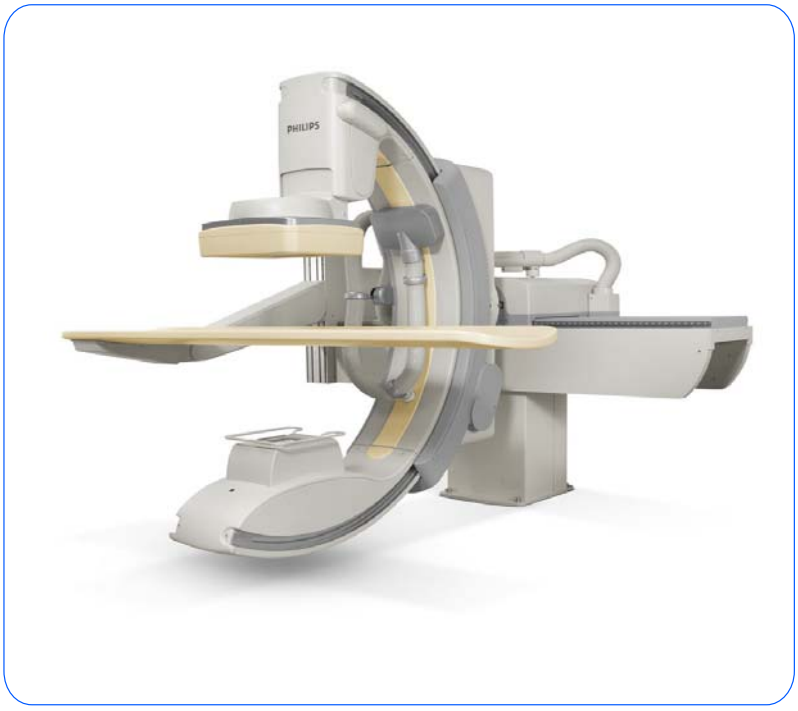
DICOM

Conformance Statement

MultiDiagnost ELEVA with
Flat Detector R3.1.1.



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1 DICOM CONFORMANCE STATEMENT OVERVIEW

The MultiDiagnost Eleva with Flat Detector is a multifunctional X-ray system, designed to provide faster, more confident diagnoses. It combines a wide applicational range with revolutionary Eleva technology that adapts the system to your way of working. Equipped with Philips' latest dynamic Flat Detector that provides excellent image quality at the lowest possible dose.

The MultiDiagnost Eleva with Flat Detector system is an Digital Fluorography modality. Depending on the purchased options and chosen configuration, the MultiDiagnost Eleva with Flat Detector system provides the following DICOM data exchange features:

- Request Worklist
- Issue Procedure information to RIS / HIS system
- Image acquisition and display
- Image review and processing
- Image handling, storage and networking,
- Administration of patient, physician and examination data.
- Read and Write DICOM CD-RW disks.
- Read and write DICOM DVD-RW disks.
- It allows the operator to print images stored in the database on a DICOM printer.
- Copy images from the local database to remote databases and vice versa.
- Import images for viewing.
- Storage Commitment function
- It allows a remote system to Query the MD ELEVA System database and to Retrieve images from it.
- Can send out images either as raw data or as processed data.

The main application areas are:

- R/F examinations
- Vascular examinations
- Interventional procedures

This DICOM Conformance Statement describes the DICOM conformance of the MultiDiagnost Eleva with Flat Detector system.

Disclaimer:
Imported Images are not intended to be exported

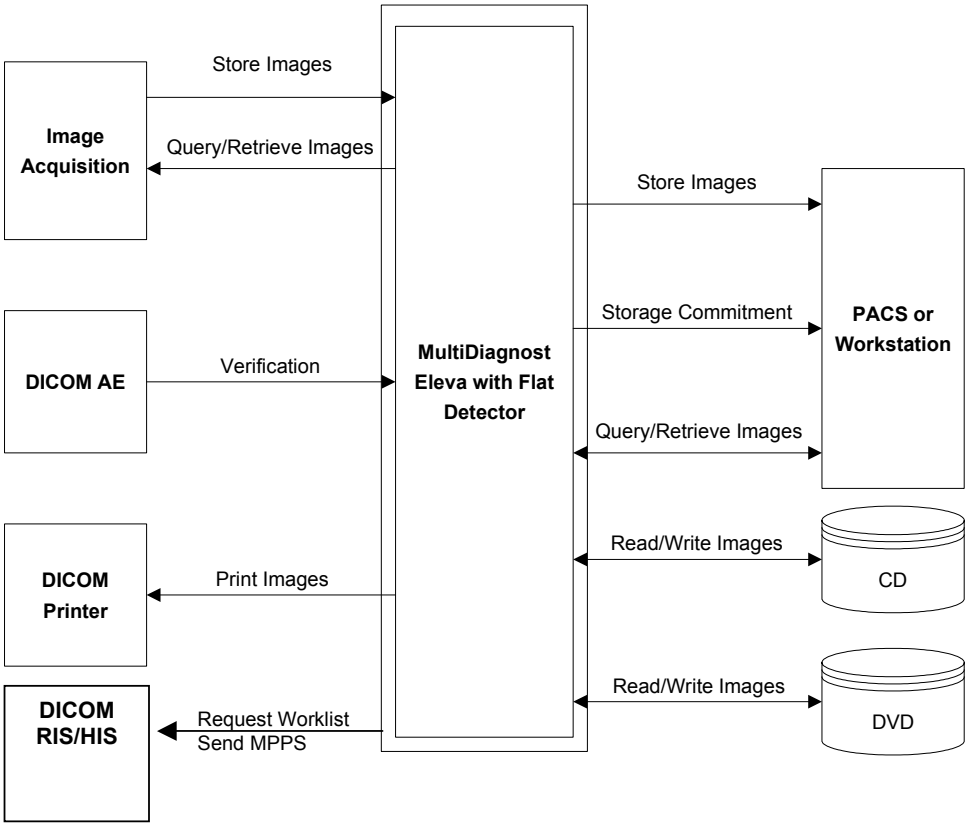

Figure 1: MultiDiagnost Eleva with Flat Detector System in a DICOM Network environment

MultiDiagnost Eleva with Flat Detector 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 MultiDiagnost Eleva with Flat Detector.

This DICOM Conformance Statement describes the DICOM conformance of the MultiDiagnost Eleva with Flat Detector platform.

Table 1 presents an overview of all network services and the applicable SOP classes as provided by MultiDiagnost Eleva with Flat Detector system.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
Storage			
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
Digital X-Ray Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
Private Storage			
Specialized X-Ray	1.3.46.670589.2.3.1.1	Yes	Yes
CX Image	1.3.46.670589.2.4.1.1	Yes	Yes
3D Volume Storage	1.3.46.670589.5.0.1.1	Yes	Yes
3D Volume Object Storage	1.3.46.670589.5.0.2.1	Yes	Yes
Surface Storage	1.3.46.670589.5.0.3.1	Yes	Yes
MR Cardio Storage	1.3.46.670589.5.0.8.1	Yes	Yes
CT Synthetic Image	1.3.46.670589.5.0.9	Yes	Yes
MR Synthetic Image	1.3.46.670589.5.0.10	Yes	Yes
MR Cardio Analysis Storage	1.3.46.670589.5.0.11.1	Yes	Yes
CX Synthetic Image	1.3.46.670589.5.0.12	Yes	Yes
Perfusion	1.3.46.670589.5.0.13	Yes	Yes
Perfusion Analysis	1.3.46.670589.5.0.14	Yes	Yes
Query/Retrieve			
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	Yes
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Yes	Yes
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Patient/Study Only Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	Yes	Yes
Patient/Study Only Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	Yes	Yes
Workflow Management			
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No
Verification	1.2.840.10008.1.1	No	Yes
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Yes	No
Print Management			
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	Yes	No
> Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
> Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
> Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
> Printer	1.2.840.10008.5.1.1.16	Yes	No
Basic Color Print Management (Meta)	1.2.840.10008.5.1.1.18	Yes	No

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
> Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
> Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
> Basic Color Image Box	1.2.840.10008.5.1.1.4.1	Yes	No
> Printer	1.2.840.10008.5.1.1.16	Yes	No
Presentation LUT	1.2.840.10008.5.1.1.23	Yes	No

The following table lists the Supported media Storage Application Profiles (with roles).

Table 2: Media Services

Media Storage Application Profile	Write Files (FSC / FSU)	Read Files (FSR)	Supported media
CD – R Disk			
General Purpose CD-R	YES / YES	YES	CD
DVD Disk			
General Purpose DVD-JPEG	YES / NO	YES	DVD+R / DVD+RW

Note: Not supported are the media DVD -R / -RW.

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3 INTRODUCTION

3.1 Revision History

Table 3: Revision History

Document Version	Date of Issue	Author	Description
04	09-12-2005	PMS MIT-IO	Final version of the DICOM Conformance Statement for MultiDiagnost Eleva with Flat Detector R3.1.1

3.2 Audience

This DICOM Conformance Statement is intended for:

- (potential) customers
- system integrators of medical equipment
- 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 1 through 8 and follows the contents and structuring requirements of the DICOM Standard PS 3.2 –2004.
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 DICOM Conformance Statement.
  Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant DICOM Conformance Statements. If the DICOM Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**
  The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery.
  The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

3.4 Definitions, Terms and Abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3-2004 and PS 3.4-2004.
The word Philips in this document refers to Philips Medical Systems.

The following acronyms and abbreviations may be used in this document:

AE	Application Entity
ACP	Archiving / Connectivity and Print
ACR	American College of Radiology
CD	Compact Disc
CD-R	CD-Recordable
CSE	Customer Support Engineer
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DVD	Digital Video Disc
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
FD	Flat Detector
FSC	File-set Creator
FSR	File-set Reader
FSU	File-set Updater
GUI	Graphical User Interface
HIPAA	Health Insurance Portability and Accountability Act
HIS	Hospital Information System
ILE	DICOM Implicit VR Little Endian
IHE	Integrating the Healthcare Enterprise
IOD	Information Object Definition
JPEG	Joint Photographic Experts Group
MD	MultiDiagnost
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance
MWL	Modality Worklist
N/A	Not Applicable
NEMA	National Electrical Manufacturers Association
PACS	Picture Archiving and Communication System
PDU	Protocol Data Unit
PMS(N)	Philips Medical Systems (Nederland B.V.)
Q/R	Query/Retrieve (Service Class)

RIS	Radiology Information System
RWA	Real-World Activity
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
VR	Value Representation
WLM	Worklist Management

The following terms are used in this document:

MultiDiagnost Eleva with Flat Detector System.
The MultiDiagnost Eleva with Flat Detector is a multifunctional X-ray system, designed to provide faster, more confident diagnoses. It combines a wide applicational range with revolutionary Eleva technology that adapts the system to your way of working. Equipped with Philips' latest dynamic Flat Detector that provides excellent image quality at the lowest possible dose.

Image Archive (PACS)
A PACS is a system that provides long term storage of images, Presentation States, Key Image Notes and Evidence Documents [IHE].

Image Display Viewer
The Image Display Viewer is a system that offers browsing of Patients' Studies. In addition, it may support the retrieval and display of selected sets of images, Presentation States, Key Image Notes, and Evidence Documents [IHE].

Department System Scheduler
A department-based information system that provides functions related to the management of orders received from external systems or through the department system's user interface. Upon a defined workflow action, makes procedures available for charge posting. The actor defines the action/event that actually causes charges to post [IHE].

Performed Procedure Step Manager
A system that re-distribute the Modality Performed Procedure Step Information from the Acquisition Modality or image Creator to the Department System Scheduler/Order Filler and Image Manager [IHE].

Printer
A system that accepts and processes DICOM print requests as a DICOM Print SCP and performs image rendering on hardcopy media. The system must support pixel rendering according to the DICOM Grayscale Standard Display Function [IHE].

3.5 References

[DICOM] Digital Imaging and Communications in Medicine (DICOM), Part 1 – 16 (NEMA PS 3.1-2004 – PS 3.16-2004),
National Electrical Manufacturers Association (NEMA)

Publication Sales 1300 N. 17th Street, Suite 1847
Rosslyn, Virginia. 22209, United States of America

[IHE] Integrating the Healthcare Enterprise
(IHE) Technical Framework Revision 5.4:
Radiological Society of North America (RSNA), Inc.
820 Jorie Boulevard, Oak Brook, IL, United States of America

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 MultiDiagnost Eleva with Flat Detector Application Entity and the “external world” or Real-World Activities,
- A functional description of the MultiDiagnost Eleva with Flat Detector Application Entity, and
- the sequencing constraints among them.

4.1.1 Application Data Flow

The **MultiDiagnost ELEVA with Flat Detector** (**MD ELEVA)** has two Application Entities in its implementation, namely

- MultiDiagnost ELEVA with Flat Detector RIS Application Entity (**MD ELEVA RIS AE**) and
- MultiDiagnost ELEVA with Flat Detector ACP AE Application Entity (**MD ELEVA ACP AE**).

Figure 2 shows the Networking application data flow as a functional overview of these application entities. On the left-hand side, the local Real-World Activities (RWA) are presented, whereas on the right-hand side, the remote Real-World Activities are presented.

As depicted in Figure 2, the MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS AE and MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE incorporate the following functionality:

- After RWA Request Verification, the MD ELEVA with FLAT DETECTOR as SCP provides standard Verification Service Class functionality to the requesting SCU.
- After RWA Import Images, the MD ELEVA with FLAT DETECTOR as SCP provides standard Storage Service Class functionality to the requesting SCU.
- After RWA Query Local Images/Retrieve Local Images, the MD ELEVA with FLAT DETECTOR 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 MD ELEVA with FLAT DETECTOR as SCU uses the remote SCP Storage Service Class functionality to store local images, either as raw data or as processed data, on a remote database.
- After operator RWA Find Remote Images, the MD ELEVA with FLAT DETECTOR as SCU uses the remote SCP Query/Retrieve Service Class functionality to query remote images.
- After operator RWA Move Remote Images, the MD ELEVA with FLAT DETECTOR as SCU uses the remote SCP Query/Retrieve Service Class functionality to retrieve remote images.
- After operator RWA Request Storage Commitment, the MD ELEVA with FLAT DETECTOR as SCU uses the remote SCP Storage Commitment Service Class functionality to commit remote images.
- After operator RWA Print Images, the MD ELEVA with FLAT DETECTOR as SCU uses the remote Print Management Service Class to print local images.

- After operator RWA Request Printer Status, the MD ELEVA with FLAT DETECTOR as SCU uses the remote Print Management Service Class to request the printer status.
- The MD ELEVA with FLAT DETECTOR can request a Worklist from a remote system such as a RIS / HIS system. The MD ELEVA with FLAT DETECTOR can issue the request information using the Modality Performed Procedure Step service to update the RIS.
- The MD ELEVA with FLAT DETECTOR can request to query a selected remote system, request to copy images from MD ELEVA with FLAT DETECTOR to a selected remote system, request storage commitment on exported images, request to retrieve selected images from remote systems and can request to print images. This results in Associations initiated by MD ELEVA with FLAT DETECTOR.
- The MD ELEVA with FLAT DETECTOR is able to reply on verification requests, to execute a requested query, to store received images into MD ELEVA with FLAT DETECTOR and retrieve requested images from MD ELEVA with FLAT DETECTOR. These requests from remote systems are done via Associations initiated by the remote systems.
- The MD ELEVA with FLAT DETECTOR is also able to display the contents (i.e. directory listing) of DICOM CD-Recordable disk to Write, Read and Update images, either as raw data or as processed data (RF / XA), on / from a DICOM CD-Recordable disk.
- The MD ELEVA with FLAT DETECTOR is also able to display the contents (i.e. directory listing) of DICOM DVD disk to Write and Read images, either as raw data or as processed data (RF / XA), on / from a DICOM DVD disk.

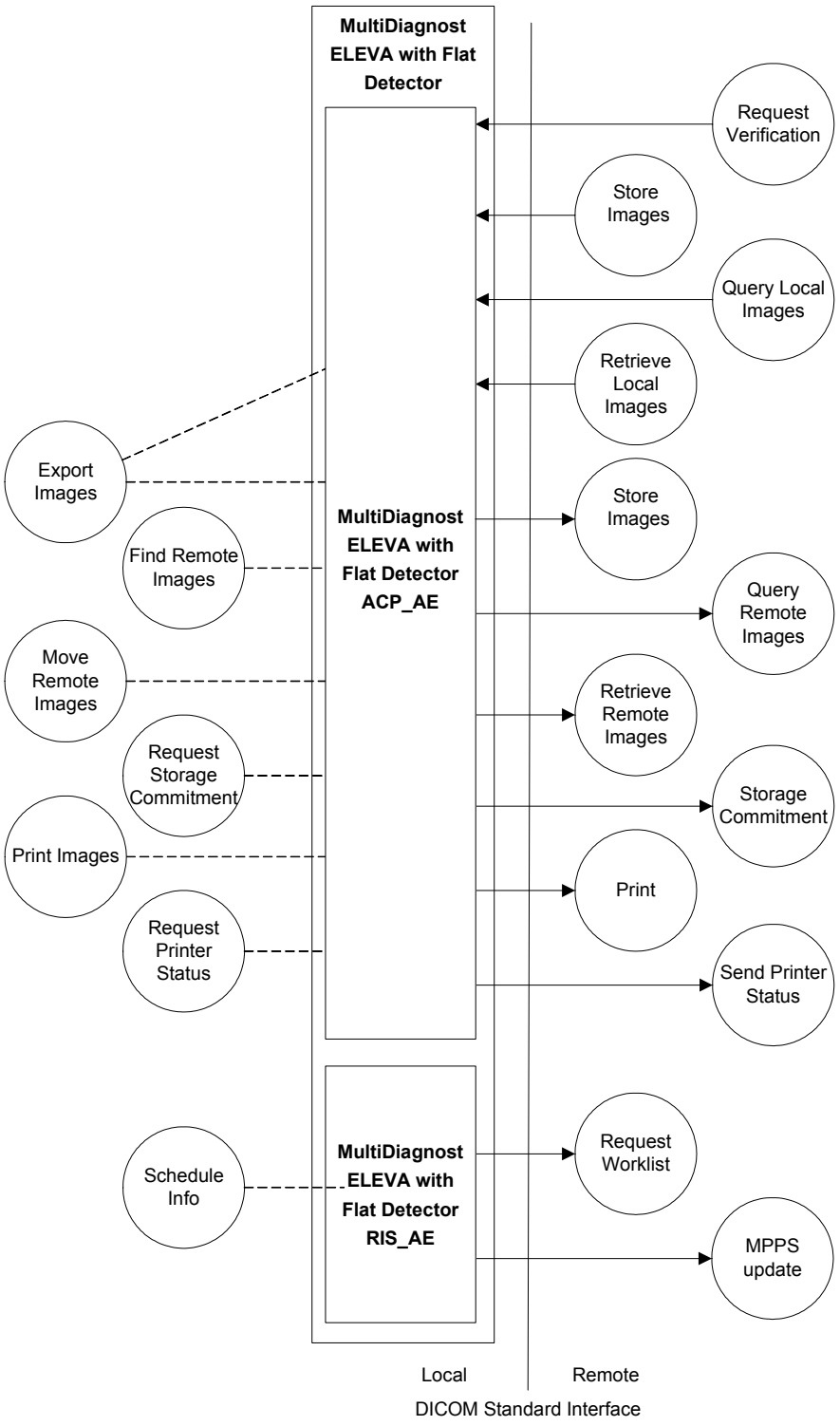


Figure 2: Networking Application Data Flow Diagram of the MultiDiagnost ELEVA with Flat Detector

4.1.2 Functional Definition of AE's

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

4.1.2.1 Functional Definition of MD ELEVA with FLAT DETECTOR

The MD ELEVA with FLAT DETECTOR includes the following service classes.

Verification Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Verification service as SCP (RWA Request Verification).

A remote SCU shall request an association with the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE for Verification SOP class. After accepting the association, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall receive and respond to the Verification request, and release the association when requested.

Storage Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Storage service as SCP (RWA Import Images).

A remote SCU shall request an association with the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE for Storage SOP classes. After accepting the association, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall receive the Storage requests, store the data in the local database, send the applicable Storage responses, and release the association when requested.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Storage service as SCU (RWA Export Images, triggered by operator or retrieve request).

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request an association with the selected remote SCP for all applicable Storage SOP classes. When the association is accepted, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the Storage requests (including data from local database), receive the Storage responses and act accordingly, and release the association. Finally, if configured, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request storage commitment per Storage Commitment service (ref. Storage Commitment service class).

Query/Retrieve Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Query/Retrieve service as SCP (RWA Query Local Images and RWA Retrieve Local Images).

A remote SCU shall request an association with the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE for Query/Retrieve SOP classes. After accepting the association, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall receive the Query/Retrieve requests. In case of a Retrieve request, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request storage per Storage service as SCU (ref. Storage Service Class). Next, the

MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the applicable Query/Retrieve responses, and release the association when requested.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Query/Retrieve service as SCU (RWA Find Remote Images and RWA Move Remote Images).

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request an association with the selected remote SCP for the applicable (configured) Query/Retrieve SOP class. When the association is accepted, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the Query/Retrieve requests, receive the Query/Retrieve responses and act accordingly, and finally release the association.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE fully supports the Cancel functionality, both as SCU and as SCP.

Storage Commitment Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Storage Commitment service as SCU (RWA Request Storage Commitment).

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request an association with the selected remote SCP for the Storage Commitment Push Model SOP class. When the association is accepted, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the Storage Commitment requests, receive the Storage Commitment responses and act accordingly, and release the association.

When the remote commitment actions have been finished, the remote SCP should request an association with the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE (still SCU). After accepting the association, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall receive the Storage Commitment reports, and release the association when requested.

The Storage Commitment Service can be done Synchronous and Asynchronous.
A detailed specification of the Storage Commitment is described in section 4.2.1.3.4 (RWA Request Storage Commitment).

