ANAP | AUTO | |
| Derivation Code Sequence | 0008,9215 | SQ | | ANAP | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | | |
| >Code Value | 0008,0100 | SH | | ALWAYS | | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | | |
| Icon Image Sequence | 0088,0200 | SQ | | ALWAYS | AUTO | |
| >Bits Allocated | 0028,0100 | US | | ALWAYS | AUTO | |
| >Bits Stored | 0028,0101 | US | | ALWAYS | AUTO | |
| >Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| >High Bit | 0028,0102 | US | | ALWAYS | AUTO | |
| >Photometric Interpretation | 0028,0004 | CS | | ALWAYS | AUTO | |
| >Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| >Pixel Representation | 0028,0103 | US | | ALWAYS | AUTO | |
| >Rows | 0028,0010 | US | | ALWAYS | AUTO | |
| >Samples per Pixel | 0028,0002 | US | | ALWAYS | AUTO | |
| Referenced Image Sequence | 0008,1140 | SQ | | ANAP | AUTO | |
| >Purpose of Reference Code Sequence | 0040,A170 | SQ | | ANAP | AUTO | |
| >>Code Meaning | 0008,0104 | LO | | ALWAYS | | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | | |
| >Referenced Frame Number | 0008,1160 | IS | | ANAP | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO | |
| Source Image Sequence | 0008,2112 | SQ | | ANAP | AUTO | |
| >Purpose of Reference Code Sequence | 0040,A170 | SQ | | ANAP | AUTO | |
| >>Code Meaning | 0008,0104 | LO | | ALWAYS | | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | | |
| >Referenced Frame Number | 0008,1160 | IS | | ANAP | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO | |

Table 196: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|-----------|-----------|-------|-------------------|--------|---------|
| Bits Allocated | 0028,0100 | US | | ALWAYS | AUTO | |
| Bits Stored | 0028,0101 | US | | ALWAYS | AUTO | |
| Blue Palette Color Lookup Table Descriptor | 0028,1103 | US /SS | | ANAP | AUTO | |
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Green Palette Color Lookup Table Data | 0028,1202 | O W | | ANAP | AUTO | |
| Green Palette Color Lookup Table Descriptor | 0028,1102 | US /SS | | ANAP | AUTO | |
| High Bit | 0028,0102 | US | | ALWAYS | AUTO | |

| | | | | | | |
|---|-----------|---------------|--|--------|------|--|
| Largest Image Pixel Value | 0028,0107 | US /SS | | ANAP | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | | ALWAYS | AUTO | |
| Pixel Aspect Ratio | 0028,0034 | IS | | ANAP | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Pixel Representation | 0028,0103 | US | | ALWAYS | AUTO | |
| Planar Configuration | 0028,0006 | US | | ANAP | AUTO | |
| Red Palette Color Lookup Table Data | 0028,1201 | O W | | ANAP | AUTO | |
| Red Palette Color Lookup Table Descriptor | 0028,1101 | US /SS | | ANAP | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |
| Samples per Pixel | 0028,0002 | US | | ALWAYS | AUTO | |
| Smallest Image Pixel Value | 0028,0106 | US /SS | | ANAP | AUTO | |

Table 197: SC Equipment Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--|-----------|----|-------|-------------------|--------|---------|
| Conversion Type | 0008,0064 | CS | | ALWAYS | AUTO | |
| Modality | 0008,0060 | CS | | ANAP | 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 198: 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 199: Overlay Plane Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------|-----------|---------------|-------|-------------------|--------|---------|
| Overlay Bit Position | 6000,0102 | US | | ALWAYS | AUTO | |
| Overlay Bits Allocated | 6000,0100 | US | | ALWAYS | AUTO | |
| Overlay Columns | 6000,0011 | US | | ALWAYS | AUTO | |
| Overlay Data | 6000,3000 | O W/ OB | | ANAP | AUTO | |
| Overlay Description | 6000,0022 | LO | | ANAP | AUTO | |
| Overlay Label | 6000,1500 | LO | | ANAP | AUTO | |
| Overlay Origin | 6000,0050 | SS | | ALWAYS | AUTO | |
| Overlay Rows | 6000,0010 | US | | ALWAYS | AUTO | |
| Overlay Subtype | 6000,0045 | LO | | ANAP | AUTO | |
| Overlay Type | 6000,0040 | CS | | ALWAYS | AUTO | |
| ROI Area | 6000,1301 | IS | | ANAP | AUTO | |
| ROI Mean | 6000,1302 | DS | | ANAP | AUTO | |
| ROI Standard Deviation | 6000,1303 | DS | | ANAP | AUTO | |

