FUJIFILM

DICOM Conformance Statement

Console Advance
DR-ID 300CL/DR-ID 330CL/DR-ID 700CL/ DR-ID 800CL/DR-ID 900CL

for

DICOM Storage
DICOM Storage Commitment
DICOM MWM
DICOM MPPS
DICOM Print
DICOM Query / Retrieve
DICOM Media Storage
DICOM Dose SR
(Standard)

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1 CONFORMANCE STATEMENT OVERVIEW

Table 1-1 provides an overview of the network services supported by DR-ID 300CL.

The DR-ID 300CL implements the necessary DICOM services to save acquired images to a network storage device.

TABLE 1-1 NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Computed Radiography Image Storage	Yes	Yes
Digital X-ray Image Storage – For Presentation	Yes	Yes
Digital X-ray Image Storage – For Processing	Yes	No
Digital Mammography X-Ray Image Storage – For Presentation	Yes	Yes
Digital Mammography X-Ray Image Storage – For Processing	Yes	No
Secondary Capture Image Storage	Yes	No
X-Ray Radiation Dose SR	Yes	No
Workflow Management		
Modality Worklist Information Model – FIND	Yes	No
Modality Performed Procedure Step	Yes	No
Storage Commitment Push Model	Yes	No
Query/Retrieve		
Study Root Query/Retrieve Information Model - FIND	Yes	No
Study Root Query/Retrieve Information Model - MOVE	Yes	No
Print Management		
Basic Grayscale Print Management Meta	Yes	No

Table 1-2 provides an overview of the Media Storage Application Profiles supported by DR-ID300CL

TABLE 1- 2 MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC)	Read Files (FSR)
DVD		
General Purpose DVD² RW	Yes	Yes
USB drive		
General Purpose USB drive	Yes	No

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3 INTRODUCTION

3.1 REVISION HISTORY

Document Version	Date of Issue	Author	Description
1.0	July, 2009	FUJIFILM	Version for Final Text
2.0	March, 2010	FUJIFILM	Updated Support Offline-Media
3.0	December, 2010	FUJIFILM	Updated
4.0	June, 2011	FUJIFILM	Updated
5.0	September, 2011	FUJIFILM	Updated
6.0	January,2012	FUJIFILM	Updated
7.0	July, 2012	FUJIFILM	Updated
8.0	November, 2012	FUJIFILM	Updated Support Query / Retrieve
9.0	March, 2013	FUJIFILM	Updated
10.0	September, 2013	FUJIFILM	Updated
11.0	February, 2014	FUJIFILM	Updated Support Enhanced General Equipment Module
12.0	May, 2015	FUJIFILM	Updated 8.4 GRAYSCALE IMAGE CONSISTENCY
15.0	July, 2016	FUJIFILM	Updated 8.1.1.14 General Image Module
16.0	March, 2019	FUJIFILM	Update Support Secondary Capture Image Storage 8.1.1.5 X-Ray Radiation Dose SR IOD
18.0	January,2020	FUJIFILM	Update 4.3.3 IPv4 and Ipv6 Support
19.0	October,2020	FUJIFILM	Update ! 8.1.1.15 General Image Module 8.1.5.1 X-Ray Radiation Dose Report

3.2 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.

3.3 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 FUJIFILM 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 FUJIFILM and non- FUJIFILM equipment.

— Test procedures should be defined to validate the desired level of connectivity.

— The DICOM standard will evolve to meet the users' future requirements. FUJIFILM is actively involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue its delivery.

3.4 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	DICOM Application Entity
CR	Computed Radiography
DX	Digital X-ray
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
IE	Information Entity
IOD	(DICOM) Information Object Definition
ISO	International Standard Organization
MG	Mammography
PDU	DICOM Protocol Data Unit
SC	Secondary Capture
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
VM	Value Multiplicity
VR	Value Representation

3.5 REFERENCES

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.18, 2007

4 NETWORKING

4.1 IMPLEMENTATION MODEL

4.1.1 Application Data Flow

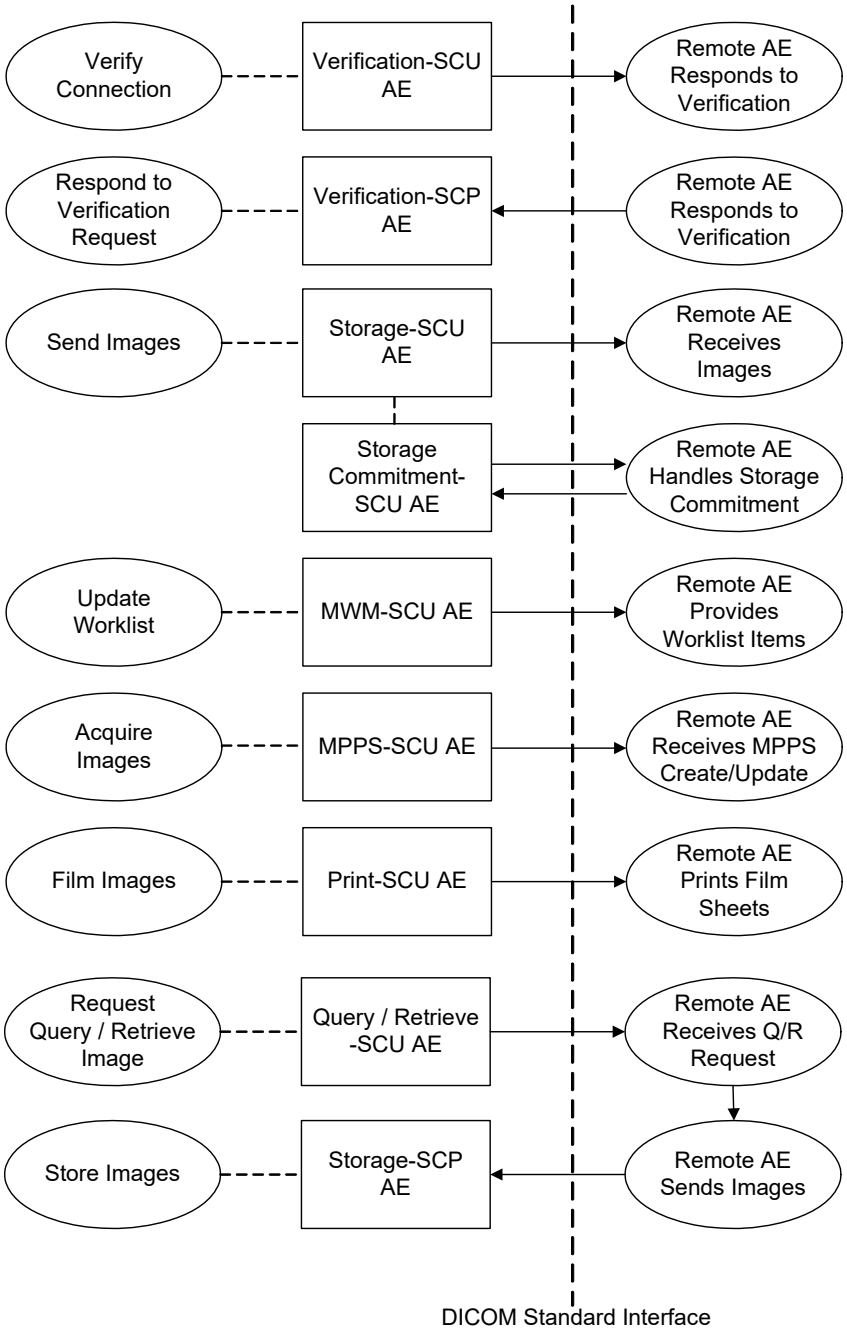


FIGURE 4.1-1 APPLICATION DATA FLOW DIAGRAM

— 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 via the Service Tool.

