

TOSHIBA

**DICOM CONFORMANCE STATEMENT
FOR
IMAGE PROCESSOR MODEL**

PDR-04A(Zexira)

TOSHIBA MEDICAL SYSTEMS CORPORATION

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1. CONFORMANCE STATEMENT OVERVIEW

Table 1-1 provides an overview of the network services supported by PDR Series.

**Table 1-1
NETWORK SERVICES**

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
X-Ray Radiofluoroscopic Image Storage	Yes	Option (see Note 3)
X-Ray Angiographic Image Storage	Yes	Option (see Note 3)
Computed Radiography Image Storage	No	Option (see Note 3)
Digital X-Ray Image Storage – For Presentation	No	Option (see Note 3)
Digital X-Ray Image Storage – For Processing	No	Option (see Note 3)
Secondary Capture Image Storage	No	Option (see Note 3)
X-Ray Radiation Dose SR	Yes	Option (see Note 3)
Workflow Management		
Modality Worklist Information Model – Find	Option (see Note 1)	No
Modality Performed Procedure Step	Option (see Note 2)	No
Query/Retrieve		
Patient Root Query/Retrieve Information Model – FIND	Option (see Note 3)	No
Patient Root Query/Retrieve Information Model – MOVE	Option (see Note 3)	No
Study Root Query/Retrieve Information Model – FIND	Option (see Note 3)	No
Study Root Query/Retrieve Information Model – MOVE	Option (see Note 3)	No
Print Management		
Basic Grayscale Print Management	Yes	No
Basic Film Session SOP Class	Yes	No
Basic film Box SOP Class	Yes	No
Basic Grayscale Image Box SOP Class	Yes	No
Printer SOP Class	Yes	No
Verification		
Verification	Yes	Option (see Note 3)

NOTE1: MWM OPTION License must be installed.

NOTE2: MPPS OPTION License must be installed.

NOTE3: Q/R OPTION License must be installed.

Table 1-2 provides an overview of the Media Storage Application Profiles supported by PDR Series.

**Table 1-2
MEDIA SERVICES**

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk – Recordable		
General Purpose CD-R	Option (see Note 4)	Option (see Note 3)
General Purpose CD-RW	Option (see Note 4)	Option (see Note 3)
DVD – Recordable		
General Purpose DVD-R	Option (see Note 4)	Option (see Note 3)
General Purpose DVD-RW	Option (see Note 4)	Option (see Note 3)
BD - Recordable		
General Purpose BD-R	No	Option (see Note 3)
General Purpose BD-RE	Option (see Note 4)	Option (see Note 3)
USB Media		
General Purpose USB Media	Option (see Note 4)	Option (see Note 3)

NOTE3: Q/R OPTION License must be installed.

NOTE4: DICOMDIR OPTION License must be installed.

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3. INTRODUCTION

3.1 AUDIENCE

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

3.2 REMARKS

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

The scope of this Conformance Statement is to facilitate communication with Toshiba Medical Systems and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

- The comparison of different conformance statements is the first step towards assessing interconnectivity between Toshiba Medical Systems and non- Toshiba Medical Systems equipment.
- Test procedures should be defined to validate the desired level of connectivity.
- The DICOM standard will evolve to meet the users' future requirements. Toshiba Medical Systems is actively involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue its delivery.

3.3 DEFINITIONS, TERMS AND ABBREVIATIONS

Definitions, terms and abbreviations used in this document are defined within the different parts of the DICOM standard.

Abbreviations and terms are as follows:

AE	Application Entity
DIMSE	DICOM Message Service Element
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
IE	Information Entity
IOD	Information Object Definition
ISO	International Standard Organization
MPPS	Modality Performed Procedure Step
MSPS	Modality Scheduled Procedure Step
MWM	Modality Worklist Management
R	Required Key Attribute
O	Optional Key Attribute
PDU	Protocol Data Unit
SCU	Service Class User (DICOM client)
SCP	Service Class Provider (DICOM server)
SOP	Service-Object Pair
U	Unique Key Attribute
UID	Unique Identifier

3.4 REFERENCES

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.18, 2004

4. NETWORKING

4.1 IMPLEMENTATION MODEL

4.1.1 Application Data Flow

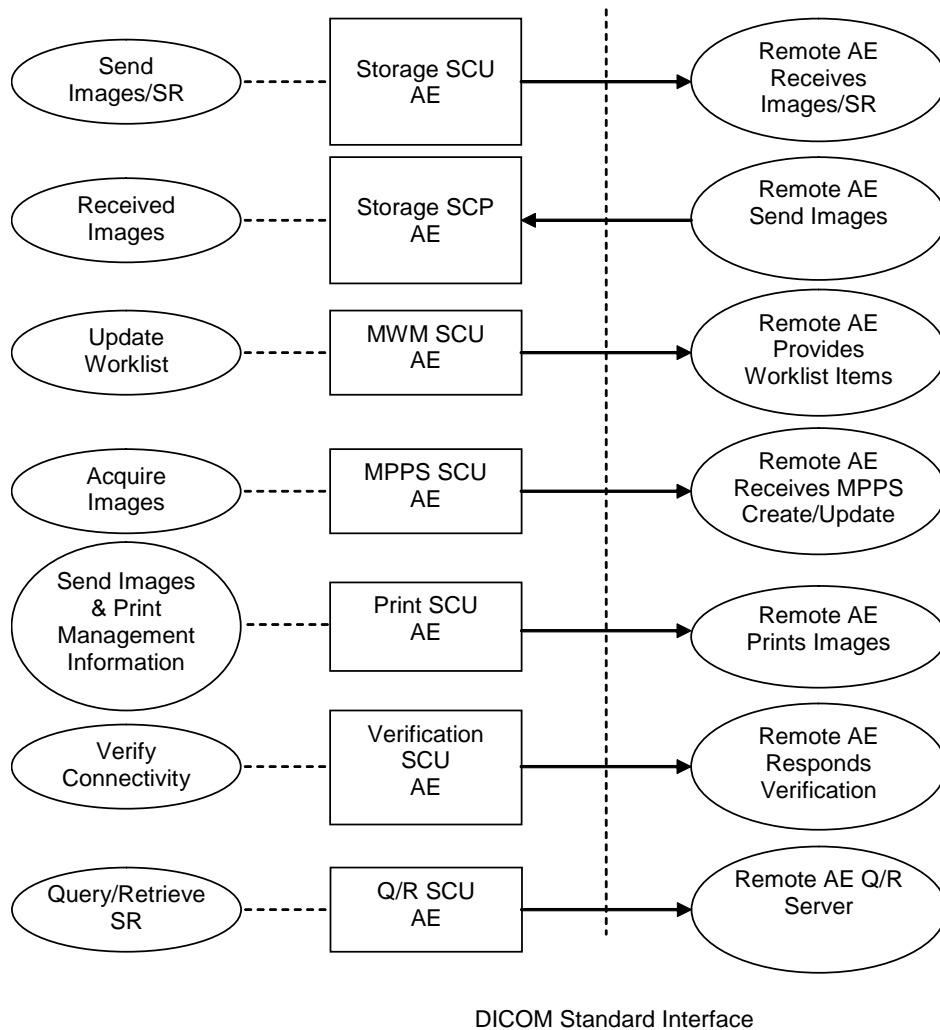


Figure 4.1-1
APPLICATION DATA FLOW DIAGRAM

- The Storage SCU AE sends images/Structure Report to a remote AE manually or automatically. It is associated with the local real-world activity “Send Images”. “Send Images” is performed upon user request for specific images selected or upon acquiring a new image.
- The MWM SCU AE receives Worklist information from a remote AE. It is associated with the local real-world activity “Update Worklist”. When the “Update Worklist” is performed the MWM SCU AE queries a remote AE for worklist items and provides the set of worklist items matching the query request. “Update Worklist” is performed manually.
- The MPPS SCU AE sends MPPS information to a remote AE. It is associated with the local real-world activity “Acquire Images”. When the “Acquire Images” is performed, the MPPS SCU AE creates and updates Modality Performed Procedure Step instances managed by a remote AE. Acquisition of images will result in automated creation of an MPPS Instance. Completion of the MPPS is performed as the result of an operator action.
- The Print SCU AE prints images on a remote AE (Printer). It is associated with the local real-world activity “Send Images & Print Management Information”. “Send Images & Print Management Information” creates a print-job within the print queue containing one or more virtual film sheets composed from images selected by the user or from images acquired automatically.
- The Verification SCU AE issues a C-ECHO to verify a DICOM connection to a remote AE. It is associated with the local real-world activity “Verify Connectivity”. “Verify Connectivity” is performed by the user upon a DICOM connection error.
- The Query/Retrieve SCU AE requests to retrieve images after selecting the transferred images from the Study List, the Series List or the Image list.

4.1.2 Functional Definition of AEs

4.1.2.1 Functional Definition of Storage SCU AE

The Storage SCU AE is implemented as an application entity for transmitting images.

This service is used to send demographic information and pixel data to an external image manager.

4.1.2.2 Functional Definition of MWM SCU AE

The MWM SCU AE is implemented as an application entity for retrieving the Modality Worklist from the Department System Scheduler/Order Filler. The DICOM C-Find Service of MWL is used to request the scheduled procedure steps.

4.1.2.3 Functional Definition of MPPS SCU AE

The MPPS SCU AE is implemented as an application entity for information of acquiring images. The Modality Performed Procedure Step is used to notify image's acquisition steps.

4.1.2.4 Functional Definition of Print SCU AE

The Print SCU AE Basic Print Management Mata SCU is implemented as an application entity for printing images. The DICOM Basic Print Management Mata Service is used to print demographic information and pixel data to an external film printer.

4.1.2.5 Functional Definition of Verification SCU AE

The Verification SCU AE issues a C-ECHO to verify a DICOM connection to a remote AE. It is performed by the user upon a DICOM connection error.

4.1.2.6 Functional Definition of Query/Retrieve SCU AE

The Query/Retrieve SCU AE requests to retrieve images after selecting the transferred images from the Study List, the Series List or the Image list.

4.1.3 Sequencing of Real-World Activities

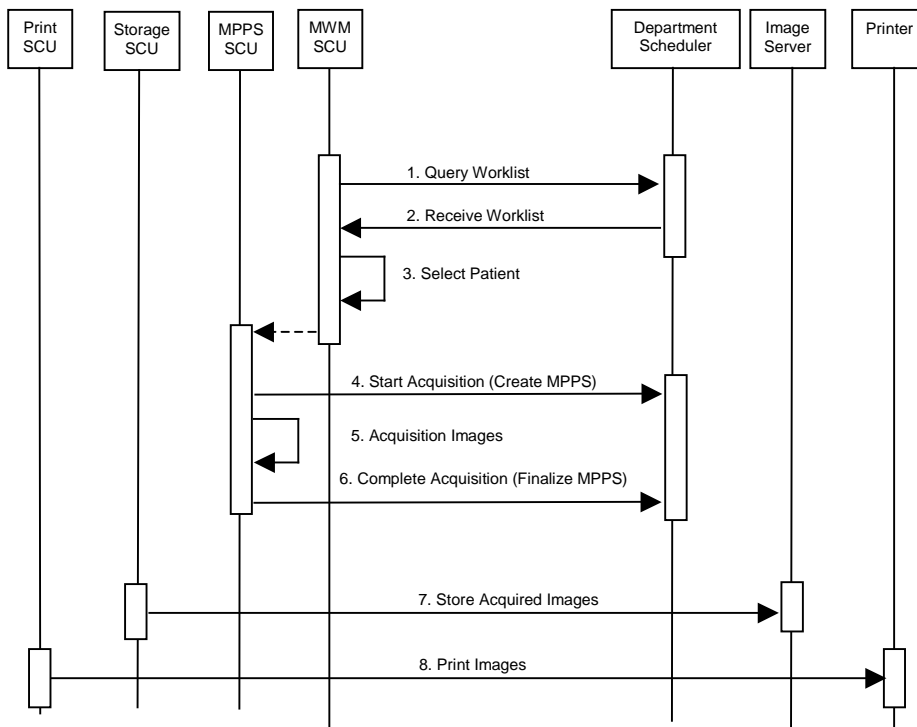


Figure 4.1-2
SEQUENCING CONSTRAINTS

Under typical scheduled workflow conditions the sequencing constraints illustrated in Figure 4.1-2 apply:

1. Query Worklist
2. Receive Worklist of Modality Scheduled Procedure Steps (MSPS)
3. Select Patient from Worklist
4. Start Acquisition and Create MPPS
5. Acquire Images
6. Complete Acquisition and Finalize MPPS
7. Store Acquired Images
8. Print Images

Other workflow situations (e.g. unscheduled procedure steps) will have other sequencing constraints. Some activities may be omitted according to situations.

4.2 AE SPECIFICATIONS

4.2.1 Storage SCU AE Specification

4.2.1.1 SOP Classes

The Storage SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-1
SOP CLASSES FOR THE STORAGE SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	No

4.2.1.2 Association Policies

4.2.1.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-2
DICOM APPLICATION CONTEXT FOR THE STORAGE SCU AE

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

4.2.1.2.2 Number of Associations

The Storage SCU AE can initiate one Associations at a time for each destination to which a transfer request is being processed in the active job queue list.

Table 4.2-3
NUMBER OF ASSOCIATIONS INITIATED FOR THE STORAGE SCU AE

Maximum number of simultaneous Associations	1
---	---

4.2.1.2.3 Asynchronous Nature

The Storage SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

4.2.1.2.4 Implementation Identifying Information

The implementation information for the Storage SCU AE is:

Table 4.2-4
DICOM IMPLEMENTATION CLASS FOR THE STORAGE SCU AE

Implementation Class UID	1.2.392.200036.9116.32.4
--------------------------	--------------------------

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Send Images

4.2.1.3.1.1 Description and Sequencing of Activities

The Storage SCU AE attempts to initiate a new Association in order to issue a Storage request (C-STORE). If the job contains multiple images then multiple C-STORE requests will be issued over the same Association. If the image transfer fails, the Storage SCU AE will retry this send-job automatically.