Table 200: 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 Data | 0028,3006 | US /SS | | ANAP | AUTO | |
| >LUT Descriptor | 0028,3002 | US /SS | | ANAP | AUTO | |
| >LUT Explanation | 0028,3003 | LO | | ANAP | AUTO | |
| >Modality LUT Type | 0028,3004 | LO | | ANAP | AUTO | |

Table 201: VOI LUT Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-----------------------------------|-----------|-----------|-------|-------------------|--------|---------|
| Window Center | 0028,1050 | DS | | ANAP | AUTO | |
| Window Center & Width Explanation | 0028,1055 | LO | | ANAP | AUTO | |
| Window Width | 0028,1051 | DS | | ANAP | AUTO | |
| VOI LUT Sequence | 0028,3010 | SQ | | ANAP | AUTO | |
| >LUT Data | 0028,3006 | US /SS | | ALWAYS | | |
| >LUT Descriptor | 0028,3002 | US /SS | | ALWAYS | | |
| >LUT Explanation | 0028,3003 | LO | | ANAPCV | | |

Table 202: SOP Common Module

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

Table 203: Additional Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------------------|-----------|----|-------|-------------------|--------|------------------------|
| Medical Alerts | 0010,2000 | LO | | ANAPCV | COPY | Patient Medical Module |
| Allergies | 0010,2110 | LO | | ANAPCV | COPY | Patient Medical Module |
| Pregnancy Status | 0010,21C0 | US | | VNAP | COPY | Patient Medical Module |
| Special Needs | 0038,0050 | LO | | ANAPCV | COPY | Patient Medical Module |
| Patient State | 0038,0500 | LO | | ANAPCV | COPY | Patient Medical Module |
| Scheduled Performing Physician's Name | 0040,0006 | PN | | ANAPCV | AUTO | |

8.1.1.9. Softcopy Presentation State Storage SOP Class**Table 204: IOD of Created Softcopy Presentation State Storage SOP Class Instances**

| Information Entity | Module | Presence Of Module |
|--------------------|-------------------------------|--------------------|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Study | Patient Study Module | CONDITIONAL |
| Series | General Series Module | ALWAYS |
| Equipment | General Equipment Module | ALWAYS |
| Presentation State | Overlay Plane Module | CONDITIONAL |
| Presentation State | Displayed Area Module | ALWAYS |
| Presentation State | Graphic Annotation Module | CONDITIONAL |
| Presentation State | Spatial Transformation Module | CONDITIONAL |

| | | |
|--------------------|--|-------------|
| Presentation State | Graphic Layer Module | CONDITIONAL |
| Presentation State | Modality LUT Module | CONDITIONAL |
| Presentation State | Softcopy Presentation LUT Module | ALWAYS |
| Presentation State | Overlay Activation Module | CONDITIONAL |
| Presentation State | Softcopy VOI LUT Module | CONDITIONAL |
| Series | Presentation Series Module | ALWAYS |
| Presentation State | Presentation State Identification Module | ALWAYS |
| Presentation State | Presentation State Relationship Module | ALWAYS |
| Presentation State | Presentation State Shutter Module | ALWAYS |
| Presentation State | SOP Common Module | ALWAYS |
| | Additional Module | CONDITIONAL |

Table 205: Patient Module

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

Table 206: General Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Accession Number | 0008,0050 | SH | | VNAP | AUTO | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | AUTO | |
| Study Date | 0008,0020 | DA | | VNAP | AUTO | |
| Study Description | 0008,1030 | LO | | ANAPCV | AUTO | |
| Study ID | 0020,0010 | SH | | VNAP | AUTO | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO | |
| Study Time | 0008,0030 | TM | | VNAP | AUTO | |
| Procedure Code Sequence | 0008,1032 | SQ | | ANAP | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | AUTO | |
| >Context Group Extension Creator UID | 0008,010D | UI | | ANAP | AUTO | |
| >Context Group Extension Flag | 0008,010B | CS | | ANAPCV | AUTO | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | AUTO | |
| >Context Group Version | 0008,0106 | DT | | ANAP | AUTO | |
| >Context Identifier | 0008,010F | CS | | ANAP | AUTO | |
| >Mapping Resource | 0008,0105 | 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 | |