— The Verification SCP AE responds successfully to C-ECHO requests from known AE Titles. It is associated with the local real-world activity “Respond to Verification Request”.

— The Storage-SCU Application Entity sends images to a remote AE. It is associated with the local real-world activity “Send Images”. “Send Images” is performed upon user request for each study completed or for specific images selected. When activated by user’s settings (auto-send), each marked set of images can be immediately stored to a preferred destination whenever a Patient/Study is closed by the user.

— Receiving the storage commitment request from the Storage-SCU AE, the Storage Commitment-SCU AE will request Storage Commitment and record commitment information in the local database if a commitment is successfully obtained.

— The MWM-SCU Application Entity receives Worklist information from a remote AE. It is associated with the local real-world activities “Update Worklist”. When the “Update Worklist” local real-world activity is performed the MWM-SCU Application Entity queries a remote AE for worklist items and provides the set of worklist items matching the query request. ”Update Worklist” is performed as a result of an operator request or can be performed automatically at specific time intervals.

— The MPPS-SCU Application Entity sends MPPS information to a remote AE. When the “Acquire Images” local real-world activity is performed the MPPS-SCU Application Entity 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 Application Entity prints images on a remote AE (Printer). It is associated with the local real-world activity “Film Images”. “Film Images” creates a print-job within the print queue containing one or more virtual film sheets composed from images selected by the user.

— The Query/Retrieve-SCU Application Entity queries remote AEs for lists of studies, series and instances and retrieves selected studies, series or instances from lists. It is associated with the local real-world activity “Requests Query/Retrieve”

— The Storage-SCP Application Entity receives incoming images. It is associated with the local real-world activity “Store Images”.

4.1.2 Functional Definition of AEs

4.1.2.1 Functional Definition of Verification-SCU Application Entity

The Verification-SCU AE issues a C-ECHO to verify a DICOM connection to a remote AE. It is performed via the Service Tool.

4.1.2.2 Functional Definition of Verification-SCP Application Entity

The Verification-SCP AE responds successfully to C-ECHO requests from known AE Titles.

4.1.2.3 Functional Definition of Storage-SCU Application Entity

The existence of a send-job queue entry with associated network destination will activate the Storage-SCU AE. An association request is sent to the destination AE and upon successful negotiation of a Presentation Context the image transfer is started. If the association cannot be opened, the related send-job is set to an error state. By default, the Storage AE will retry to initiate another association for this send-job automatically.

4.1.2.4 Functional Definition of Storage Commitment-SCU Application Entity

The Storage Commitment-SCU AE receiving the storage commitment request from the Storage-SCU AE, the Storage Commitment-SCU AE will request Storage Commitment and record commitment information in the local database if a commitment is successfully obtained.

4.1.2.5 Functional Definition of MWM-SCU Application Entity

Worklist Update attempts to download a Worklist from a remote node. If the MWM-SCU AE establishes an Association to a remote AE, it will transfer all worklist items via the open Association. During receiving the worklist response items are counted and the query processing is canceled if the configurable limit of items is reached. The results will be displayed in a separate list, which will be cleared with the next Worklist Update.

4.1.2.6 Functional Definition of MPPS-SCU Application Entity

The MPPS-SCU AE creates an MPPS Instance automatically when the user selects and starts a worklist item. And the MPPS data is updated when the user completes the acquisition.

4.1.2.7 Functional Definition of Print-SCU Application Entity

The existence of a print-job in the print queue will activate the Print-SCU AE. An association is established with the printer and the printer's status determined. If the printer is operating normally, the film sheets described within the print-job will be printed. Changes in printer status will be detected (e.g. out of film) and reported to the user. If the printer is not operating normally, the print-job will set to an error state and can be restarted by the user via the job control interface.

4.1.2.8 Functional Definition of Query/Retrieve-SCU Application Entity

The Query/Retrieve-SCU Application Entity is activated through the user interface when a user selects a remote AE to query (from a pre-configured list), then initiates a query. Queries are performed recursively from the study through the series and instance levels until all matching instances have been listed. And the Query/Retrieve AE is activated through the user interface when a user selects a study, series or instance for retrieval. A connection to the remote AE is established to initiate and monitor the retrieval and the Storage-SCP AE receives the retrieved instances.

4.1.2.9 Functional Definition of Storage-SCP Application Entity

Storage-SCP waits in the background for connections, will accept associations with Presentation Contexts for SOP Classes of the Storage Service Class, and will store the received instances to the local database where they may subsequently be listed and viewed through the user interface.