Print Management Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE Print service acts as a Service Class User SCU (RWA Print Images).

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request an association with the selected remote SCP (printer) for all applicable SOP classes of the applicable Print Management Meta SOP class. When the association is accepted, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the Print requests (including data from local database), receive the Print responses and act accordingly, and finally release the association.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Printer service as SCU (RWA Request Printer Status)

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request an association with the selected remote SCP (printer) for the Printer SOP class.

When the association is accepted, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the Get / Event Report request, receive the Printer responses and act accordingly, and finally release the association.

Worklist Service Class
The MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS Application Entity (MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS AE) acts as a Service Class User (SCU) for Worklist and MPPS.

Media Service Class.
The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE acts also as a File Set Creator (FSC), File Set Reader (FSR) and File Set Updater (FSU) for supported CD + R medium and
File Set Creator (FSC) and File Set Reader (FSR) for supported DVD + RW medium.

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 MD ELEVA with FLAT DETECTOR.

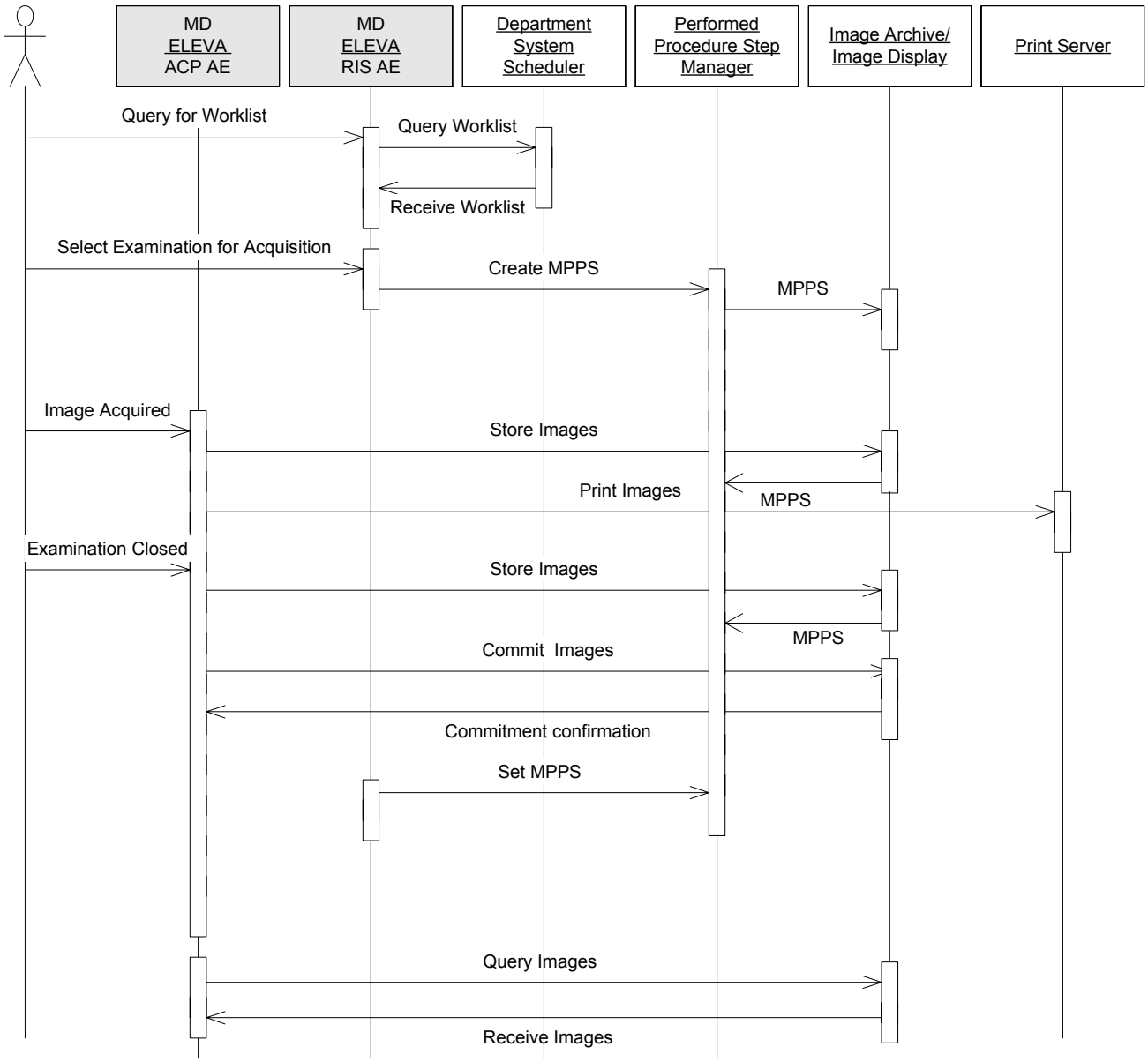


Figure 3: Sequencing of the Real World Activities of MD ELEVA with FLAT DETECTOR

Examinations, identified with a new UID, are created inside the MultiDiagnost Eleva with Flat Detector RIS as result of Worklist Management or on manual scheduling by

the clinical user. Once an examination (an equivalent to the DICOM Procedure Step) is created, the clinical user can select this examination for acquisition.

The administration Patient information, put in by the clinical user, and the worklist patient information will be sent together to the MultiDiagnost Eleva with Flat Detector ACP.
A Examination, selection for acquisition is synchronized between the MultiDiagnost Eleva with Flat Detector RIS and the MultiDiagnost Eleva with Flat Detector ACP.
Once an acquisition has started, the MPPS CREATED messages are sent from the MultiDiagnost Eleva with Flat Detector RIS to the RIS.
Acquired images from the MultiDiagnost Eleva with Flat Detector ACP and related data from the clinical user are added to the examination.

The composite images acquired are automatic forwarded to the MultiDiagnost ELEVA ACP AE, and can now be used for Viewing, Printing or Exporting.

When the clinical user has indicated on the MultiDiagnost Eleva with Flat Detector ACP that the examination is finished the Examination will be deleted here, as soon as the automatic export of the images has taken place.

A MPPS "**COMPLETED"** or "**DISCONTINUED"** message is sent from the MultiDiagnost ELEVA RIS AE to the RIS.

4.2 AE SPECIFICATIONS

The next section in the DICOM Conformance Statement contains the specifications of the Network capabilities of the **MD ELEVA with FLAT DETECTOR** consists of the next DICOM Application Entities:

- **MultiDiagnost Eleva with Flat Detector ACP AE** (MD ELEVA ACP AE)
- **MultiDiagnost Eleva with Flat Detector RIS AE** (MD ELEVA RIS AE)

The functions supported by these AE's are specified in the sections 4.2.1 and 4.2.2.
The media functionality is described in section 5.

4.2.1 MultiDiagnost Eleva with Flat Detector ACP AE

The MultiDiagnost Eleva with Flat Detector ACP Application Entity provides Standard Extended Conformance to the DICOM V3.0 SOP classes as SCU/SCP as specified in Table 4.
The following remarks are important:

- In case the remote system does not support the import of a specific Image Storage SOP Class, the MultiDiagnost Eleva with Flat Detector ACP AE will convert (if configured to do so) these images and sends them via the SC Image SOP Class.
- The Imported Images should only be used for viewing purposes.
- The MultiDiagnost Eleva with Flat Detector ACP AE requests for a Storage Commitment.

4.2.1.1 Supported SOP Classes MultiDiagnost Eleva with Flat Detector ACP AE as SCP/SCU.

This Application Entity provides extended Standard Conformance to the following SOP classes.

Table 4: SOP Classes for MultiDiagnost Eleva with Flat Detector ACP AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No	Yes
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No
PRINTER			
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	Yes	No
> Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
> Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
> Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
> Printer	1.2.840.10008.5.1.1.16	Yes	No
Basic Color Print Management (Meta)	1.2.840.10008.5.1.1.18	Yes	No
> Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
> Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
> Basic Color Image Box	1.2.840.10008.5.1.1.4.1	Yes	No
> Printer	1.2.840.10008.5.1.1.16	Yes	No
Presentation LUT	1.2.840.10008.5.1.1.23	Yes	No
MODALITY SOP CLASSES			
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
Digital X-Ray Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
QUERY / RETRIEVE			
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	Yes
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Yes	Yes
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Patient/Study Only Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	Yes	Yes
Patient/Study Only Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	Yes	Yes
SPECIALIZED SOP CLASSES			
Specialized X-Ray	1.3.46.670589.2.3.1.1	Yes	Yes
CX Image	1.3.46.670589.2.4.1.1	Yes	Yes
3D Volume Storage	1.3.46.670589.5.0.1.1	Yes	Yes
3D Volume Object Storage	1.3.46.670589.5.0.2.1	Yes	Yes
Surface Storage	1.3.46.670589.5.0.3.1	Yes	Yes
MR Cardio Storage	1.3.46.670589.5.0.8.1	Yes	Yes
CT Synthetic Image	1.3.46.670589.5.0.9	Yes	Yes
MR Synthetic Image	1.3.46.670589.5.0.10	Yes	Yes
MR Cardio Analysis Storage	1.3.46.670589.5.0.11.1	Yes	Yes
CX Synthetic Image	1.3.46.670589.5.0.12	Yes	Yes
Perfusion	1.3.46.670589.5.0.13	Yes	Yes
Perfusion Analysis	1.3.46.670589.5.0.14	Yes	Yes

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

Remarks:

- During installation the list of available SOP classes can be configured per MultiDiagnost Eleva with Flat Detector ACP. The SOP classes to be supported can be configured per remote station.
- The Private SOP classes may be stored in image archives, but are to be used by MultiDiagnost Eleva with Flat Detector ACP only!
- In case the remote SCP system does not support the import of a specific image storage SOP class, the MultiDiagnost Eleva with Flat Detector ACP will convert and send such images as Secondary Capture images (if configured to do so).
- After storing images as SCU the MultiDiagnost Eleva with Flat Detector ACP shall request Storage Commitment (only if configured to do so).

4.2.1.2 Association Policies

This section shall contain a description of the General Association Establishment and Acceptance policies of the AE.

4.2.1.2.1 General

The MultiDiagnost Eleva with Flat Detector ACP as SCU will offer unrestricted maximum PDU size on Associations initiated.This is also configurable per remote station. When the MultiDiagnost Eleva with Flat Detector ACT acts as SCP the maximum number of simultaneous associations is unlimited by default, but the maximum can be limited via the configuration.

The DICOM standard application context shall be specified.

Table 5: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2 Number of Associations

The number of simultaneous Associations supported by MultiDiagnost Eleva with Flat Detector ACP as a Service Class Provider (SCP) is in principle not limited.

Table 6: Number of Associations as an Association Initiator for MultiDiagnost Eleva with Flat Detector ACP

Maximum number of simultaneous associations	3 *

* As a result of local activities, MultiDiagnost Eleva with Flat Detector ACP will initiate at most 3 simultaneous associations.
One association may be used to issue **query** requests, the other association may be used to issue **store or retrieve** requests, and another association may be used for **print** requests.
Furthermore, MultiDiagnost Eleva with Flat Detector ACP may initiate an association for each remote retrieve request, executed by MultiDiagnost Eleva with Flat Detector ACP as a C-MOVE operation. These associations are used to

issue the C-STORE sub-operations implied by the retrieve requests. The number of simultaneous store associations for this retrieve purpose is principally not limited.
The number of simultaneous associations for Storage Commitment is configurable.

Table 7: Number of Associations as an Association Acceptor for MultiDiagnost Eleva with Flat Detector ACP

Maximum number of simultaneous associations	Configurable

Nevertheless, the number of simultaneous supported associations shall be determined by the available resources (CPU, memory, disk space).

4.2.1.2.3 Asynchronous Nature

MD ELEVA with FLAT DETECTOR does not support asynchronous operations, and will not perform asynchronous window negotiation.

Table 8: Asynchronous Nature as an Association Initiator for MultiDiagnost Eleva with Flat Detector ACP

Maximum number of outstanding asynchronous transactions	N/A

4.2.1.2.4 Implementation Identifying Information

Following Implementation Class UID and Version Name are defined.

Table 9: DICOM Implementation Class and Version for MultiDiagnost Eleva with Flat Detector ACP

THE IMPLEMENTATION CLASS UID:	**1.3.46.670589.5.2.23**
Implementation Version Name	ViewForum R4.2

4.2.1.3 Association Initiation Policy

MultiDiagnost Eleva with Flat Detector ACP shall initiate associations as a result of the following events.

- The MultiDiagnost Eleva with Flat Detector ACP operator or a remote (Query/Retrieve) application copies selected images from the MultiDiagnost Eleva with Flat Detector ACP database to another database; ref. section 4.2.1.3.1 Export Images.
- The MultiDiagnost Eleva with Flat Detector ACP operator queries a remote database; ref. section 4.2.1.3.2 Find Remote Images.
- The MultiDiagnost Eleva with Flat Detector ACP operator copies selected images from a remote database to another database; ref. section 4.2.1.3.3 Move Remote Images.
- The operator requests storage commitment of images on a remote database; ref. section 4.2.1.3.4 Request Storage Commitment.

- The MultiDiagnost Eleva with Flat Detector ACP operator requests to print selected images of the MultiDiagnost Eleva with Flat Detector ACP database; ref. section 4.2.1.3.5 Print Images.
- The MultiDiagnost Eleva with Flat Detector ACP operator requests the status of the selected printer; ref. section 4.2.1.3.6
- Request Printer Status.

4.2.1.3.1 Export Images

4.2.1.3.1.1 Description and Sequencing of Activities

The RWA Export Images involves the storage of images from the local MultiDiagnost Eleva with Flat Detector ACP database to a remote system. This export of images can be done as raw data either as processed data, XA or RF. There are two ways for the MultiDiagnost Eleva with Flat Detector ACP to initiate Export Images.

1. The operator is able to copy the images selected in a patient folder from the local MultiDiagnost Eleva with Flat Detector ACP database to another database by means of the copy tool in the MultiDiagnost Eleva with Flat Detector ACP data-handling tool. For each selected patient MultiDiagnost Eleva with Flat Detector ACP 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.
   MultiDiagnost Eleva with Flat Detector ACP handles operator copy requests one after another.

2. A remote application copies images from the local MultiDiagnost Eleva with Flat Detector ACP database to another database by sending a C-MOVE request to MultiDiagnost Eleva with Flat Detector ACP. For each received retrieve request MultiDiagnost Eleva with Flat Detector ACP 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. MultiDiagnost ELEVA with Flat Detector ACP is able to simultaneously handle C-MOVE requests.

Along with the image data the MultiDiagnost ELEVA with Flat Detector ACP 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 8.1.4 Coerced / Modified fields, for more information on Presentation State storage.

If configured, the MultiDiagnost ELEVA with Flat Detector ACP shall also try and initiate a storage commitment of the stored image (after releasing the storage association). See section 4.2.1.3.4 (RWA Request Storage Commitment) for a detailed specification of the storage commitment.

Figure 4 shows the sequence of events after the operator or remote application initiates the RWA Export Images.

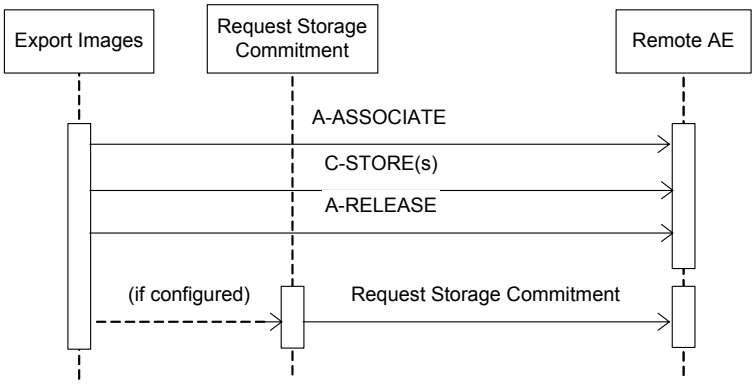


Figure 4: Sequencing of RWA Export Images

4.2.1.3.1.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. The Presentation Contexts proposed by the MultiDiagnost ELEVA with Flat Detector ACP AE for Export Images are defined in Table 10.

Table 10: Proposed Presentation Contexts for Export Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Digital X-Ray Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Specialized X-Ray	1.3.46.670589.2.3.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
CX Image	1.3.46.670589.2.4.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
3D Volume Storage	1.3.46.670589.5.0.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
3D Volume Object Storage	1.3.46.670589.5.0.2.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Surface Storage	1.3.46.670589.5.0.3.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
MR cardio Storage	1.3.46.670589.5.0.8.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
CT Synthetic Image	1.3.46.670589.5.0.9	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
MR Synthetic Image	1.3.46.670589.5.0.10	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
MR Cardio Analysis Storage	1.3.46.670589.5.0.11.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
CX Synthetic Image	1.3.46.670589.5.0.12	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Perfusion	1.3.46.670589.5.0.13	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Perfusion Analysis	1.3.46.670589.5.0.14	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Ultra sound Multi-frame Image Storage	1.2.840 .10008.5.1 .4.1.1.3.1	ILE ELE EBE JPEG Baseline (Note 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4 .50	SCU	None
Ultra sound Image Storage	1.2.840 .10008.5.1 .4.1.1.6.1	ILE ELE EBE JPEG Baseline (Note 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4 .50	SCU	None

Note : For performance reasons the ELE transfer syntax is preferred. Extended negotiation is not supported.

Note1: Only for Photometric Interpretation of RGB and YBR_FULL_422. Therefore JPEG Baseline transfer syntax may NOT be configured for SCU systems that are capable of handling storage of monochrome images too.

4.2.1.3.1.3 SOP Specific Conformance for SOP Classes

Important remarks about the exported images:

- In case the remote system does not support modality specific image storage SOP class, the MD ELEVA ACP 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.
- The MD ELEVA ACP AE allows the operator to modify attributes of the stored images. MD ELEVA ACP AE does not modify the pixel values of the stored images.
  Modified images retain their original Study, Series and Image UID.
- On the export of an imported image the MD ELEVA ACP AE adds private attributes to the image.
- The exported MD ELEVA ACP AE 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 MD ELEVA ACP AE to generate it.
- Exported CT/MR images relate Scanogram and Slice images in the following way: Attribute 'Referenced Image Sequence' is present in the slice images and points to the related Scanogram image.
  Note that Attribute 'Frame of Reference UID' in the Scanogram (Localiser image) and related image slices are not guaranteed to be equal; this depends on the source of the images.
- For Secondary Capture images only one Window Width and Window Centre value is exported.
- Please refer to section 8.1.4 Coerced / Modified fields, for more information on stored images.
- When the location of a graphic or text annotation is specified relatively with regards to the displayed area. (i.e. DICOM attribute: Bounding Box Annotation Units, Anchor Point Annotation Units or Graphic Annotation Units equals “DISPLAY”), the annotation is not displayed.
- Areas occluded by Shutter are always black in MD ELEVA ACP AE, whereas it is possible to want it to be white in DICOM.
- On the export of such an image the MultiDiagnost ELEVA with Flat Detector ACP first sets up an association to determine if the SCP supports the Grayscale Softcopy Presentation State SOP Class.
  If the SCP doesn't supports the Grayscale Softcopy Presentation State service the Graphical information is added to the image object additional a new instance UID is generated for this image.
- All kind of Images sending out, are included with Performed Procedure Step Tags like: (Start Date, Start Time, ID).

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 MD ELEVA ACP AE configuration.
The MD ELEVA ACP AE can convert the transfer syntax when exporting images. The MD ELEVA ACP AE can perform a transfer syntax according to the following table.

Table 11: Transfer Syntax Conversion

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

- *JPEG Baseline is only supported for images with Photometric Interpretation of YBR_FULL_422.*
- *As MD ELEVA ACP AE 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 MD ELEVA ACP AE will stop the transfer of the images and release the association as soon as it receives an unsuccessful Store Response Status.
In case that a remote application requested the transfer (by means of a C-MOVE request), a move response with status unsuccessful is sent to the retrieve requestor.

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

Table 12: DICOM Command Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Storage is complete	0000	Continues with next store until completed thereafter the store job is marked as completed and the association is released.
Refused	Out of Resources	A7xx	The store job fails and the association is released. The reason is logged and reported to the user.
Error	Data set does not match SOP Class	A9xx	The store job fails and the association is released. The reason is logged and reported to the user.
	Cannot understand	Cxxx	The store job fails and the association is released. The reason is logged and reported to the user.
Warning	Coercion of Data Elements	B000	Continues with next store until completed thereafter the store job is marked as completed and the association is released.
	Elements discarded	B006	Continues with next store until completed thereafter the store job is marked as completed and the association is released.
	Data set does not match SOP class	B007	Continues with next store until completed thereafter the store job is marked as completed and the association is released.

Table 13: DICOM Command Communication Failure Behavior

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

4.2.1.3.2 Find Remote Images

4.2.1.3.2.1 Description and Sequencing of Activities

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

The operator queries a remote database by means of the query tool in the MD ELEVA ACP AE data handling facility. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP 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 Query/Retrieve dialog on the GUI is closed).

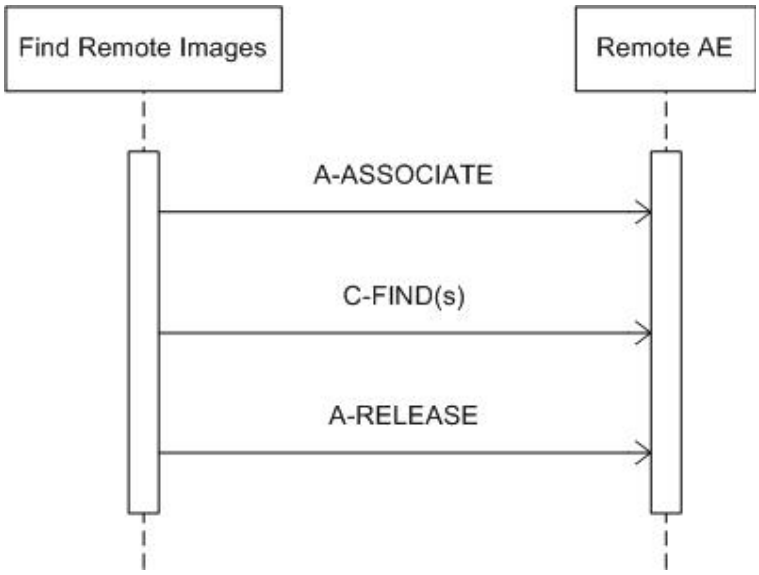


Figure 5: Sequencing of RWA Find Remote Images

4.2.1.3.2.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for Find Remote Images are defined in Table 14.