Table 207: Patient Study Module

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

Table 208: General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--|-----------|----|-------|-------------------|--------|---------|
| Body Part Examined | 0018,0015 | CS | | ANAP | AUTO | |
| Laterality | 0020,0060 | CS | | ANAPCV | AUTO | |
| Operators' Name | 0008,1070 | PN | | ANAPEV | AUTO | |
| Patient Position | 0018,5100 | CS | | ANAP | AUTO | |
| Protocol Name | 0018,1030 | LO | | ANAP | AUTO | |
| Series Date | 0008,0021 | DA | | VNAP | AUTO | |
| Series Description | 0008,103E | LO | | ANAP | AUTO | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO | |
| Series Time | 0008,0031 | TM | | VNAP | AUTO | |
| Referenced Performed Procedure Step Sequence | 0008,1111 | SQ | | ANAP | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO | |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAPCV | AUTO | |
| >Requested Procedure ID | 0040,1001 | SH | | ALWAYS | AUTO | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | VNAP | AUTO | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | ALWAYS | AUTO | |
| Comments on the Performed Procedure Step | 0040,0280 | ST | | ANAPCV | AUTO | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAPCV | AUTO | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAPCV | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | AUTO | |
| >Context Group Extension Creator UID | 0008,010D | UI | | ANAP | AUTO | |
| >Context Group Extension Flag | 0008,010B | CS | | ANAP | AUTO | |
| >Context Group Local Version | 0008,0107 | DT | | ANAP | AUTO | |
| >Context Group Version | 0008,0106 | DT | | ANAP | AUTO | |
| >Context Identifier | 0008,010F | CS | | ANAPCV | AUTO | |
| >Mapping Resource | 0008,0105 | CS | | ANAP | AUTO | |

Table 209: General Equipment Module

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

Table 210: Overlay Plane Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------|-----------|----|-------|-------------------|--------|---------|
| Overlay Bit Position | 6000,0102 | US | | ALWAYS | AUTO | |

| | | | | | | |
|------------------------|-----------|---------------|--|--------|-------|--|
| Overlay Bits Allocated | 6000,0100 | US | | ALWAYS | AUTO | |
| Overlay Columns | 6000,0011 | US | | ALWAYS | AUTO | |
| Overlay Data | 6000,3000 | O W/ OB | | ALWAYS | AUTO | |
| Overlay Description | 6000,0022 | LO | | ANAPEV | AUTO | |
| Overlay Label | 6000,1500 | LO | | EMPTY | FIXED | |
| Overlay Origin | 6000,0050 | SS | | ALWAYS | AUTO | |
| Overlay Rows | 6000,0010 | US | | ALWAYS | AUTO | |
| Overlay Subtype | 6000,0045 | LO | | ANAPEV | AUTO | |
| Overlay Type | 6000,0040 | CS | | ALWAYS | AUTO | |
| ROI Area | 6000,1301 | IS | | ANAPEV | AUTO | |
| ROI Mean | 6000,1302 | DS | | ANAPEV | AUTO | |
| ROI Standard Deviation | 6000,1303 | DS | | ANAPEV | AUTO | |

Table 211: Displayed Area Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|--|-----------|----|-----------------------|-------------------|--------|---------|
| Displayed Area Selection Sequence | 0070,005A | SQ | | ALWAYS | AUTO | |
| >Displayed Area Bottom Right Hand Corner | 0070,0053 | SL | | ALWAYS | AUTO | |
| >Displayed Area Top Left Hand Corner | 0070,0052 | SL | | ALWAYS | AUTO | |
| >Presentation Pixel Aspect Ratio | 0070,0102 | IS | | ANAPCV | AUTO | |
| >Presentation Pixel Magnification Ratio | 0070,0103 | FL | | ANAPCV | AUTO | |
| >Presentation Pixel Spacing | 0070,0101 | DS | | ANAPCV | AUTO | |
| >Presentation Size Mode | 0070,0100 | CS | MAGNIFY, SCALE TO FIT | ALWAYS | AUTO | |
| >Zoom Mode | 2001,103F | CS | | ANAPCV | 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 | |