4.1.3 Sequencing of Real-World Activities

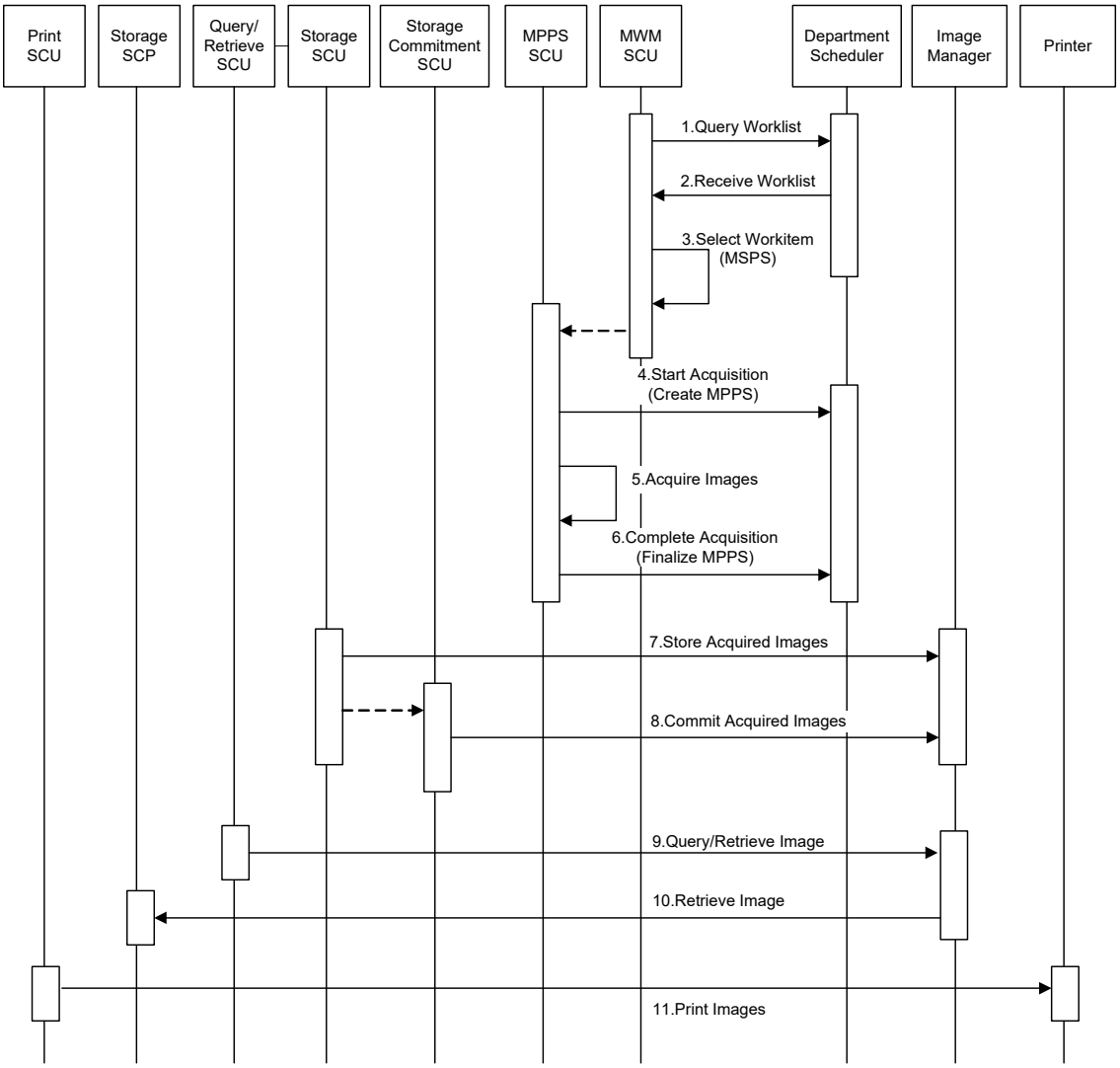


FIGURE 4.1-2 SEQUENCING CONSTRAINTS

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

1. Query Worklist
2. Receive Worklist
3. Select Workitem (MSPS)
4. Start Acquisition (Create MPPS)
5. Acquire Images
6. Complete Acquisition (Finalize MPPS)
7. Store Acquired Images
8. Commit Acquired Images
9. Query/Retrieve Images
10. Receive Images
11. Print Images

Other workflow situations (e.g. auto-send) will have other sequencing constraints.

4.2 AE SPECIFICATIONS

4.2.1 Verification-SCU Application Entity Specification

4.2.1.1 SOP Classes

DR-ID 300CL provides Standard Conformance to the following SOP Classes:

TABLE 4.2-1 SOP CLASSES FOR THE VERIFICATION-SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	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 VERIFICATION-SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2 Number of Associations

DR-ID 300CL initiates one Association at a time for each destination to which a transfer request is being processed in the active job queue list. Only one job will be active at a time, the other remains pending until the active job is completed or failed.

TABLE 4.2-3 NUMBER OF ASSOCIATIONS INITIATED FOR THE VERIFICATION -SCU AE

Maximum number of simultaneous Associations	1

4.2.1.2.3 Asynchronous Nature

DR-ID 300CL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2-4 ASYNCHRONOUS NATURE FOR THE VERIFICATION-SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.1.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

TABLE 4.2-5 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE VERIFICATION-SCU AE

Implementation Class UID	1.2.392.200036.9125.5342.1
Implementation Version Name	A00

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 DR-ID 300CL will acquire images and send those images automatically to the pre-set remote host or select images from the list of images thus stored and send them to the specified destination.

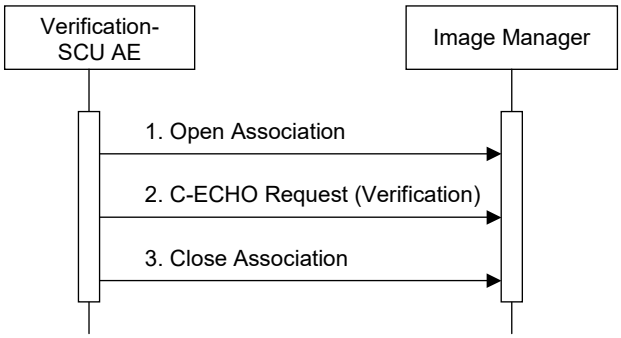


FIGURE 4.2-1 SEQUENCING OF ACTIVITY – VERIFY CONNECTION

A possible sequence of interactions between the Storage-SCU AE and an Image Manager (e.g. a storage or archive device supporting the Storage SOP Classes as an SCP) is illustrated in the Figure above:

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

4.2.1.3.1.2 Proposed Presentation Contexts

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

TABLE 4.2-6 PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY VERIFY CONNECTION

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

4.2.1.3.1.3 SOP Specific Conformance Verification SOP Classes

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

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

TABLE 4.2-7 VERIFICATION RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The Verification-SCU AE judges the remote AE is present and active on the network.
*	*	Any other status code.	The Verification-SCU AE judges the remote AE is not present or not active on the network.

4.2.1.4 Association Acceptance Policy

The Verification-SCU AE does not accept any association.

4.2.2 Verification-SCP Application Entity Specification

4.2.2.1 SOP Classes

DR-ID 300CL provides Standard Conformance to the following SOP Classes:

TABLE 4.2-8 SOP CLASSES FOR THE VERIFICATION-SCP AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No	Yes

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 VERIFICATION-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 ACCEPTED FOR THE VERIFICATION-SCP AE

Maximum number of simultaneous Associations	Unlimited

4.2.2.2.3 Asynchronous Nature

DR-ID 300CL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2-11 ASYNCHRONOUS NATURE FOR THE VERIFICATION-SCP AE

Maximum number of outstanding asynchronous transactions	1

4.2.2.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

TABLE 4.2-12 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE VERIFICATION-SCP AE

Implementation Class UID	1.2.392.200036.9125.5342.1
Implementation Version Name	A00

4.2.2.3 Association Initiation Policy

The Verification-SCP AE does not initiate associations.

4.2.2.4 Association Acceptance Policy

4.2.2.4.1 Activity – Respond to Verification Request

4.2.2.4.1.1 Description and Sequencing of Activities

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

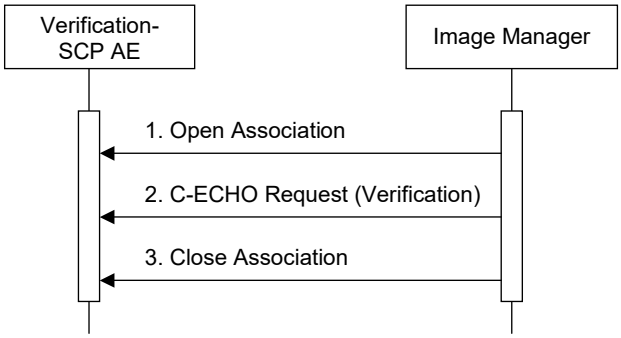


FIGURE 4.2-2 SEQUENCING OF ACTIVITY – RESPOND TO VERIFICATION REQUEST

A possible sequence of interactions between the Verification-SCP AE and an Image Manager (e.g. a storage or archive device supporting the Verification SOP Classes as an SCU) is illustrated in the Figure above:

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

TABLE 4.2-13 ASSOCIATION REJECTION REASONS

Result	Source	Reason/Diag	Explanation
1 – rejected-permanent	DICOM UL service-user	3 – calling-AE-title not- recognized	The association request contained an unrecognized calling AE Title. An association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the association acceptor has not been configured to recognize the AE Title of the association initiator.
1 – rejected-permanent	DICOM UL service-provider (ASCE related function)	1 – no-reason-given	The association request could not be parsed. An association request with the same format will not succeed at a later time.

4.2.2.4.1.2 Accepted Presentation Contexts

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

TABLE 4.2-14 ACCEPTED PRESENTATION CONTEXTS FOR ACTIVITY RESPOND TO VERIFICATION REQUEST

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	SCP	None

4.2.2.4.1.3 SOP Specific Conformance for Verification SOP Class

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

4.2.3 Storage-SCU Application Entity Specification

4.2.3.1 SOP Classes

DR-ID 300CL provides Standard Conformance to the following SOP Classes:

TABLE 4.2-15 SOP CLASSES FOR THE STORAGE-SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	No
Digital X-ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	No
Digital X-ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	No
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	No
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	No

NOTE: Secondary Capture Image Storage only Supports bone mineral density report.