Table 14: Proposed Presentation Contexts for Find Remote Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
Patient Root Query /Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Study Root Query /Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

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

4.2.1.3.2.3 SOP Specific Conformance for SOP Classes

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE will not generate queries containing optional keys. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE will not generate relational queries.

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 of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE

Query Level	Query Key			
	Name	Tag	Query Key	Matching Key
Patient	Patient's Name	0010,0010	X	X
	Patient ID	0010,0020	X	X
	Patient's Birth Date	0010,0030	X	
	Patient's Sex	0010,0040	X	
Study	Study Date	0008,0020	X	X
	Study Time	0008,0030	X	
	Accession Number	0008,0050	X	X
	Modalities in Study	0008,0061		
	Referring Physician's Name	0008,0090	X	
	Study Description	0008,1030	X	
	Study Instance UID	0020,000D		
	Study ID	0020,0010	X	X
	Requesting Physician	0032,1032		
Series	Modality	0008,0060	X	
	Station Name	0008,1010	X	
	Performing Physician's Name	0008,1050	X	
	Body Part Examined	0018,0015	X	
	Protocol Name	0018,1030	X	
	Series Instance UID	0020,000E		
	Series Number	0020,0011		
	Performed Station Name	0040,0242	X	
	Performed Procedure Step Start Date	0040,0244	X	
	Performed Procedure Step ID	0040,0253	X	
	Performed Procedure Type Description	0040,0255	X	
Image	SOP Class UID	0008,0016	X	
	SOP Instance UID	0008,0018	X	
	Content Date	0008,0023	X	
	Content Time	0008,0033	X	
	Instance Number	0020,0013	X	

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

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

Table 16: DICOM Command Response Status Handling Behavior

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

Table 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.

4.2.1.3.3 Move Remote Images

4.2.1.3.3.1 Description and Sequencing of Activities

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

The operator is able to copy the selected images in a patient folder from a remote database to another, local or remote, database by means of the copy tool in the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE data handling facility. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP 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).

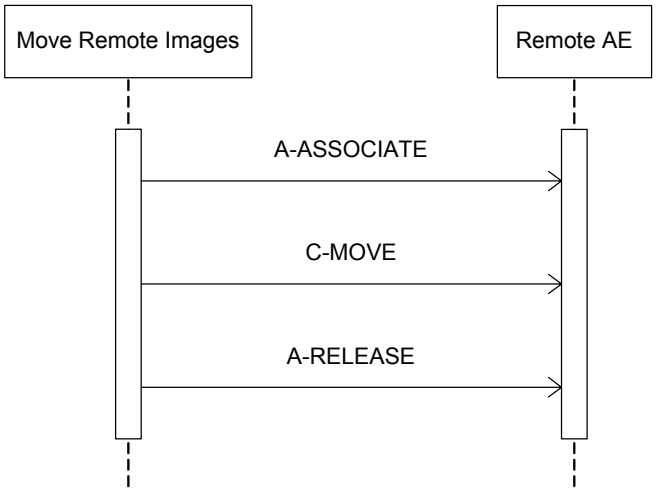


Figure 6: Sequencing of RWA Move Remote Images

4.2.1.3.3.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for Move Remote Images are defined in Table 18.

Table 18: Proposed Presentation Contexts for Move Remote Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
Patient Root Query /Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Study Root Query /Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

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

4.2.1.3.3.3 SOP Specific Conformance for SOP Classes

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard conformance.

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

Table 19: DICOM Command Response Status Handling Behavior

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

Table 20: 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.

4.2.1.3.4 Request Storage Commitment

4.2.1.3.4.1 Description and Sequencing of Activities

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

If configured, Storage Commitment will be initiated in a new association after closing the association of the related image storage (C-STORE). This new association will be open until the remote archive sends a storage commitment report (**synchronous**) or when the configured maximum time is passed. When this maximum configured period is passed, it is the responsibility of the remote archive to setup a new association with MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE and send the storage commitment report (**asynchronous**).

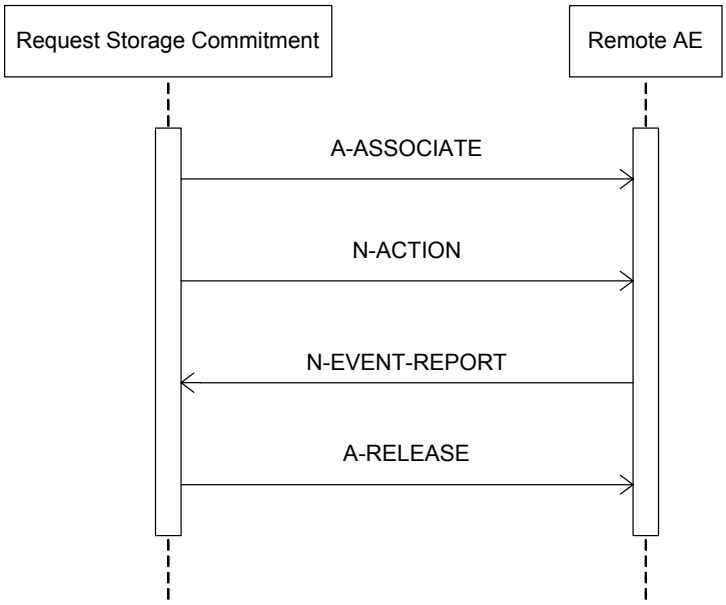


Figure 7: Sequencing of Synchronous RWA Request Storage Commitment

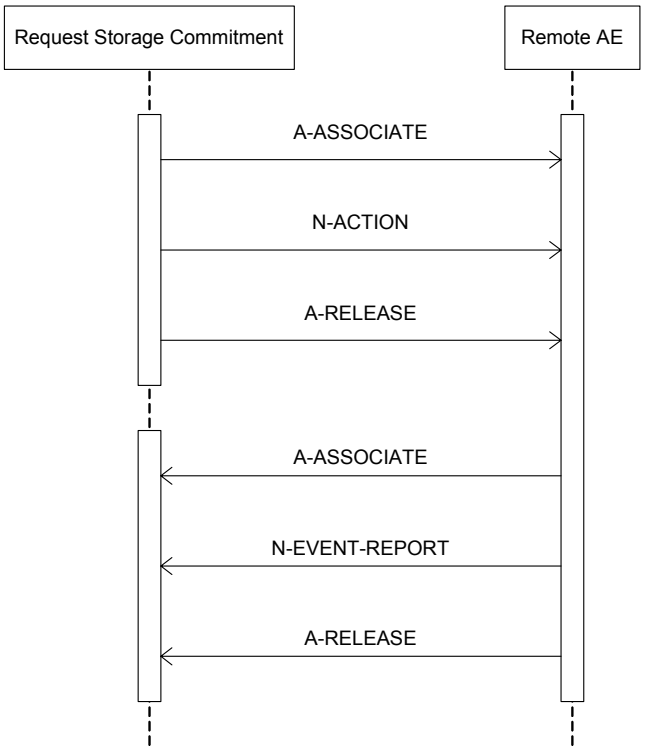


Figure 8: Sequencing of Asynchronous RWA Request Storage Commitment

4.2.1.3.4.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for Request Storage Commitment are defined in Table 21.

Table 21: Proposed Presentation Contexts for Request Storage Commitment

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU SCU SCU	None None None

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

4.2.1.3.4.3 SOP Specific Conformance for SOP Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard conformance. In MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE many remote nodes can be configured for storage Images. Per remote node one node can be configured to deliver the Storage Commitment service. Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 22: DICOM Command Response Status Handling Behavior

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

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE does not take any more actions on receiving the N-EVENT-REPORT, even when failures exist (Event Type ID 2).

Table 23: 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 Print Images

4.2.1.3.5.1 Description and Sequencing of Activities

The RWA Print Images involves the printing of images by sending the selected images to a Print Management SCP (i.e. printer).
After selecting the print destination (out of choice list of configured printers) and some print parameters (depending on the configuration and the selected printer; these values can be configured too), the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall initiate an association to the selected printer and use it to send the print job.
MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE also has an option for print preview.

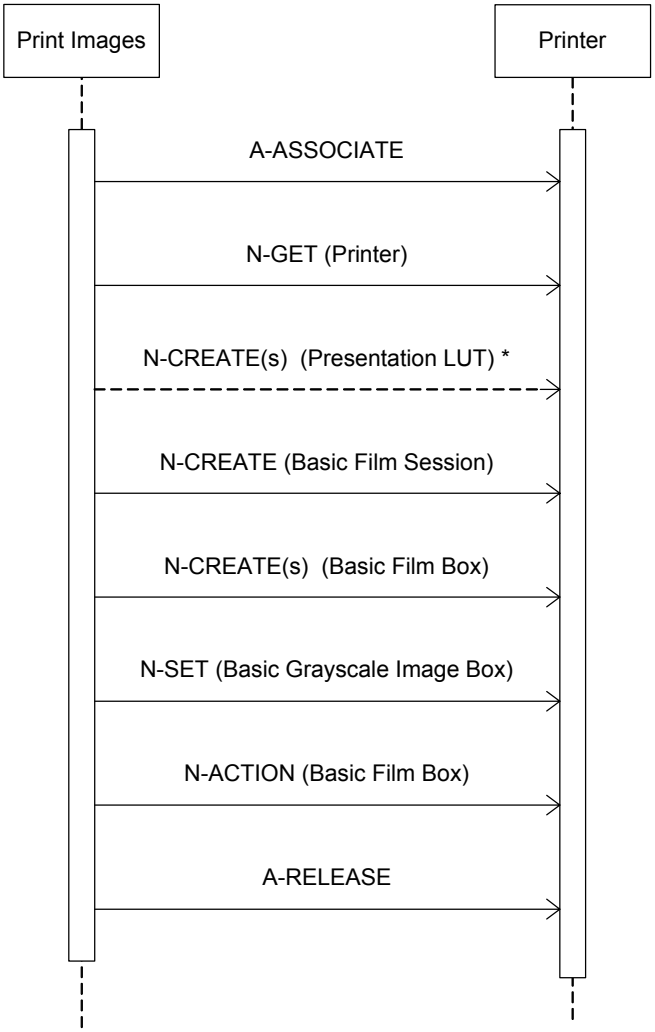


Figure 9: Sequencing of RWA Print Images

- Note that the Presentation LUT SOP class is only supported for Grayscale image printing.

4.2.1.3.5.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for Print Images are defined in Table 24.

Table 24: Proposed Presentation Contexts for Print Images

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List (note)**	**UID List**		
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Color Print Management (Meta)	1.2.840.10008.5.1.1.14	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Presentation LUT	1.2.840.10008.5.1.1.23	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

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

Overlay, Annotation (showing the values of some major identifying attributes) and **Shutter information** is processed in the images sent to the printer (i.e. burnt-in in the image).

The next abbreviations are used in the following tables:

Used Presentation Values:

ALWAYS	the module or attribute shall always be present with value
ANAP	Attribute Not Always Present
VNAP	Value Not Always Present (attribute sent zero length if no value is present)
EMPTY	Attribute is sent without a value
MAYBE	the module may be present under specified condition
OPTIONAL	the module may be available, depending on source object

Used Source Items:

AUTO	the attribute value is generated automatically
CONF	the attribute value source is a configurable parameter
IMPL	the attribute value source is a user-implicit configuration setting
MPPS	the attribute value source is a modality performed procedure step
MWL	the attribute value source is a modality Worklist
SPEC	the attribute value source is a specific DICOM object
USER	the attribute value source is explicit user input

4.2.1.3.5.3 SOP Specific Conformance Printer SOP Class

The Printer process conforms to the Printer Sop Class.
The following DIMSE service element is supported:

N-GET

N-GET DIMSE does not create any Data Set Attributes.
The behavior on successful and unsuccessful transfer is given in the table below.

Table 25: DICOM Command Response Status Handling Behavior for Printer N-GET

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

4.2.1.3.5.4 SOP Specific Conformance Basic Film Session SOP Class

The Printer process conforms to the Basic Film Session Sop Class.
The following DIMSE service element is supported:

N-CREATE

The following table lists the supported attributes for the N-CREATE DIMSE.

Table 26: Basic Film Session Presentation Module

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

The behavior on successful and unsuccessful transfer is given in the table below.

Table 27: DICOM Command Response Status Handling Behavior for Basic Film Session N-CREATE

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

4.2.1.3.5.5 SOP Specific Conformance Basic Film Box SOP Class

The Printer process conforms to the Basic Film Box Sop Class.
The following DIMSE service elements are supported:

N-CREATE
N-ACTION

The following table lists the supported attributes for the N-CREATE DIMSE

Table 28: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Display Format	2010,0010	ST	STANDARD\1,1 CUSTOM\1	ALWAYS	CONF
Film Orientation	2010,0040	CS	PORTRAIT; LANDSCAPE	ALWAYS	CONF
Film Size ID	2010,0050	CS	8INX10IN, 8_5INX11IN, A, 10INX12IN, 10INX14IN, A3, 11INX14IN, 11INX17IN, A4, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM	ALWAYS	CONF
Magnification Type	2010,0060	CS		ALWAYS	USER
Max Density	2010,0130	US		VNAP	CONF
Trim	2010,0140	CS	NO, YES	VNAP	CONF
Configuration Information	2010,0150	ST	L=1, L=V	ALWAYS	CONF

Table 29: Basic Film Box Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO
>Referenced SOP Class UID	0008,1150	UI	UID of Parent Film Session	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	UID of Parent LUT Presentation	ALWAYS	AUTO
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO

The behavior on successful and unsuccessful transfer is given in the table below.

Table 30: DICOM Command Response Status Handling Behavior for Basic Film Box N-CREATE

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

N-ACTION DIMSE does not create any Data Set Attributes.
The behavior on successful and unsuccessful transfer is given in the table below.

Table 31: DICOM Command Response Status Handling Behavior for Basic Film Box N-ACTION

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

4.2.1.3.5.6 SOP Specific Conformance Basic Grayscale Image Box SOP Class

The Printer process conforms to the Basic Grayscale Image Box Sop Class.
The following DIMSE service element is supported:

N-SET

The following table lists the supported attributes for the N-SET DIMSE

Table 32: Basic Grayscale Image Box SOP Class - N-SET-RQ - Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	2020,0010	US	1	ALWAYS	AUTO
Polarity	2020,0020	CS	NORMAL	ALWAYS	AUTO
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO
> Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO
> Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO
> Rows	0028,0010	US		ALWAYS	IMPL
> Columns	0028,0011	US		ALWAYS	IMPL
> Bits Allocated	0028,0100	US	8, 16, 16	ALWAYS	AUTO
> Bits Stored	0028,0101	US	8, 14, 12	ALWAYS	IMPL
> High Bit	0028,0102	US	7, 13, 11	ALWAYS	AUTO

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

The behavior on successful and unsuccessful transfer is given in the table below.

Table 33: DICOM Command Response Status Handling Behavior for Basic Grayscale Image Box N-SET

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

4.2.1.3.5.7 SOP Specific Conformance Basic Color Image Box SOP Class

The Printer process conforms to the Basic Color Image Box Sop Class.
The following DIMSE service element is supported:

N-SET

The following table lists the supported attributes for the N-SET DIMSE

Table 34: Basic Color Image Box SOP Class - N-SET-RQ - Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	2020,0010	US	1	ALWAYS	AUTO
Polarity	2020,0020	CS	NORMAL	ALWAYS	AUTO
Basic Color Image Sequence	2020,0111	SQ		ALWAYS	AUTO
> Samples per Pixel	0028,0002	US	3	ALWAYS	AUTO
> Photometric Interpretation	0028,0004	CS	RGB	ALWAYS	AUTO
> Planar Configuration	0028,0006	US	0,1	ALWAYS	IMPL
> Rows	0028,0010	US		ALWAYS	IMPL
> Columns	0028,0011	US		ALWAYS	IMPL

> Bits Allocated	0028,0100	US	8	ALWAYS	AUTO
> Bits Stored	0028,0101	US	8	ALWAYS	IMPL
> High Bit	0028,0102	US	7	ALWAYS	AUTO
> Pixel Representation	0028,0103	US	0	ALWAYS	AUTO
> Pixel Data	7FE0,0010	OW		ALWAYS	AUTO

The behavior on successful and unsuccessful transfer is given in the table below.

Table 35: DICOM Command Response Status Handling Behavior for Basic Color Image Box N-SET

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

4.2.1.3.5.8 SOP Specific Conformance Presentation LUT SOP Class

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

N-CREATE

The following table lists the supported attributes for the N-CREATE DIMSE

Table 36: Presentation LUT Module

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

The behavior on successful and unsuccessful transfer is given in the table below.

Table 37: DICOM Command Response Status Handling Behavior for Presentation LUT N-CREATE

Service Status	Further Meaning	Error Code	Behavior
Success	Presentation LUT successfully created	0000	The print job continues.
Warning	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	B605	The print job continues and the warning is logged.

The N-EVENT-REPORT of the Printer SOP Class is summarized in Table below.

Table 38: DICOM Command Response Status Handling Behavior for Printer N-EVENT-REPORT

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

Note: ELEVA will ignore the contents of these events. However, the printer status is polled via a separate association.

The behavior of the AE during communication failure is summarized in Table 39.

Table 39: DICOM Command Communication Failure Behavior

Exception	Behavior
ARTIM Time-out	Print job fails.
Reply Time-out	The association is released.
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.

4.2.1.3.6 Request Printer Status

4.2.1.3.6.1 Description and Sequencing of Activities

The RWA Request Printer Status involves the request for the printer status of the configured Print Management SCP's (i.e. printers).

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE will periodically request the printer status. If an association already exists for a print job (RWA Print Images) then the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall use this association, otherwise a new association shall be initiated.

The status codes as returned by the printer shall be logged for service purposes and shall not be shown on the GUI.
The Printer Status Tool may be used to reveal the received printer status.

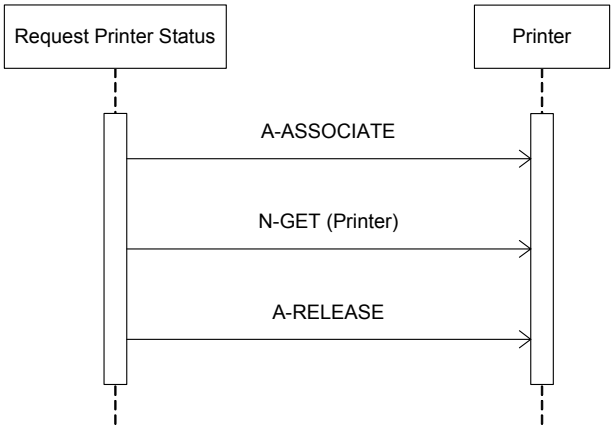


Figure 10: Sequencing of RWA Request Printer Status

4.2.1.3.6.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for Request Printer Status are defined in Table 40.

Table 40: Proposed Presentation Contexts for

Request Printer Status

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
Printer	1.2.840.10008.5.1.1.16	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Note: For performance reasons the ELE transfer syntax is preferred and shall be chosen in case multiple Transfer Syntaxes are accepted in the Association Acceptance

4.2.1.3.6.3 SOP Specific Conformance for the Printer SOP Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard conformance to the Printer SOP class.

All details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors are provided in Table 41.

Table 41: DICOM Command Response Status Handling Behavior

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

The behavior of the AE during communication failure is summarized in Table 42.

Table 42: DICOM Command Communication Failure Behavior

Exception	Behavior
ARTIM Timeout	Print job fails.
Reply Time-out	The association is released.
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

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept Associations for the following purposes:

- To allow remote applications to verify application level communication with MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE; ref. section 4.2.1.4.1 Request Verification.
- To allow remote applications to store images in the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database (i.e. image import); ref. section 4.2.1.4.2 Import Images.
- To allow remote applications to query the MultiDiagnost Eleva with Flat Detector database; ref. section 4.2.1.4.3 Query Local Images.
- To allow remote applications to retrieve images from the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE MultiDiagnost Eleva with Flat Detector database; ref. section 4.2.1.4.4 Retrieve Local Images.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP 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 MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE system.
The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall reject association requests from applications that do not address the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE, i.e. applications that offer a wrong "**called AE title**".
The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE title is defined during configuration of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE system.

4.2.1.4.1 Request Verification

4.2.1.4.1.1 Description and Sequencing of Activities

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept associations from systems that wish to verify application level communication using the C-ECHO command.

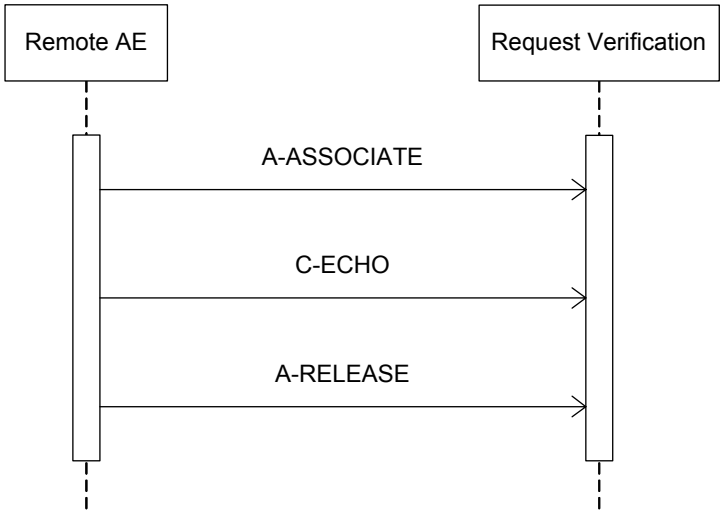


Figure 11: Sequencing of RWA Request Verification

4.2.1.4.1.2 Accepted Presentation Contexts

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall be able to accept the presentation contexts as specified in the next table.