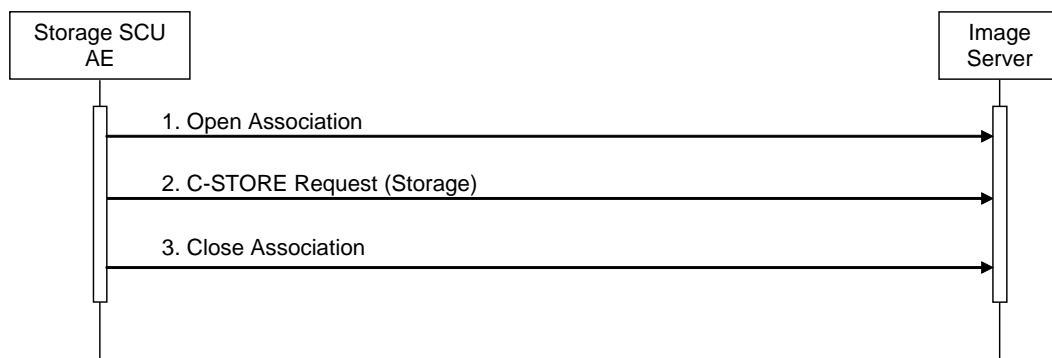


Figure 4.2-1
SEQUENCING OF ACTIVITY – SEND IMAGES

A possible sequence of interactions between the Storage SCU AE and an Image Server is illustrated in the Figure above:

1. The Storage SCU AE opens an Association with the Image Server
2. Acquired images are transmitted to the Image Server using a Storage request (C-STORE) and the Image Server replies with a C-STORE response (status success).
3. The Storage SCU AE closes the Association with the Image Server.

4.2.1.3.1.2 Proposed Presentation Contexts

The Storage SCU AE is capable of proposing the Presentation Contexts shown in the following table:

**Table 4.2-5
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY SEND IMAGES**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian Explicit VR Little Endian Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Little Endian Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70	SCU	None
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.1.3.1.3 SOP Specific Conformance for Storage SOP Classes

The Storage SCU AE provides standard conformance to the Storage Service Class as an SCU.

The behavior of Storage SCU AE when encountering status codes in a C-STORE response is summarized in the table below:

Table 4.2-6
STORAGE C-STORE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has successfully stored the SOP Instance. If all SOP Instances in a send job have status success then the job is marked as complete.
Refused	Out of Resources	A7xx	The Association is aborted using A-ABORT and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. This is a transient failure.
Error	Data Set does not match SOP Class	A9xx	The Association is aborted using A-ABORT and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.
Error	Cannot Understand	Cxxx	The Association is aborted using A-ABORT and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.
Warning	Coercion of Data Elements	B000	Image transmission is considered successful if it is configured that the status would be considered successful.
Warning	Data Set does not match SOP Class	B007	Image transmission is considered successful if it is configured that the status would be considered successful.
Warning	Elements Discarded	B006	Image transmission is considered successful if it is configured that the status would be considered successful.
*	*	Any other status code.	The Association is aborted using A-ABORT and the send job is marked as failed. The status code is logged and the job failure is reported to the user via the job control application.

The behavior of Storage SCU AE during communication failure is summarized in the table below:

Table 4.2-7
STORAGE COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted and the send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.
Association aborted by the SCP or network layers	The send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.

If the image transfer fails, the Storage SCU AE will retry this send-job automatically.

The contents of Image Storage SOP Instances created by the Storage SCU AE conform to the DICOM Image IOD definitions and are described in section 8.1.

4.2.1.4 Association Acceptance Policy

The Storage SCU AE does not accept Associations.

4.2.2 Storage SCP AE Specification

4.2.2.1 SOP Classes

The Storage SCP AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-8
SOP CLASSES FOR THE STORAGE SCP AE**

SOP Class Name	SOP Class UID	SCU	SCP
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Option (see Note 3)
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	No	Option (see Note 3)
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Option (see Note 3)
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Option (see Note 3)
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	No	Option (see Note 3)
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Option (see Note 3)
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	No	Option (see Note 3)

NOTE3: Q/R OPTION License must be installed.

4.2.2.2 Association Policies

4.2.2.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-9
DICOM APPLICATION CONTEXT FOR THE STORAGE SCP AE**

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

4.2.2.2.2 Number of Associations

**Table 4.2-10
NUMBER OF ASSOCIATIONS INITIATED FOR THE STORAGE SCP AE**

Maximum number of simultaneous Associations	1
---	---

4.2.2.2.3 Asynchronous Nature

The Storage SCP AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

4.2.2.2.4 Implementation Identifying Information

The implementation information for the Storage SCP AE is:

Table 4.2-11
DICOM IMPLEMENTATION CLASS AND VERSION FOR THE STORAGE SCP AE

Implementation Class UID	1.2.392.200036.9116.32.4
Implementation Version Name	TOSHIBA.PLESSART

4.2.2.3 Association Initiation Policy

4.2.2.3.1 Activity – Received Images

4.2.2.3.1.1 Description and Sequencing of Activities

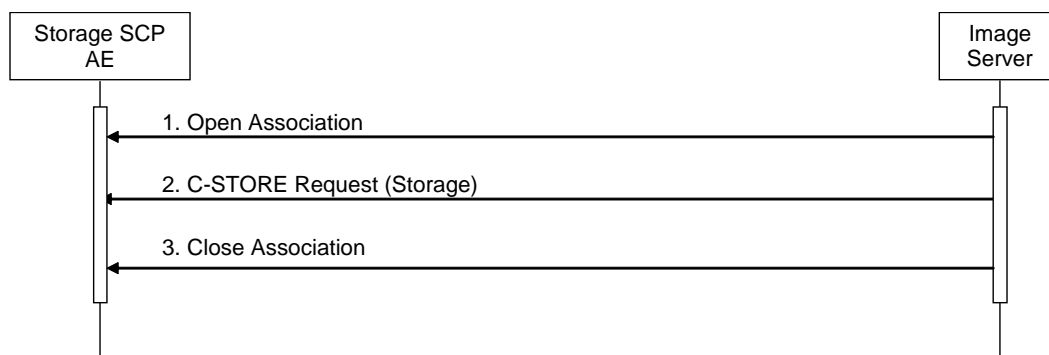


Figure 4.2-2
SEQUENCING OF ACTIVITY – RECEIVE IMAGES

A possible sequence of interactions between the Storage SCP AE and an Image Server is illustrated in the Figure above:

1. The Image Server opens an Association with the Storage SCP AE
2. The Images are transmitted to from Image Server using a Storage request (C-STORE) and the Storage SCP AE replies with a C-STORE response (status success).
3. The Storage SCP AE closes the Association with the Image Server.

4.2.2.3.1.2 Proposed Presentation Contexts

The Storage SCP AE is capable of proposing the Presentation Contexts shown in the following table:

**Table 4.2-12
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY RECEIVE IMAGES**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian Explicit VR Little Endian Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Little Endian Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70	SCP	None
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70	SCP	None
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Little Endian Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70	SCP	None
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4.2.2.3.1.3 SOP Specific Conformance for Storage SOP Classes

The Storage SCP AE provides standard conformance to the Storage Service Class as an SCP.

The behavior of Storage SCP AE when encountering status codes in a C-STORE response is summarized in the table below:

Table 4.2-13
STORAGE C-STORE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has successfully stored the SOP Instance. If all SOP Instances in a send job have status success then the job is marked as complete.
Refused	Out of Resources	A7xx	The Association is aborted using A-ABORT and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. This is a transient failure.
Error	Data Set does not match SOP Class	A9xx	The Association is aborted using A-ABORT and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.
Error	Cannot Understand	Cxxx	The Association is aborted using A-ABORT and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.
Warning	Coercion of Data Elements	B000	Image transmission is considered successful if it is configured that the status would be considered successful.
Warning	Data Set does not match SOP Class	B007	Image transmission is considered successful if it is configured that the status would be considered successful.
Warning	Elements Discarded	B006	Image transmission is considered successful if it is configured that the status would be considered successful.
*	*	Any other status code.	The Association is aborted using A-ABORT and the send job is marked as failed. The status code is logged and the job failure is reported to the user via the job control application.

The behavior of Storage SCP AE during communication failure is summarized in the table below:

Table 4.2-14
STORAGE COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted and the send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.
Association aborted by the SCP or network layers	The send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.

4.2.2.4 Association Acceptance Policy

The Storage SCP AE does not accept Associations.

4.2.3 MWM SCU AE Specification

4.2.3.1 SOP Classes

The MWM SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-15
SOP CLASSES FOR THE MWM SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Option (see Note 1)	No

NOTE1: MWM OPTION License must be installed.

4.2.3.2 Association Policies

4.2.3.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-16
DICOM APPLICATION CONTEXT FOR THE MWM SCU AE

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

4.2.3.2.2 Number of Associations

The MWM SCU AE initiates one Association at a time for a Worklist request.

Table 4.2-17
NUMBER OF ASSOCIATIONS INITIATED FOR THE MWM SCU AE

Maximum number of simultaneous Associations	1
---	---

4.2.3.2.3 Asynchronous Nature

The MWM SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 4.2-18
ASYNCHRONOUS NATURE FOR THE MWM SCU AE

Maximum number of outstanding asynchronous transactions	1
---	---

4.2.3.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-19
DICOM IMPLEMENTATION CLASS FOR THE MWM SCU AE

Implementation Class UID	1.2.392.200036.9116.32.4
--------------------------	--------------------------

4.2.3.3 Association Initiation Policy

4.2.3.3.1 Activity – Update Worklist

4.2.3.3.1.1 Description and Sequencing of Activities

The request for An “Update Worklist” is initiated by user interaction, i.e. pressing the buttons “Patient Worklist Query” .With “Patient Worklist Query” a dialog to enter search criteria is opened and an interactive query can be performed.

Upon initiation of the request, the MWM SCU AE will build an Identifier for the C-FIND request, will initiate an Association to send the request and will wait for Worklist responses. After retrieval of all responses, the MWM SCU AE will access the local database to add or update patient demographic data. The results will be displayed in a separate list.

The MWM SCU AE will initiate an Association in order to issue a C-FIND request according to the Modality Worklist Information Model.

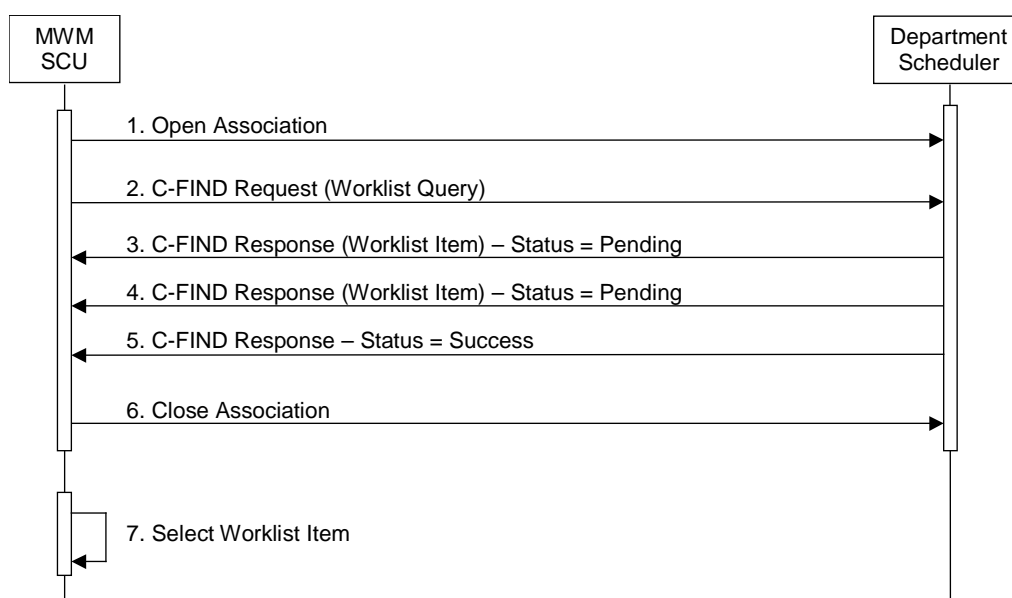


Figure 4.2-3
SEQUENCING OF ACTIVITY – UPDATE WORKLIST

A possible sequence of interactions between the MWM SCU AE and a Department Scheduler (e.g. a device such as a RIS or HIS which supports the Modality Worklist SOP Class as an SCP) is illustrated in the Figure above:

1. The MWM SCU AE opens an association with the Department Scheduler
2. The MWM SCU AE sends a C-FIND request to the Department Scheduler containing the Worklist Query attributes.
3. The Department Scheduler returns a C-FIND response containing the requested attributes of the first matching Worklist Item.
4. The Department Scheduler returns another C-FIND response containing the requested attributes of the second matching Worklist Item.
5. The Department Scheduler returns another C-FIND response with status Success indicating that no further matching Worklist Items exist. This example assumes that only two Worklist items match the Worklist Query.
6. The MWM SCU AE closes the association with the Department Scheduler.
7. The user selects a worklist item from the Worklist and prepares to acquire new images.

4.2.3.3.1.2 Proposed Presentation Contexts

The MWM SCU AE will propose Presentation Contexts as shown in the following table:

Table 4.2-20
Proposed Presentation Contexts for Activity Update Worklist

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.3.3.1.3 SOP Specific Conformance for Modality Worklist SOP Class

The MWM SCU AE provides standard conformance to the Modality Worklist SOP Class as an SCU.

The behavior of the MWM SCU when encountering status codes in a Modality Worklist C-FIND response is summarized in the table below.

Table 4.2-21
Modality Worklist C-FIND Response Status Handling Behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Matching is complete	0000	The SCP has completed the matches. Worklist items are available for display or further processing.
Refused	Out of Resources	A700H	The Association is aborted using A-ABORT and the worklist is empty. The status meaning is logged.
Failed	Identifier does not match SOP Class	A900H	
Failed	Unable to Process	CxxxH	
Cancel	Matching terminated due to Cancel request	FE00H	If the query was cancelled due to too many worklist items then the SCP has completed the matches. Worklist items are available for display or further processing. The status meaning is logged.
Pending	Matches are continuing	FF00H	The Association is aborted using A-ABORT and the worklist item contained in the Identifier is collected for later display or further processing.
Pending	Matches are continuing – Warning that one or more Optional Keys were not supported	FF01H	
*	*	Any other status code.	The Association is aborted using A-ABORT and the worklist is empty. The status meaning is logged.

The behavior of the MWM SCU AE during communication failure is summarized in the table below.

Table 4.2-22
MODALITY WORKLIST COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the worklist is empty. The reason is logged.
Association aborted by the SCP or network layers	The worklist is empty and the reason is logged.