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 STORAGE-SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.3.2.2 Number of Associations

DR-ID 300CL initiates Three Associations at a time for each destination to which a transfer request is being processed in the active job queue list. Three jobs will be active at a time, the other remains pending until the active job is completed or failed.

TABLE 4.2-17 NUMBER OF ASSOCIATIONS INITIATED FOR THE STORAGE-SCU AE

Maximum number of simultaneous Associations	3

4.2.3.2.3 Asynchronous Nature

DR-ID 300CL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2-18 ASYNCHRONOUS NATURE FOR THE STORAGE-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 AND VERSION FOR THE STORAGE-SCU AE

Implementation Class UID	1.2.392.200036.9125.5342.1
Implementation Version Name	A00

4.2.3.3 Association Initiation Policy

4.2.3.3.1 Activity – Send Images

4.2.3.3.1.1 Description and Sequencing of Activities

The DR-ID 300CL will acquire images and send those images automatically to the pre-set remote host or select images from the list of images thus stored and send them to the specified destination.

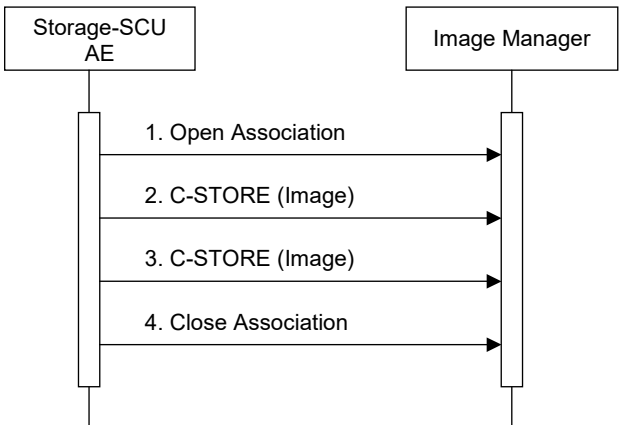


FIGURE 4.2-3 SEQUENCING OF ACTIVITY – SEND IMAGES

A possible sequence of interactions between the Storage-SCU AE and an Image Manager (e.g. a storage or archive device supporting the Storage SOP Classes as an SCP) is illustrated in the Figure above:

1. The Storage-SCU AE opens an association with the Image Manager
2. An acquired image is transmitted to the Image Manager using a C-STORE request and the Image Manager replies with a C-STORE response (status success).
3. Another acquired image is transmitted to the Image Manager using a C-STORE request and the Image Manager replies with a C-STORE response (status success).
4. The Storage-SCU AE closes the association with the Image Manager.

NOTE: Many other message sequences are possible depending on the number of images to be stored.

4.2.3.3.1.2 Proposed Presentation Contexts

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

TABLE 4.2-20 PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY SEND IMAGES

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		
Digital X-ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		
Digital X-ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		

Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
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		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

NOTE: Multiple Transfer Syntax can be set in an Abstract Syntax, however only one setting that is set first is valid.

4.2.3.3.1.3 SOP Specific Conformance Image Storage SOP Classes

This implementation tries to send all images that belong to a single study over a single association. If some of the images could not be sent successfully, this implementation will terminate the association and try to resend all images over another association.

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

TABLE 4.2-21 STORAGE C-STORE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error 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.
*	*	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.

4.2.3.4 Association Acceptance Policy

The Storage-SCU AE does not accept any association.

4.2.4 Storage Commitment-SCU Application Entity Specification

4.2.4.1 SOP Classes

DR-ID 300CL provides Standard Conformance to the following SOP Classes:

TABLE 4.2-22 SOP CLASSES FOR THE STORAGE COMMITMENT-SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No

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 4.2-23 DICOM APPLICATION CONTEXT FOR THE STORAGE COMMITMENT-SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.4.2.2 Number of Associations

The Storage Commitment-SCU AE can initiate up to three associations at a time.

TABLE 4.2-24 NUMBER OF ASSOCIATIONS INITIATED FOR THE STORAGE COMMITMENT-SCU AE

Maximum number of simultaneous associations	3

The Storage Commitment SCU AE accepts associations to receive N-EVENT-REPORT notifications for the Storage Commitment Push Model SOP Class.

TABLE 4.2-25 NUMBER OF ASSOCIATIONS ACCEPTED FOR THE STORAGE COMMITMENT-SCU AE

Maximum number of simultaneous associations	3

4.2.4.2.3 Asynchronous Nature

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

TABLE 4.2-26 ASYNCHRONOUS NATURE FOR THE STORAGE COMMITMENT-SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.4.2.4 Implementation Identifying Information

TABLE 4.2-27 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE STORAGE COMMITMENT-SCU AE

Implementation Class UID	1.2.392.200036.9125.5342.1
Implementation Version Name	A00

4.2.4.3 Association Initiation Policy

4.2.4.3.1 Activity – Commit Sent Images

4.2.4.3.1.1 Description and Sequencing of Activities

If the remote AE is configured as a Storage Commitment-SCP AE, the Storage Commitment-SCU AE will, after all images have been sent, transmit a single storage commitment request (N-ACTION). Upon receiving the N-ACTION response the Storage Commitment-SCU AE will release the association. The notification of storage commitment (N-EVENT-REPORT) will be received over a separate association.

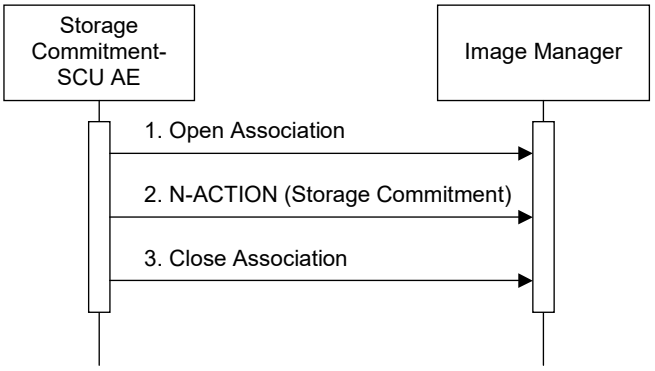


FIGURE 4.2-4 SEQUENCING OF ACTIVITY – COMMIT SENT IMAGES

A possible sequence of interactions between the Storage Commitment-SCU AE and an Image Manager (e.g. a storage or archive device supporting the Storage Commitment SOP Classes as an SCP) is illustrated in the Figure above:

1. The Storage Commitment-SCU AE opens an association with the Image Manager.
2. A storage commitment request (N-ACTION) is transmitted to the Image Manager to obtain storage commitment of previously transmitted images. The Image Manager replies with an N-ACTION response indicating the request has been received and is being processed.
3. The Storage Commitment-SCU AE closes the association with the Image Manager.

NOTE: The N-EVENT-REPORT will be sent over a separate association initiated by the Image Manager. (See Section 4.2.2.4.1)

4.2.4.3.1.2 Proposed Presentation Contexts

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

TABLE 4.2-28 PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY COMMIT SEND IMAGES

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.4.3.1.3 SOP Specific Conformance for Storage Commitment SOP Classes

The Storage Commitment-SCU AE provides standard conformance to the Storage Commitment Service Class as an SCU. The Storage Commitment-SCU AE will request storage commitment for instances of the Storage SOP Classes if the remote AE is configured as a Storage Commitment-SCP AE and a presentation context for the Storage Commitment Push Model has been accepted.