Table 212: Graphic Annotation Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------------|-----------|----|-------|-------------------|--------|---------|
| Graphic Annotation Sequence | 0070,0001 | SQ | | ALWAYS | AUTO | |
| >Graphic Layer | 0070,0002 | CS | | ALWAYS | AUTO | |
| >Graphic Object Sequence | 0070,0009 | SQ | | ANAP | AUTO | |
| >>Graphic Annotation Units | 0070,0005 | CS | | ALWAYS | AUTO | |
| >>Graphic Data | 0070,0022 | FL | | ALWAYS | AUTO | |
| >>Graphic Dimensions | 0070,0020 | US | | ALWAYS | AUTO | |
| >>Graphic Filled | 0070,0024 | CS | | ANAP | AUTO | |
| >>Graphic Type | 0070,0023 | CS | | ALWAYS | AUTO | |
| >>Number of Graphic Points | 0070,0021 | US | | 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 | |
| >Text Object Sequence | 0070,0008 | SQ | | ANAP | AUTO | |
| >>Anchor Point | 0070,0014 | FL | | ALWAYS | AUTO | |
| >>Anchor Point Annotation Units | 0070,0004 | CS | | ALWAYS | AUTO | |
| >>Anchor Point Visibility | 0070,0015 | CS | | ALWAYS | AUTO | |
| >>Unformatted Text Value | 0070,0006 | ST | | ALWAYS | AUTO | |

Table 213: 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 214: 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 215: 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, millirads, milliseconds, mm ² /sec, normalized, seconds, US | ALWAYS | AUTO | |

Table 216: Softcopy Presentation LUT Module

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

Table 217: Overlay Activation Module

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

Table 218: 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 219: Presentation Series Module

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

Table 220: Presentation State Identification Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|----|-------|-------------------|--------|---------|
| Presentation Creation Date | 0070,0082 | DA | | ALWAYS | AUTO | |

| | | | | | | |
|----------------------------|-----------|----|--|--------|------|--|
| Presentation Creation Time | 0070,0083 | TM | | ALWAYS | AUTO | |
| Content Creator's Name | 0070,0084 | PN | | VNAP | AUTO | |
| Content Description | 0070,0081 | LO | | VNAP | AUTO | |
| Content Label | 0070,0080 | CS | | ALWAYS | AUTO | |
| Instance Number | 0020,0013 | IS | | ALWAYS | AUTO | |

Table 221: Presentation State Relationship Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-------------------------------|-----------|----|-------|-------------------|--------|---------|
| Referenced Series Sequence | 0008,1115 | SQ | | ALWAYS | AUTO | |
| >Series Instance UID | 0020,000E | UI | | 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 | |

Table 222: Presentation State Shutter Module

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

Table 223: SOP Common Module

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

Table 224: Additional Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Medical Alerts | 0010,2000 | LO | | ANAPCV | COPY | |
| 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 | |
| Scheduled Performing Physician's Name | 0040,0006 | PN | | ANAPCV | AUTO | |

8.1.1.10. Ultrasound Image Storage SOP Class**Table 225: 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 | Image Pixel Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |
| Image | US Image Module | ALWAYS |
| Image | SOP Common Module | ALWAYS |

Table 226: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Patient ID | 0010,0020 | LO | | VNAP | AUTO | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | AUTO | |
| Patient's Name | 0010,0010 | PN | | VNAP | AUTO | |
| Patient's Sex | 0010,0040 | CS | | VNAP | AUTO | |
| 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 | |

Table 227: General Study Module

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

Table 228: 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 229: General Equipment Module

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

Table 230: General Image Module

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

Table 231: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|---------------|-------|-------------------|--------|---------|
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |

Table 232: Contrast/Bolus Module

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

Table 233: US Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|----|-------|-------------------|--------|---------|
| Bits Allocated | 0028,0100 | US | | ALWAYS | AUTO | |

| | | | | | | |
|----------------------------|-----------|----|--|--------|------|--|
| High Bit | 0028,0102 | US | | ALWAYS | AUTO | |
| Image Type | 0008,0008 | CS | | VNAP | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | | ALWAYS | AUTO | |
| Samples per Pixel | 0028,0002 | US | | ALWAYS | AUTO | |

Table 234: SOP Common Module

| 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 | |
| Specific Character Set | 0008,0005 | CS | | ANAP | AUTO | |

8.1.1.11. Ultrasound Multi-frame Image Storage SOP Class**Table 235: 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 | Image Pixel Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |
| Image | Cine Module | ALWAYS |
| Image | Multi-Frame Module | ALWAYS |
| Image | US Image Module | ALWAYS |
| Image | SOP Common Module | ALWAYS |

Table 236: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Patient ID | 0010,0020 | LO | | VNAP | AUTO | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | AUTO | |
| Patient's Name | 0010,0010 | PN | | VNAP | AUTO | |
| Patient's Sex | 0010,0040 | CS | | VNAP | AUTO | |
| 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 | |

Table 237: General Study Module

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

Table 238: 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 239: 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 240: General Equipment Module

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

Table 241: General Image Module

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

Table 242: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|---------------|-------|-------------------|--------|---------|
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |

Table 243: Contrast/Bolus Module

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

Table 244: 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 245: Multi-Frame Module