Acquired images will always use the Study Instance UID specified for the Scheduled Procedure Step (if available). If an acquisition is unscheduled, a Study Instance UID will be generated locally.

The table below provides a description of the MWM SCU AE Worklist Request Identifier and specifies the attributes that are copied into the images. Unexpected attributes returned in a C-FIND response are ignored.

**Table 4.2-23
WORKLIST REQUEST IDENTIFIER**

Module Name Attribute Name	Tag	VR	M	R	D	IOD
SOP Common						
Specific Character Set	(0008,0005)	CS		x		
SOP Class UID	(0008,0016)	UI		x		
Institution Name	(0008,0080)	LO		x		
Institution Address	(0008,0081)	ST		x		
Institution Department Name	(0008,1040)	LO		x		
Scheduled Procedure Step						
Scheduled Procedure Step Sequence	(0040,0100)	SQ		x		
> Modality	(0008,0060)	CS	(S)	x		
> Scheduled Station AE Title	(0040,0001)	AE	S	x		
> Scheduled Procedure Step Start Date	(0040,0002)	DA	R	x		
> Scheduled Procedure Step Start Time	(0040,0003)	TM		x		
> Scheduled Performing Physician's Name	(0040,0006)	PN		x		
> Scheduled Station Name	(0040,0010)	SH	(S)	x		
Requested Procedure						
Study Date	(0008,0020)	DA		x		
Study Time	(0008,0030)	TM		x		
Referenced Study Sequence	(0008,1110)	SQ		x		
Study Instance UID	(0020,000D)	UI		x		
Requesting Service	(0032,1033)	LO		x		
Requesting Procedure Description	(0032,1060)	LO		x		
Requesting Procedure Code Sequence	(0032,1064)	SQ		x		
Requested Procedure ID	(0040,1001)	SH		x		
Requested Procedure Priority	(0040,1003)	SH		x		
Requested Procedure Arrangements	(0040,1004)	LO		x		
Requested Procedure Location	(0040,1005)	LO		x		
Imaging Service Request						
Accession Number	(0008,0050)	SH	(S)	x	x	x
Referring Physician's Name	(0008,0090)	PN	(S)	x	x	x
Visit Status						
Visit status ID	(0038,0008)	CS		x		
Current Patient Location	(0038,0300)	LO		x		
Patient's Institution Residence	(0038,0400)	LO		x		
Visit Admission						
Admitting Diagnoses Description	(0008,1080)	LO		x		
Patient Identification						
Patient's Name	(0010,0010)	PN	(S)	x	x	x
Patient ID	(0010,0020)	LO	(S)	x	x	x
Other Patient Ids	(0010,1000)	LO		x	x	
Other Patient Names	(0010,1001)	PN		x	x	
General Study						
Study Description	(0008,1030)	LO		x		
Name of Physician(s) Reading Study	(0008,1060)	PN		x		
General Series						

Performing Physician' s Name	(0008,1050)	PN		X		
Operator's Name	(0008,1070)	PN		X		
Body Part Examin	(0018,0015)	CS		x		
Patient Demographic						
Patient's Birth Date	(0010,0030)	DA		x	x	x
Patient's Birth Time	(0010,0032)	TM		x		
Patient's Sex	(0010,0040)	CS		x	x	x
Patient's Age	(0010,1010)	AS		x		
Patient's Size	(0010,1020)	DS		x		
Patient's Weight	(0010,1030)	DS		x		
Patient's Address	(0010,1040)	LO		x		
Patient's Telephone Numbers	(0010,2154)	SH		x		
Ethnic Group	(0010,2160)	SH		x		
Occupation	(0010,2180)	SH		x		
Patient Comments	(0010,4000)	LT		x		
Confidentiality Constraint on Patient Data Description	(0040,3001)	LO		x		
Patient Medical						
Medical Alerts	(0010,2000)	LO		x	x	x
Contrast Allergies	(0010,2110)	LO		x	x	x
Additional Patient History	(0010,21B0)	LT		x	x	x
Pregnancy Status	(0010,21C0)	US		x	x	x
Special Needs	(0038,0050)	LO		x	x	x
Patient State	(0038,0500)	LO		x	x	x

The above table should be read as follows:

- Module Name: The name of the associated module for supported worklist attributes.
- Attribute Name: Attributes supported to build the MWM SCU AE Worklist Request Identifier.
- Tag: DICOM tag for this attribute.
- VR: DICOM VR for this attribute.
- M: Matching keys for Worklist Update. An "S" will indicate that the MWM SCU AE will supply an attribute value for Single Value Matching. A "R" will indicates Range Matching .A "(S)" will indicate that NULL attribute value may be set by the user.
- R: Return keys. An "x" will indicate that the MWM SCU AE will supply this attribute as Return Key with zero length for Universal Matching.
- D: Displayed keys. An "x" indicates that this worklist attribute is displayed to the user during a patient registration. For example, Patient Name will be displayed when registering the patient prior to an examination. However some of displayed keys, for example Patient's Size and Patient's Weight, are not displayed after an examination.
- IOD: An "x" indicates that this Worklist attribute is included into all Object Instances created during performance of the related Procedure Step.

4.2.3.4 Association Acceptance Policy

The MWM SCU AE does not accept Associations.

4.2.4 MPPS SCU AE Specification

4.2.4.1 SOP Classes

The MPPS SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-24
SOP CLASSES FOR THE MPPS SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Option (see Note 2)	No

NOTE2: MPPS OPTION License must be installed.

4.2.4.2 Association Policies

4.2.4.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-25
DICOM APPLICATION CONTEXT FOR THE MPPS SCU AE

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

4.2.4.2.2 Number of Associations

The MPPS SCU AE initiates one Association at a time.

Table 4.2-26
NUMBER OF ASSOCIATIONS INITIATED FOR THE MPPS SCU AE

Maximum number of simultaneous Associations	1
---	---

4.2.4.2.3 Asynchronous Nature

The MPPS SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 4.2-27
ASYNCHRONOUS NATURE FOR THE MPPS SCU AE

Maximum number of outstanding asynchronous transactions	1
---	---

4.2.4.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-28
DICOM IMPLEMENTATION CLASS FOR THE MPPS SCU AE

Implementation Class UID	1.2.392.200036.9116.32.4
--------------------------	--------------------------

4.2.4.3 Association Initiation Policy

4.2.4.3.1 Activity – Acquire Images

4.2.4.3.1.1 Description and Sequencing of Activities

The MPPS SCU AE performs the creation of an MPPS Instance automatically when the user selects and starts a worklist item. Further updates on the MPPS data can be performed when the user completes the acquisition.

The MPPS SCU AE will initiate an Association to issue an:

- N-CREATE request according to the CREATE Modality Performed Procedure Step SOP Instance operation, or an:
- N-SET request to update the contents and state of the MPPS according to the SET Modality Performed Procedure Step Information operation.

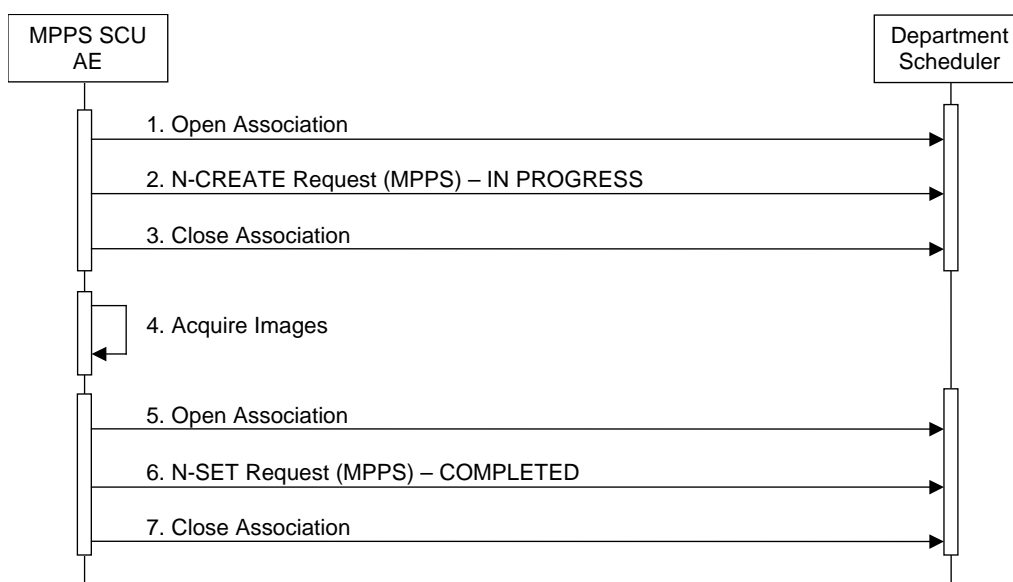


Figure 4.2-4
SEQUENCING OF ACTIVITY – ACQUIRE IMAGES

A possible sequence of interactions between the MPPS SCU AE and a Department Scheduler (e.g. a device such as a RIS or HIS which supports the MPPS SOP Class as an SCP) is illustrated in the Figure above:

1. The MPPS SCU AE opens an association with the Department Scheduler
2. The MPPS SCU AE sends an N-CREATE request to the Department Scheduler to create an MPPS Instance with status of “IN PROGRESS” and create all necessary attributes. The Department Scheduler acknowledges the MPPS creation with an N-CREATE response (status success).
3. The MPPS SCU AE closes the association with the Department Scheduler.
4. All images are acquired and stored in the local database.
5. The MPPS SCU AE opens an association with the Department Scheduler.
6. The MPPS SCU AE sends an N-SET request to the Department Scheduler to update the MPPS instance with status of “COMPLETED” and set all necessary attributes. The Department Scheduler acknowledges the MPPS update with an N-SET response (status success).
7. The MPPS SCU AE closes the association with the Department Scheduler.

4.2.4.3.1.2 Proposed Presentation Contexts

The MPPS SCU AE will propose Presentation Contexts as shown in the following table:

Table 4.2-29
PROPOSED PRESENTATION CONTEXTS FOR REAL-WORLD ACTIVITY ACQUIRE IMAGES

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.4.3.1.3 SOP Specific Conformance for MPPS SOP Class

The MPPS SCU AE provides standard conformance to the Modality Performed Procedure Step SOP Class as an SCU.

The behavior of the MPPS SCU AE when encountering status codes in an MPPS N-CREATE or N-SET response is summarized in the table below.

Table 4.2-30
MPPS N-CREATE / N-SET RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
Failure	Processing Failure – Performed Procedure Step Object may no longer be updated	0110H	The Association is aborted and the MPPS is marked as failed. The status meaning is logged and reported to the user.
Warning	Attribute Value Out of Range	0116H	
*	*	Any other status code.	

The behavior of the MPPS SCU AE during communication failure is summarized in the table below:

Table 4.2-31
MPPS COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted and the MPPS is marked as failed. The reason is logged and reported to the user.
Association aborted by the SCP or network layers	The MPPS is marked as failed. The reason is logged and reported to the user.

The table below provides a description of the MPPS N-CREATE and N-SET request identifiers sent by the MPPS SCU AE. Empty cells in the N-CREATE and N-SET columns indicate that the attribute is not sent. An “x” indicates that an appropriate value will be sent. An “Zero length” attribute will be sent with zero length.

**Table 4.2-32
MPPS N-CREATE / N-SET REQUEST IDENTIFIER**

Attribute Name	Tag	VR	N-CREATE	N-SET
SOP Common				
Specific Character Set	(0008,0005)	CS	From configuration	From configuration
SOP Class UID	(0008,0016)	UI	1.2.840.10008.3.1.2.3.3	1.2.840.10008.3.1.2.3.3
SOP Instance UID	(0008,0018)	UI	Automatically created.	Automatically created
Performed Procedure Step Relationship				
Scheduled Procedure Step Attribute Sequence	(0040,0270)	SQ	Zero length	
> Accession Number	(0008,0050)	SH	From Modality Worklist or Automatically created.	
>Referenced Study Sequence	(0008,1110)	SQ	Zero length	Zero or more items
> Study Instance UID	(0020,000D)	UI	From Modality Worklist or Automatically created.	
> Requested Procedure Description	(0032,1060)	LO	From Modality Worklist	
> Scheduled Procedure Step Description	(0040,0007)	LO	From Modality Worklist	
> Scheduled Procedure Step ID	(0040,0009)	SH	From Modality Worklist	
> Requested Procedure ID	(0040,1001)	SH	From Modality Worklist	
Patient's Name	(0010,0010)	PN	From Modality Worklist or User input	
Patient ID	(0010,0020)	LO	From Modality Worklist or User input	
Patient's Birth Date	(0010,0030)	DA	From Modality Worklist or user input.	
Patient's Sex	(0010,0040)	CS	From Modality Worklist or user input.	
Referenced Patient Sequence	(0008,1120)	SQ	Zero length	Zero or more items
Performed Procedure Step Information				
Performed Procedure Step ID	(0040,0253)	SH	Automatically created.	
Performed Station AE Title	(0040,0241)	AE	MPPS AE Title	
Performed Station Name	(0040,0242)	SH	Zero length	
Performed Location	(0040,0243)	SH	Zero length	
Performed Procedure Step Start Date	(0040,0244)	DA	Actual start date	
Performed Procedure Step Start Time	(0040,0245)	TM	Actual start time	
Performed Procedure Step End Date	(0040,0250)	DA	Zero length	Actual end date
Performed Procedure Step End Time	(0040,0251)	TM	Zero length	Actual end time
Performed Procedure Step Status	(0040,0252)	CS	IN PROGRESS	COMPLETED or DISCONTINUED
Performed Procedure Step Description	(0040,0254)	LO	From Modality Worklist.	From Modality Worklist.