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

TABLE 4.2-29 STORAGE COMMITMENT N-ACTION RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The request for storage commitment is considered successfully sent. A timer is started which will expire if no N-EVENT-REPORT for the Transaction UID is received within a configurable timeout period.
*	*	Any other status code.	The association is aborted and the request for storage commitment is marked as failed.

4.2.4.4 Association Initiation Policy

4.2.4.4.1 Activity – Receive Storage Commitment

4.2.4.4.1.1 Description and Sequencing of Activities

The Storage Commitment-SCU AE will accept associations in order to receive responses to a storage commitment request.

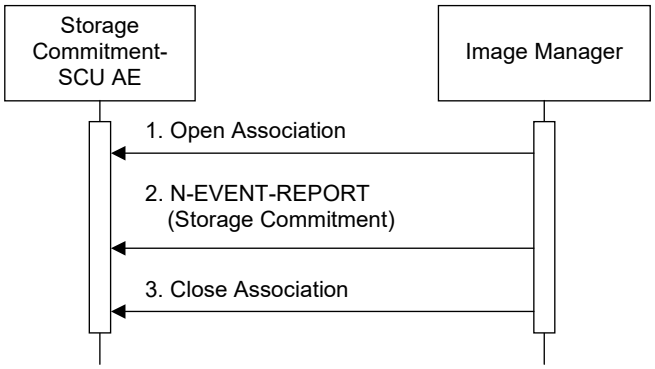


FIGURE 4.2-5 SEQUENCING OF ACTIVITY – RECEIVE STORAGE COMMITMENT

A possible sequence of interactions between the Storage Commitment-SCU AE and an Image Manager (e.g. a storage or archive device supporting the Storage Commitment SOP Classes as an SCP) is illustrated in the Figure above:

1. The Image Manager opens an association with the Storage Commitment-SCU AE.
2. The Image Manager sends an N-EVENT-REPORT request notifying the Storage-SCU AE of the status of a previous storage commitment request. The Storage-SCU AE replies with an N-EVENT-REPORT response confirming receipt.
3. The Image Manager closes an association with the Storage Commitment-SCU AE.

4.2.4.4.1.2 Proposed Presentation Contexts

The Presentation Contexts shown in the following table are acceptable to the Storage Commitment-SCU AE:

TABLE 4.2-30 PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY RECEIVE STORAGE COMMITMENT

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.4.4.1.3 SOP Specific Conformance for Storage Commitment SOP Classes

The behavior of Storage Commitment-SCU AE when receiving Event Types within the N-EVENT-REPORT is summarized in the Table below.

TABLE 4.2-31 STORAGE COMMITMENT N-EVENT-REPORT BEHAVIOR

Event Type Name	Event Type ID	Behavior
Storage Commitment Request Successful	1	The Storage Commitment SCU AE permits the operator(s) to delete the Referenced SOP Instances under Referenced SOP Sequence (0008,1199), or deletes the Instances from the local database automatically.
Storage Commitment Request Complete – Failures Exist	2	The Storage Commitment SCU AE requests the Storage SCU AE to send the Referenced SOP Instances under Failed SOP Sequence (0008,1198).

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

TABLE 4.2-32 STORAGE COMMITMENT N-EVENT-REPORT RESPONCE STATUS REASONS

Service Status	Further Meaning	Error Code	Reasons
Success	Success	0000	The storage commitment result has been successfully received.
Failure	Unrecognized Operation	0211H	The Transaction UID in the N-EVENT-REPORT request is not recognized (was never issued within an N-ACTION request).
Failure	Resource Limitation	0213H	The Transaction UID in the N-EVENT-REPORT request has expired (no N-EVENT-REPORT was received within a configurable time limit).
Failure	No Such Event Type	0113H	An invalid Event Type ID was supplied in the N-EVENT-REPORT request.

Service Status	Further Meaning	Error Code	Reasons
Failure	Processing Failure	0110H	An internal error occurred during processing of the N-EVENT-REPORT. A short description of the error will be returned in Error Comment (0000,0902).
Failure	Invalid Argument Value	0115H	One or more SOP Instance UIDs with the Referenced SOP Sequence (0008,1199) or Failed SOP Sequence (0008,1198) was not included in the Storage Commitment Request associated with this Transaction UID. The unrecognized SOP Instance UIDs will be returned within the Event Information of the N-EVENT-REPORT response.
*	*	Any other status code.	The storage commitment result has some error, so result has not been successfully received.

4.2.5 MWM-SCU Application Entity Specification

4.2.5.1 SOP Classes

DR-ID 300CL provides Standard Conformance to the following SOP Classes:

TABLE 4.2-33 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	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 4.2-34 DICOM APPLICATION CONTEXT FOR THE MWM-SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.5.2.2 Number of Associations

DR-ID 300CL initiates one Association at a time for each destination to which a transfer request is being processed in the active job queue list. Only one job will be active at a time, the other remains pending until the active job is completed or failed.

TABLE 4.2-35 NUMBER OF ASSOCIATIONS INITIATED FOR THE MWM-SCU AE

Maximum number of simultaneous Associations	1

4.2.5.2.3 Asynchronous Nature

DR-ID 300CL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2-36 ASYNCHRONOUS NATURE FOR THE MWM-SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.5.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

TABLE 4.2-37 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE MWM-SCU AE

Implementation Class UID	1.2.392.200036.9125.5342.1
Implementation Version Name	A00

4.2.5.3 Association Initiation Policy

4.2.5.3.1 Activity – Update Worklist

4.2.5.3.1.1 Description and Sequencing of Activities

The request for an Update Worklist is initiated by user interaction, i.e. pressing the buttons “Refresh” or automatically at specific time intervals, configurable by the user.

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 list.

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

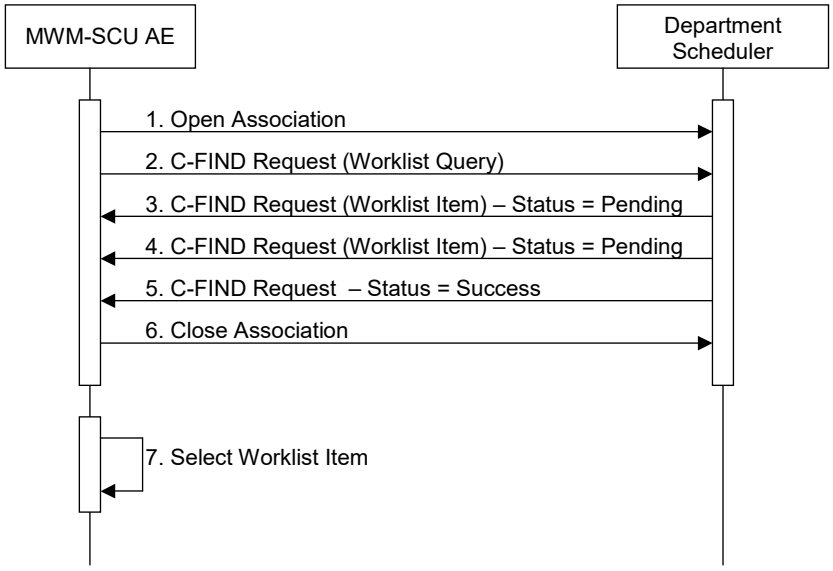


FIGURE 4.2-6 SEQUENCING OF ACTIVITY – UPDATE WORKLIST

A possible sequence of interactions between the MWM-SCU AE and a Departmental 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 Departmental 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 2 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.