Table 43: Acceptable Presentation Contexts for Request Verification

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

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 MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the MULTIDIAGNOST ELEVA with FLAT

DETECTOR ACP 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.

4.2.1.4.1.3 SOP Specific Conformance for C-ECHO SOP Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard conformance to the Verification service class.

The behavior of an Application Entity shall be summarized as shown in Table 44.
The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 44: Verification C-ECHO Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
N/A			

4.2.1.4.2 Import Images

4.2.1.4.2.1 Description and Sequencing of Activities

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept associations from systems that wish to store images in the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database using the C-STORE command.

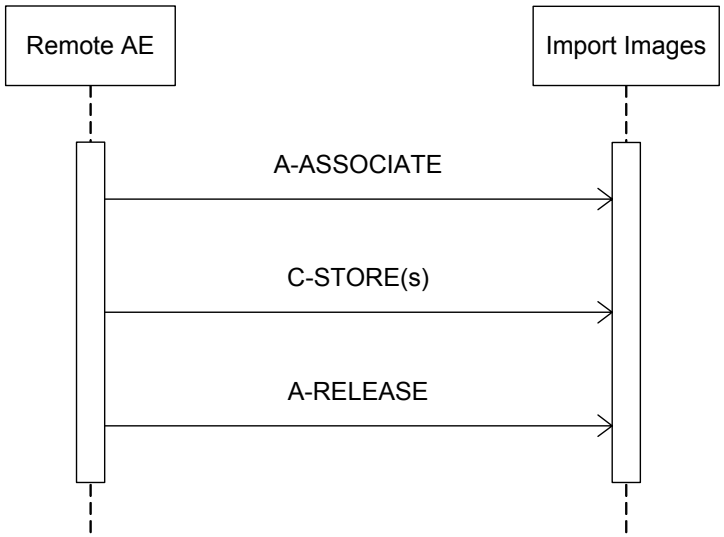


Figure 12: Sequencing of RWA Import Images

4.2.1.4.2.2 Accepted Presentation Contexts

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall be able to accept the presentation contexts as specified in the next table.

Table 45: Acceptable Presentation Contexts for Import Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Digital X-Ray Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Specialized X-Ray	1.3.46.670589.2.3.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
CX Image	1.3.46.670589.2.4.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
3D Volume Storage	1.3.46.670589.5.0.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
3D Volume Object Storage	1.3.46.670589.5.0.2.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Surface Storage	1.3.46.670589.5.0.3.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
MR cardio Storage	1.3.46.670589.5.0.8.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
CT Synthetic Image	1.3.46.670589.5.0.9	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
MR Synthetic Image	1.3.46.670589.5.0.10	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
MR Cardio Analysis Storage	1.3.46.670589.5.0.11.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
CX Synthetic Image	1.3.46.670589.5.0.12	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Perfusion	1.3.46.670589.5.0.13	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Perfusion Analysis	1.3.46.670589.5.0.14	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Ultra sound Multi-frame Image Storage	1.2.840 .10008.5.1 .4.1.1.3.1	ILE ELE EBE JPEG Baseline (Note 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4 .50	SCP	None
Ultra sound Image Storage	1.2.840 .10008.5.1 .4.1.1.6.1	ILE ELE EBE JPEG Baseline (Note 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4 .50	SCP	None

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

Note 1 : Only for Photometric Interpretation of RGB and YBR_FULL_422. Therefore JPEG Baseline transfer syntax may NOT be configured for SCU systems that are capable of handling storage of monochrome images too.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP 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.

4.2.1.4.2.3 SOP Specific Conformance for SOP Classes

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard level 1 (Base) conformance to the Storage service class.

If the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE imports an image and during the association negotiation the Presentation State SOP class was not negotiated, then the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE creates a Presentation State instance for the imported image.
The following table gives an overview of the image formats that can be viewed or stored.

Table 46: Support for Photometric Interpretation

Photometric Interpretation	Storage	Viewing
MONOCHROME1	Yes	Yes
MONOCHROME2	Yes	Yes
RGB	Yes	Yes
YBR_FULL	Yes	No
YBR_FULL_422	Yes *	Yes *
YBR_PARTIAL_422	Yes	No
PALETTE COLOR	Yes	No
Other	Yes	No

*Note: * is an Compressed YBR_FULL_422 images received per JPEG Baseline transfer shall be stored (and consequently viewed) as RGB images.*

If the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE **receives** improper DICOM, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE tries as much as possible to make it proper DICOM (if configured to do so). The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE also tries to remain as transparent as possible on images; on export the images must be changed only to such extend as really necessary. Therefore it is not guaranteed that all DICOM violations of incoming images are repaired (e.g. enumerated values are not changed).
Thus improper DICOM import may result in improper DICOM export from the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE (no checks are available for incorrect UID's, Date/Time formats, etc.).

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE **stores** all additional standard, private and retired attributes in received images. Retrieval of these attributes VR's is only possible (by means of a C-STORE) if the following conditions are satisfied:

- The image was encoded (when MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE was C-STORE SCP) using one of the explicit value representations; or
- The image was encoded (when MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE was C-STORE SCP) using implicit value representation and the destination (i.e. a remote C-STORE SCP) has accepted implicit value representation as the only transfer syntax applicable to the storage SOP class of the image (with MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE as C-STORE SCU).

Otherwise the VR shall be set to Unknown (UN).

Important implementation remarks and restrictions:

- The DICOM standard does not guarantee that the advanced MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE applications can process the received images. This depends on the presence and consistency of a set of attributes in these images. The conditions for running the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE applications shall be specified in separate Annexes.
- See 8.1.4 Coerced / Modified fields, for details on Coerced and Modified Attributes.

- When the location of a Graphic or Text Annotation is specified relatively with regards to the displayed area.
  (i.e. DICOM attribute: Bounding Box Annotation Units (0070,0003),
  Anchor Point Annotation Units (0070,0004) or
  Graphic Annotation Units (0070,0005) equals “DISPLAY”),
  the annotation is not displayed.

- Areas occluded by shutter are always black in MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE, whereas it is possible to want it to be white in DICOM.
- On the export of imported images the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE adds private attributes to the image.
- MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE does NOT support IVUS (IntraVascular UltraSound) Ultrasound images.
- If during the image transfer the Presentation States instances are transferred before the images, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE changes the content of the Images.

For the following attributes, present in the original images, **MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE** will takes the following action:

Table 47: Actions taken by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE:

Attribute Name	Tag	Actions	
		Removed from original images	Set to a zero length value in the exported images
Referenced Patient Sequence	0008,1120	X	
Procedure Code Sequence	0008,1032	X	
Performed Protocol Code Sequence	0040,0260	X	
Requested Attributes Sequence	0040,0275	X	
Comments on the Performed Procedure Step	0040,0280	X	
Patient’s Birth Date	0010,0032		X
Other Patient’s ID's	0010,1000		X
Other Patient’s Names	0010,1001		X
Ethnic Group	0010,2160		X
Patient Comments	0010,4000		X
Patient's Age	0010,1010		X
Patient's Size	0010,1020		X
Patient's Weight	0010,1030		X
Occupation	0010,2180		X
Additional Patient's History	0010,21B0		X

Support for Additional Standard, Private and Retired attributes:
MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE stores all Additional Standard, Private and Retired attributes in received images.
Retrieval of these attributes is only possible (by means of a C-MOVE request) if the following conditions are satisfied:

- The image was encoded (when MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE was C-STORE SCP) using one of the explicit value representations or

- The image was encoded (when MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE was C-STORE SCP) using implicit value representation and the move destination (i.e. a C-STORE Service Class Provider) has accepted implicit value representation as the only transfer syntax applicable to the storage SOP class of the image (when MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE is C-STORE SCU).

The Response Status Behavior of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE is as described in Table 48. The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 48: Storage C-STORE Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Storage is complete	0000	The image(s) shall be stored in the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database.
Refused	Out of Resources	A700	The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database is full – recovery from this condition is left to the SCU. MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall send a notification, log the condition, and abort the association.
Error	Data set does not match SOP class	A900	The SOP class of the image(s) does not match the negotiated abstract syntax. MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall send a notification, log the condition, and abort the association.
	Cannot understand	C000	The image(s) cannot be parsed. MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall send a notification, log the condition, and abort the association.
Warning	Coercion of Data Elements	B000	N/A
	Elements discarded	B006	N/A
	Data set does not match SOP class	B007	N/A

4.2.1.4.3 Query Local Images

4.2.1.4.3.1 Description and Sequencing of Activities

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept associations from systems that wish to query the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database using the C-FIND command.

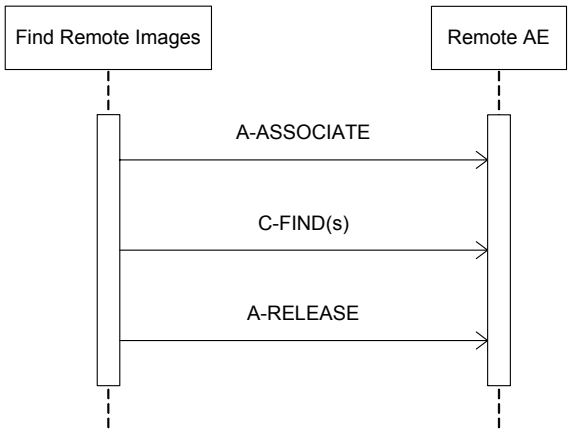


Figure 13: Sequencing of RWA Query Local Images

4.2.1.4.3.2 Accepted Presentation Contexts

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall be able to accept the presentation contexts as SCP, as specified in the next table.

Table 49: Acceptable Presentation Contexts for Query Local Images

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List (note)**	**UID List**		
Patient Root Query /Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Study Root Query /Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

Note : 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 MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP 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.

4.2.1.4.3.3 SOP Specific Conformance for SOP Classes

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard conformance to the Query/Retrieve service class. Relational queries are not supported. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall handle simultaneous C-FIND requests simultaneously.

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

The following Query Keys shall be supported:

Table 50: Supported Query Keys

Query Level	Query Key		Standard Matching
	Name	Tag	
Patient	Patient's Name	(0010,0010)	Yes
	Patient ID	(0010,0020)	Yes
Study	Study Date	(0008,0020)	Yes
	Study Time	(0008,0030)	Yes
	Accession Number	(0008,0050)	Yes
	Study Instance UID	(0020,000D)	Yes
	Study ID	(0020,0010)	Yes
Series	Modality	(0008,0060)	Yes
	Series Instance UID	(0020,000E)	Yes
	Series Number	(0020,0011)	Yes
Image	SOP Instance UID	(0008,0018)	Yes
	Instance Number	(0020,0013)	Yes

When querying optional keys the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE will respond successfully for available keys if queried per **universal matching**; otherwise it will respond with warning.
Note that when querying optional keys with **non-universal matching** the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE will return information using universal matching for those keys.
Note that when a query is performed per Patient/Study Only Query/Retrieve Information Model SOP class on Patient Level, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE always sends back the attribute "Patient's Name" (0010,0010), also when it was not requested.
The response status behavior of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE is as described in Table 51. The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 51: Query/Retrieve C-FIND Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	The C-FIND request handling is completed, no more C-FIND responses are sent.
Refused	Out of Resources	A700	N/A
Failed	Identifier does not match SOP class	A900	N/A
	Unable to process	C000	The C-FIND request cannot be parsed. MultiDiagnost Eleva with Flat Detector logs the reason.
Cancel	Matching terminated due to Cancel Request	FE00	The C-FIND request is cancel, no more C-FIND responses are sent.
Pending	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	FF00	The C-FIND responses are continuing.
	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	FF01	The C-FIND responses are continuing.

4.2.1.4.4 Retrieve Local Images

4.2.1.4.4.1 Description and Sequencing of Activities

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept associations from systems that wish to retrieve images from the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database using the C-MOVE command.

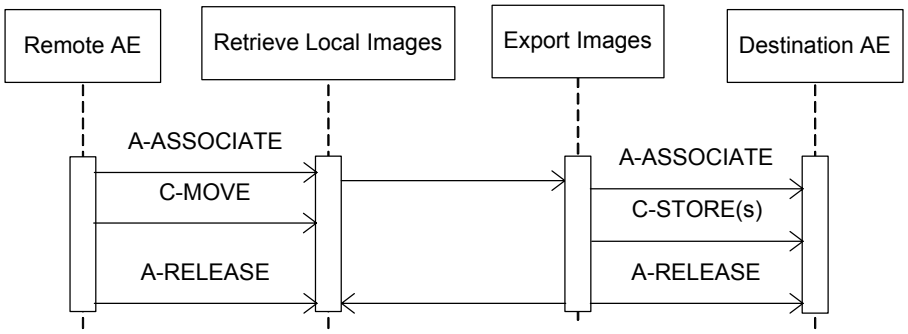


Figure 14: Sequencing of RWA Retrieve Local Images

After RWA Retrieve Local Images the RWA Export Images is started; the RWA Export Images is described in section 4.2.1.3.1.

4.2.1.4.4.2 Accepted Presentation Contexts

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall be able to accept the presentation contexts as specified in the next table.

Table 52: Acceptable Presentation Contexts for Retrieve Local Images

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List (note)	UID List		
Patient Root Query /Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Study Root Query /Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Note : 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 MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP 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.

4.2.1.4.4.3 SOP Specific Conformance for SOP Classes

The response status behavior of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE is as described in Table 53. The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 53: Query/Retrieve C-MOVE Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Sub-operations complete – No Failures	0000	The C-MOVE command has been completed.
Refused	Out of Resources – Unable to calculate number of matches	A701	N/A
	Out of Resources – Unable to perform Sub-operations	A702	N/A
	Move Destination unknown	A801	No C-STORE command will be sent. MultiDiagnost Eleva with Flat Detector logs the reason.
Failed	Identifier does not match SOP class	A900	N/A
	Unable to process	C000	The C-MOVE request cannot be parsed. No Store Command will be sent. MultiDiagnost Eleva with Flat Detector logs the reason.

Service Status	Further Meaning	Error Code	Behavior
Cancel	Sub-operations terminated due to Cancel Indication	FE00	The C-MOVE request is cancelled, no more C-MOVE responses are sent.
Warning	Sub-operations complete – One or more Failures	B000	N/A
Pending	Sub-operations are continuing	FF00	Approximately every 30 seconds to indicate progress.

4.2.2 MultiDiagnost Eleva with Flat Detector ACP AE

The 4.2.2 MultiDiagnost Eleva with Flat Detector ACP Application Entity (MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE) provides Standard Conformance to the following DICOM 3.0 SOP classes as an SCU specified in the Table below.

4.2.2.1 Supported SOP Classes by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE as SCU.

This Application Entity provides extended Standard Conformance to the SOP classes Specified in the next Table.

Table 54: Query Supported SCU SOP Classes by the MultiDiagnost Eleva with Flat Detector ACP AE

SOP Class Name	UID
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP Application Entity does not support DICOM 3.0 SOP classes as a SCP.

4.2.2.2 Association Policies

This section shall contain a description of the General Association Establishment and Acceptance policies of the AE.

4.2.2.2.1 General

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP offers unrestricted max. PDU size on associations initiated by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP. The PDU size is also configurable per remote station.

The DICOM standard application context shall be specified.

Table 55: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

4.2.2.2.2 Number of Associations

The maximum number of simultaneous associations is by default unlimited, but the maximum can be limited via the configuration repository.

4.2.2.2.3 Asynchronous Nature

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP does not support asynchronous operations and will not
perform asynchronous window negotiation.

4.2.2.2.4 Implementation Identifying Information

Following Implementation Class UID and Version Name are defined for the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP.

THE IMPLEMENTATION CLASS UID:	**1.3.46.670589.5.2.23**
THE IMPLEMENTATION VERSION NAME:	**VIEWFORUM R4.2**

4.2.2.2.5 Association Acceptance Policy

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP Application Entity does not handle incoming associations.

4.2.2.2.6 Association Initiation Policy

For each request an association to the peer entity is established.

4.2.2.3 Real – World Activity – Management Worklist (MWL) – FIND

4.2.2.3.1 Association Real – World Activity

For each Broad or specific Worklist request, an association towards the Basic Worklist Management SCP is established and a C-FIND request is transmitted. The Broad query can be configured with a combination of the Matching Keys:

- Scheduled Station AE Title
- Scheduled Procedure Step Start Date
- Modality

Each of the matching keys is optional. The association will be closed on reception of the last C-FIND response. The Worklist Query result is displayed in the Patient List. The query is interruptible if it was triggered by the user.

4.2.2.3.2 Description and Sequencing of Activities

This RWA may be initiated in two ways.

1. After clicking the Query Worklist button the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall request an association with the configured remote Basic Worklist Management SCP.
When the association is accepted the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall send the Broad Query find request, wait for response, and then release the association.

2. After clicking the Patient Query button - entering and confirming the matching key values - the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall request an association with the configured remote Basic Worklist Management SCP.

When the association is accepted the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall send the patient query find request, wait for response, and then release the association.

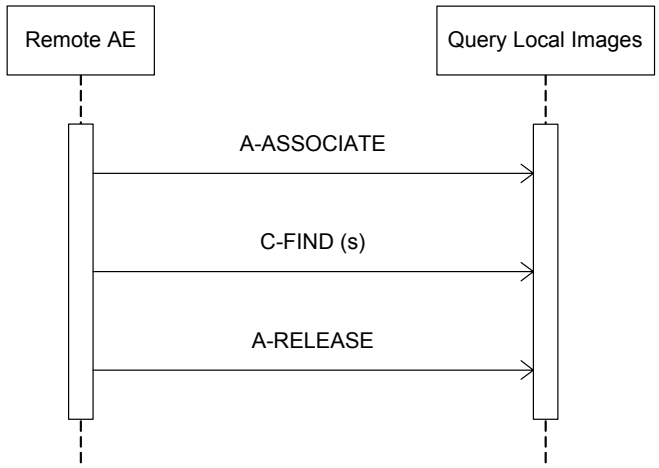


Figure 15: Sequencing of RWA Query Worklist

4.2.2.3.3 SOP Specific Conformance – MWL-FIND

By default, the patient/examination list update is performed by a “Broad” Query with pre-configured matching keys. This MWL query may be performed in the system background and may be disabled. The time interval between subsequent background queries is configurable.
The Broad Query may also be issued by the operator and will be performed from the Patient List User interface.

The table below gives an overview of the Matching Keys for a Broad Query.

Table 56: Matching Keys for Broad Query

Attribute Name	Tag	Note
Scheduled Station AE Title	0040,0001	Configurable of: “ALL” or comma separated list of Application Entity names
Scheduled Procedure Step Start Date	0040,0002	Configurable of: ”ALL”, “<Today”, <Today + Tomorrow”, “<Today + Yesterday”
Modality (type)	0008,0060	“CR”, “OT”, “XA”, “RF”, “DX”, “US”

When Date matching is configured, the Date value is continuously generated from local system time, including nightshift tolerance in the morning hours taking the steps from “<Yesterday”.
The modality type query may be used for environments that do not schedule per individual modality’s AE Title, but for a modality pool.

The optional Patient Based Worklist Query is typically triggered by operator action when a patient arrives at the system for examination. MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP expects the operator to enter the value(s) of the search key(s).

The Table below gives an overview of the Matching Keys for a Patient Query

Table 57: Matching Keys for Patient Query

Matching Keys for Patient Query			
Attribute Name	**Tag**	**Note**	**Wildcard Search (using " * " only**
Patient's Name	0010,0010	Identified from admission form.	Yes
Patient ID	0010,0020	Identified from admission form.	Yes
Accession Number	0008,0040	Identified from admission form.	Yes
Requested Procedure ID	0040,1001	Identified from admission form.	Yes
Scheduled Station AE Title	0040,0001		Yes
Scheduled Procedure Step Start Date	0040,0002	This key may be optionally (default: no) added by the system. Its value is (Configurable) one of: date of <today>, date of <today> and subsequent dates, date of prior to and incl. <today>	No

Wildcard search (using " * " only) is supported for:

- "Patient's Name",
- "Patient ID",
- "Accession Number",
- "Requested Procedure ID", and
- "Scheduled Station AE Title".

The Patient Query can be cancelled after the user has pressed a "Cancel" Button on the User Interface. In this case the DICOM association will be aborted immediately. As the query is performed asynchronously, intermate results are displayed in the meantime.

4.2.2.3.3.1 Patient and Study Merge

The ELEVA looks in its internal database, of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP, for a Study with the same Study Instance UID (0020,000D) as given in the Scheduled Procedure Step (SPS).

If a Study Instance UID match was not found, it looks for a Patient with the same Patient ID (0010,0020) as given in the Scheduled Procedure Step.

If no Patient match is found, a new Patient is created, using attributes from Scheduled Procedure Step.

If Patient with a matching Patient ID was found, attributes are updated for the internal Patient, based on the attributes as given in the Scheduled Procedure Step. A new Study with a Study Instance UID as given in the Scheduled Procedure Step is created.

If a Study Instance UID match was found, all Patient attributes as given in the Scheduled Procedure Step are updated in the internal database for the parent patient
of this study. Study attributes are updated for the internal study based on the attributes as given in the Scheduled Procedure Step.

4.2.2.3.3.2 Scheduled Procedure Step (= Examination) Merge

If the internal database of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP contains no SPS with Scheduled Procedure Step ID (0040,0009) identifying an incoming Scheduled Procedure Step, it creates a new one and creates an corresponding Examination referencing this Scheduled Procedure Step ID.

If the internal database of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP contains already an SPS with the Scheduled Procedure Step ID (0040,0009) identifying an incoming Scheduled Procedure Step, the behaviour depends on the corresponding Examination state.