Performed Procedure Type Description	(0040,0255)	LO	From Modality Worklist.	From Modality Worklist.
Procedure Code Sequence	(0008,1032)	SQ		Zero or more items
Image Acquisition Results				
Modality	(0008,0060)	CS	From configuration	
Study ID	(0020,0010)	SH	Automatically created.	
Performed Protocol Code Sequence	(0040,0260)	SQ	Zero length	
Performed Series Sequence	(0040,0340)	SQ	Zero or more items	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
> Operators' Name	(0008,1070)	PN		Zero length
> Referenced Image Sequence	(0008,1140)	SQ		Zero or more items
>> Referenced SOP Class UID	(0008,1150)	UI		x
>> Referenced SOP Instance UID	(0008,1155)	UI		x
> Protocol Name	(0018,1030)	LO		x
> Series Instance UID	(0020,000E)	UI		x
Radiation Dose Module				
Distance Source to Detector	(0018,1110)	DS	0	x
Image and Fluoroscopy Area Dose Product	(0018,115E)	DS	0	x
Total Time of Fluoroscopy	(0040,0300)	US	0	x
Total Number of Exposures	(0040,0301)	US	0	x
Entrance Dose	(0040,0302)	DS	0	x
Distance Source to Entrance	(0040,0306)	DS	0	x
Exposure Dose Sequence	(0040,030E)	SQ		Zero or more items
> KVP	(0018,0060)	DS		x
> Exposure Time	(0018,1150)	IS		x
> X-ray Tube Current in μ A	(0018,8151)	IS		x
Entrance Dose in mGy	(0040,8302)	DS	0	x

4.2.4.4 Association Acceptance Policy

The MPPS SCU AE does not accept Associations.

4.2.5 Print SCU AE Specification

4.2.5.1 SOP Classes

The Print SCU AE provides Standard Conformance to the following Meta SOP Classes:

Table 4.2-33
META SOP CLASSES FOR THE PRINT SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Yes	No

The above Meta SOP Classes are defined by the following set of supported SOP Classes:

Table 4.2-34
SOP CLASSES FOR THE PRINT SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
Basic film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No

4.2.5.2 Association Policies

4.2.5.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-35
DICOM APPLICATION CONTEXT FOR THE PRINT SCU AE

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

4.2.5.2.2 Number of Associations

The Print SCU AE initiates one Associations at a time.

Table 4.2-36
NUMBER OF ASSOCIATIONS INITIATED FOR THE PRINT SCU AE

Maximum number of simultaneous Associations	1
---	---

4.2.5.2.3 Asynchronous Nature

The Print SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

4.2.5.2.4 Implementation Identifying Information

The implementation information for the Print SCU AE is:

Table 4.2-37
DICOM IMPLEMENTATION CLASS AND VERSION FOR THE PRINT SCU AE

Implementation Class UID	1.2.392.200036.9116.32.4
Implementation Version Name	TOSHIBA.PLESSART

4.2.5.3 Association Initiation Policy

4.2.5.3.1 Activity – Send Images & Print Management Information

4.2.5.3.1.1 Description and Sequencing of Activities

A user composes images onto film sheets and requests them to be sent to a specific hardcopy device. The user can select the desired film format and number of copies.

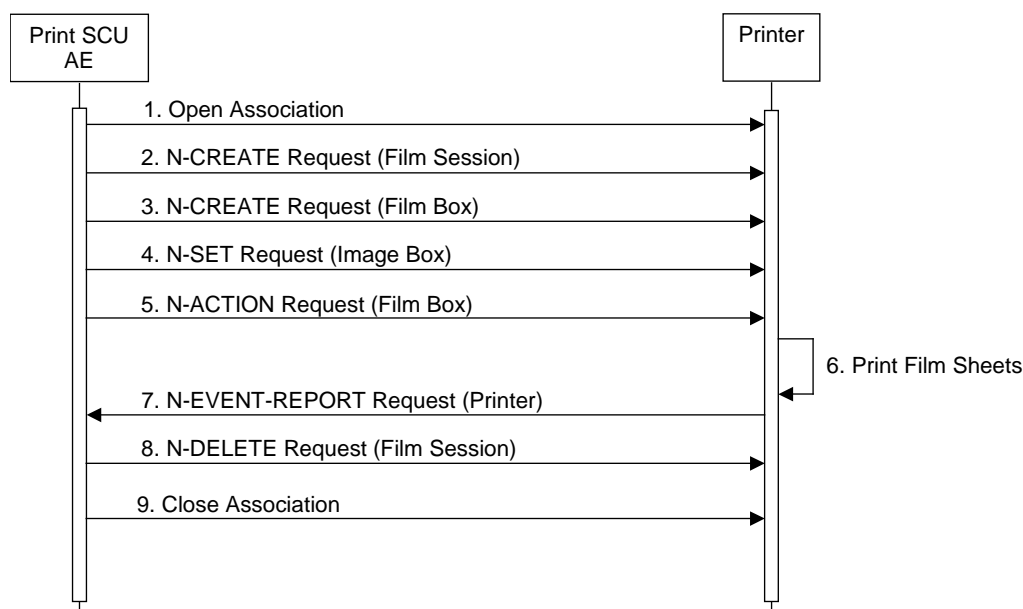


Figure 4.2-5
SEQUENCING OF ACTIVITY – SEND IMAGES & PRINT MANAGEMENT INFORMATION

A typical sequence of DIMSE messages sent over an association between the Print SCU AE and a Printer is illustrated in the Figure above:

1. The Print SCU AE opens an Association with the Printer.
2. N-CREATE on the Film Session SOP Class creates a Film Session.
3. N-CREATE on the Film Box SOP Class creates a Film Box linked to the Film Session.
4. N-SET on the Image Box SOP Class transfers the contents of the film sheet to the printer.
5. N-ACTION on the Film Box SOP Class instructs the Printer to print the Film Box
6. The Printer prints the requested number of film sheets.
7. The Printer asynchronously reports its status via N-EVENT-REPORT notification (Printer SOP Class). The printer can send this message at any time. The Print SCU AE does not require the N-EVENT-REPORT to be sent. The Print SCU AE is capable of receiving an N-EVENT-REPORT notification at any time during an association.
8. N-DELETE on the Film Session SOP Class deletes the complete Film Session SOP Instance hierarchy.
9. The Print SCU AE closes the Association with the Printer.

4.2.5.3.1.2 Proposed Presentation Contexts

The Print SCU AE is capable of proposing the Presentation Contexts shown in the table below:

**Table 4.2-38
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY
SEND IMAGES & PRINT MANAGEMENT INFORMATION**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.5.3.1.3 Common SOP Specific Conformance for all Print SOP Classes

The general behavior of the Print SCU AE during communication failure is summarized in the table below. This behavior is common for all SOP Classes supported by the Print SCU AE.

**Table 4.2-39
PRINT COMMUNICATION FAILURE BEHAVIOR**

Exception	Behavior
Timeout	The Association is aborted and the print-job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.
Association aborted by the SCP or network layers	The print-job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.

4.2.5.3.1.4 SOP Specific Conformance for Printer SOP Class

The Print SCU AE supports the following DIMSE operations and notifications for the Printer SOP Class:

— N-EVENT-REPORT

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.5.3.1.4.1 Printer SOP Class Notifications (N-EVENT-REPORT)

The Print SCU AE is capable of receiving an N-EVENT-REPORT request at any time during an association.

The behavior of the Print SCU AE when receiving Event Types within the N-EVENT-REPORT is summarized in the table below:

Table 4.2-40
PRINTER SOP CLASS N-EVENT-REPORT BEHAVIOUR

Event Type Name	Event Type ID	Behavior
Normal	1	The print-job continues to be printed.
Warning	2	The print-job continues to be printed.
Failure	3	The print-job continues to be printed.
*	*	The print-job continues to be printed.

The reasons for returning specific status codes in an N-EVENT-REPORT response are summarized in the table below:

Table 4.2-41
PRINTER SOP CLASS N-EVENT-REPORT RESPONSE STATUS REASONS

Service Status	Further Meaning	Status Code	Reasons
Success	Success	0000	The notification event has been successfully received.

4.2.5.3.1.5 SOP Specific Conformance for the Film Session SOP Class

The Print SCU AE supports the following DIMSE operations for the Film Session SOP Class:

- N-CREATE
- N-DELETE

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.5.3.1.5.1 Film Session SOP Class Operations (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the table below:

Table 4.2-42
FILM SESSION SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	(2000,0010)	IS	1 .. 10	ALWAYS	User
Print Priority	(2000,0020)	CS	LOW, MID, or HIGH	ALWAYS	User
Medium Type	(2000,0030)	CS	BLUE FILM, CLEAR FILM or PAPER	ALWAYS	User
Film Destination	(2000,0040)	CS	MAGAZINE or PROCESSOR	ALWAYS	User

The behavior of the Print SCU AE when encountering status codes in an N-CREATE response is summarized in the table below:

Table 4.2-43
FILM SESSION SOP CLASS N-CREATE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
Warning	Attribute Value Out of Range	0116H	The N-CREATE operation is considered successful.
Warning	Attribute List Error	0107H	
*	*	Any other status code.	The Association is aborted and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.5.3.1.5.2 Film Session SOP Class Operations (N-DELETE)

The behavior of the Print SCU AE when encountering status codes in an N-DELETE response is summarized in the table below:

Table 4.2-44
PRINTER SOP CLASS N-DELETE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
*	*	Any other status code.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.5.3.1.6 SOP Specific Conformance for the Film Box SOP Class

The Print SCU AE supports the following DIMSE operations for the Film Box SOP Class:

- N-CREATE
- N-ACTION

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.5.3.1.6.1 Film Box SOP Class Operations (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the table below:

**Table 4.2-45
FILM BOX SOP CLASS N-CREATE REQUEST ATTRIBUTES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Display Format	(2010,0010)	CS	STANDARD, R C=1,2,3,4,5 R=1,2,3,4,5	ALWAYS	User
Film Orientation	(2010,0040)	CS	PORTRAIT or LANDSCAPE	ALWAYS	User
Film Size ID	(2010,0050)	CS	8INX10IN, 10INX14IN, 14INX14IN, 10INX12IN, 11INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM	ALWAYS	User
Magnification Type	(2010,0060)	CS	REPLICATE, BILINEAR, CUBIC or NONE	ALWAYS	User
Border Density	(2010,0100)	CS	BLACK or WHITE	ALWAYS	User
Empty Image Density	(2010,0110)	CS	BLACK or WHITE	ALWAYS	User
Min Density	(2010,0120)	CS	0 .. 50	ALWAYS	User
Max Density	(2010,0130)	CS	0 .. 310	ALWAYS	User
Trim	(2010,0140)	CS	YES or NO	ALWAYS	User
Referenced Film Session Sequence	(2010,0500)	SQ		ALWAYS	Auto
>Referenced SOP Class UID	(0008,1150)	UI	1.2.840.10008.5.1.1.1	ALWAYS	Auto
>Referenced SOP Instance UID	(0008,1155)	UI	From created Film Session SOP Instance	ALWAYS	Auto

The behavior of the Print SCU AE when encountering status codes in an N-CREATE response is summarized in the table below:

Table 4.2-46
FILM BOX SOP CLASS N-CREATE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
Warning	Requested Min Density or Max Density outside of printer's operating range	B605H	The N-CREATE operation is considered successful.
*	*	Any other status code.	The Association is aborted and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.5.3.1.6.2 Film Box SOP Class Operations (N-ACTION)

An N-ACTION Request is issued to instruct the Print SCP to print the contents of the Film Box. The Action Reply argument in an N-ACTION response is not evaluated.

The behavior of the Print SCU AE when encountering status codes in an N-ACTION response is summarized in the table below:

Table 4.2-47
FILM BOX SOP CLASS N-ACTION RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. The film has been accepted for printing.
Warning	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page).	B603H	The N-ACTION operation is considered successful.
Warning	Image size is larger than Image Box size. The image has been demagnified.	B604H	
Warning	Image size is larger than Image Box size. The image has been cropped to fit.	B609H	The Association is aborted and the print-job is marked as failed. The status meaning is logged and reported to the user.
Warning	Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit.	B60AH	
Failure	Unable to create Print Job SOP Instance; print queue is full.	C602H	
Failure	Image size is larger than Image Box size.	C603H	
Failure	Combined Print Image Size is larger than Image Box size.	C613H	
*	*	Any other status code.	

4.2.5.3.1.7 SOP Specific Conformance for the Grayscale Image Box SOP Class

The Print SCU AE supports the following DIMSE operations for the Grayscale Image Box SOP Class:

— N-SET

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.5.3.1.7.1 Grayscale Image Box SOP Class Operations (N-SET)

The attributes supplied in an N-SET Request are listed in the table below:

Table 4.2-48
GRAYSCALE IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Magnification Type	(2010,0060)	CS	REPLICATE, BILINEAR, CUBIC or NONE	ALWAYS	User
Image Position	(2020,0010)	US	1	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	Depends on film size	ALWAYS	Auto
>Columns	(0028,0011)	US	Depends on film size	ALWAYS	Auto
>Bits Allocated	(0028,0100)	US	8	ALWAYS	Auto
>Bits Stored	(0028,0101)	US	8	ALWAYS	Auto
>High Bit	(0028,0102)	US	7	ALWAYS	Auto
>Pixel Representation	(0028,0103)	US	0	ALWAYS	Auto
>Pixel Data	(7FE0,0010)	OW		ALWAYS	Auto

The behavior of the Print SCU AE when encountering status codes in an N-SET response is summarized in the table below:

**Table 4.2-49
GRAYSCALE IMAGE BOX SOP CLASS N-SET RESPONSE STATUS HANDLING BEHAVIOR**

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. Image successfully stored in Image Box.
Warning	Image size is larger than Image Box size. The image has been demagnified.	B604H	The N-SET operation is considered successful.
Warning	Requested Min Density or Max Density outside of printer's operating range.	B605H	
Warning	Image size is larger than Image Box size. The image has been cropped to fit.	B609H	The Association is aborted and the print-job is marked as failed. The status meaning is logged and reported to the user.
Warning	Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit.	B60AH	
Failure	Image size is larger than Image Box size.	C603H	
Failure	Insufficient memory in printer to store the image.	C605H	
Failure	Combined Print Image Size is larger than Image Box size.	C613H	
*	*	Any other status code.	

4.2.5.4 Association Acceptance Policy

The Print SCU AE does not accept Associations.

4.2.6 Verification AE Specification

4.2.6.1 SOP Classes

The Verification AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-50
SOP CLASSES FOR THE VERIFICATION AE**

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	Option (see Note 3)

NOTE3: Q/R OPTION License must be installed.

4.2.6.2 Association Policies

4.2.6.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-51
DICOM APPLICATION CONTEXT FOR THE VERIFICATION AE**

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

4.2.6.2.2 Number of Associations

The Verification SCU AE initiates one Association at a time.