4.2.5.3.1.2 Proposed Presentation Contexts

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

TABLE 4.2-38 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

4.2.5.3.1.3 SOP Specific Conformance for Modality Worklist SOP Classes

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

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

TABLE 4.2-39 MODALITY WORKLIST C-FIND RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the matches. Worklist items are available for display or further processing.
*	*	Any other status code.	The association is aborted using A-ABORT and the status meaning 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 4.2-40 WORKLIST REQUEST IDENTIFIER

Module Name Attribute Name	Tag	VR	M	R	D	IOD
SOP Common						
Specific Character Set	(0008,0005)	CS		x		x
Scheduled Procedure Step						
Scheduled Procedure Step Sequence	(0040,0100)	SQ		x		
>Scheduled Procedure Step ID	(0040,0009)	SH		x		x
>Scheduled Station AE Title	(0040,0001)	AE	S	x		
>Scheduled Procedure Step Start Data	(0040,0002)	DA	S/R	x		
>Scheduled Procedure Step Start Time	(0040,0003)	TM		x		
>Scheduled Performing Physician's Name	(0040,0006)	PN		x		
>Scheduled Procedure Step Description	(0040,0007)	LO		x		x
>Scheduled Protocol Code Sequence	(0040,0008)	SQ		x		x
>>Code Value	(0008,0100)	SH		x		x
>>Coding Scheme Designator	(0008,0102)	SH		x		x
>>Coding Scheme Version	(0008,0103)	SH		x		x
>>Code Meaning	(0008,0104)	LO		x		x
>Modality	(0008,0060)	CS	S	x		x
Requested Procedure						
Requested Procedure ID	(0040,1001)	SH	S	x		
Requested Procedure Code Sequence	(0032,1064)	SQ		x		
>Code Value	(0008,0100)	SH		x		
>Coding Scheme Designator	(0008,0102)	SH		x		
>Coding Scheme Version	(0008,0103)	SH		x		
>Code Meaning	(0008,0104)	LO		x		
Study Instance UID	(0020,000D)	UI		x		x
Referenced Study Sequence	(0008,1110)	SQ		x		x
>Referenced SOP Class UID	(0008,1150)	UI		x		x
>Referenced SOP Instance UID	(0008,1155)	UI		x		x
Requested Procedure Description	(0032,1060)	LO		x		
Names of Intended Recipients of Results	(0040,1010)	PN		x		
Imaging Service Request						
Referring Physician's Name	(0008,0090)	PN		x		
Referring Physician	(0032,1032)	PN		x	x	
Requesting Service	(0032,1033)	LO		x	x	
Accession Number	(0008,0050)	SH	S	x	x	x
Order Enterer's Location (*1)	(0040,2009)	SH		x		
Visit Identification						
Visit Status						
Current Patient Location (*2)	(0038,0300)	LO		x	x	
Patient’s Institution Residence	(0038,0400)	LO		x	x	
Visit Relationship						
Referenced Patient Sequence	(0008,1120)	SQ		x		
>Referenced SOP Class UID	(0008,1150)	UI		x		
>Referenced SOP Instance UID	(0008,1155)	UI		x		

Module Name Attribute Name	Tag	VR	M	R	D	IOD
Visit Admission						
Patient Relationship						
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		
Patient Demographic						
Patients Birth Date	(0010,0030)	DA		x	x	x
Patient's Sex	(0010,0040)	CS		x	x	x
Ethnic Group	(0010,2160)	SH		x		
Patient Comments	(0010,4000)	LT		x	x	
Patient Medical						
Patient State	(0038,0500)	LO		x		
Pregnancy Status	(0010,21C0)	US		x	x	
Additional Patient History	(0010,21B0)	LT		x		
Radiation Dose (Extended)						
Radiation Dose Sequence	(0040,030E)	SQ		x		
>Exposure Type	(0018,115A)	CS		x		
>KVp	(0018,0060)	DS		x		
>X-ray Tube Current in μA	(0018,8151)	DS		x		
>Exposure Time	(0018,1150)	IS		x		
>Filter Type	(0018,1160)	LO		x		
>Filter Material	(0018,7050)	CS		x		
General Study (Extended)						
Study Description	(0008,1030)	LO		x		
Image Acquisition Results (Extended)						
Study ID	(0020,0010)	SH		x		
Basic Film Session Presentation (Extended)						
Number of Copies	(2000,0010)	IS		x		
Private						
Distribution Code	(0009,xx90)	ST		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 (automatic) Worklist Update. An “S” will indicate that the MWM-SCU AE will supply an attribute value for Single Value Matching, a “R” will indicate Range Matching and a “*” will denote wildcard matching.

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.

IOD: An “x” indicates that this worklist attribute is included into all Object Instances created during performance of the related Procedure Step.

(*1) With mobile specifications, the “Order Enterer's Location” cannot be displayed on the worklist screen.

(*2) Other than mobile specifications, the “Current Patient Location” cannot be displayed on the worklist screen.

With any of these specifications, both (*1) “Order Enterer's Location” and (*2) “Current Patient Location” can be displayed on the Order Information screen.

4.2.5.4 Association Acceptance Policy

The MWM-SCU AE does not accept any association.

4.2.6 MPPS-SCU Application Entity Specification

4.2.6.1 SOP Classes

DR-ID 300CL provides Standard Conformance to the following SOP Classes:

TABLE 4.2-41 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	Yes	No

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 4.2-42 DICOM APPLICATION CONTEXT FOR THE MPPS-SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.6.2.2 Number of Associations

DR-ID 300CL initiates one Association at a time for each destination to which a transfer request is being processed in the active job queue list. Only one job will be active at a time, the other remains pending until the active job is completed or failed.

TABLE 4.2-43 NUMBER OF ASSOCIATIONS INITIATED FOR THE MPPS-SCU AE

Maximum number of simultaneous Associations	1

4.2.6.2.3 Asynchronous Nature

DR-ID 300CL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2-44 ASYNCHRONOUS NATURE FOR THE MPPS-SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.6.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

TABLE 4.2-45 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE MPPS-SCU AE

Implementation Class UID	1.2.392.200036.9125.5342.1
Implementation Version Name	A00

4.2.6.3 Association Initiation Policy

4.2.6.3.1 Activity – Acquire Images

4.2.6.3.1.1 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.

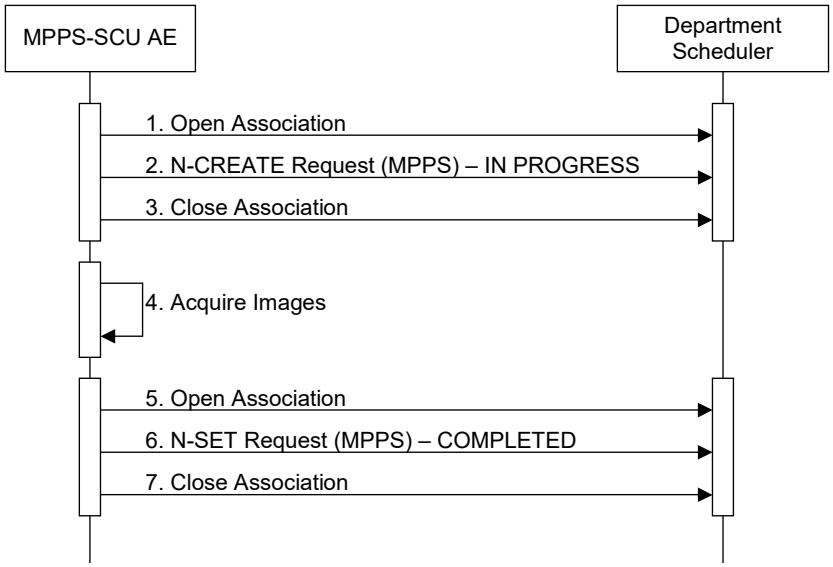


FIGURE 4.2-7 SEQUENCING OF ACTIVITY – ACQUIRE IMAGES

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 Departmental 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.