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

Table 246: US Image Module

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

Table 247: SOP Common Module

| 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 | |
| Specific Character Set | 0008,0005 | CS | | ANAP | AUTO | |

8.1.1.12. X-Ray Angiographic Image Storage SOP Class

Table 248: 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 | Image Pixel Module | ALWAYS |
| Image | Cine Module | CONDITIONAL |
| Image | X-Ray Image Module | ALWAYS |
| Image | X-Ray Acquisition Module | ALWAYS |
| Image | XA Positioner Module | ALWAYS |
| Image | SOP Common Module | ALWAYS |

Table 249: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Patient ID | 0010,0020 | LO | | VNAP | AUTO | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | AUTO | |
| Patient's Name | 0010,0010 | PN | | VNAP | AUTO | |
| Patient's Sex | 0010,0040 | CS | | VNAP | AUTO | |
| 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 | |

Table 250: General Study Module

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

Table 251: 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 252: General Equipment Module

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

Table 253: General Image Module

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

Table 254: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|---------------|-------|-------------------|--------|---------|
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |

Table 255: 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 256: X-Ray Image Module

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

Table 257: X-Ray Acquisition Module

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

Table 258: 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 259: SOP Common Module

| 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 | |
| Specific Character Set | 0008,0005 | CS | | ANAP | AUTO | |

8.1.1.13. X-Ray Radiofluoroscopic Image Storage SOP Class**Table 260: 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 | Image Pixel Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |
| Image | Cine Module | CONDITIONAL |
| Image | Multi-Frame Module | ALWAYS |
| Image | Mask Module | CONDITIONAL |
| Image | X-Ray Image Module | ALWAYS |

| | | |
|-------|-------------------------------------|-------------|
| Image | X-Ray Acquisition Module | ALWAYS |
| Image | X-Ray Tomography Acquisition Module | CONDITIONAL |
| Image | Multi-frame Overlay Module | CONDITIONAL |
| Image | SOP Common Module | ALWAYS |

Table 261: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Patient ID | 0010,0020 | LO | | VNAP | AUTO | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | AUTO | |
| Patient's Name | 0010,0010 | PN | | VNAP | AUTO | |
| Patient's Sex | 0010,0040 | CS | | VNAP | AUTO | |
| 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 | |

Table 262: General Study Module

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

Table 263: 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 264: General Equipment Module

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

Table 265: General Image Module

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

Table 266: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|---------------|-------|-------------------|--------|---------|
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |

Table 267: Contrast/Bolus Module

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

Table 268: Cine Module

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

Table 269: Multi-Frame Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------|-----------|----|-------|-------------------|--------|---------|
| Number of Frames | 0028,0008 | IS | | ALWAYS | AUTO | |

Table 270: 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 271: X-Ray Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Bits Allocated | 0028,0100 | US | | ALWAYS | AUTO | |
| Bits Stored | 0028,0101 | US | | ALWAYS | AUTO | |
| Frame Increment Pointer | 0028,0009 | AT | | ALWAYS | AUTO | |
| High Bit | 0028,0102 | US | | ALWAYS | AUTO | |
| Image Type | 0008,0008 | CS | | ALWAYS | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | | ALWAYS | AUTO | |
| Pixel Intensity Relationship | 0028,1040 | CS | | ALWAYS | AUTO | |
| Pixel Representation | 0028,0103 | US | | ALWAYS | AUTO | |
| Samples per Pixel | 0028,0002 | US | | ALWAYS | AUTO | |

Table 272: 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 273: X-Ray Tomography Acquisition Module

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

Table 274: 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 275: SOP Common Module

| 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 | |
| Specific Character Set | 0008,0005 | CS | | ANAP | 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 276: 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 277: 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 | 0008,1096 | 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 |

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--|-----------|---------|-------|-------------------|--------|
| 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 |
| 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 |

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--|-----------|----|-------|-------------------|--------|
| 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 | 0200,0013 | 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 278: 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 279: 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 |
| 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 |

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 280: Additional Attributes for Export Images

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------------|-----------|----|-------|-------------------|--------|
| General Image Module | | | | | |
| Presentation LUT Shape | 2050,0020 | CS | | 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.

8.3.1. Context Groups

Not applicable.

8.3.2. Template Specifications

Not applicable.

8.3.3. Private code definitions

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 281: 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 |
| 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 Color Image | 1.3.46.670589.11.0.0.12.3 |
| Private MR ExamCard Storage | 1.3.46.670589.11.0.0.12.4 |

8.6. Private Transfer Syntaxes

Not applicable.