**Table 4.2-52
NUMBER OF ASSOCIATIONS INITIATED FOR THE VERIFICATION AE**

Maximum number of simultaneous Associations	1
---	---

4.2.6.2.3 Asynchronous Nature

The Verification AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

4.2.6.2.4 Implementation Identifying Information

The implementation information for the Verification AE is:

**Table 4.2-53
DICOM IMPLEMENTATION CLASS FOR THE VERIFICATION AE**

Implementation Class UID	1.2.392.200036.9116.32.4
--------------------------	--------------------------

4.2.6.3 Association Initiation Policy

4.2.6.3.1 Activity – Verify Connectivity

4.2.6.3.1.1 Description and Sequencing of Activities

The Verification AE attempts to initiate a new association in order to issue a verification request (C-ECHO) if needed.

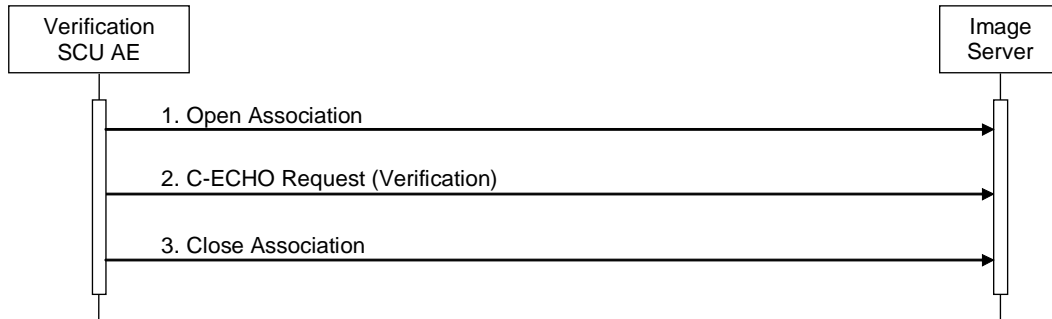


Figure 4.2-6
SEQUENCING OF ACTIVITY – VERIFY CONNECTIVITY

A possible sequence of interactions between the Verification AE and an Image Server is illustrated in the Figure above:

1. The Verification AE opens an association with the Image Server.
2. The Verification AE issues a verification request (C-ECHO) and the Image Server replies with a C-ECHO response (status success).
3. The Verification SCU AE closes the association with the Image Server.

4.2.6.3.1.2 Proposed Presentation Contexts

The Verification AE will propose the Presentation Contexts shown in the following table:

Table 4.2-54
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY VERIFY CONNECTIVITY

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.6.3.1.3 SOP Specific Conformance for Verification SOP Class

The Verification SCU AE provides standard conformance to the Verification Service Class as an SCU.

The behavior of the Verification SCU AE when encountering status codes in a C-ECHO response is summarized in the table below:

**Table 4.2-55
VERIFICATION RESPONSE STATUS HANDLING BEHAVIOR**

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The Verification SCU AE judges the remote AE is present and active on the network.

The behavior of the Verification SCU AE during communication failure is summarized in the table below:

**Table 4.2-56
VERIFICATION COMMUNICATION FAILURE BEHAVIOR**

Exception	Behavior
Timeout	The association is aborted and the failure reason is logged and reported to the user.
Association aborted by the SCP or network layers	The failure reason is logged and reported to the user.

4.2.7 Q/R SCU AE Specification

4.2.7.1 SOP Classes

The Q/R SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-57
SOP CLASSES FOR THE Q/R SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Patient Root Q/R Information Model – Find	1.2.840.10008.5.1.4.1.2.1.1	Option (see Note 3)	No
Patient Root Q/R Information Model – Move	1.2.840.10008.5.1.4.1.2.1.2		
Study Root Q/R Information Model – Find	1.2.840.10008.5.1.4.1.2.2.1		
Study Root Q/R Information Model – Move	1.2.840.10008.5.1.4.1.2.2.2		

NOTE3: Q/R OPTION License must be installed.

4.2.7.2 Association Policies

4.2.7.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-58
DICOM APPLICATION CONTEXT FOR THE Q/R SCU AE

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

4.2.7.2.2 Number of Associations

The Q/R SCU AE initiates one association at a time.

Table 4.2-59
NUMBER OF ASSOCIATIONS INITIATED FOR THE Q/R SCU AE

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

4.2.7.2.3 Asynchronous Nature

The Q/R SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-60
ASYNCHRONOUS NATURE FOR THE Q/R SCU AE

Maximum number of outstanding asynchronous transactions	1
---	---

4.2.7.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-61
DICOM IMPLEMENTATION CLASS AND VERSION FOR THE Q/R SCU AE

Implementation Class UID	1.2.392.200036.9116.32.4
Implementation Version Name	TOSHIBA.PLESSART

4.2.7.3 Association Initiation Policy

4.2.7.3.1 Activity – Query and Retrieve Instances

4.2.7.3.1.1 Description and Sequencing of Activities

The Q/R SCU AE is activated when the user selects a remote node to query and enters some key information, Patient's Name, Patient ID and/or Study Date. The user can select series to be retrieved. The instances will be received at the Storage SCP AE.

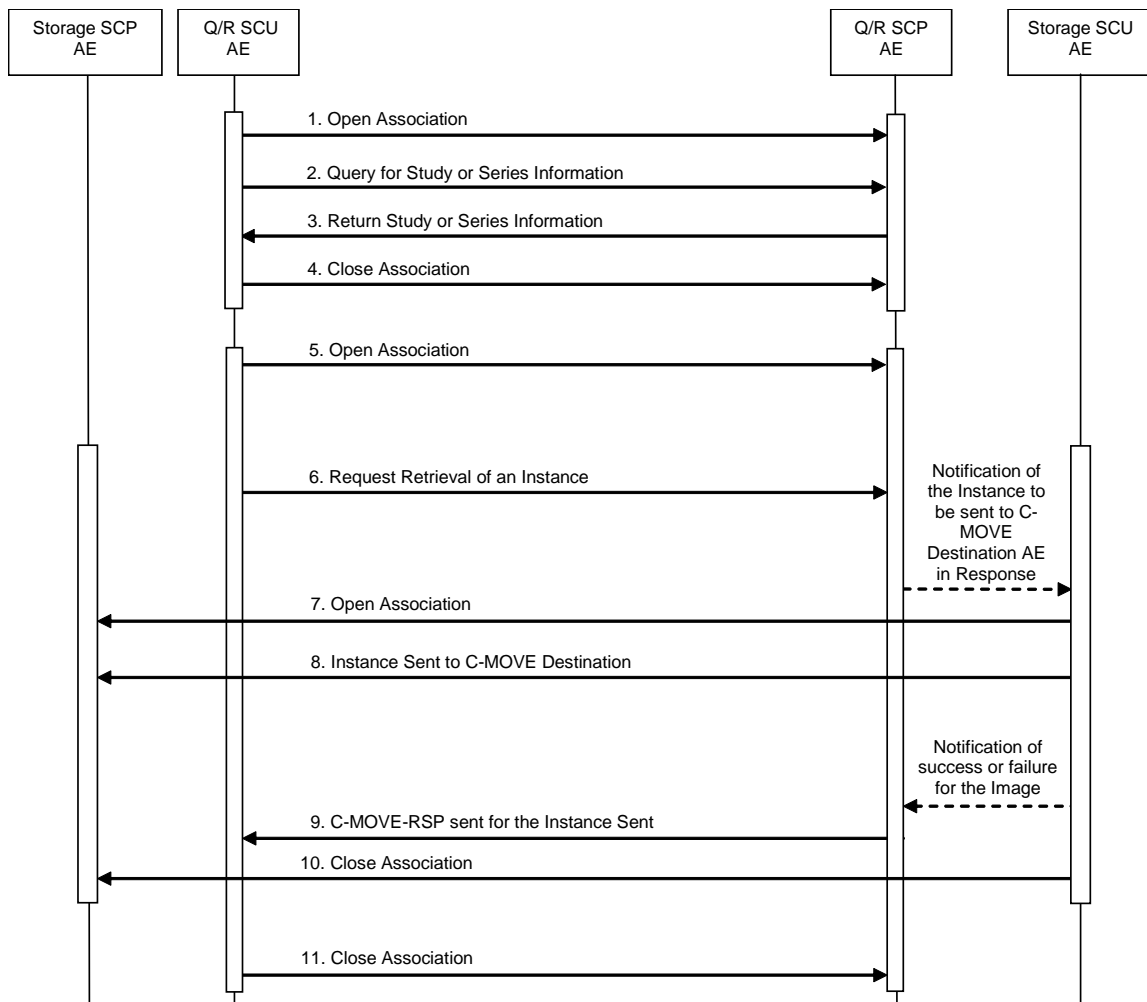


Figure 4.2-7
SEQUENCING OF ACTIVITY – QUERY AND RETRIEVE INSTANCES

The following sequencing constraints illustrated in the Figure above:

1. The Q/R SCU AE opens an association with the Q/R SCP AE.
2. The Q/R SCU AE sends a C-FIND-RQ Message.
3. The Q/R SCP AE returns a C-FIND-RSP Message to the Q/R SCU AE with matching information. A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. A final C-FIND-RSP is sent indicating that the matching is complete.
4. The Q/R SCU AE closes the association.
5. The Q/R SCU AE opens an association with the Q/R SCP AE.
6. The Q/R SCU AE sends a C-MOVE-RQ Message. The Q/R SCP AE notifies the Storage SCU AE to send the Composite SOP Instances to the peer C-MOVE Destination AE as indicated in the C-MOVE-RQ.
7. The Storage SCU AE opens an association with the C-MOVE Destination AE.
8. The Storage SCU AE sends instances to the C-MOVE Destination AE. The Storage SCU AE indicates to the Q/R SCP AE whether the transfer succeeded or failed.
9. The Q/R SCP AE then returns a C-MOVE-RSP indicating this success or failure.
10. The Storage SCU AE closes the association.
11. The Q/R SCU AE closes the association.

4.2.7.3.1.2 Proposed Presentation Contexts

The Q/R SCU AE will propose Presentation Contexts shown in the following table:

**Table 4.2-62
PROPOSED PRESENTATION CONTEXTS FOR REAL-WORLD ACTIVITY
QUERY AND RETRIEVE INSTANCES**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Patient Root Q/R Information Model – Find	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Patient Root Q/R Information Model – Move	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Study Root Q/R Information Model – Find	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Study Root Q/R Information Model – Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.7.3.1.3 SOP Specific Conformance for Q/R Find SOP Classes

The Q/R SCU AE provides standard conformance to the Query/Retrieve Find SOP Classes as an SCU.

The behavior of the Q/R SCU AE when encountering status codes in a Q/R C-FIND response is summarized in the table below:

**Table 4.2-63
THE Q/R SCU AE C-FIND RESPONSE STATUS BEHAVIOR**

Service Status	Further Meaning	Status Code	Behavior
Success	Matching is complete	0000	The SCP has completed the matches. Study or Series information items are available for display or further processing.
*	*	Any other status code	The association is aborted using A-ABORT and the Study or Series information is marked as failed. The status meaning is logged and reported to the user.

The behavior of the Q/R SCU AE during communication failure is summarized in the table below.

**Table 4.2-64
Q/R FIND COMMUNICATION FAILURE BEHAVIOR**

Exception	Behavior
Timeout	The association is aborted and the study or series query is marked as failed. The reason is logged and reported to the user.
Association aborted by the SCP or network layers	The study or series query is marked as failed. The reason is logged and reported to the user.

All queries are initiated at the highest level of the information model (the PATIENT level), and then for each response received.

The table below provides a description of the Q/R SCU AE C-FIND Request Identifier.

Table 4.2-65
PATIENT ROOT REQUEST IDENTIFIER FOR C-FIND

Name	Tag	Types of Matching
Patient Level		
Patient's Name	(0010,0010)	*, U
Patient ID	(0010,0020)	UNIQUE
Patient's Birth Date	(0010,0030)	*, U
Patient Sex	(0010,0040)	*, U
Patient Comment	(0010,4000)	*

Types of Matching:

The types of Matching supported by the Q/R SCU AE. An "*" indicates wildcard matching, and a "U" indicates Universal Matching. "UNIQUE" indicates that this is the Unique Key for that query level, in which case Universal Matching or Single Value Matching is used depending on the query level.

All queries are initiated at the highest level of the information model (the STUDY level), and then for each response received.

The table below provides a description of the Q/R SCU AE C-FIND Request Identifier.

**Table 4.2-66
STUDY ROOT REQUEST IDENTIFIER FOR C-FIND**

Name	Tag	Types of Matching
Study Date	(0008,0020)	U, R
Study Time	(0008,0030)	U
Accession Number	(0008,0050)	*, U
Query/Retrieve Level	(0008,0052)	“STUDY “
Modalities in study	(0008,0061)	“XA/RF”
Referring Physician’s Name	(0008,0090)	U
Study Description	(0008,1030)	*, U
Patient’s Name	(0010,0010)	S,*,U
Patient ID	(0010,0020)	S,*,U
Patient’s Birth Date	(0010,0030)	U
Patient Sex	(0010,0040)	*, U
Patient Comment	(0010,4000)	U
Study Instance UID	(0020,000D)	UNIQUE
Study ID	(0020,0010)	*, U
Number of Study Related Series	(0020,1206)	U
Number of Study Related Instance	(0020,1208)	U

Types of Matching:

The types of Matching supported by the Q/R SCU AE. An “S” indicates the identifier attribute uses Single Value Matching, an “R” indicates Range Matching, an “*” indicates wildcard matching, and a “U” indicates Universal Matching. “UNIQUE” indicates that this is the Unique Key for that query level, in which case Universal Matching or Single Value Matching is used depending on the query level.

4.2.7.3.1.4 SOP Specific Conformance for Q/R Move SOP Classes

The Q/R SCU AE provides standard conformance to the Query/Retrieve Move SOP Classes as an SCU.

The behavior of the Q/R SCU AE when encountering status codes in a Q/R C-MOVE response is summarized in the table below:

Table 4.2-67
THE Q/R SCU AE C-MOVE RESPONSE STATUS BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Sub-operations complete – No Failures	0000	The Storage SCP AE has successfully received the SOP Instance. If all SOP Instances in a move job have status success then the job is marked as complete.
*	*	Any other status code	The association is aborted using A-ABORT and the move job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.

The behavior of the Q/R SCU AE during communication failure is summarized in the table below.

Table 4.2-68
Q/R MOVE COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The association is aborted using A-ABORT and the retrieve is marked as failed. The reason is logged and reported to the user if an interactive query.
Association aborted by the SCP or network layers	The retrieve is marked as failed. The reason is logged and reported to the user if an interactive query.

4.2.7.4 Association Acceptance Policy

The Q/R SCU AE does not accept associations.