If the Examination is still “scheduled”, the SPS attributes are compared to the attributes sent with the most recent WLM query. If at least one attribute differs, the scheduled Examination is deleted and re-scheduled. Manual changes the user might have performed on this Examination are lost.

If the Examination has already started, no changes are performed, and the potential changes of the incoming Scheduled Procedure Step are disregarded.

4.2.2.4 Modality Worklist Information Model – FIND SOP Class

Table 58: Modules of the Modality Worklist Information Model – FIND SOP Class

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

Table 59: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – SOP Common Module

Attribute Name	Tag	VR	Note
Specific Character Set	0008, 0005	CS	Configurable: Not queried, or queried as “ISO-IR 100”

Table 60: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Patient Identifier Module

Attribute Name	Tag	VR	Note
Patient’s Name	0010,0010	PN	Displayed. Optional matching key in Patient Query
Patient ID	0010,0020	LO	Displayed. Optional matching key in Patient Query
Patient Other ID’s	0010,1000	LO	Displayed.

Table 61: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Patient Demographic Module

Attribute Name	Tag	VR	Note
Patient's Birth Date	0010,0030	DA	Displayed. Used for calculation of Patient Type.
Patient's Sex	0010,0040	CS	Applied Value(s): F, M, O
Patient's Size	0010,1020	DS	Stored. Used for calculation of Patient Type.
Patient's Weight	0010,1030	DS	Stored. Used for calculation of Patient Type.
Ethnic Group	0010,2160	SH	Displayed.
Patient Comments	0010,4000	LT	Displayed.

Table 62: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Patient Medical Module

Attribute Name	Tag	VR	Note
Medical Alerts	0010,2000	LO	Displayed.
Contrast Allergies	0010,2110	LO	Displayed.
Additional Patient History	0010,21B0	LT	Displayed.
Pregnancy Status	0010,21C0	US	Displayed. Applied Value(s): 0001, 0002, 0003, 0004

Table 63: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Visit Status Module

Attribute Name	Tag	VR	Note
Current Patient Location	0038,0300	LO	Stored.

Table 64: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Schedule Procedure Step Module

Attribute Name	Tag	VR	Note
Scheduled Procedure Step Sequence	0040,0100	SQ	
> Modality	0008,0060	CS	Stored. Optional matching key for Broad and Patient Query
> Requested Contrast Agent	0032,1070	LO	Stored.
> Scheduled AE Title	0040,0001	AE	Stored. Optional matching key for Broad and Patient Query
> Scheduled Procedure Step Start Date	0040,0002	DT	Stored. Displayed until Examination becomes in progress. Optional matching key for Broad and Patient Query
> Scheduled Procedure Step Start Time	0040,0003	TM	Stored. Displayed until Examination becomes in progress.
> Scheduled Procedure Step End Date	0040,0004	DT	
> Scheduled Procedure Step End Time	0040,0005	TM	
> Scheduled Performing Physician's Name	0040,0006	PN	Stored.
> Scheduled Procedure Step Description	0040,0007	LO	Stored. Displayed if configured as source item for code mapping.
> Scheduled Action Item Code Sequence	0040,0008	SQ	Stored. Displayed if configured as source item for code mapping.

Attribute Name	Tag	VR	Note
>> Code Value	0008,0100	SH	Displayed.
>> Coding Scheme Designator	0008,0102	SH	Stored.
>> Coding Scheme Version	0008,0103	SH	Stored.
>> Code Meaning	0008,0104	LO	Stored.
> Scheduled Procedure Step ID	0040,0009	SH	Stored.
> Scheduled Station Name	0040,0010	SH	Stored.
> Scheduled Procedure Step Location	0040,0011	SH	Stored.
> Pre-Medication	0040,0012	LO	Stored.
> Scheduled Procedure Step Status	0040,0020	CS	Stored.
> Comments on the Scheduled Procedure Step	0040,0400	LT	Stored.

Table 65: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Requested Procedure Module

Attribute Name	Tag	VR	Note
Referenced Study Sequence	0008,1110	SQ	Stored.
> Referenced SOP Class UID	0008,1150	UI	Stored.
> Referenced SOP Instance UID	0008,1155	UI	Stored.
Study Instance UID	0020,000D	UI	Stored.
Requested Procedure Description	0032,1060	LO	Stored.
Requested Procedure Code Sequence	0032,1064	SQ	Stored.
> Code Value	0008,0100	SH	Stored. Displayed if configured as source item for code mapping.
> Coding Scheme Designator	0008,0102	SH	Stored.
> Coding Scheme Version	0008,0103	SH	Stored.
> Code Meaning	0008,0104	LO	Stored.
Requested Procedure ID	0040,1001	SH	Stored. Displayed if configured as source item for code mapping. Optional matching key for Patient Query
Patient Transport Arrangements	0040,1004	LO	Stored.
Names of Intended Recipients of Results	0040,1010	PN	Displayed.
Requested Procedure Comments	0040,1400	LT	Stored.

Table 66: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Imaging Service Request Module

Attribute Name	Tag	VR	Note
Accession Number	0008,0050	SH	Displayed. Optional matching key for Patient Query
Referring Physician's Name	0008,0090	PN	Displayed.
Requesting Physician	0032,1032	PN	Displayed.
Requesting Service	0032,1033	LO	Displayed.
Imaging Service Request Comments	0040,2400	LT	Stored.

4.2.2.4.1.1 Proposed Presentation Contexts

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP Application Entity will propose the presentation contexts as given in the next table.

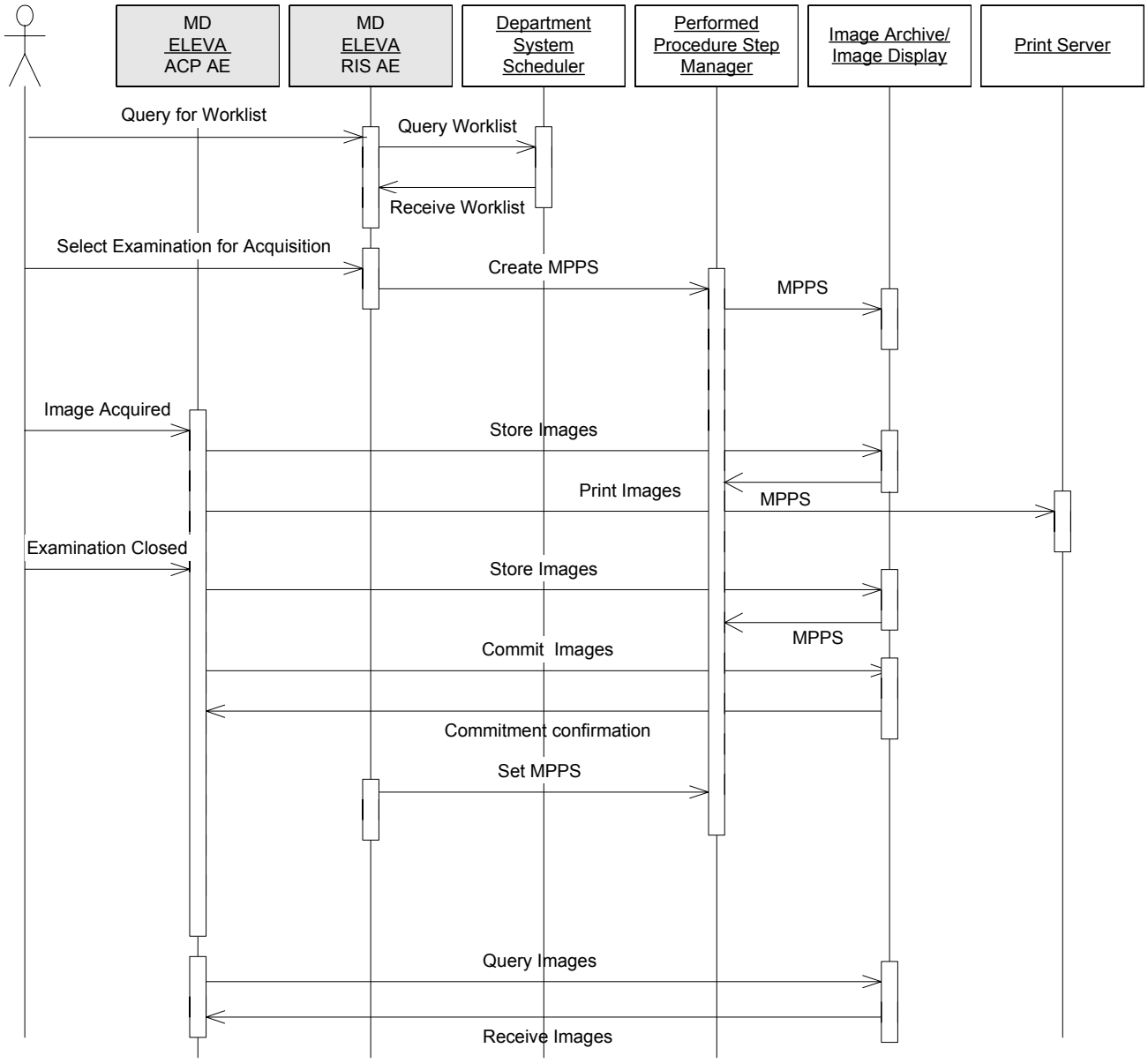
Table 67: Proposed Presentation Contexts MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP MWL SCU

Abstract Syntax	UID	Transfer Syntax	UID List	Role	Ext. Neg.
MWL-FIND	1.2.840.10008.5.1.4.31	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Note: ELE is preferred Transfer Syntax

4.2.2.5 Real–World Activity –Modality Performed Procedure Step (MPPS)

4.2.2.5.1 Association Real – World Activity



An MULTIDIAGNOST ELEVA with FLAT DETECTOR “Examination” is regarded equivalent to a DICOM Procedure Step.
It is scheduled or manually entered before an acquisition is taken, and performed by taking acquisitions.

If scheduled by the RIS, one Examination is the result of one Scheduled Procedure Step. Since an examination may not be re-opened after having been closed and each examination workflow context is enclosed in one **MPPS**, one examination may result in 0:1 MPPS instances.
However, image archiving after the examination’s closure leads to 1:n MPPS instances per examination (append case).

An initial MPPS **IN PROGRESS** message with **N-CREATE** is sent once the first X-Ray Radiation has been released. The system does not generate intermate MPPS IN PROGRESS messages for subsequent acquisitions of this Scheduled Procedure Step / Examination instance.

After the Examination has been closed by the clinical user, the system will change the MPPS status of the related examination to “COMPLETED” and generate a MPPS **COMPLETED** message by **N-SET**. The examination cannot be reopened.
The MultiDiagnost ELEVA with Flat Detectoralso generates MPPS messages for unscheduled examinations.

The clinical user might cancel an unclosed examination at any time.
Depending on the state of the examination and MPPS related system configuration, an MPPS IN PROGRESS message might be already sent (discontinued case) or not (abandoned case).
If not, (abandoned case) the system generates an MPPS IN PROGRESS message.
In both cases the system sends a MPPS **DICONTINUED** message.
The reason for abandoning or discontinuing a procedure step is unspecified.

4.2.2.5.1.1 Sequencing of Performed Procedure Steps

The performed sequence order of scheduled procedure steps may be interchanged by the user.

4.2.2.5.1.2 Interleave of Performed Procedure Steps

MPPS messages may interleave. Depending on the application workflow optimization by the user, an MPPS sequence like this may come up:

MPPS / Inst UID 1: N_CREATE / IN PROGRESS
MPPS / Inst UID 2: N_CREATE / IN PROGRESS
MPPS / Inst UID 3: N_CREATE / IN PROGRESS
...
MPPS / Inst UID 2: N_SET / COMPLETED
MPPS / Inst UID 1: N_SET / COMPLETED
MPPS / Inst UID 3: N_SET / COMPLETED

(i.e.: running multiple procedure steps ‘in parallel’).

4.2.2.5.2 Presentation Context Table

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP will propose the presentation contexts as given in the next table.

Table 68: Proposed Presentation Context for the Verification by the RIS AE

Abstract Syntax	UID	Transfer Syntax	UID List	Role	Ext. Neg.
MPPS	1.2.840.10008.3.1.2.3.3	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Note: For Modality Performed Procedure Step, ELE is preferred.

4.2.2.5.3 SOP Specific Conformance

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP by default derives the specific acquisition protocol from the Scheduled Protocol Code Sequence Items. If this Sequence contains more than one Protocol Code, these codes will be displayed as separate examinations on the UI, but will be handled by one common MPPS instance.

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP supports 3 more (configurable) mapping relations, as shown below:

Table 69: The Configurable Mapping Relations are:

Examination is selected from:			
Attribute Name	**Tag**	**→**	**Note**
Scheduled Procedure Step			
Scheduled Procedure Step Description	0040,0007		
Scheduled Protocol Code Sequence	0040,0008	Code Value	default
Requested Procedure			
Requested Procedure Description	0032,1060		
Requested Procedure Code Sequence	0032,1064	Code Value	

Table 70: The Evaluated Attributes of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP are:

Evaluated Attributes of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP			
Attribute Name	**Tag**	**Evaluated**	**Note**
Coding Scheme Version	0008,0103	No	
Coding Scheme Designator	0008,0102	No	
Code Meaning	0008,0104	No	
Code Value	0008,0100	Yes	for mapping the examination settings

That is, MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP expects, that any used Code Value is unique (unambiguous) within a given RIS domain.

The number of items in the Scheduled Protocol Code Sequence accepted by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP is not limited.

4.2.2.5.3.1 All Supported N-CREATE-RQ Models:

Table 71: MPPS SOP Class - N-CREATE-RQ - SOP Common Module

Attribute Name	**Tag**	**VR**	**Note**
Specific Character Set	0008,0005	CS	ISO_IR 100
SOP Class UID	0008,0016	UI	1.2.840.10008.3.1.2.3.3
SOP Instance UID	0008,0018	UI	

Table 72: MPPS SOP Class - N-CREATE-RQ - Image Acquisition Results Module

Attribute Name	Tag	VR	Note
Modality	0008,0060	CS	Applied Value: RF
Study ID	0020,0010	SH	If scheduled: Req. Procedure ID, else: equipment generated Study identifier
Performed Action Item Code Sequence	0040,0260	SQ	0 length
>Code Value	0008,0100	SH	
>Coding Scheme Designator	0008,0102	SH	
>Coding Scheme Version	0008,0103	SH	
>Code Meaning	0008,0104	LO	
Performed Series Sequence	0040,0340	SQ	
>Retrieve AE Title	0008,0054	AE	
>Series Description	0008,103E	LO	
>Performing Physician's Name	0008,1050	PN	
>Operators' Name	0008,1070	PN	
>Referenced Image Sequence	0008,1140	SQ	
>>Referenced SOP Class UID	0008,1150	UI	Uniquely identifies the referenced SOP Class. This attribute is only used only if Images may be retrieved as Single Image SOP Classes.
>>Referenced SOP Instance UID	0008,1155	UI	Uniquely identifies the referenced SOP Instance. This attribute is only used only if Images may be retrieved as Single Image SOP Classes.
>Protocol Name	0018,1030	LO	
>Series Instance UID	0020,000E	UI	
>Referenced Non-Image Composite SOP Instance Sequence	0040,0220	SQ	
>>Referenced SOP Class UID	0008,1150	UI	
>>Referenced SOP Instance UID	0008,1155	UI	

Table 73: MPPS SOP Class - N-CREATE-RQ – Performed Procedure Step Information Module

Attribute Name	Tag	VR	Note
Procedure Code Sequence	0008,1032	SQ	
>Code Value	0008,0100	SH	
>Coding Scheme Designator	0008,0102	SH	
>Coding Scheme Version	0008,0103	SH	
>Code Meaning	0008,0104	LO	
>Mapping Resource	0008,0105	CS	
>Context Group Version	0008,0106	DT	
>Context Group Local Version	0008,0107	DT	
>Code Set Extension Flag	0008,010B	CS	Applied Value(s): N, Y
>Context Group Extension Creator UID	0008,010D	UI	
>Context Identifier	0008,010F	CS	
Performed Station AE Title	0040,0241	AE	Eleva
Performed Station Name	0040,0242	SH	0 length
Performed Location	0040,0243	SH	0 length
Performed Procedure Step Start Date	0040,0244	DA	
Performed Procedure Step Start Time	0040,0245	TM	
Performed Procedure Step End Date	0040,0250	DA	0 length
Performed Procedure Step End Time	0040,0251	TM	0 length

Attribute Name	Tag	VR	Note
Performed Procedure Step Status	0040,0252	CS	Applied Value(s): COMPLETED, DISCONTINUED, IN PROGRESS
Performed Procedure Step ID	0040,0253	SH	
Performed Procedure Step Description	0040,0254	LO	0 length
Performed Procedure Type Description	0040,0255	LO	0 length

Table 74: Proposed MPPS SOP Class - N-CREATE-RQ – Performed Procedure Step Relationship Module

Attribute Name	Tag	VR	Note
Referenced Patient Sequence	0008,1120	SQ	
>Referenced SOP Class UID	0008,1150	UI	Uniquely indentifies the referenced SOP Class. Required if Referenced Patient Sequence (0008:1200) is sent. Applied Value(s): 1.2.840.10008.3.1.2.1.1
>Referenced SOP Instance UID	0008,1155	UI	Uniquely indentifies the referenced SOP Instance. Required if Referenced Patient Sequence (0008:1120) is sent.
Patient's Name	0010,0010	PN	
Patient ID	0010,0020	LO	
Patient's Birth Date	0010,0030	DA	
Patient's Sex	0010,0040	CS	
Scheduled Step Attribute Sequence	0040,0270	SQ	
>Accession Number	0008,0050	SH	
>Referenced Study Sequence	0008,1110	SQ	0 length if unscheduled
>>Referenced SOP Class UID	0008,1150	UI	
>>Referenced SOP Instance UID	0008,1155	UI	
>Study Instance UID	0020,000D	UI	
>Requested Procedure Description	0032,1060	LO	
>Scheduled Procedure Step Description	0040,0007	LO	
>Scheduled Protocol Code Sequence	0040,0008	SQ	
>>Code Value	0008,0100	SH	
>>Coding Scheme Designator	0008,0102	SH	
>>Coding Scheme Version	0008,0103	SH	
>>Code Meaning	0008,0104	LO	
>>Mapping Resource	0008,0105	CS	
>>Context Group Version	0008,0106	DT	
>>Context Group Local Version	0008,0107	DT	
>>Code Set Extension Flag	0008,010B	CS	Applied Value(s): N, Y
>>Context Group Extension Creator UID	0008,010D	UI	
>>Context Identifier	0008,010F	CS	
>Scheduled Procedure Step ID	0040,0009	SH	
>Requested Procedure ID	0040,1001	SH	

Table 75: MPPS SOP Class - N-CREATE-RQ - Radiation Dose Module

Attribute Name	Tag	VR	Note
Image Area Dose Product	0018,115E	DS	See Note
Total Time Of Fluoroscopy	0040,0300	US	See Note
Total Number of Exposures	0040,0301	US	See Note
Entrance Dose	0040,0302	US	See Note

Note: Not sent in case of appended MPPS instances

4.2.2.5.3.2 All Supported N-SET-RQ Models:

Table 76: MPPS SOP Class - N-SET-RQ - SOP Common Module

Attribute Name	Tag	VR	Note
SOP Class UID	0008,0016	UI	1.2.840.10008.3.1.2.3.3
SOP Instance UID	0008,0018	UI	

Table 77: MPPS SOP Class - N-SET-RQ - Image Acquisition Results Module

Attribute Name	Tag	VR	Note
Performed Protocol Code Sequence	0040,0260	SQ	1 item only
> Code Value	0008,0100	SH	
> Coding Scheme Designator	0008,0102	SH	
> Coding Scheme Version	0008,0103	SH	
> Code Meaning	0008,0104	SH	
Performed Series Sequence	0040,0340	SQ	One or more items
> Retrieve AE Title	0008,0054	AE	Zero length
> Series Description	0008,103E	LO	Zero length
> Performing Physician's Name	0008,1050	PN	Zero length
> Operator's Name	0008,1070	PN	Name(s) of the operator(s)
> Referenced Image Sequence	0008,1140	SQ	
>> Referenced SOP Class UID	0008,1150	UI	Presently only RF class
>> Referenced SOP Instance UID	0008,1155	UI	
> Protocol Name	0018,1030	LO	Copy of Performed Protocol Code Sequence → Code Value
> Series Instance UID	0020,000E	UI	
> Referenced Standalone SOP Instance Sequence	0040,0220	SQ	Zero length

Table 78: MPPS SOP Class - N-SET-RQ - Performed Procedure Step Information Module

Attribute Name	Tag	VR	Note
Procedure Code Sequence	0008,1032	SQ	
> Code Value	0008,0100	SH	
> Coding Scheme Designator	0008,0102	SH	
> Coding Scheme Version	0008,0103	SH	
> Code Meaning	0008,0104	LO	
Performed Procedure Step End Date	0040,0250	DA	
Performed Procedure Step End Time	0040,0251	TM	
Performed Procedure Step Status	0040,0252	CS	Applied Value(s):

Attribute Name	Tag	VR	Note
			COMPLETED, DISCONTINUED
Performed Procedure Step Description	0040,0254	LO	Zero length
Performed Procedure Type Description	0040,0255	LO	

Table 79: MPPS SOP Class - N-SET-RQ - Radiation Dose Module

Attribute Name	Tag	VR	Note
Image Area Dose Product	0018,115E	DS	Not accumulating: re-processed images, non-digital images. See Note
Total Time Of Fluoroscopy	0040,0300	US	See Note
Total Number of Exposures	0040,0301	US	Not counting: re-processed images. See Note
Entrance Dose	0040,0302	US	See Note

Note: Not sent in case of appended MPPS instances

4.3 NETWORK INTERFACES

4.3.1 Physical Network Interface

The MD ELEVA with FLAT DETECTOR (MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE and the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE) application provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of [DICOM].