4.2.6.3.1.2 Proposed Presentation Contexts

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

TABLE 4.2-46 PROPOSED PRESENTATION CONTEXTS FOR 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

4.2.6.3.1.3 SOP Specific Conformance for MPPS7 SOP Classes

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 4.2-47 MPPS N-CREATE / N-SET RESPONSE HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
*	*	Any other status code.	The association is aborted and the MPPS is marked as failed. The status meaning 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. A "Zero length" attribute will be sent with zero length.

TABLE 4.2-48 MPPS N-CREATE / N-SET REQUEST IDENTIFIER

Attribute Name	Tag	VR	N-CREATE	N-SET
Specific Character Set	(0008,0005)	CS	From MWL	
Performed Procedure Step Relationship				
Scheduled Step Attribute Sequence	(0040,0270)	SQ	From MWL	
>Study Instance UID	(0020,000D)	UI	From MWL	
>Referenced Study Sequence	(0008,1110)	SQ	From MWL	
>>Referenced SOP Class UID	(0008,1150)	UI	From MWL	
>>Referenced SOP Instance UID	(0008,1155)	UI	From MWL	
>Accession Number	(0008,0050)	SH	From MWL or User Input	
>Requested Procedure ID	(0040,1001)	SH	From MWL	
>Requested Procedure Description	(0032,1060)	LO	From MWL	
>Scheduled Procedure Step ID	(0040,0009)	SH	From MWL	
>Scheduled Procedure Step Description	(0040,0007)	LO	From MWL	
>Scheduled Protocol Code Sequence	(0040,0008)	SQ	From MWL	
>>Code Value	(0008,0100)	SH	From MWL	
>>Coding Scheme Designator	(0008,0102)	SH	From MWL	
>>Coding Scheme Version	(0008,0103)	SH	From MWL	
>>Code Meaning	(0008,0104)	LO	From MWL	

Attribute Name	Tag	VR	N-CREATE	N-SET
Patient's Name	(0010,0010)	PN	From MWL or User Input	
Patient ID	(0010,0020)	LO	From MWL or User Input	
Patient's Birth Data	(0010,0030)	DA	From MWL or User Input	
Patient's Sex	(0010,0040)	CS	From MWL or User Input	
Referenced Patient Sequence	(0008,1120)	SQ	From MWL	
>Referenced SOP Class UID	(0008,1150)	UI	From MWL	
>Referenced Instance UID	(0008,1155)	UI	From MWL	
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	x	
Performed Location	(0040,0243)	SH	x	
Performed Procedure Step Start Data	(0040,0244)	DA	Actual start date	
Performed Procedure Step Start Time	(0040,0245)	TM	Actual start time	
Performed Procedure Step Status	(0040,0252)	CS	IN PROGRESS	DISCONTINUED or COMPLETED
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 Description	(0040,0254)	LO	x	x
Performed Procedure Type Description	(0040,0255)	LO	x	x
Comments on the Performed Procedure Step	(0040,0280)	ST	x	x
Procedure Code Sequence	(0008,1032)	SQ	x	x
>Code Value	(0008,0100)	SH	x	x
>Coding Scheme Designator	(0008,0102)	SH	x	x
>Coding Scheme Version	(0008,0103)	SH	x	x
>Code Meaning	(0008,0104)	LO	x	x
Image Acquisition Results				
Modality	(0008,0060)	SH	From MWL	
Study ID	(0020,0010)	SH	From MWL	
Performed Protocol Code Sequence	(0040,0260)	SQ	From MWL	x
>Code Value	(0008,0100)	SH	From MWL	x
>Coding Scheme Designator	(0008,0102)	SH	From MWL	x
>Coding Scheme Version	(0008,0103)	SH	From MWL	x
>Code Meaning	(0008,0104)	LO	From MWL	x
Performed Series Sequence	(0040,0340)	SQ	x	x
>Series Description	(0008,103E)	LO	x	x
>Retrieve AE Title	(0008,0054)	AE	x	x
>Performed Physician’s Name	(0008,1050)	PN	x	x
>Operator's Name	(0008,1070)	PN	x	x
>Protocol Name	(0018,1030)	LO	x	x
>Series Instance UID	(0020,000E)	UI	x	x
>Referenced Image Sequence	(0008,1140)	SQ	x	x
>>Referenced SOP Class UID	(0008,1150)	UI	x	x
>>Referenced SOP Instance UID	(0008,1155)	UI	x	x

Attribute Name	Tag	VR	N-CREATE	N-SET
>Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)	SQ	x	x
>>Referenced SOP Class UID	(0008,1150)	UI	x	x
>>Referenced SOP Instance UID	(0008,1155)	UI	x	x
X-ray Acquisition Dose (Extended)				
Image and Fluoroscopy Area Dose Product	(0018,115E)	DS	x	x
Radiation Dose Sequence	(0040,030E)	SQ	x	x
>Exposure Type	(0018,115A)	CS	x	x
>KVp	(0018,0060)	DS	x	x
>X-ray Tube Current in μA	(0018,8151)	DS	x	x
>Exposure Time	(0018,1150)	IS	x	x
>Filter Type	(0018,1160)	LO	x	x
>Filter Material	(0018,7050)	CS	x	x
Billing and Material Management Codes (Extended)				
Film Consumption Sequence	(0040,0321)	SQ	x	x
>Number of Films	(2100,0170)	IS	x	x
>Film Size ID	(2010,0050)	CS	x	x
Billing Supplies and Devices Sequence	(0040,0324)	SQ	x	x
>Billing Item Sequence	(0040,0296)	SQ	x	x
>>Code Value	(0008,0100)	SH	x	x
>>Coding Scheme Designator	(0008,0102)	SH	x	x
>>Coding Scheme Version	(0008,0103)	SH	x	x
>>Code Meaning	(0008,0104)	LO	x	x
>Quantity Sequence	(0040,0293)	SQ	x	x
>>Quantity	(0040,0294)	DS	x	x
Private				
Exposure Status Sequence	(0019,XXA0)	SQ	x	x
>Distance Source to Detector	(0018,1110)	DS	x	x
>Distance Source to Patient	(0018,1111)	DS	x	x
>Exposure	(0018,1152)	IS	x	x
>Exposure in μAs	(0018,1153)	IS	x	x
>Grid	(0018,1166)	CS	x	x
>Estimated Radiographic Magnification Factor	(0018,1114)	DS	x	x
>Image Area Dose Product	(0018,115E)	DS	x	x
>Anode Target Material	(0018,1191)	CS	x	x
>Body Part Thickness	(0018,11A0)	DS	x	x
>Compression Force	(0018,11A2)	DS	x	x
>Positioner Primary Angle	(0018,1510)	DS	x	x
>Exposure Division Count	(0019,YY71)	IS	x	x
>Exposure Status	(0019,YYA1)	CS	x	x
>Exposure Kind	(0019,YYA2)	CS	x	x
>Entrance Dose	(0040,0302)	US	x	x
>Organ Dose	(0040,0316)	DS	x	x
>Entrance Dose in mGy	(0040,8302)	DS	x	x

4.2.6.4 Association Acceptance Policy

The MWM-SCU AE does not accept any association.