4.3 NETWORK INTERFACES

4.3.1 Physical Network Interface

This Product supports a single network interface. One of the following physical network interfaces will be available as a standard:

Table 4.3-1
SUPPORTED PHYSICAL NETWORK INTERFACES

Ethernet 1000baseT
Ethernet 100baseT
Ethernet 10baseT

4.3.2 Additional Protocols

None.

4.4 CONFIGURATION

4.4.1 AE Title/Presentation Address Mapping

4.4.1.1 Local AE Titles

All local applications use the AE Titles and TCP/IP Ports configured via the Service Tool. The Field Service Engineer can configure the TCP Port via the Service Tool.

**Table 4.4-1
AE TITLE CONFIGURATION TABLE**

Application Entity	Default AE Title	Default TCP/IP Port
Storage SCU	PDR04A	Not Applicable
Print SCU		
Verification SCU		

**Table 4.4-2
AE TITLE CONFIGURATION TABLE(OPTION)**

Application Entity	Default AE Title	Default TCP/IP Port
MWM SCU Option (see Note 1)	PDR04A	Not Applicable
MPPS SCU Option (see Note 2)		
Q/R SCU Option (see Note 3)	XRClinicViewer	Not Applicable
Storage SCP Option (see Note 3)	XRLinkSRV	11112(Don't set the same port # as other SCU's ports.)
Verification SCP Option (see Note 3)		

NOTE1: MWM OPTION License must be installed.

NOTE2: MPPS OPTION License must be installed.

NOTE3: Q/R OPTION License must be installed.

4.4.1.2 Remote AE Title / Presentation Address Mapping

The AE Titles, host names and port numbers of remote applications are configured using the Service/Installation Tool.

4.4.2 Parameters

A large number of parameters related to acquisition and general operation can be configured using the Service/Installation Tool. The table below only shows those configuration parameters relevant to DICOM communication. See the Product's Service Manual for details on general configuration capabilities.

**Table 4.4-3
CONFIGURATION PARAMETERS TABLE**

Parameter	Configurable (Yes/No) [Range]	Default Value
General Parameters		
Max PDU Receive Size	No	16384 Bytes (16Kbytes)
Max PDU Send Size		
Time-out waiting for a acceptance or rejection response to an Association Request (Application Level Timeout)	No	15 sec
Time-out waiting for a response to an Association release request (Application Level Timeout)	No	30 sec
Time-out waiting for completion of a TCP/IP connect request (Low-level timeout)	No	15 sec
Time-out awaiting a Response to a DIMSE Request (Low-Level Timeout)	No	360 sec
Time-out for waiting for data between TCP/IP-packets (Low Level Timeout)	No	30 sec
Storage SCU Parameters		
Storage SCU time-out waiting for a response to a C-STORE-RQ	No	120 sec
Number of times a failed send job may be retried	Yes [1 to 5]	3
Delay between retrying failed send jobs	No	1 min
Maximum number of simultaneously initiated Associations by the Storage SCU AE	No	1
Supported Transfer Syntaxes	No	Implicit VR Little Endian
Modality Worklist SCU Parameters		
Maximum number of simultaneously initiated Associations by the MWM SCU AE	No	1
Supported Transfer Syntaxes for MWM	No	Implicit VR Little Endian
Modality Worklist SCU time-out waiting for the final response to a C-FIND-RQ	No	600 sec
Maximum number of Worklist Items	No	100
Query Worklist for specific Scheduled Station AE Title (Only supported Characters are available)	Yes	PDR04A
Query Worklist for specific Modality Value	Yes [RF,XA]	RF
Print SCU Parameters		
Print SCU time-out waiting for a response to an N-CREATE-RQ	No	60sec
Print SCU time-out waiting for a response to an N-SET-RQ	No	30sec

Parameter	Configurable (Yes/No) [Range]	Default Value
Print SCU time-out waiting for a response to an N-ACTION-RQ	No	360sec
Maximum number of simultaneously initiated Associations by the Print SCU AE	No	1
Supported Transfer Syntaxes for Print	No	Implicit VR Little Endian

5. MEDIA INTERCHANGE

5.1 IMPLEMENTATION MODEL

5.1.1 Application Data Flow

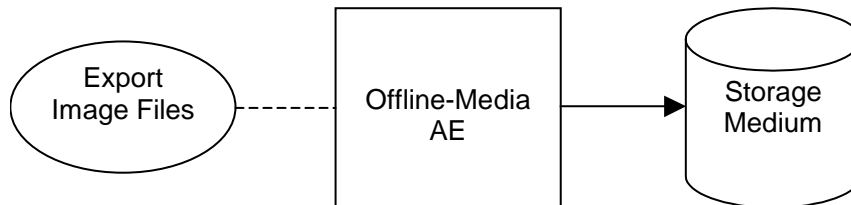


Figure 5.1-1
APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE

- The Offline-Media AE exports instances to a CD-R, DVD+R or USB Storage medium. It is associated with the local real-world activity “Export Instances” performed upon user request.
- The Offline-Media AE imports instances from a CD-R, DVD+R or USB Storage medium. It is associated with the local real-world activity “Import Instances” performed upon user request.
- The Offline-Media AE updates instances from a USB Storage medium. It is associated with the local real-world activity “Add Instances” performed upon user request.

5.1.2 Functional Definition of AEs

5.1.2.1 Functional Definition of Offline-Media AE

The Offline-Media AE is performed upon user request for selected instances to/from an offline DICOM CD-R, DVD+R or USB medium. It therefore performs the following tasks:

Export:

- Builds DICOM Information Objects.
- Creates a DICOMDIR file that represents the contents of the DICOM Information Objects to be recorded.
- Records DICOM Information Objects and the DICOMDIR file to the CD-R, DVD+R or USB medium.

Import:

- Reads the DICOMDIR file that represents the contents of the data as recorded.
- Displays the ordered list of instances, identifying information.
- Loads the selected instances from the CD-R, DVD+R or USB medium and displays them on the screen.

Addition:

- Reads a File-set of the USB medium and writes it to the local storage device.
- Adds the instances to the File-set, then writes it to the medium.
- Modifies the DICOMDIR file.

Note: The Offline-Media AE can update files created by the product itself.

5.1.3 Sequencing of Real-World Activities

5.1.3.1 Activity – Export Instances

Operator requests to create new File-set(s) onto a new CD-R, DVD+R or USB medium. The requests are placed in a queue and are executed in the background.

The operations for “Export Instances” are described below:

- Step-1: Select the instances on the local storage device to be created to the medium.
- Step-2: Request to copy to the medium.

5.1.3.2 Activity – Import Instances

Operator requests to retrieve File-set(s) on the CD-R, DVD+R or USB medium. The requests are placed in a queue and are executed in the background.

The operations for “Import Instances” are described below:

- Step-1: Select the instances on the medium to be retrieved to the local storage device.
- Step-2: Request to copy to the local storage device.

5.1.3.3 Activity – Add Instances

Operator requests to add new objects to an already existing File-set on the USB medium. The requests are placed in a queue and are executed in the background.

The operations for “Add Instances” are described below:

- Step-1: Select the instances on the local storage device to be added to the medium.
- Step-2: Request to copy to the medium.

5.1.4 File Meta Information for Implementation Class and Version

The implementation information written to the File Meta Header in each file is:

**Table 5.1-1
DICOM IMPLEMENTATION CLASS AND VERSION FOR MEDIA STORAGE**

File Meta Information Version	1
Implementation Class UID	1.2.392.200036.9116.32.4
Implementation Version Name	TOSHIBA.PLESSART

5.2 AE SPECIFICATIONS

5.2.1 Offline-Media AE Specification

The Offline-Media AE provides standard conformance to the DICOM Interchange Option of the Media Storage Service Class. The Application Profiles and roles are listed below:

**Table 5.2-1
APPLICATION PROFILES, ACTIVITIES AND ROLES FOR OFFLINE-MEDIA**

Application Profiles Supported	Real World Activity	Role	SC Option
STD-GEN-CD	Export Instances	FSC	Interchange
	Import Instances	FSR	Interchange

5.2.1.1 File Meta Information for the Application Entity

The Source Application Entity Title is the local AE title of Storage SCP.

5.2.1.2 Real-World Activities

5.2.1.2.1 Activity – Export Instances

The Offline-Media AE acts as an FSC using the interchange option when requested to export SOP Instances from the local database to a CD-R, DVD+R or USB medium.

5.2.1.2.1.1 Media Storage Application Profiles

The Offline-Media AE supports the STD-GEN-CD Application Profiles.

5.2.1.2.1.1.1 Options

The Offline-Media AE supports the SOP Classes and Transfer Syntaxes listed in Table 5.3-1.

5.2.1.2.2 Activity – Import Instances

The Offline-Media AE acts as an FSR using the interchange option when requested to import SOP Instances from a CD-R, DVD+R or USB medium to the local database.

5.2.1.2.2.1 Media Storage Application Profiles

The Offline-Media AE supports the STD-GEN-CD Application Profiles.

5.2.1.2.2.1.1 Options

The Offline-Media AE supports the SOP Classes and Transfer Syntaxes listed in Table 5.3-1.

5.2.1.2.3 Activity – Add Instances

The Offline-Media AE acts as an FSU using the interchange option when requested to add SOP Instances from the local database to a USB medium.

5.2.1.2.3.1 Media Storage Application Profiles

The Offline-Media AE supports the STD-GEN-CD Application Profiles.

5.2.1.2.3.1.1 Options

The Offline-Media AE supports the SOP Classes and Transfer Syntaxes listed in Table 5.3-1.

5.3 AUGMENTED AND PRIVATE APPLICATION PROFILES

5.3.1 Augmented Application Profiles

5.3.1.1 Augmented Application Profiles – STD-GEN-CD

5.3.1.1.1 SOP Class Augmentations

The Augmented Application Profiles support the following SOP Classes and Transfer Syntaxes:

Table 5.3-1
SOP CLASS AUGMENTATIONS

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Media Storage Directory Storage	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed	1.2.840.10008.1.2.1
RF Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian Uncompressed	1.2.840.10008.1.2.1
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Explicit VR Little Endian	1.2.840.10008.1.2.1

5.3.1.1.2 Directory Augmentations

Not applicable.

5.3.1.1.3 Other Augmentations

Not applicable.

5.3.2 Private Application Profiles

Not applicable.

5.4 MEDIA CONFIGURATION

Not applicable.

6. SUPPORT OF CHARACTER SETS

This product supports the following character sets:

ISO-IR 6 (default)

ISO-IR 87(Japanese)

JIS X 0208(Kanji)

Character set ISO-IR 87 can be set to the tags listed in the table below;

Table 6-1
Tag lists for ISO-IR 87

Attribute Name	Tag	VR
Patient's Name	(0010,0010)	PN

7. SECURITY

This product does not support any specific security measures.

It is assumed that this product is used within a secured environment. It is assumed that a secured environment includes at a minimum:

- a. Firewall or router protections to ensure that only approved external hosts have network access to the product.
- b. Firewall or router protections to ensure that the product only has network access to approved external hosts and services.
- c. Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN))

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

8. ANNEXES

8.1 IOD CONTENTS

8.1.1 Created SOP Instances

Table 8.1-1 specifies the attributes of an XA Image transmitted by the Storage SCU AE.

Table 8.1-2 specifies the attributes of an RF Image transmitted by the Storage SCU AE.

The following tables use a number of abbreviations. The abbreviations used in the “Presence of ...” column are:

VNAP	Value Not Always Present (attribute sent zero length if no value is present)
ANAP	Attribute Not Always Present
ALWAYS	Always Present
EMPTY	Attribute is sent without a value

The abbreviations used in the “USAGE” column are:

M	the attribute value is Mandatory
C	the attribute value is Conditional
U	the attribute value is User Option

The abbreviations used in the “Source” column:

MWL	the attribute value source is from Modality Worklist
USER	the attribute value source is from User input
AUTO	the attribute value is generated automatically
CONFIG	the attribute value source is a configurable parameter

8.1.1.1 XA Image IOD

Table 8.1-1
IOD OF CREATED XA IMAGE SOP INSTANCES

IE	Module	Reference	Presence of Module	Usage
Patient	Patient	Table 8.1-8	ALWAYS	M
	Clinical Trial Subject		EMPTY	U
Study	General Study	Table 8.1-9	ALWAYS	M
	Patient Study	Table 8.1-10	ANAP	U
	Clinical Trial Study		EMPTY	U
Series	General Series	Table 8.1-11	ALWAYS	M
	Clinical Trial Series		EMPTY	U
Frame of Reference	Synchronization		EMPTY	U
Equipment	General Equipment	Table 8.1-12	ALWAYS	M
Image	General Image	Table 8.1-13	ALWAYS	M
	Image Pixel	Table 8.1-14	ALWAYS	M
	Contrast/Bolus	Table 8.1-15	ALWAYS	C
	Cine	Table 8.1-16	ANAP	C
	Multi-frame	Table 8.1-17	VNAP	C
	Frame Pointers		EMPTY	U
	Mask		EMPTY	C
	Display Shutter	Table 8.1-18	ANAP	U
	Device		EMPTY	U
	Intervention		EMPTY	U
	X-ray Image	Table 8.1-20	ALWAYS	M
	X-ray Acquisition	Table 8.1-21	ALWAYS	M
	X-ray Collimator		EMPTY	U
	X-ray Table	Table 8.1-22	ANAP	C
	XA Positioner	Table 8.1-23	ALWAYS	M
	DX Detector	Table 8.1-25	ALWAYS	U
	Overlay Plane		EMPTY	U
	Multi-frame Overlay		EMPTY	C
	Modality LUT		EMPTY	C/U
	VOI LUT	Table 8.1-26	ALWAYS	U
SOP Common	Table 8.1-19	ALWAYS	M	