MD ELEVA with FLAT DETECTOR inherits its TCP/IP stack from Windows XP (i.e. the operating system platform).

MD ELEVA with FLAT DETECTOR supports a single network interface: Ethernet ISO.8802-3.

With standard supported physical medium include:

- IEEE 802.3 10BASE-TX
- IEEE 802.3 100BASE-TX (Fast Ethernet)
- IEEE 802.3 1000BASE-X (Fiber Optic Gigabit Ethernet).

4.4 CONFIGURATION

The MultiDiagnost Eleva with Flat Detector system is configured by means of a configuration program.
This program is accessible at start-up of the MultiDiagnost Eleva with Flat Detector system. It is password protected and intended to be used by Philips Customer Support Engineers only.

The configuration program shall prompt the Customer Support Engineer to enter configuration information as required by the MultiDiagnost Eleva with Flat Detector application.

4.4.1 AE Title/Presentation Address Mapping

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

4.4.1.1 Local AE Titles

The MD ELEVA with FLAT DETECTOR exits of two Application Entity titles and two IP addresses. One for the MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS AE and one for the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE.
At installation the Customer Support Engineer can change the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE host name.
The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE can be changed independently.

The MultiDiagnost Eleva with Flat Detector ACP AE listens on **port 3010** (default**).**

Table 80: AE Title Configuration Table

Application Entity	Default AE Title	Default TCP/IP Port
MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE	<IP host name MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP>	3010 *
MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS AE	<IP host name MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS >	Configurable

*Note: * Not configurable.*

4.4.1.2 Remote AE Title/Presentation Address Mapping

4.4.1.2.1 Remote Association Initiators

All relevant remote applications able to setup a DICOM association towards MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE and MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS AE must be configured at MultiDiagnost Eleva with Flat Detector configuration time.

The Customer Support Engineer (CSE) must provide the following information for each remote application:

- The **Application Entity Title**.
- The **SOP Classes** and **Transfer Syntaxes** for which MultiDiagnost Eleva with Flat Detector ACP AE accepts associations.

4.4.1.2.2 Remote Association Acceptors

The following information must be provided for all relevant remote applications that are able to accept DICOM associations from MultiDiagnost Eleva with Flat Detector RIS 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 Specified Operational Parameters

The specification of important operational parameters, and if configurable, their default value and range, shall be specified here.

The configuration parameters like SOP Classes and Transfer Syntaxes to be used are given in Table 4.

The configuration parameters for the MultiDiagnost Eleva with Flat Detector ACP are given in Table 81, and categorized in the following sections for the MultiDiagnost Eleva with Flat Detector ACP:

- General Parameters.
- Local Configurable Parameters.
- Remote Configurable Parameters.
- General Print Parameters.
- Printer Specific Print Parameters.

Table 81: Configuration Parameters table

Parameter	Configurable	Default Value
General Parameters		
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	No	-
General DIMSE level time-out values	No	-
Time-out waiting for response to TCP/IP connect request. (Low-level timeout)	No	-
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	No	-
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	No	-
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	-
Local Configurable Parameters		
Size constraint in maximum object size	No	-
Maximum PDU size the AE can receive	Yes	0 (unlimited)
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	0 (unlimited)
Maximum PDU size the AE can send	No	-
AE specific DIMSE level time-out values	No	-
Number of simultaneous associations by Service and/or SOP class	No	-
SOP class support	Yes	none
Transfer Syntax support	Yes	ELE
Storage Commitment request must be sent after Storage request	Yes	not
Storage Commitment time-out (synchronous to asynchronous)	Yes	none
Automatic conversion of images of SOP classes not supported by remote systems into Secondary Capture Image Storage SOP instances	Yes	convert to SC
Export of pure DICOM images (i.e. only the standard DICOM attributes as defined in the related IOD) or extended DICOM images (with additional Standard DICOM, Private and Retired attributes)	Yes	allow all attributes
Support of overlays for DICOM node not supporting Presentation State objects [2]	Yes	enabled
Support of overlays for DICOM node supporting Presentation State objects [2]	Yes	disabled
Support of overlays for CD [2]	Yes	disabled
General Print Parameters		
The DICOM printers that may be selected by the operator	Yes	none
Printer Specific Print Parameters [3]		
Medium type	Yes	all available
Film size ID (i.e. media size)	Yes	all available
Resolution (300 / 600 dpi)	Yes	300
Color model (8 / 16 bits color)	Yes	8
Min Density	Yes	0
Max Density	Yes	0

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

Note 2: The MultiDiagnost Eleva with Flat Detector Copy-tool can override the configured setting of overlay support.

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

5 MEDIA INTERCHANGE

5.1 Implementation Model

The Implementation Model identifies the DICOM Application Entities in a specific implementation, and relates the Application Entities to Real-World Activities.

5.1.1 Application Data Flow

The MD ELEVA with FLAT DETECTOR consists of one single application entity only: the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP Application Entity.

Figure 16 shows the Media Interchange Application Data Flow as a functional overview of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for CD-R and DVD.

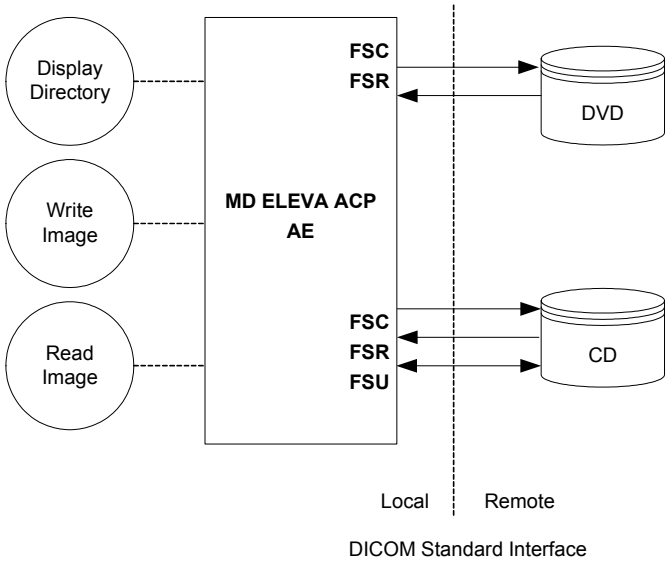


Figure 16: Media Interchange Application Data Flow Diagram

Table 88 shows the Media Interchange overview of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP and the supporting roles for CD-R and DVD.

Table 82: media Services table

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

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP will act as a FSR, for CD-R and DVD, when reading the directory of the medium.
The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP will act as a FSC / FSU for a CD-R and as FSC for DVD, when writing the selected images in a patient folder onto the medium.
MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE supports the media profiles as shows in the Table below:

Table 83: media Profiles supported by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP

Application Profile	CD	DVD+RW / DVD+R
General Purpose	STD-GEN-CD	STD-GEN-DVD

Note; DVD-R and DVD-RW can be read but are not supported for writing.

Supported Photometric Interpretations
The MD ELEVA with FLAT DETECTOR supports images with the following DICOM Photometric Interpretations as shows in the Table below:

Table 84: Photometric interpretations supported by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP

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 Table below.

Table 85: Transfer Syntaxes of DVD / CD supported by MD ELEVA with FLAT DETECTOR

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

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

MD ELEVA with FLAT DETECTOR supports images with Lossy image compression via JPEG as described as shows in the Table below.

Table 86: JPEG coding supported by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP

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 MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE supports this only for Ultrasound Images.

5.1.2 Functional Definitions of AE's

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

5.1.2.1 Functional Definition of MultiDiagnost ELEVA with Flat Detector ACP

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP is the one and only application entity within MD ELEVA with Flat Detector. It includes the following service class.

Media Storage Service Class for CD and DVD

The MULTIDIAGNOST ELEVA with FLAT DETECTORACP can perform the CD-R media Storage service as SCU, with capabilities for:
RWA Display Directory (as FSR),
RWA Write Images (as FSC / FSU), and
RWA Read Images (as FSR).

For DVD the MULTIDIAGNOST ELEVA with FLAT DETECTORACP can perform the media Storage service as SCU, with capabilities for:
RWA Display Directory (as FSR),
RWA Write Images (as FSC), and
RWA Read Images (as FSR).

5.1.3 Sequencing of Real World Activities

Whenever a CD or DVD has to written the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP first tries to read the DICOMDIR. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP will compile the updated DICOMDIR and any required DICOM images into a CD or DVD session image; this CD or DVD session image will be written to CD or DVD disk.

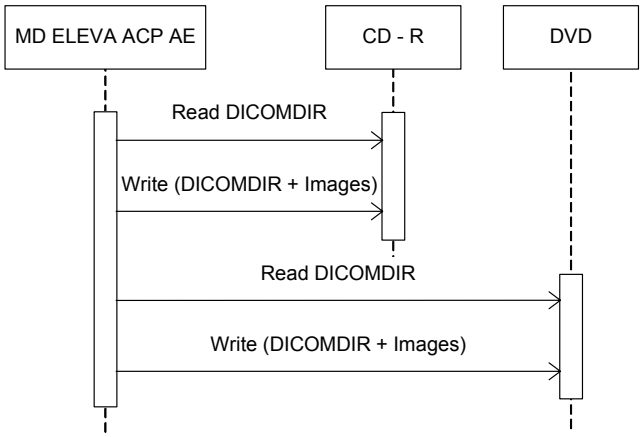


Figure 17: Sequencing of RWA Write Images

5.1.4 File Meta Information for Implementation Class and Version

This section shall be used to list the values assigned to the File Meta Information attributes (ref. [DICOM] PS 3.10) that pertain to the Implementation Class and Version.

The Implementation Class UID and the Implementation Version Name in the File Meta Header are as specified for Networking (ref. Table 9 in section 4.2.1.2.4).

Table 87: DICOM Implementation Class and Version for MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP

Implementation Class and Version	
File Meta Information Version	00, 01
Implementation Class UID	1.3.46.670589.5.2.23
Implementation Version Name	ViewForum R4.2

5.2 AE Specifications

The next section in the DICOM Conformance Statement contains the specification of the one and only MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP Application Entity.

5.2.1 MultiDiagnost Eleva with Flat Detector ACP

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP 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) and
the media Storage Application Profiles STD-GEN-DVD-JPEG ([DICOM] PS 3.12)
for Reading and Writing.

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE supports multi-patient and multi-session CD-R / DVD disks, both for Reading and Writing.

Supported media by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE are:

- **CD:** CD R / CD RW with the profile: STD-GEN-CD and
- **DVD:** DVD+R and DVD+RW with the profile: STD-GEN-DVD-JPEG and the Transfer Syntax ELE uncompressed.

The DVD - R and DVD - RW media can be Read but are NOT supported for Writing.

The supported Application Profiles, their Roles and the Service Class (SC) options, all defined in DICOM terminology, are listed in Table 88.

Table 88: AE Related Application Profiles, Real-World Activities, and Roles for CD-R and DVD

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

Only adding on instances is supported for the FSU, deleting is not supported.

5.2.1.1 File Meta Information for the

The Source Application Entity Title is configurable (see ref. section 5.4 Media Configuration).

5.2.1.2 Real-World Activities

5.2.1.2.1 Display Directory

When a database open action is initiated on the CD-R or DVD then MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP acts as an FSR using the interchange option to read the DICOMDIR of the CD-R or DVD medium.

This will result in an overview of the patients, studies, series and images on the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP screen.

5.2.1.2.1.1 Media Storage Application Profile

As depicted in Table 88, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP supports the RWA Display Directory for the STD-GEN-CD and the STD-GEN-DVD-JPEG Application Profile.

5.2.1.2.1.1.1 Options

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

5.2.1.2.2 Write Images

When an image transfer to CD-R or DVD is initiated then the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP acts as an FSC or FSU (CD-R only) using the interchange option to export SOP Instances from the local database to a CD-R or DVD medium.

5.2.1.2.2.1 Media Storage Application Profile

As depicted in Table 88, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP supports the RWA Write Images for the STD-GEN-CD and the STD-GEN-DVD-JPEG Application Profile.

5.2.1.2.2.1.1 Options

The same remarks as in section 4.2.1.3.1.3 about the existence of Optional, Retired and Private Attributes are applicable.
The DICOMDIR file will be extended when new images are written. In case some attributes are not present in an image but are specified as mandatory in the DICOMDIR definition in DICOM media, a generated value will be filled in.

Implementation remarks and restrictions
When writing the DICOMDIR records, key values are generated when no value of the corresponding attribute is supplied, according to the following table.

Table 89: Generated Keys

Key	Tag	Generated Value
Patient Keys		
Patient ID	(0010,0020)	At import MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP each time creates a new value based on the Study Instance UID for each new study written to the CD-R / DVD (even if this study belongs to a patient recorded earlier). Otherwise the default-generated value shall be a succession of “UNKNOWN”, the Patient’s Name, the Patient’s Birth Date, and the Patient’s Sex, concatenated by using underscore characters.
Study Keys		
Study Date	(0008,0020)	Date on which this Study was created.
Study Time	(0008,0030)	Time on which this Study was created.
Study ID	(0020,0010)	“UNKNOWN”
Series Keys		
Series Number	(0020,0011)	1
Image Keys		
Instance Number	(0020,0013)	1

The default value for the Pixel Intensity Relationship (0028,1040) is set to DISP.
MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP can write Volumes of the media to that media.
MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP asks for a new media if media is spanning over more CD-R / DVD disks.

5.2.1.2.3 Read Images

When an image transfer from CD-R or DVD is initiated then the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP acts as an FSR using the interchange option to import SOP Instances from the CD-R / DVD mdum.

5.2.1.2.3.1 Media Storage Application Profile

As depicted in Table 88, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP supports the RWA Read Images for the STD-GEN-CD and STD-GEN-DVD-JPEG Application Profile.

5.2.1.2.3.1.1 Options

The mandatory attributes of the DICOM images are required for the correct storage of the images in the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP internal image database.

Optional attributes and Retired / Private attributes are stored too – if present; this is equivalent with the level 2 (Full) conformance for the Storage service class in the Network support; ref. section 4.2.1.4.2.

The same remarks as in section 4.2.1.4.2.3 about the storage of images and about requirements to process read images via the dcated MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP application functions are applicable.

5.3 Augmented and Private Application Profiles

This section shall be used for the description of Augmented and Private Application Profiles.

5.3.1 Augmented Application Profiles

None.

5.3.2 Private Application Profiles

None.

5.4 Media Configuration

Any configuration issues may be found in the Networking section 4.4 CONFIGURATION.

6 SUPPORT OF CHARACTER SETS

When the MD ELEVA with FLAT DETECTOR receives images with undefined character set then the import will be terminated with error status code.

The MD ELEVA with FLAT DETECTOR supports the extended character set ISO IR 100, which is the Latin alphabet No 1, supplementary set.

The default Factory Settings for the WLM query request attribute "Specific Character set (0008,0005)" is "NO" and should be configured to support the “” 27H Character.

7 SECURITY

7.1 Security Profiles

None supported.

7.2 Association level security

Any calling AE title and/or IP address may open an association.

7.3 Application level security

The MD ELEVA with FLAT DETECTOR does not supports the HIPAA Audit trail profile.

8 ANNEXES

8.1 IOD Contents

This section specifies each IOD created by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE to be exported as UnProcessed / Processed Images.

- All supported IOD's can be converted (if configured) to a Secondary Capture Image Storage SOP Class, section 8.1.1.1
- X-Ray Radiofluoroscopic Image Storage SOP Class,section 8.1.1.2 (Processed Mode)
- Grayscale Softcopy Presentation State (AS LAST SEEN / NEW AT IMPORT), section 8.1.1.3
- Grayscale Softcopy Presentation State Object of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE, (AS AQUIRED) section 8.1.1.4
- SOP Instances in Captured Image(s). section 8.1.2
- Captured Image as Photo(s).section 8.1.2.1
- Captured Image(s) as Original section 8.1.2.2

8.1.1 SOP Instances MultiDiagnost ELEVA with flat Detector

This section specifies each IOD to be exported by the **MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE.**
This can take place as UNPROCESSED RAW data and PROCESSED data as RF.

If the remote system does not support the import of a specific Image Storage SOP Class, the MultiDiagnost Eleva with Flat Detector ACP AE will convert (if configured to do so) these images and sends them via the SC Image SOP Class.
The Imported Images should only be used for viewing purposes.

Used abbreviations are:

Used Presentation Values:

ALWAYS	the module or attribute shall always be present with value
ANAP	Attribute Not Always Present
ANAPC	Attribute Not Always Present but under Condition
VNAP	Value Not Always Present (attribute sent zero length if no value is present)
EMPTY	Attribute is sent without a value
MAYBE	the module may be present under specified condition
OPTIONAL	the module may be available, depending on source object

Used Source Items:

AUTO	the attribute value is generated automatically
CONF	the attribute value source is a configurable parameter
IMPL	the attribute value source is a user-implicit configuration setting
MPPS	the attribute value source is a Modality Performed Procedure Step
MWL	the attribute value source is a Modality Worklist
SPEC	the attribute value source is a specific DICOM object
USER	the attribute value source is explicit user input

8.1.1.1 Secondary Capture Image Storage SOP Class for the MD ELEVA Processed Mode

Table 90: Modules of the Secondary Capture Image Storage SOP Class

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module	Table 91	ALWAYS
Study	General Study Module	Table 92	ALWAYS
Series	General Series Module	Table 94	ALWAYS
Equipment	General Equipment Module	Table 95	ALWAYS
	SC Equipment Module	Table 93	ALWAYS
Image	General Image Module	Table 96	ALWAYS
	Image Pixel Module	Table 97	ALWAYS
	SC Image Module	Table 98	ALWAYS
	SOP Common Module	Table 99	ALWAYS

Table 91: Secondary Capture Image Storage SOP Class - Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN		ALWAYS	AUTO
Patient’s ID	0010,0020	LO		VNAP	AUTO
Patient's Birth Date	0010,0030	DA		VNAP	AUTO
Patient's Sex	0010,0040	CS	Applied Value(s): F, M, O	VNAP	AUTO

Table 92: Secondary Capture Image Storage SOP Class - General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	0020,000D	UI		ALWAYS	AUTO
Study Date	0008,0020	DA	Date on which this Study was created.	ALWAYS	AUTO
Study Time	0008,0030	TM	Time on which this Study was created.	ALWAYS	AUTO
Accession Number	0008,0050	SH		VNAP	AUTO
Referring Physician’s Name	0008,0090	PN		VNAP	AUTO
Study Description	0008,1030	LO		VNAP	AUTO
Study ID	0020,0010	SH		ALWAYS	AUTO

Table 93: Secondary Capture Image Storage SOP Class - SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	0008,0060	CS	OT	ALWAYS	AUTO
Conversion Type	0008,0064	CS	WSD	ALWAYS	AUTO

Table 94: Secondary Capture Image Storage SOP Class - General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Instance UID	0020,000E	UI		ALWAYS	AUTO
Series Number	0020,0011	IS		ALWAYS	AUTO
Laterality	0020,0060	CS	Applied Value(s): L, R	VNAP	AUTO
Series Date	0008,0021	DA	Date the Series started	ALWAYS	AUTO
Series Time	0008,0031	TM	Time the Series started	ALWAYS	AUTO
Performing Physicians' Name	0008,1050	PN		VNAP	AUTO
Protocol Name	0018,1030	LO		ANAP	AUTO
Referenced Performed Procedure Step_Sequence	0008,1111	SQ		ANAP	AUTO
>Referenced SOP Class UID	0008,1150	UI	Required if Referenced Study Component Sequence (0008:1111) is sent.	ALWAYS	AUTO
>Referenced SOP Instance UID	0008,1155	UI	Required if referenced Study Component Sequence (0008:1111) is sent.	ALWAYS	AUTO
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO
Performed Procedure Step ID	0040,0253	SH		ALWAYS	AUTO
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO
>Scheduled Procedure Step ID	0040,0009	SH		MAYBE	AUTO
>Requested Procedure ID	0040,1001	SH		MAYBE	AUTO

Table 95: Secondary Capture Image Storage SOP Class - General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO
Institution Name	0008,0080	LO		ALWAYS	AUTO
Station Name	0008,1010	SH	Eleva	ALWAYS	AUTO
Manufacturer's Module Name	0008,1090	LO	Extended Digital Imaging	ALWAYS	AUTO
Device Serial Number	0018,1000	LO	DSI R6.1.1	ALWAYS	AUTO
Software Versions	0018,1020	LO	CRISP R1.0.1 PMS1.1 MIMIT EVIIMDictionary PMS1.1 MIMIT PIIMDICTIONARY PMS1.1 MIMIT EVIIMDictionary	ALWAYS	AUTO

Table 96: Secondary Capture Image Storage SOP Class - General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	0008,0008	CS	ORIGINAL, PRIMARY, SINGLE PLANE	ALWAYS	AUTO
Instance Number	0008,0013	IS		ALWAYS	AUTO

Acquisition Date	0008,0022	DA		ANAP	AUTO
Content Date	0008,0023	DA		ALWAYS	AUTO
Acquisition Time	0008,0032	TM		ALWAYS	AUTO
Content Time	0008,0033	TM		ALWAYS	AUTO
Acquisition Number	0020,0012	IS		ALWAYS	AUTO
Instance Number	0020,0013	IS		ALWAYS	AUTO
Patient Orientation	0020,0020	CS	Always zero length value	ALWAYS	AUTO

Table 97: Secondary Capture Image Storage SOP Class - Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	CS	Monochrome2	ALWAYS	AUTO
Row	0028,0010	US	1024	ALWAYS	AUTO
Columns	0028,0011	US	1024	ALWAYS	AUTO
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO
Bits Stored	0028,0101	US	14	ALWAYS	AUTO
High Bit	0028,0102	US	13	ALWAYS	AUTO
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO
Pixel Data	7FE0,0010	OW		ALWAYS	AUTO

Table 98: Secondary Capture Image Storage SOP Class - SC Image Module

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

Table 99: Secondary Capture Image Storage SOP Class - SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP	CONF
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.1.7	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO

8.1.1.2 **X-Ray RadioFluoroscopic** SOP Class for the **MD ELEVA Processed Mode**

The following tables give a detailed overview of all supported attributes of the XRF Storage SOP Class for the Processed Mode with or without Overlays. The list of possible values are given. The situation that an attribute is present conditionally / optionally or that an attribute may contain a zero length value, is indicated too. Conditions and Defined / Enumerated Values of DICOM 3.0 are applicable but are not shown in the tables.

Table 100: Modules of the X-Ray RadioFluoroscopic Image Storage SOP Class

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module	Table 101	ALWAYS
Study	General Study Module	Table 102	ALWAYS
Series	General Series Module	Table 103	ALWAYS
Equipment	General Equipment Module	Table 104	ALWAYS
Image	Image Pixel Module	Table 109	ALWAYS
	General Image Module	Table 108	ALWAYS
	Cine Module	Table 105	ALWAYS
	Multi-Frame	Table 106	ALWAYS
	Display Shutter Module	Table 107	ALWAYS
	Overlay Plane	Table 112	CONDITIONAL
	XRF Positioner	Table 111	ALWAYS
	X-ray Image Module	Table 110	ALWAYS
	X-Ray Acquisition Module	Table 113	ALWAYS
	SOP Common Module	Table 114	ALWAYS
	VOI LUT Module	Table 115	OPTIONAL

Table 101: XRF Image Storage SOP Class - Patient Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN	Received from RIS or Entered by Operator	ALWAYS	AUTO
Patient ID	0010,0020	LO	Received from RIS or Entered by Operator	VNAP	AUTO
Patient's Birth Date	0010,0030	DA	Received from RIS or Entered by Operator	VNAP	AUTO
Patient's Sex	0010,0040	CS	Received From RIS or Entered by Operator. F,M,O	VNAP	AUTO

Table 102: XRF Image Storage SOP Class - General Study Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	0020,000D	UI	Generated at the creation of the study or received from RIS.	ALWAYS	AUTO
Study Date	0008,0020	DA	Date on which this Study was created.	ALWAYS	AUTO
Study Time	0008,0030	TM	Time on which this Study was created.	ALWAYS	AUTO
Accession Number	0008,0050	SH	Zero length if not received from RIS	VNAP	AUTO
Referring Physician's Name	0008,0090	PN	Zero length if not received from RIS	VNAP	AUTO
Study Description	0008,1030	LO		VNAP	AUTO
Study ID	0020,0010	SH	Undefined	ALWAYS	AUTO

Table 103: XRF Image Storage SOP Class - General Series Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA	Date the Series started.	ALWAYS	AUTO
Series Time	0008,0031	TM	Time the Series started.	ALWAYS	AUTO
Modality	0008,0060	CS	RF	ALWAYS	AUTO
Performing Physicians' Name	0008,1050	PN	Received from RIS, entered by user or is empty if not known.	VNAP	AUTO
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO
> Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.3	ALWAYS	AUTO
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
Protocol Name	0018,1030	LO		VNAP	AUTO
Series Instance UID	0020,000E	UI		ALWAYS	CONF
Series Number	0020,0011	IS		VNAP	AUTO
Laterality	0020,0060	CS	Always zero length value.	MAYBE	AUTO
Performed Procedure Step Start Date	0040,0244	DA		VNAP	AUTO
Performed Procedure Step Start Time	0040,0245	TM		VNAP	AUTO
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO
Performed Procedure Step Description	0040,0254	LO		VNAP	AUTO
Request Procedure Sequence	0040,0275	SQ		ANAP	AUTO
> Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO
> Scheduled Procedure Step ID	0040,0009	SH		VNAP	AUTO
> Requested Procedure ID	0040,1001	SH		VNAP	AUTO

Table 104: XRF Image Storage SOP Class – General Equipment Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO
Institution Name	0008,0080	LO		ALWAYS	AUTO
Station Name	0008,1010	SH	Eleva	ALWAYS	AUTO
Manufacturer's Model Name	0008,1090	LO	Extended Digital Imaging	ALWAYS	AUTO
Device Serial Number	0018,1000	LO	DSI R6.1.1	ALWAYS	AUTO
Software Versions	0018,1020	LO	CRISP R1.0.1 PMS1.1MIMIT EVIIMDictionary PMS1.1 MIMIT PIIMDICTIONARY PMS1.1 MIMIT EVIIMDictionary	ALWAYS	AUTO

Table 105: XRF Image Storage SOP Class - Cine Module Attributes (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame Time	0018.1063	DS		VNAP	AUTO
Cine Rate	0018,0040	IS		ANAP	AUTO

Table 106:XRF Image Storage SOP Class – Multi-Frame Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Frame	0028,0008	IS		ALWAYS	AUTO
Frame Increment Pointer	0028,0009	AT	00181063	ALWAYS	AUTO

Table 107: XRF Image Storage SOP Class - Display Shutter Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Shutter Shape	0018,1600	CS	RECTANGULAR	ALWAYS	AUTO
Shutter Left Vertical Edge	0018,1602	IS		ANAP	AUTO
Shutter Right Vertical Edge	0018,1604	IS		ANAP	AUTO
Shutter Upper Horizontal Edge	0018,1606	IS		ANAP	AUTO
Shutter Lower Horizontal Edge	0018,1608	IS		ANAP	AUTO

Table 108: XRF Image Storage SOP Class - General Image Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Date	0008,0022	DA		VNAP	AUTO
Content Date	0008,0023	DA		MAYBE	AUTO
Acquisition Time	0008,0032	TM		ANAP	AUTO
Content Time	0008,0033	TM		MAYBE	AUTO
Acquisition Number	0020,0012	IS		VNAP	AUTO
Instance Number	0020,0013	IS		VNAP	AUTO
Patient Orientation	0020,0020	CS		MAYBE	AUTO
Presentation LUT Shape	2050,0020	CS	IDENTITY	VNAP	AUTO

Table 109: XRF Image Storage SOP Class - Image Pixel Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Row	0028,0010	US	1024, 512	ALWAYS	AUTO
Columns	0028,0011	US	1024, 512	ALWAYS	AUTO
Pixel Data	7FE0,0010	OW		ALWAYS	AUTO

Table 110: XRF Image Storage SOP Class – X-Ray Image Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	0008,0008	CS	ORIGINAL, PRIMARY, SINGLE PLANE	ALWAYS	AUTO
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO
Bits Stored	0028,0101	US	14	ALWAYS	AUTO
High Bit	0028,0102	US	13	ALWAYS	AUTO
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO
Pixel Intensity Relationship	0028,1040	CS	DISP	ALWAYS	AUTO

Table 111:XRF Image Storage SOP Class – XRF Positioner Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Distance Source to Detector	0018,1110	DS		ALWAYS	AUTO

Table 112: XRF Image Storage SOP Class - Overlay Plane Module (O)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Overlay Rows	6000,0010	US	512, 1024	ANAP	AUTO
Overlay Columns	6000,0011	US	512, 1024	ANAP	AUTO
Overlay Time	6000,0040	CS	G	ANAP	AUTO
Overlay Origin	6000,0050	SS	1, 1	ANAP	AUTO
Overlay Bits Allocated	6000,0100	US	1	ANAP	AUTO
Overlay Bits Position	6000,0102	US	0	ANAP	AUTO
Overlay Data	6000,3000	OW		ANAP	AUTO

Note: This Overlay Plane Module is only present if Overlays is configured to be supported

Table 113: XRF Image Storage SOP Class – X-Ray Acquisition Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
KVP	0018,0060	DS	Always zero length value.	VNAP	AUTO
Exposure	0018,1152	IS		MAYBE	AUTO
Radiation Setting	0018,1155	CS	GR, SC	ALWAYS	AUTO
Exposure Time	0018,1150	IS	Required if Exposure (0018,1152) is not present.	ANAP	AUTO
X-Ray Tube Current	0018,1151	IS	Required if Exposure (0018,1152) is not present.	ANAP	AUTO
Exposure	0018,1152	IS	Required if either Exposure Time (0018,1150) or X-Ray Tube Current (0018,1151) are not present.	MAYBE	AUTO

Note: In this system up to 3 attributes are sent out together, namely the attributes (0018,1150) "Exposure Time", attributes (0018,1151) "X-Ray Tube Current" and "Exposure " (0018,1152).

Table 114: XRF Image Storage SOP Class – SOP Common Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP	CONF
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.12.2	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO

Table 115: XRF Image Storage SOP Class – VOI LUT Module (O)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	0028,1050	DS	is related to the Contrast / Brightness.	ANAP	AUTO
Window Width	0028,1051	DS	is related to the Contrast / Brightness.	ALWAYS	AUTO

8.1.1.3 Grayscale Softcopy Presentation State (AS LAST SEEN) for the Processed Mode

When the MD ELEVA with FLAT DETECTOR imports a storage object without Presentation State object then it will create a presentation object for this storage object, which it then can use for export with the Presentation Label ”**NEW AT IMPORT**” (if negotiated).

If private Presentation State information exists, then this will be used to create the Presentation State object. Depending on the setup, the MD ELEVA with FLAT DETECTOR may or may not add this Private Presentation State information on export with the Presentation Label ”**AS LAST SEEN**”.

Table 116: Modules of the Grayscale Softcopy Presentation State Storage SOP Class

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module	Table 117	ALWAYS
Study	General Study Module	Table 118	ALWAYS
Series	General Series Module	Table 119	ALWAYS
	Presentation Series Module	Table 122	ALWAYS
Equipment	General Equipment Module	Table 120	ALWAYS
Image	Display shutter module	Table 121	ALWAYS
	Displayed Area Module	Table 125	ALWAYS
	Graphic Layer Module	Table 128	MAYBE
	Graphic Annotation	Table 129	MAYBE
	Softcopy Presentation LUT Module	Table 124	ALWAYS
	Softcopy VOI LUT Module	Table 123	MAYBE
	Presentation State Module	Table 126	ALWAYS
	SOP Common Module	Table 122	ALWAYS

Table 117: Grayscale Softcopy Presentation State Storage SOP Class - Patient Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN		ALWAYS	SPEC
Patient ID	0010,0020	LO		VNAP	SPEC
Patient's Birth Date	0010,0030	DA		VNAP	SPEC
Patient's Sex	0010,0040	CS	Applied Value(s): F, M, O	VNAP	SPEC

Table 118: Grayscale Softcopy Presentation State Storage SOP Class - General Study Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	0008,0020	DA	Date on which this Study was created.	ALWAYS	SPEC
Study Time	0008,0030	TM	Time on which this Study was created.	ALWAYS	SPEC
Accession Number	0008,0050	SH		VNAP	SPEC
Referring Physician's Name	0008,0090	PN		VNAP	SPEC
Study Description	0008,1030	LO		VNAP	SPEC
Study Instance UID	0020,000D	UI		ALWAYS	SPEC
Study ID	0020,0010	SH		VNAP	SPEC

Table 119: Grayscale Softcopy Presentation State Storage SOP Class - General Series Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA	Date the Series started	ALWAYS	AUTO
Series Time	0008,0031	TM	Time the Series started	ALWAYS	AUTO
Performing Physician's Name	0008,1050	PN		VNAP	USER
Referenced Performed Procedure Step_Sequence	0008,1111	SQ		ANAP	AUTO
>Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.3	ALWAYS	AUTO
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
Protocol Name	0018,1030	LO		ANAP	SPEC
Series Number	0020,0011	IS		VNAP	SPEC
Series Instance UID	0020,000E	UI		ALWAYS	AUTO
Laterally	0020,0060	CS	Applied Value(s): L, R	MAYBE	SPEC
Performed Procedure Step Start Date	0040,0244	DT		ALWAYS	SPEC
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	SPEC
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO
Performed Procedure Step Description	0040,0254	LO		VNAP	SPEC
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO
> Requested Procedure ID	0040,1001	SH		ANAP	AUTO
> Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO
> Scheduled Procedure Step ID	0040,0009	SH		MAYBE	AUTO

Table 120: Grayscale Softcopy Presentation State Storage SOP Class - General Equipment Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO
Institution Name	0008,0080	LO	Hospital	ALWAYS	USER
Station Name	0008,1010	SH		ALWAYS	AUTO
Manufacturer's Model Name	0008,1090	LO	ViewForum	ALWAYS	AUTO
Device Serial Number	0018,1000	LO		ALWAYS	AUTO
Software Versions	0018,1020	LO	ViewForum 4.2 PMS1.1 MIMIT EVIIMDictionary	ALWAYS	AUTO

Table 121: Grayscale Softcopy Presentation State Storage SOP Class - DISPLAY Shutter Module (C)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Shutter Shape	0018,1600	CS	RECTANGULAR	ALWAYS	SPEC
Shutter Left Vertical Edge	0018,1602	IS		ANAP	USER
Shutter Right Vertical Edge	0018,1604	IS		ANAP	USER
Shutter Upper Horizontal Edge	0018,1606	IS		ANAP	USER
Shutter Lower Horizontal Edge	0018,1608	IS		ANAP	USER

Table 122: Grayscale Softcopy Presentation State Storage SOP Class - SOP Common Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP	AUTO
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.11.1	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO

Table 123: Grayscale Softcopy Presentation State Storage SOP Class - Softcopy VOI LUT Module (C)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Softcopy VOI LUT Sequence	0028,3110	SQ		ALWAYS	SPEC
> Window Center	0028,1050	DS		ANAP	SPEC
> Window Width	0028,1051	DS		ANAP	SPEC

Table 124: Softcopy PS Storage SOP Class – Softcopy Presentation LUT Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Presentation LUT Shape	2050,0020	CS	INVERSE	ANAP	AUTO

Table 125: Grayscale Softcopy Presentation State Storage SOP Class - Displayed Area Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Displayed Area Selection Sequence	0070,005A	SQ		ALWAYS	AUTO
> Displayed Area Top Left Hand Corner	0070,0052	SL	1, 1	ALWAYS	AUTO
> Displayed Area Bottom Right Hand Corner	0070,0053	SL	1024, 1024	ALWAYS	AUTO
> Presentation Size Mode	0070,0100	CS	SCALE TO FIT	ALWAYS	AUTO
> Presentation Pixel Spacing	0070,0101	DS	Required if Presentation Size Mode (0070,0100) is TRUE SIZE. May be present if Presentation Size Mode (0070,0100) is SCALE TO FIT or MAGNIFY.	ANAP	AUTO
Presentation Pixel Aspect Ratio	0070,0102	IS		ANAP	AUTO

Table 126: Grayscale Softcopy Presentation State Storage SOP Class - Presentation State Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO
> Series Instance UID	0020,000E	UI		ALWAYS	AUTO
> Referenced Image Sequence	0008,1140	SQ		ALWAYS	AUTO
>> Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.5.1.4.1.1.12.2	ALWAYS	AUTO
>> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
Instance Number	0020,0013	IS		ALWAYS	AUTO
Presentation Label	0070,0080	CS	“AS LAST SEEN”, ”NEW AT IMPORT”	ALWAYS	AUTO
Presentation Description	0070,0081	LO		VNAP	AUTO
Presentation Creation Date	0070,0082	DA	Current Date	ALWAYS	AUTO
Presentation Creation Time	0070,0083	TM	Current Time	ALWAYS	AUTO
Presentation Creator’s Name	0070,0084	PN		VNAP	AUTO

Table 127: Grayscale Softcopy Presentation State Storage SOP Class - Presentation Series Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	0008,0060	CS	PR = Presentation State	ALWAYS	AUTO

Table 128: Grayscale Softcopy Presentation State Storage SOP Class - Graphic Layer Module (C)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Graphic Layer Sequence	0070,0060	SQ		ANAP	AUTO
> Graphic Layer	0070,0002	CS	VFGFX	ANAP	AUTO
> Graphic Layer Order	0070,0062	IS		ANAP	AUTO
> Graphic Layer Recommended Display RGB Value	0070,0067	US	FFFF, FFFF, FFFF	ANAP	AUTO
> Graphic Layer Description	0070,0068	LO	ViewForum Graphics	ANAP	AUTO

Table 129: Grayscale Softcopy Presentation State Storage SOP Class - Graphic Annotation Module (C)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Graphic Annotation Sequence	0070,0001	SQ		ANAP	AUTO
> Graphic Layer	0070,0002	CS	Layer created on import VFGFX	ANAP	USER
>Text Object Sequence	0070,0008	SQ		ANAP	USER
>> Bounding Box Annotation Units	0070,0003	CS	PIXEL	ALWAYS	USER
>> Anchor Point Annotation Units	0070,0004	CS	PIXEL	ALWAYS	USER
>> Unformatted Text Value	0070,0006	ST		ANAP	USER
>> Bounding Box Top Left Hand Corner	0070,0010	FL		ALWAYS	USER
>> Bounding Box Bottom Right Hand Corner	0070,0011	FL		ALWAYS	USER
>> Bounding Box Text Horizontal Justification	0070,0012	CS	CENTER, LEFT, RIGHT	ALWAYS	USER

>> Anchor Point	0070,0014	FL		ALWAYS	USER
>> Anchor Point Visibility	0070,0015	CS	N, Y	ALWAYS	USER
> Graphic Object Sequence	0070,0009	SQ		ANAP	USER
>> Graphic Annotation Units	0070,0005	CS	PIXEL	ALWAYS	USER
>> Graphic Dimensions	0070,0020	US		ALWAYS	USER
>> Number of Graphics Points	0070,0021	US		ALWAYS	USER
>> Graphic Data	0070,0022	FL		ALWAYS	USER
>> Graphic Type	0070,0023	CS	CIRCLE, ELLIPSE, INTERPOLATED, POINT, POLYLINE	ALWAYS	USER
>> Graphic Filled	0070,0024	CS	N, Y	ANAP	USER

8.1.1.4 Grayscale Softcopy Presentation State (AS ACQUIRED) for Processed Mode

This section specifies each IOD created by the **MD ELEVA** for the **Processed Mode.**

If private Presentation State information exists, in RAW mode, then the ELEVA DICOM AE will be send the Presentation State object with the Presentation Label ”**AS AQUIRED”**.

Table 130: Modules of the Grayscale Softcopy Presentation State Storage SOP Class

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module	Table 131	ALWAYS
Study	General Study Module	Table 132	ALWAYS
Series	General Series Module	Table 133	ALWAYS
	Presentation Series Module	Table 140	ALWAYS
Equipment	General Equipment Module	Table 134	ALWAYS
Presentation State	Display shutter module	Table 135	ALWAYS
	Displayed Area Module	Table 139	ALWAYS
	Softcopy Presentation LUT Module	Table 138	ALWAYS
	Softcopy VOI LUT Module	Table 137	ALWAYS
	Presentation State Module	Table 141	ALWAYS
	SOP Common Module	Table 136	ALWAYS

Table 131: Softcopy PS Storage SOP Class – C-STORE-RQ - Patient Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN		ALWAYS	SPEC
Patient ID	0010,0020	LO		VNAP	SPEC
Patient's Birth Date	0010,0030	DA		VNAP	SPEC
Patient's Sex	0010,0040	CS	Applied Value(s): F, M, O	VNAP	SPEC

Table 132: Softcopy PS Storage SOP Class – C-STORE-RQ - General Study Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	0008,0020	DA	Date on which this presentation was created.	ALWAYS	SPEC
Study Time	0008,0030	TM	Time on which this presentation was created.	ALWAYS	SPEC
Accession Number	0008,0050	SH		VNAP	SPEC
Referring Physician’s Name	0008,0090	PN		VNAP	SPEC
Study Description	0008,1030	LO		ANAP	SPEC

Study ID	0020,0010	SH		VNAP	SPEC
Study Instance UID	0020,000D	UI		ALWAYS	SPEC

Table 133: Softcopy PS Storage SOP Class – C-STORE-RQ - General Series Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA	Date the Series started	VNAP	SPEC
Series Time	0008,0031	TM	Time the Series started	VNAP	SPEC
Protocol Name	0008,1030	LO		ANAP	AUTO
Performing Physician's Name	0008,1050	PN		VNAP	USER
Referenced Performed Procedure Step_Sequence	0008,1111	SQ		ANAP	AUTO
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
Series Instance UID	0020,000E	UI		ALWAYS	AUTO
Series Number	0020,0011	IS		VNAP	SPEC
Performed Procedure Step Start Date	0040,0244	DT		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	SPEC
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO
>Requested Procedure ID	0040,1001	SH		MAYBE	AUTO
>Scheduled Procedure Step ID	0040,0009	SH		MAYBE	AUTO
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO

Table 134: Softcopy PS Storage SOP Class – C-STORE-RQ - General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO
Institution Name	0008,0080	LO		ALWAYS	USER
Station Name	0008,1010	SH	Eleva	ALWAYS	AUTO
Manufacturer's Model Name	0008,1090	LO	ViewForum	ALWAYS	AUTO
Device Serial Number	0018,1000	LO	DSI R6.1.1	ALWAYS	AUTO
Software Versions	0018,1020	LO	ViewForum 3.2 PMS1.1 MIMIT EVIIMDictionary PMS1.1MIMITPIIMDICTIONARY PMS1.1 MIMIT EVIIMDictionary	ALWAYS	AUTO

Table 135: Grayscale Softcopy Presentation State Storage SOP Class - Shutter Module(M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Shutter Shape	0018,1600	CS	RECTANGULAR	ALWAYS	AUTO
Shutter Left Vertical Edge	0018,1602	IS		ALWAYS	AUTO
Shutter Right Vertical Edge	0018,1604	IS		ALWAYS	AUTO
Shutter Upper Horizontal Edge	0018,1606	IS		ALWAYS	AUTO
Shutter Lower Horizontal Edge	0018,1608	IS		ALWAYS	AUTO

Table 136: Softcopy PS Storage SOP Class – C-STORE-RQ - SOP Common Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP	CONF
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.11.1	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO

Table 137: Softcopy PS Storage SOP Class – C-STORE-RQ - VOI LUT Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Softcopy VOI LUT Sequence	0028,3110	SQ		ALWAYS	AUTO
> Referenced Image Sequence	0008,1140	SQ		ALWAYS	AUTO
>> References SOP Class UID	0008,1150	UI	1.3.46.670589.2.3.1.1	ALWAYS	AUTO
>> References SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
> Window Center	0028,1050	DS		ALWAYS	AUTO
> Window Width	0028,1051	DS		ALWAYS	AUTO

Table 138: Softcopy PS Storage SOP Class – C-STORE-RQ - Softcopy Presentation LUT Module (M)

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

Table 139: Softcopy PS Storage SOP Class – C-STORE-RQ - Displayed Area Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Displayed Area Selection Sequence	0070,005A	SQ		ALWAYS	AUTO
> Displayed Area Top Left Hand Corner	0070,0052	SL	1, 1	ALWAYS	AUTO
> Displayed Area Bottom Right Hand Corner	0070,0053	SL	1024, 1024	ALWAYS	AUTO
> Presentation Size Mode	0070,0100	CS	Applied Value(s): MAGNIFY, SCALE TO FIT, TRUE SIZE	ALWAYS	AUTO
> Presentation Pixel Spacing	0070,0101	DS		ANAPC	AUTO
> Presentation Pixel Aspect Ratio	0070,0102	IS	1, 1	ANAPC	AUTO

Table 140: Softcopy PS Storage SOP Class – C-STORE-RQ - Presentation Series Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	0008,0060	CS	PR	ALWAYS	AUTO

Table 141: Softcopy PS Storage SOP Class – C-STORE-RQ - Presentation State Module (M)

Attribute Name	Tag	VR	Value	Presence of Value	Source
Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO
> Referenced Image Sequence	0008,1140	SQ		ALWAYS	AUTO
>> Referenced SOP Class UID	0008,1150	UI	1.3.46.670589.2.3.1.1, 1.2.840.10008.5.1.4.1.1.12.2	ALWAYS	AUTO
>> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
> Series Instance UID	0020,000E	UI		ALWAYS	AUTO
Instance Number	0020,0013	IS		ALWAYS	AUTO
Content Label	0070,0080	CS	“AS ACQUIRED”	ALWAYS	USER
Content Description	0070,0081	LO		VNAP	AUTO
Presentation Creation Date	0070,0082	DT	Date on which this presentation was created.	ALWAYS	AUTO
Presentation Creation Time	0070,0083	TM	Time on which this presentation was created.	ALWAYS	AUTO
Content Creator's Name	0070,0084	PN		VNAP	AUTO

8.1.2 SOP Instances in Captured Image(s).

On the MultiDiagnost Eleva with Flat Detector it is possible to make Snap Shots from image(s) and exports these Captured Image(s) as Photo or as Original image data.