8.1.1.2 RF Image IOD

**Table 8.1-2
IOD OF CREATED RF IMAGE SOP INSTANCES**

IE	Module	Reference	Presence of Module	Usage
Patient	Patient	Table 8.1-8	ALWAYS	M
	Clinical Trial Subject		EMPTY	U
Study	General Study	Table 8.1-9	ALWAYS	M
	Patient Study	Table 8.1-10	ANAP	U
	Clinical Trial Study		EMPTY	U
Series	General Series	Table 8.1-11	ALWAYS	M
	Clinical Trial Series		EMPTY	U
Frame of Reference	Synchronization		EMPTY	U
Equipment	General Equipment	Table 8.1-12	ALWAYS	M
Image	General Image	Table 8.1-13	ALWAYS	M
	Image Pixel	Table 8.1-14	ALWAYS	M
	Contrast/Bolus	Table 8.1-15	ALWAYS	U
	Cine	Table 8.1-16	ALWAYS	U
	Multi-frame	Table 8.1-17	VNAP	U
	Frame Pointers		EMPTY	U
	Mask		EMPTY	U
	X-ray Image	Table 8.1-20	ALWAYS	M
	X-ray Acquisition	Table 8.1-21	ALWAYS	M
	X-ray Collimator		EMPTY	U
	Display Shutter	Table 8.1-18	ANAP	U
	Device		EMPTY	U
	Intervention		EMPTY	U
	X-ray Table	Table 8.1-22	ANAP	C
	XRF Positioner	Table 8.1-24	ALWAYS	U
	X-Ray Tomo Acquisition		EMPTY	C
	DX Detector	Table 8.1-25	ALWAYS	U
	Overlay Plane		EMPTY	U
	Modality LUT		EMPTY	U
	VOI LUT	Table 8.1-26	ALWAYS	U
SOP Common	Table 8.1-19	ALWAYS	M	

8.1.1.3 DOSE SR IOD

**Table 8.1-3
IOD OF CREATED DOSE SR SOP INSTANCES**

IE	Module	Reference	Presence of Module	Usage
Patient	Patient	Table 8.1-8	ALWAYS	M
Study	General Study	Table 8.1-9	ALWAYS	M
	Patient Study	Table 8.1-10	ANAP	U
Series	SR Document Series	Table 8.1-6	ALWAYS	M
Equipment	General Equipment	Table 8.1-12	ALWAYS	M
	Enhanced GENERAL Equipment	Table 8.1-7	ALWAYS	M
Document	SR Document General	Table 8.1-4	ALWAYS	M
	SR Document Content	Table 8.1-5	ALWAYS	M
	SOP Common	Table 8.1-19	ALWAYS	M

8.1.1.4 DOSE SR Modules

**Table 8.1-4
SR DOCUMENT GENERAL MODULES OF CREATED DOSE SR SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Content Date	(0008,0023)	DA	Ex.) "20131231"	ALWAYS	AUTO
Content Time	(0008,0033)	TM	Ex.) "105620"	ALWAYS	AUTO
Performed Procedure Code Sequence	(0040,A372)	SQ		ALWAYS	AUTO
Completion Flag	(0040,A491)	CS	Ex.) "PARTIAL "	ALWAYS	AUTO
Verification Flag	(0040,A493)	CS	Ex.) "UNVERIFIED"	ALWAYS	AUTO

**Table 8.1-5
SR DOCUMENT CONTENT MODULES OF CREATED SR SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Value Type	(0040,A040)	CS	Ex.) "CONTAINER "	ALWAYS	AUTO
Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>Code Value	(0008,0100)	SH	Ex.)"113701"	ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>Code Meaning	(0008,0104)	LO	Ex.)"X-Ray Radiation Dose Report "	ALWAYS	AUTO
Content Template Sequence	(0040,A504)	SQ		ALWAYS	AUTO
>Mapping Resource	(0008,0105)	CS	Ex.) "DCMR"	ALWAYS	AUTO
>Template Identifier	(0040,DB00)	CS	Ex.) "10001 "	ALWAYS	AUTO
Continuity Of Content	(0040,A050)	CS	Ex.)"SEPARATE"	ALWAYS	AUTO
Content Sequence	(0040,A730)	SQ		ALWAYS	AUTO
>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>Value Type	(0040,A040)	CS	Ex.)"CODE"	ALWAYS	AUTO
>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>Code Value	(0008,0100)	SH	Ex.)"113854"	ALWAYS	AUTO
>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>Code Meaning	(0008,0104)	LO	Ex.)"Source of Dose Information"	ALWAYS	AUTO
>Concept Code Sequence	(0040,A168)	SQ		ALWAYS	AUTO
>>Code Value	(0008,0100)	SH	Ex.)"113856"	ALWAYS	AUTO
>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO

>>Code Meaning	(0008,0104)	LO	Ex.)"Automated Data Collection "	ALWAYS	AUTO
>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>Value Type	(0040,A040)	CS	Ex.)"CONTAINER "	ALWAYS	AUTO
>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>Code Value	(0008,0100)	SH	Ex.)"113702"	ALWAYS	AUTO
>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>Code Meaning	(0008,0104)	LO	Ex.)"Accumulated X-Ray Dose Data "	ALWAYS	AUTO
>Continuity Of Content	(0040,A050)	CS	Ex.)"CONTINUOUS"	ALWAYS	AUTO
>Content Sequence	(0040,A730)	SQ		ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"CONTAINER "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"122505"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Calibration "	ALWAYS	AUTO
>>Content Sequence	(0040,A730)	SQ		ALWAYS	AUTO
>>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>>Value Type	(0040,A040)	CS	Ex.)"TEXT"	ALWAYS	AUTO
>>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"113724"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"Calibration Responsible Party "	ALWAYS	AUTO
>>>Text Value	(0040,A160)	UT	Ex.)"Calibration Responsible Party "	ALWAYS	AUTO
>>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"113763"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"Calibration Uncertainty "	ALWAYS	AUTO

>>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>>Code Value	(0008,0100)	SH	Ex.)"% "	ALWAYS	AUTO
>>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>>Code Meaning	(0008,0104)	LO	Ex.)"Percent "	ALWAYS	AUTO
>>>>Numeric Value	(0040,A30A)	DS	Ex.)"1 "	ALWAYS	AUTO
>>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"122322"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"Calibration Factor"	ALWAYS	AUTO
>>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>>Code Value	(0008,0100)	SH	Ex.)"1 "	ALWAYS	AUTO
>>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>>Code Meaning	(0008,0104)	LO	Ex.)"no units"	ALWAYS	AUTO
>>>>Numeric Value	(0040,A30A)	DS	Ex.)"1 "	ALWAYS	AUTO
>>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>>Value Type	(0040,A040)	CS	Ex.)"DATETIME"	ALWAYS	AUTO
>>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"113723"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"Calibration Date"	ALWAYS	AUTO
>>>Date Time	(0040,A120)	DT	Ex.)"19800101010101"	ALWAYS	AUTO
>>>Relationship Type	(0040,A010)	CS	Ex.)"HAS CONCEPT MOD "	ALWAYS	AUTO
>>>Value Type	(0040,A040)	CS	Ex.)"CODE"	ALWAYS	AUTO

>>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"113794"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"Dose Measurement Device "	ALWAYS	AUTO
>>>Concept Code Sequence	(0040,A168)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"A-2C090 "	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"SRT "	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"Dosimeter "	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"TEXT"	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113780"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Reference Point Definition"	ALWAYS	AUTO
>>Text Value	(0040,A160)	UT	Ex.)"Patient surface (FSD = 972mm) "	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113722"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Dose Area Product Total "	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"Gy.cm2"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"Gy.cm2"	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"1.18249992188066"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO

>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113725"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Dose (RP) Total "	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"mGy "	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"mGy "	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"2.15337692946196"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113727"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Acquisition Dose Area Product Total "	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"Gy.cm2"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"Gy.cm2"	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"1.004779991e-002"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113729"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Acquisition Dose (RP) Total "	ALWAYS	AUTO

>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"mGy "	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"mGy "	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"1.833000034e-002"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113855"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Total Acquisition Time"	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"s "	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"s "	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"6.e-003 "	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113726"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Fluoro Dose Area Product Total"	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"Gy.cm2"	ALWAYS	AUTO

>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"Gy.cm2"	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"1.17245212197304"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113728"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Fluoro Dose (RP) Total"	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"mGy "	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"mGy "	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"2.13504692912102"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113730"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Total Fluoro Time "	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"s "	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"s "	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"197.9 "	ALWAYS	AUTO
>Relationship Type	(0040,A010)	CS	Ex.)"HAS OBS CONTEXT "	ALWAYS	AUTO
>Value Type	(0040,A040)	CS	Ex.)"TEXT"	ALWAYS	AUTO

>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>Code Value	(0008,0100)	SH	Ex.)"121015"	ALWAYS	AUTO
>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>Code Meaning	(0008,0104)	LO	Ex.)"Device Observer Model Name"	ALWAYS	AUTO
>Text Value	(0040,A160)	UT		ALWAYS	AUTO
>Relationship Type	(0040,A010)	CS	Ex.)"HAS OBS CONTEXT "	ALWAYS	AUTO
>Value Type	(0040,A040)	CS	Ex.)"CODE"	ALWAYS	AUTO
>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>Code Value	(0008,0100)	SH	Ex.)"113705"	ALWAYS	AUTO
>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>Code Meaning	(0008,0104)	LO	Ex.)"Scope of Accumulation "	ALWAYS	AUTO
>Concept Code Sequence	(0040,A168)	SQ		ALWAYS	AUTO
>>Code Value	(0008,0100)	SH	Ex.)"113016"	ALWAYS	AUTO
>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>Code Meaning	(0008,0104)	LO	Ex.)"Performed Procedure Step"	ALWAYS	AUTO
>Content Sequence	(0040,A730)	SQ		ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"HAS PROPERTIES"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"UIDREF"	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"110180"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Study Instance UID"	ALWAYS	AUTO
>>UID	(0040,A124)	UI	Ex.)"1.2.392.200036.9116.32.4.XX"	ALWAYS	AUTO
>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>Value Type	(0040,A040)	CS	Ex.)"CONTAINER "	ALWAYS	AUTO
>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>Code Value	(0008,0100)	SH	Ex.)"113706"	ALWAYS	AUTO
>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>Code Meaning	(0008,0104)	LO	Ex.)"Irradiation Event X-Ray Data"	ALWAYS	AUTO
>Continuity Of Content	(0040,A050)	CS	Ex.)"SEPARATE"	ALWAYS	AUTO

>Content Template Sequence	(0040,A504)	SQ		ALWAYS	AUTO
>>Mapping Resource	(0008,0105)	CS	Ex.)"DCMR"	ALWAYS	AUTO
>>Template Identifier	(0040,DB00)	CS	Ex.)"10003 "	ALWAYS	AUTO
>Content Sequence	(0040,A730)	SQ		ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"TEXT"	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113780"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Reference Point Definition"	ALWAYS	AUTO
>>Text Value	(0040,A160)	UT	Ex.)"Patient surface (FSD = 972mm) "	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113737"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Distance Source to Reference Point"	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"mm"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"mm"	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"972 "	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"TEXT"	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"125203"	ALWAYS	AUTO

>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Acquisition Protocol"	ALWAYS	AUTO
>>Text Value	(0040,A160)	UT	Ex.)"DR"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"DATETIME"	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"111526"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"DateTime Started"	ALWAYS	AUTO
>>Date Time	(0040,A120)	DT	Ex.)"20150416210535"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"CODE"	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113721"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Irradiation Event Type"	ALWAYS	AUTO
>>Concept Code Sequence	(0040,A168)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"P5-06000"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"SRT "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Fluoroscopy "	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"122130"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Dose Area Product "	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"Gy.cm2"	ALWAYS	AUTO

>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"Gy.cm2"	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"7.363119721e-002"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113738"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Dose (RP) "	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"mGy "	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"mGy "	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"0.13408300280571"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113790"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Collimated Field Area "	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"cm2 "	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"cm2 "	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"1042.82763671875"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"CODE"	ALWAYS	AUTO

>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113732"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Fluoro Mode "	ALWAYS	AUTO
>>Concept Code Sequence	(0040,A168)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113630"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Continuous"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113733"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"KVP "	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"kV"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"kV"	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"50"	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113734"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"X-Ray Tube Current"	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO

>>>>Code Value	(0008,0100)	SH	Ex.)"mA"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"mA"	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"0.5 "	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113735"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Exposure Time "	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"ms"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"ms"	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"12900 "	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO
>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>>>Code Value	(0008,0100)	SH	Ex.)"113793"	ALWAYS	AUTO
>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"DCM "	ALWAYS	AUTO
>>>Code Meaning	(0008,0104)	LO	Ex.)"Pulse Width "	ALWAYS	AUTO
>>Measured Value Sequence	(0040,A300)	SQ		ALWAYS	AUTO
>>>Measurement Units Code Sequence	(0040,08EA)	SQ		ALWAYS	AUTO
>>>>Code Value	(0008,0100)	SH	Ex.)"ms"	ALWAYS	AUTO
>>>>Coding Scheme Designator	(0008,0102)	SH	Ex.)"UCUM"	ALWAYS	AUTO
>>>>Code Meaning	(0008,0104)	LO	Ex.)"ms"	ALWAYS	AUTO
>>>Numeric Value	(0040,A30A)	DS	Ex.)"0 "	ALWAYS	AUTO
>>Relationship Type	(0040,A010)	CS	Ex.)"CONTAINS"	ALWAYS	AUTO

>>Value Type	(0040,A040)	CS	Ex.)"NUM "	ALWAYS	AUTO
>>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO

**Table 8.1-6
SR DOCUMENT SERIES MODULE ATTRIBETES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	Ex.) "SR"	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Generated by device.	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Ex.) "1 "	ALWAYS	AUTO
Series Date	(0008,0021)	DA	Ex.) "20131231"	ALWAYS	AUTO
Series Time	(0008,0031)	TM	Ex.) "105620"	ALWAYS	AUTO
Protocol Name	(0018,1030)	LO	Ex.) "Upper GI"	ALWAYS	USER
Series Description	(0008,103E)	LO	Ex.) "Sequence"	VNAP	AUTO
Referenced Performed Procedure Step Sequence	(0008,1111)	LO	Not Applicable	ANAP	AUTO

**Table 8.1-7
ENHANCED GENERAL EQUIPMENT MODULE ATTRIBETES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	"TOSHIBA "	ALWAYS	AUTO
Manufacturer's Model Name	(0008,1090)	LO	"PDR-04A "	ALWAYS	AUTO
Device Serial Number	(0018,1000)	LO	From Configuration	ALWAYS	CONFIG
Software Version	(0018,1020)	LO	Generated by device	ALWAYS	AUTO

8.1.1.5 Common Modules

**Table 8.1-8
PATIENT MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	(0010,0010)	PN	From Modality Worklist or user input. Ex.) "TOSHIBA^TARO"	ALWAYS	MWL/ USER
Patient ID	(0010,0020)	LO	From Modality Worklist or user input. Ex.) "00000001"	ALWAYS	MWL/ USER
Patient's Birth Date	(0010,0030)	DA	From Modality Worklist or user input. Ex.) "20131231"	VNAP	MWL/ USER
Patient's Sex	(0010,0040)	CS	From Modality Worklist or user input. Ex.) "M"	VNAP	MWL/ USER
Other Patient IDs	(0010,1000)	LO	From Modality Worklist. Ex.) "00000001"	VNAP	MWL
Patient Comments	(0010,4000)	LT	From user input. Comments of patient.	VNAP	USER

**Table 8.1-9
GENERAL STUDY MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	(0008,0020)	DA	Ex.) "20040402"	ALWAYS	AUTO
Study Time	(0008,0030)	TM	Ex.) "105620"	ALWAYS	AUTO
Accession Number	(0008,0050)	SH	From Modality Worklist, generated by device or user input. Ex.) "123456"	VNAP	MWL/ AUTO
Referring Physician's Name	(0008,0090)	PN	From user input.	VNAP	MWL
Study Description	(0008,1030)	LO	Ex.) "UPPER GI"	ALWAYS	USER
Study Instance UID	(0020,000D)	UI	From Modality Worklist or generated by device. Ex.) " 1.2.392.200036.9116.32.4.40987.2 0150416210154.1259.5856 "	ALWAYS	MWL/ AUTO
Study ID	(0020,0010)	SH	Ex.) "10"	ALWAYS	AUTO

**Table 8.1-10
PATIENT STUDY MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Age	(0010,1010)	AS	Ex.) "010Y"	VNAP	AUTO

**Table 8.1-11
GENERAL SERIES MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	(0008,0021)	DA	Ex.) "20131231"	ALWAYS	AUTO
Series Time	(0008,0031)	TM	Ex.) "105620"	ALWAYS	AUTO
Modality	(0008,0060)	CS	Ex.) "RF"	ALWAYS	CONFIG
Series Description	(0008,103E)	LO	Ex.) "Sequence"	VNAP	AUTO
Performing Physician's Name	(0008,1050)	PN	Ex.) "OPERATOR"	VNAP	USER
Operator's Name	(0008,1070)	PN	Ex.) "OPERATOR"	ALWAYS	USER
Body Part Examined	(0018,0015)	CS	Ex.) "ABDOMEN " Text description of the part of the body examined. Defined Terms: SKULL CSPINE TSPINE LSPINE SSPINE COCCYX CHEST CLAVICLE BREAST ABDOMEN PELVIS HIP SHOULDER ELBOW KNEE ANKLE HAND FOOT EXTREMITY HEAD HEART NECK LEG ARM JAW	ALWAYS	USER
Protocol Name	(0018,1030)	LO	Ex.) "Upper GI"	ALWAYS	USER
Series Instance UID	(0020,000E)	UI	Generated by device.	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Ex.) "1 "	ALWAYS	AUTO
Laterality	(0020,0060)	CS		EMPTY	AUTO
Performed Procedure Step Start Date	(0040,0244)	DA	Ex.) "20131231"	ANAP	AUTO
Performed Procedure Step Start Time	(0040,0245)	TM	Ex.) "105620"	ANAP	AUTO
Performed Procedure Step ID	(0040,0253)	SH	Not Applicable	ANAP	AUTO
Performed Procedure Step Description	(0040,0254)	LO	Not Applicable	ANAP	AUTO

**Table 8.1-12
GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	"TOSHIBA "	ALWAYS	AUTO
Institution Name	(0008,0080)	LO	Ex.) "TOSHIBA HOSP"	VNAP	CONFIG
Institution Address	(0008,0081)	ST	From Configuration	VNAP	CONFIG
Station Name	(0008,1010)	SH	Ex.) "ROOM1 "	VNAP	CONFIG
Manufacturer's Model Name	(0008,1090)	LO	"PDR-04A "	ALWAYS	AUTO
Device Serial Number	(0018,1000)	LO	From Configuration	ALWAYS	CONFIG
Software Version	(0018,1020)	LO	Generated by device	ALWAYS	AUTO

**Table 8.1-13
GENERAL IMAGE MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	(0008,0008)	CS	Ex.) "DERIVED\PRIMARY "	ALWAYS	AUTO
Acquisition Date	(0008,0022)	DA	Ex.) "20131231"	ALWAYS	AUTO
Content Date	(0008,0023)	DA	Ex.) "20131231"	ALWAYS	AUTO
Study Time	(0008,0030)	TM	Ex.) "105620"	ALWAYS	AUTO
Series Time	(0008,0031)	TM	Ex.) "105620"	ALWAYS	AUTO
Acquisition Time	(0008,0032)	TM	Ex.) "105620"	ALWAYS	AUTO
Content Time	(0008,0033)	TM	Ex.) "105620"	ALWAYS	AUTO
Acquisition Number	(0020,0012)	IS	Ex.) "1 "	ALWAYS	AUTO
Instance Number	(0020,0013)	IS	Ex.) "1 "	ALWAYS	AUTO
Image Comments	(0020,4000)	LT	Ex.) "COMMENT "	ALWAYS	AUTO
Patient Orientation	(0020,0020)	CS		EMPTY	AUTO

**Table 8.1-14
IMAGE PIXEL MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	(0028,0002)	US	Ex.) 1	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	Ex.) "MONOCHROME2 "	ALWAYS	AUTO
Rows	(0028,0010)	US	Ex.) 2400	ALWAYS	AUTO
Columns	(0028,0011)	US	Ex.) 2400	ALWAYS	AUTO
Pixel Spacing	(0028,0030)	DS	Ex.) "0.122\0.122 "	ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	16	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	12	ALWAYS	AUTO
High Bit	(0028,0102)	US	11	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
Smallest Image Pixel	(0028,0106)	US	0	ALWAYS	AUTO
Largest Image Pixel	(0028,0107)	US	Ex.) "4095"	ALWAYS	AUTO
Pixel Intensity Relationship	(0028,1040)	CS	Ex.) "DISP"	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OW		ALWAYS	AUTO

**Table 8.1-15
CONTRAST/BOLUS MODULE ATTRIBUTES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Contrast/Bolus Agent	(0018,0010)	LO		ALWAYS	AUTO

**Table 8.1-16
CINE MODULE ATTRIBUTES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Framee Time	(0018,1063)	DS	Ex.) 1000	ALWAYS	AUTO

**Table 8.1-17
MULTI-FRAME MODULE ATTRIBUTES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Frames	(0028,0008)	IS	Ex.) 8	ALWAYS	USER

**Table 8.1-18
DISPLAY SHUTTER MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Shutter Shape	(0018,1600)	CS	Ex.) "RECTANGULAR"	ANAP	USER
Shutter Left Vertical Edge	(0018,1602)	IS	Ex.) "0 "	ANAP	USER
Shutter Right Vertical Edge	(0018,1604)	IS	Ex.) "2400 "	ANAP	USER
Shutter Upper Horizontal Edge	(0018,1606)	IS	Ex.) "0 "	ANAP	USER
Shutter Lower Horizontal Edge	(0018,1608)	IS	Ex.) "2400"	ANAP	USER

**Table 8.1-19
SOP COMMON MODULE OF CREATED X/RF IMAGE SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	(0008,0005)	CS	Ex.) "\ISO 2022 IR 87"	VNAP	CONFIG
SOP Class UID	(0008,0016)	UI	Ex.) "1.2.840.10008.5.1.4.1.1.12.2"	ALWAYS	CONFIG
SOP Instance UID	(0008,0018)	UI	Generated by device	ALWAYS	AUTO
Instance Number	(0020,0013)	IS	Ex.) "1"	ALWAYS	AUTO

8.1.1.6 XA/RF Image Modules

**Table 8.1-20
X-RAY IMAGE MODULE OF CREATED XA/RF IMAGE SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	(0008,0008)	CS	Ex.) "DERIVED\PRIMARY "	ALWAYS	AUTO
Samples per Pixel	(0028,0002)	US	1	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	Ex.) "MONOCHROME2 "	ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	16	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	12	ALWAYS	AUTO
High Bit	(0028,0102)	US	11	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
Pixel Intensity Relationship	(0028,1040)	CS	Ex.) "DISP"	ALWAYS	AUTO

**Table 8.1-21
X-RAY ACQUISITION MODULE OF CREATED XA/RF IMAGE SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
KVP	(0018,0060)	DS	From Acquisition parameters	ANAP	AUTO
Distance Source to Detector	(0018,1110)	DS	Ex.) "1110"	ANAP	AUTO
Distance Source to Patient	(0018,1111)	DS	Ex.) "1100"	ANAP	AUTO
Field of View Shape	(0018,1147)	CS	Ex.) "RECTANGLE "	ANAP	AUTO
Field of View Dimension(s)	(0018,1149)	IS	Ex.) "342\342 "	ANAP	AUTO
Exposure Time	(0018,1150)	IS	From Acquisition parameters	ANAP	AUTO
X-ray Tube Current	(0018,1151)	IS	From Acquisition parameters	ANAP	AUTO
Average Pulse Width	(0018,1154)	DS	Ex.) "0 "	ANAP	AUTO
Radiation Setting	(0018,1155)	CS	Ex.) "GR"	ALWAYS	AUTO
Radiation Mode	(0018,115A)	CS	Ex.) "CONTINUOUS"	ANAP	AUTO
Image and Fluoroscopy Area Dose Product	(0018,115E)	DS	Ex.) "0.18077133595943"	ANAP	AUTO
Imager Pixel Spacing	(0018,1164)	DS	Ex.) "0.143\0.143 "	ANAP	USER
Body Part Thickness	(0018,11A0)	DS	Ex.) "200 "	ANAP	USER
Exposure Time in uS	(0018,8150)	DS	From Acquisition parameters	ANAP	AUTO
X-ray Tube Current in μ A	(0018,8151)	DS	From Acquisition parameters	ANAP	AUTO
Entrance Dose	(0040,0302)	US	Ex.) "0 "	ANAP	AUTO
Entrance Dose in mGy	(0040,8302)	DS	Ex.) "0.15984590351582"	ANAP	AUTO

**Table 8.1-22
X-RAY TABLE MODULE ATTRIBUTES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Table Motion	(0018,1134)	CS	"STATIC"	ANAP	AUTO
Table Vertical Increment	(0018,1135)	DS	Ex.) "0"	ANAP	AUTO
Table Lateral Increment	(0018,1136)	DS	Ex.) "0"	ANAP	AUTO
Table Longitudinal Increment	(0018,1137)	DS	Ex.) "0"	ANAP	AUTO
Table Angle	(0018,1138)	DS	Ex.) "0"	ANAP	AUTO

**Table 8.1-23
XA POSITIONER MODULE OF CREATED XA/RF IMAGE SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Distance Source to Detector	(0018,1110)	DS	Ex.) "1110"	ANAP	AUTO
Distance Source to Patient	(0018,1111)	DS	Ex.) "1100"	ANAP	AUTO
Estimated Radiographic Magnification Factor	(0018,1114)	DS	Ex.) "1.16789087093389"	ANAP	AUTO
Positioner Motion	(0018,1500)	CS	Ex.) "STATIC"	ANAP	CONFIG
Positioner Primary Angle	(0018,1510)	DS	Ex.) "0"	ANAP	AUTO
Positioner Secondary Angle	(0018,1511)	DS	Ex.) "0"	ANAP	AUTO

**Table 8.1-24
XRF POSITIONER MODULE OF CREATED XA/RF IMAGE SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Distance Source to Detector	(0018,1110)	DS	Ex.) "1100"	ANAP	AUTO
Distance Source to Patient	(0018,1111)	DS	Ex.) "1100"	ANAP	AUTO
Estimated Radiographic Magnification Factor	(0018,1114)	DS	Ex.) "1.16789087093389"	ANAP	AUTO

**Table 8.1-25
DX DETECTOR MODULE ATTRIBUTES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Detector Type	(0018,7004)	CS	Ex.) "DIRECT"	ANAP	AUTO

**Table 8.1-26
VOI LUT MODULE OF CREATED XA/RF IMAGE SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	(0028,1050)	DS	2048	ALWAYS	AUTO
Window Width	(0028,1051)	DS	4095	ALWAYS	AUTO
Rescale Intercept	(0028,1052)	DS	Ex.) "0"	ALWAYS	AUTO
Rescale Slope	(0028,1053)	DS	Ex.) "1"	ALWAYS	AUTO
Rescale Type	(0028,1054)	DS	Ex.) "UNSPECIFIED"	ALWAYS	AUTO

8.1.2 Usage of Attributes from received IOD's

No SOP Class specific fields are required.

8.1.3 Attribute Mapping

The relationships between attributes received via Modality Worklist, stored in acquired images are summarized in Table 8.1-17.

Table 8.1-27
ATTRIBUTE MAPPING BETWEEN MODALITY WORKLIST, IMAGE

Modality Worklist	Image IOD
Study Instance UID	Study Instance UID
Referenced Study Sequence	Referenced Study Sequence
Accession Number	Accession Number
--	Request Attributes Sequence
Requested Procedure ID	>Requested Procedure ID
Requested Procedure Description	--
Scheduled Procedure Step ID	>Scheduled Procedure Step ID
Scheduled Procedure Step Description	>Scheduled Procedure Step Description
Scheduled Protocol Code Sequence	--
Performed Protocol Code Sequence	--
>Scheduled Procedure Step ID	Scheduled Procedure Step ID
--	Performed Procedure Step Description
Requested Procedure Code Sequence	Procedure Code Sequence
Patient Name	Patient Name
Patient's ID	Patient's ID
Patient's Birth Date	Patient's Birth Date
Patient's Sex	Patient's Sex
Referring Physician's Name	Referring Physician's Name
Scheduled Performing Physician's Name	Performing Physician's Name
--	Operator's Name

This table shows only typical data sets.

Other data sets are also set as default settings.

All map settings, including the default setting data sets.

8.1.4 Corrected/Modified Fields

Not applicable to this product.

8.2 DATA DICTIONARY OF PRIVATE ATTRIBUTES

Not applicable to this product.

8.3 CONTROLLED TERMINOLOGY AND TEMPLATES

Not applicable to this product.

8.4 GRAYSCALE IMAGE CONSISTENCY

Not applicable to this product.

8.5 STANDARD EXTENDED/SPECIALIZED/PRIVATE SOP CLASSES

Not applicable to this product.

8.6 PRIVATE TRANSFER SYNTAXES

Not applicable to this product.