8.1.2.1 Captured Image as Photo(s).

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

Name	Tag	VR	Presence of Value	Source	Comment
Patient Module (M)					
Patient's Name	0010,0010	PN	ALWAYS	COPY	-
Patient ID	0010,0020	LO	VNAP	COPY	-
Patient's Birth Date	0010,0030	DA	VNAP	COPY	-
Patient's Sex	0010,0040	CS	VNAP	COPY	-
General Study Module (M)					
Study Date	0008,0020	DA	VNAP	COPY	Date on which this Study was created.
Study Time	0008,0030	TM	VNAP	COPY	Time on which this Study was created.
Accession Number	0008,0050	SH	VNAP	COPY	-
Referring Physician's Name	0008,0090	PN	VNAP	COPY	-
Study Description	0008,1030	LO	ALWAYS	USER	-
Study Instance UID	0020,000D	UI	ALWAYS	COPY	-
Study ID	0020,0010	SH	ALWAYS	AUTO	ReviewFolder
General Series Module (M)					
Series Date	0008,0021	DA	ALWAYS	AUTO	-
Series Time	0008,0031	TM	ALWAYS	AUTO	-
Protocol Name	0018,1030	LO	ALWAYS	USER	-
Series Instance UID	0020,000E	UI	ALWAYS	AUTO	-
Series Number	0020,0011	IS	ALWAYS	AUTO	-
Performed Procedure Step Start Date	0040,0244	DA	ALWAYS	COPY	-
Performed Procedure Step Start Time	0040,0245	TM	ALWAYS	COPY	-
General Equipment Module (M)					
Manufacturer	0008,0070	LO	ALWAYS	COPY	Philips Medical Systems
Institution Name	0008,0080	LO	ANAP	COPY	-
Manufacturer's Model Name	0008,1090	LO	ALWAYS	AUTO	ViewForum
Software Version(s)	0018,1020	LO	ALWAYS	AUTO	ViewForum 4.2 PMS1.1 MIMIT EVIIMDictionary

Name	Tag	VR	Presence of Value	Source	Comment
SC Image Equipment Module (M)					
Modality	0008,0060	CS	ALWAYS	AUTO	OT
Conversion Type	0008,0064	CS	ALWAYS	AUTO	WSD
General Image Module (M)					
Image Type	0008,0008	CS	ALWAYS	AUTO	DERIVED, SECONDARY
Acquisition Date	0008,0022	DA	ALWAYS	AUTO	-
Content Date	0008,0023	DA	ALWAYS	AUTO	-
Acquisition Time	0008,0032	TM	ALWAYS	AUTO	-
Content Time	0008,0033	TM	ALWAYS	AUTO	-
Image Pixel Module (M)					
Samples per Pixel	0028,0002	US	ALWAYS	AUTO	3
Photometric Interpretation	0028,0004	CS	ALWAYS	AUTO	RGB
Planar Configuration	0028,0006	US	ALWAYS	AUTO	0
Rows	0028,0010	US	ALWAYS	AUTO	1024
Columns	0028,0011	US	ALWAYS	AUTO	1024
Bits Allocated	0028,0100	US	ALWAYS	AUTO	8
Bits Stored	0028,0101	US	ALWAYS	AUTO	8
High Bit	0028,0102	US	ALWAYS	AUTO	7
Pixel Representation	0028,0103	US	ALWAYS	AUTO	0
Pixel Data	7FE0,0010	OW	ALWAYS	AUTO	-
SOP Common Module (M)					
Specific Character Set	0008,0005	CS	ALWAYS	COPY	-
SOP Class UID	0008,0016	UI	ALWAYS	AUTO	1.2.840.10008.5.1.4.1.1.7 (SC Image)
SOP Instance UID	0008,0018	UI	ALWAYS	AUTO	-

8.1.2.2 Captured Image(s) as Original.

The Captured Images contains the following Modules:

Information Entity	Module Name	Usage
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	Multi-Frame Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	X-ray Image Module	ALWAYS
	X-ray Acquisition Module	ALWAYS
	SOP Common Module	ALWAYS

Name	Tag	VR	Presence of Value	Source	Comment
Patient Module (M)					
Patient's Name	0010,0010	PN	ALWAYS	COPY	-
Patient ID	0010,0020	LO	VNAP	COPY	-
Patient's Birth Date	0010,0030	DA	VNAP	COPY	-
Patient's Sex	0010,0040	CS	VNAP	COPY	-
General Study Module (M)					
Study Date	0008,0020	DA	VNAP	COPY	Date on which this Study was created.
Study Time	0008,0030	TM	VNAP	COPY	Time on which this Study was created.
Accession Number	0008,0050	SH	VNAP	COPY	-
Referring Physician's Name	0008,0090	PN	VNAP	COPY	-
Study Description	0008,1030	LO	ALWAYS	USER	-
Study Instance UID	0020,000D	UI	ALWAYS	COPY	-
Study ID	0020,0010	SH	VNAP	COPY	ReviewFolder
General Series Module (M)					
Series Date	0008,0021	DA	ANAP	AUTO	-
Series Time	0008,0031	TM	ANAP	AUTO	-
Protocol Name	0018,1030	LO	ALWAYS	USER	-
Series Instance UID	0020,000E	UI	ALWAYS	AUTO	-
Series Number	0020,0011	IS	VNAP	AUTO	-
Performed Procedure Step Start Date	0040,0244	DA	ANAP	COPY	-
Performed Procedure Step Start Time	0040,0245	TM	ANAP	COPY	-
General Equipment Module (M)					
Manufacturer	0008,0070	LO	ALWAYS	COPY	Philips Medical Systems
Institution Name	0008,0080	LO	VNAP	COPY	-
Manufacturer's Model Name	0008,1090	LO	ALWAYS	AUTO	ViewForum
Software Version(s)	0018,1020	LO	ALWAYS	AUTO	ViewForum 4.2 PMS1.1 MIMIT EVIIMDictionary
Multi-Frame Module (M)					
Number of Frames	0028,0008	IS	ALWAYS	AUTO	-
Frame Increment Pointer	0028,0009	AT	ALWAYS	AUTO	-

Name	Tag	VR	Presence of Value	Source	Comment
General Image Module (M)					
Acquisition Date	0008,0022	DA	ALWAYS	AUTO	-
Content Date	0008,0023	DA	ALWAYS	AUTO	-
Acquisition Time	0008,0032	TM	ALWAYS	AUTO	-
Content Time	0008,0033	TM	ALWAYS	AUTO	-
Instance Number	0020,0013	IS	ALWAYS	AUTO	-
Image Pixel Module (M)					
Rows	0028,0010	US	ALWAYS	AUTO	1024
Columns	0028,0011	US	ALWAYS	AUTO	1024
Pixel Data	7FE0,0010	OW	ALWAYS	AUTO	-
X-ray Image Module (M)					
Image Type	0008,0008	CS	ALWAYS	AUTO	ORIGIONAL PRIMARY SINGLE PLANE
Samples per Pixel	0028,0002	US	ALWAYS	AUTO	1
Photometric Interpretation	0028,0004	CS	ALWAYS	AUTO	MONOCHROME2
Bits Allocated	0028,0100	US	ALWAYS	AUTO	16
Bits Stored	0028,0101	US	ALWAYS	AUTO	12
High Bit	0028,0102	US	ALWAYS	AUTO	11
Pixel Representation	0028,0103	US	ALWAYS	AUTO	0
Pixel Intensity Relationship	0028,1040	CS	ALWAYS	AUTO	DISP
X-ray Acquisition Module (M)					
Radiation Setting	0018,1155	CS	ALWAYS	AUTO	GR
SOP Common Module (M)					
Specific Character Set	0008,0005	CS	ALWAYS	COPY	-
SOP Class UID	0008,0016	UI	ALWAYS	AUTO	1.2.840.10008.5.1 .4.1.1.12.1 (XRF Image)
SOP Instance UID	0008,0018	UI	ALWAYS	AUTO	-

8.1.3 Attribute Mapping

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

Table 142: Attribute Mapping during Modality Workflow

Name	BWLM Tag	MPPS		Image IOD Tag
		Create Tag	Set Tag	
Specific Character Set	0008,0005	-	-	0008,0005
Accession Number	0008,0050	0008,0050	-	0008,0050
Modality	0008,0060	0008,0060	-	0008,0060
Referring Physician's Name	0008,0090	-	-	0008,0090
Operators' Name	-	-	0008,1070	0008,1070
Referenced Study Sequence	0008,1110	0008,1110	-	0008,1110
Referenced Image Sequence	0008,1150	0008,1140	0008,1140	0008,1140
> Referenced SOP Class UID SOP Class UID	-	0008,1150	0008,1150	0008,1150
> Referenced SOP Instance UID SOP Instance UID	-	0008,1155	0008,1155	0008,1155
Patient's Name	0010,0010	0010,0010	-	0010,0010
Patient ID	0010,0020	0010,0020	-	0010,0020
Patient's Birth Date	0010,0030	0010,0030	-	0010,0030
Patient's Sex	0010,0040	0010,0040	-	0010,0040
Other Patient IDs	0010,1000	-	-	0010,1000
Patient's Size	0010,1020	-	-	0010,1020
Patient's Weight	0010,1030	-	-	0010,1030
Patient's Telephone Numbers	0010,2154	-	-	0010,2154
Medical Alerts	0010,2000	-	-	0010,2000
Contrast Allergies	0010,2110	-	-	0010,2110
Ethnic group	0010,2160	-	-	0010,2160
Additional Patient History	0010,21B0	-	-	0010,21B0
Patient Comments	0010,4000	-	-	0010,4000
KVP	-	-	0018,0060	0018,0060
Protocol Name	-	-	0018,1030	0018,1030
Image Area Dose Product	-	-	0018,115E	0018,115E
Study Instance UID	0020,000D	0020,000D	-	0020,000D
Series Instance UID	-	-	0020,000E	0020,000E
Study ID	-	0020,0010	-	0020,0010
Requested Procedure Description	0032,1060	0032,1060	-	-
Scheduled Procedure Step Description	0040,0007	0040,0007	-	0040,0007
Performed Procedure Step Description	-	0040,0254	0040,0254	0040,0254
Scheduled Protocol Code Sequence	0040,0008	0040,0008	-	0040,0008
Performed Protocol Code Sequence	-	0040,0260	0040,0260	0040,0260
Scheduled Procedure Step ID	0040,0009	0040,0009	-	0040,0009
Performed Procedure Step Start Date	-	0040,0244	-	0040,0244
Performed Procedure Step Start Time	-	0040,0245	-	0040,0245
Performed Procedure Step ID	-	0040,0253	-	0040,0253
Requested Procedure ID	0040,1001	0040,1001	-	0040,1001

8.1.4 Coerced / Modified fields

In general, MultiDiagnost Eleva with Flat Detector 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 Grayscale Softcopy Presentation State object for the image data. This may also involve the creation of extra attributes. As it is not the intention of MultiDiagnost Eleva with Flat Detector to export this data as such, the SOP Instance UID shall not be changed.

If not available at import then MultiDiagnost Eleva with Flat Detector will create the additional attributes as listed in the Table below.

Table 143: Additional Attributes for Import Images

Name	Tag	Generated Value
Performed Procedure Step Start Date	0040,0244	Copied from (0008,0020) Study Date.
Performed Procedure Step Start Time	0040,0245	Copied from (0008,0030) Study Time.
Performed Procedure Step ID	0040,0253	Copied from (0020,0010) Study ID.
Performed Procedure Step Description	0040,0254	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 MultiDiagnost Eleva with Flat Detector will derive Grayscale Softcopy 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 Grayscale Softcopy Presentation State data, the MultiDiagnost Eleva with Flat Detector 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 succeng objects concerning the optional attributes (VT=3) listed in Table 144, and clear all mandatory attributes (VT=2) listed in
Table 145.

Table 144: Omitted Attributes for Import Images

Attribute Name	Tag	VR	Comment
Patient Module			
Referenced Patient Sequence	0008,1120	SQ	
Patient's Birth Time	0010,0032	TM	
Other Patient's Id's	0010,1000	LO	
Other Patient's Names	0010,1001	PN	
Ethnic Group	0010,2160	SH	
Patient Comments	0010,4000	LT	
General Study Module			
Referring Physician Identification Sequence	0008,0096	SQ	
Study Description	0008,1030	LO	
Procedure Code Sequence	0008,1032	SQ	
Physician(s) of Record	0008,1048	PN	
Physician(s) of Record Identification Sequence	0008,1049	SQ	

Attribute Name	Tag	VR	Comment
Name of Physician(s) Reading Study	0008,1060	PN	
Physician(s) Reading Study Identification Sequence	0008,1062	SQ	
Referenced Study Sequence	0008,1110	SQ	
Patient Study Module			
Admitting Diagnoses Description	0008,1080	LO	
Admitting Diagnoses Code Sequence	0008,1084	SQ	
Patient's Age	0010,1010	AS	
Patient's Size	0010,1020	DS	
Patient's Weight	0010,1030	DS	
Occupation	0010,2180	SH	
Additional Patient's History	0010,21B0	LT	
Clinical Trial Study Module			
Clinical Trial Time Point Description	0012,0051	ST	
General Series Module			
Series Date	0008,0021	DA	
Series Time	0008,0031	TM	
Series Description	0008,103E	LO	
Performing Physicians' Name	0008,1050	PN	
Performing Physician Identification Sequence	0008,1052	SQ	
Operators' Name	0008,1070	PN	
Operators Identification Sequence	0008,1072	SQ	
Referenced Performed Procedure Step Sequence	0008,1111	SQ	
Body Part Examined	0018,0015	CS	
Protocol Name	0018,1030	LO	
Smallest Pixel Value in Series	0028.0108	US/SS	
Largest Pixel Value in Series	0028.0109	US/SS	
Performed Procedure Step Start Date	0040,0244	DA	
Performed Procedure Step Start Time	0040,0245	TM	
Performed Procedure Step ID	0040,0253	SH	
Performed Procedure Step Description	0040,0254	LO	
Performed Protocol Code Sequence	0040,0260	SQ	
Request Attributes Sequence	0040,0275	SQ	
Comments on the Performed Procedure Step	0040,0280	ST	
General Equipment Module			
Institution Name	0008,0080	LO	
Institution Address	0008,0081	SH	
Station Name	0008,1010	SH	
Institutional Department Name	0008,1040	LO	
Manufacturer's Model Name	0008,1090	LO	
Device Serial Number	0018,1000	LO	
Software Versions	0018,1020	LO	
Spatial Resolution	0018,1050	DS	
Date of Last Calibration	0018,1200	DA	
Time of Last Calibration	0018,1201	TM	
Pixel Padding Value	0028,0120	US/SS	
Display Shutter Module			
Shutter Presentation Value	0018,1622	US	
Overlay Plane Module			
Overlay Description	60xx,0022	LO	
Overlay Subtype	60xx,0045	LO	
ROI Area	60xx,1301	IS	
ROI Mean	60xx,1302	DS	
ROI Standard Deviation	60xx,1303	DS	

Attribute Name	Tag	VR	Comment
Overlay Label	60xx,1500	LO	
SOP Common Module			
Instance Creation Date	0008,0012	DA	
Instance Creation Time	0008,0013	TM	
Instance Creator UID	0008,0014	UI	
Coding Scheme Identification Sequence	0008,0110	SQ	
Timezone Offset From UTC	0008,0201	SH	
Contributing Equipment Sequence	0018,A001	SQ	
Instance Number	0020,0013	IS	
SOP Instance Status	0100,0410	CS	
SOP Authorization Date and Time	0100,0420	DT	
SOP Authorization Comment	0100,0424	LT	
Authorization Equipment Certification Number	0100,0426	LO	
MAC Parameters Sequence	4FFE,0001	SQ	
Digital Signatures Sequence	FFFA,FFFA	SQ	

Table 145: Cleared Attributes for Import Images

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

MultiDiagnost Eleva with Flat Detector allows the operator to modify attributes of the stored images; see Table 146.

MultiDiagnost Eleva with Flat Detector does not modify the pixel values of the stored images.
Modified images retain their original Study, Series and Image UID.

Table 146: Modifiable Attributes

Attribute Name	Tag	VR	Comment
Patient			
Patient's Name	0010,0010	PN	
Patient ID	0010,0020	LO	
Patient's Birth Date	0010,0030	DA	
Patient's Sex	0010,0040	CS	
Medical Alerts	0010,2000	LO	
Contrast Allergies	0010,2110	LO	
Patient Comments	0010,4000	LT	
Study			
Accession Number	0008,0050	SH	
Referring Physician's Name	0008,0090	PN	
Study Description	0008,1030	LO	
Physician(s) of Record	0008,1048	PN	
Name of Physician(s) Reading Study	0008,1060	PN	
Admitting Diagnoses Description	0008,1080	LO	
Patient's Age	0010,1010	AS	
Occupation	0010,2180	SH	
Additional Patient History	0010,21B0	LT	
Examination			
Performed Station Name	0040,0242	SH	
Performed Location	0040,0243	SH	
Performed Procedure Step Description	0040,0254	LO	
Performed Procedure Type Description	0040,0255	LO	
Comments on the Performed Procedure Step	0040,0280	ST	
Series			
-	-		

8.2 Data Dictionary of Private Attributes

Not applicable.

8.3 Coded Terminology and Templates

Not applicable.

8.4 Grayscale Image consistency

The high-resolution display monitor attached to the product can be calibrated by using the service tool together with a light probe. See the [VFRB] for details on the calibration procedure.

8.5 Standard Extended/Specialized/Private SOPs

The Standard DICOM SOP Classes may be Extended with additional attributes:

Standard attributes of other SOP Classes; the presence of these attributes in exported images can be configured, see section 4.2.1.3.1.3

Retired (from ACR NEMA 1.0 or 2.0) attributes; the presence of these attributes in exported images can be configured, see section 4.2.1.3.1.3
Private attributes; the presence of these attributes in exported images can be configured, see section 4.2.1.3.1.3

The Table 147 list the supported Private SOP Classes. The usage of these SOP Classes are in the MD ELEVA with FLAT DETECTORs domain only.
However instances of these Private SOP Classes may be exported towards a PACS environment and stored in a (central) DICOM archive and should be configured in order to make this possible.

Table 147: Private SOP classes of MULTIDIAGNOST ELEVA with FLAT DETECTOR System

SOP Class	Description
3D Volume Storage (Private class)	1.3.46.670589.5.0.1.1
3D Volume Object Storage (Private class)	1.3.46.670589.5.0.2.1
Surface Storage (Private class)	1.3.46.670589.5.0.3.1
CT Synthetic Image (Private class)	1.3.46.670589.5.0.9
MR Synthetic Image (Private class)	1.3.46.670589.5.0.10
MR Cardio Storage (Private class)	1.3.46.670589.5.0.8.1
MR Cardio Analysis Storage (Private class)	1.3.46.670589.5.0.11.1
Specialized X-ray (Private class)	1.3.46.670589.2.3.1.1
CX Image (Private class)	1.3.46.670589.2.4.1.1
CX Synthetic Image (Private class)	1.3.46.670589.5.0.12
Perfusion (Private class)	1.3.46.670589.5.0.13
Perfusion Analysis (Private class)	1.3.46.670589.5.0.14

8.6 Private Transfer Syntaxes

None.