4.2.7 Print-SCU Application Entity Specification

4.2.7.1 SOP Classes

DR-ID 300CL provides Standard Conformance to the following SOP Classes:

TABLE 4.2-49 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 4.2-50 SOP CLASSES FOR THE PRINT-SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
Basic Color Image Box	1.2.840.10008.5.1.1.4.1	Yes	No
Printer	1.2.840.10008.5.1.1.16	Yes	No

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 4.2-51 DICOM APPLICATION CONTEXT FOR THE PRINT-SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.7.2.2 Number of Associations

DR-ID 300CL initiates one Association at a time for each destination to which a transfer request is being processed in the active job queue list. Only one job will be active at a time, the other remains pending until the active job is completed or failed.

TABLE 4.2-52 NUMBER OF ASSOCIATIONS INITIATED FOR THE PRINT-SCU AE

Maximum number of simultaneous Associations	1

4.2.7.2.3 Asynchronous Nature

DR-ID 300CL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2-53 ASYNCHRONOUS NATURE FOR THE PRINT-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 4.2-54 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE PRINT-SCU AE

Implementation Class UID	1.2.392.200036.9125.5342.1
Implementation Version Name	A00

4.2.7.3 Association Initiation Policy

4.2.7.3.1 Activity – Film Images

4.2.7.3.1.1 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. Each print-job is forwarded to the job queue and processed individually.

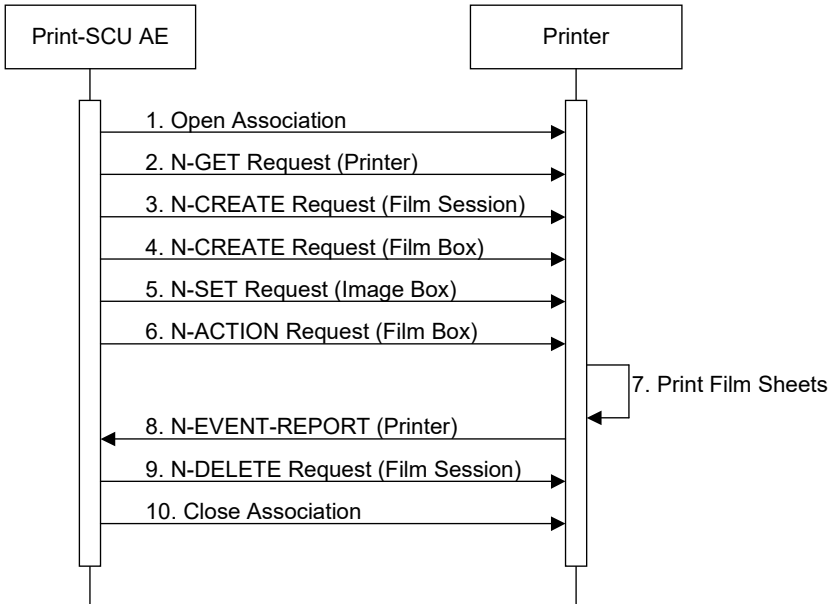


FIGURE 4.2-8 SEQUENCING OF ACTIVITY – FILM IMAGES

A typical sequence of DIMSE messages sent over an association between 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-GET on the Printer SOP Class is used to obtain current printer status information. If the Printer reports a status of FAILURE, the print-job is switched to a failed state and the user informed.
3. N-CREATE on the Film Session SOP Class creates a Film Session.
4. N-CREATE on the Film Box SOP Class creates a Film Box linked to the Film Session.
5. N-SET on the Image Box SOP Class transfers the contents of the film sheet to the printer.
6. N-ACTION on the Film Box SOP Class instructs the Printer to print the Film Box.
7. The printer prints the requested number of film sheets.
8. The Printer asynchronously reports its status via N-EVENT-REPORT notification (Printer SOP Class). If the Printer reports a status of FAILURE, the print-job is switched to a failed state and the user informed.
9. N-DELETE on the Film Session SOP Class deletes the complete Film Session SOP Instance hierarchy.
10. The Print SCU AE closes the association with the Printer.

4.2.7.3.1.2 Proposed Presentation Contexts

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

TABLE 4.2-55 PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY FILM IMAGES

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

4.2.7.3.1.3 SOP Specific Conformance Printer SOP Class

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

— N-GET

— N-EVENT-REPORT

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

4.2.7.3.1.3.1 Printer SOP Class Operation (N-GET)

The Print-SCU AE uses the Printer SOP Class N-GET operation to obtain information about the current printer status. The attributes obtained via N-GET are listed in the Table below:

TABLE 4.2-56 PRINTER SOP CLASS N-GET REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Printer Status	(2110,0010)	CS	Provided by Printer.	ALWAYS	Printer
Printer Status Info	(2110,0020)	CS	Provided by Printer.	ALWAYS	Printer

The Printer Status information is evaluated as follows:

1. If Printer status (2110,0010) is NORMAL, the print-job continues to be printed.
2. If Printer status (2110,0010) is FAILURE or WARNING, the print-job is marked as failed. The contents of Printer Status Info (2110,0020) is logged and reported to the user via the job control application.

TABLE 4.2-57 PRINTER SOP CLASS N-GET RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The request to get printer status information was success.
*	*	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.

4.2.7.3.1.3.2 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 Print-SCU AE when receiving Event Types within the N-EVENT-REPORT is summarized in the Table below:

TABLE 4.2-58 PRINTER SOP CLASS N-EVENT-REPORT BEHAVIOR

Event Type Name	Event Type ID	Behavior
Normal	1	The print-job continues to be printed.
Warning	2	The print-job is marked as failed. The contents of Printer Status Info (2110,0020) is logged and reported to the user via the job-control application.
Failure	3	The print-job is marked as failed. The contents of Printer Status Info (2110,0020) is logged and reported to the user via the job-control application.

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

TABLE 4.2-59 PRINTER SOP CLASS N-EVENT-REPORT RESPONSE STATUS REASONS

Service Status	Further Meaning	Error Code	Reasons
Success	Success	0000	The notification event has been successfully received.
*	*	Any other status code.	An error occurred during processing of the N-EVENT-REPORT. A short description of the error will be returned in Error Comment (0000,0902).

4.2.7.3.1.4 SOP Specific Conformance Film Session SOP Class

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

— N-CREATE

— N-DELETE

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

4.2.7.3.1.4.1 Film Session SOP Class Operation (N-CREATE)

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

TABLE 4.2-60 FILM SESSION SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	(2000,0010)	IS	0-9	ALWAYS	USER
Print Priority	(2000,0020)	CS	Specifies the priority of the print job. Enumerated Values: HIGH MED LOW	ALWAYS	CONFIG
Medium Type	(2000,0030)	CS	CLEAR FILM BLUE FILM	ALWAYS	CONFIG
Film Destination	(2000,0040)	CS	PROCESSOR BIN_i	ALWAYS	CONFIG
Memory Allocation	(2000,0060)	IS	39219 71438	ALWAYS	CONFIG

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

TABLE 4.2-61 FILM SESSION SOP CLASS N-CREATE RESPONSE HANDLING BEHAVIOR

Service Status	Further Meaning	Error 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.

4.2.7.3.1.4.2 Film Session SOP Class Operation (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 4.2-62 FILM SESSION SOP CLASS N-DELETE RESPONSE HANDLING BEHAVIOR

Service Status	Further Meaning	Error 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.

4.2.7.3.1.5 SOP Specific Conformance Film Box SOP Class

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

— N-CREATE

— N-ACTION

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

4.2.7.3.1.5.1 Film Box SOP Class Operation (N-CREATE)

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

TABLE 4.2-63 FILM BOX SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Display Format	(2010,0010)	ST	STANDARD \1,1	ALWAYS	USER
Film Orientation	(2010,0040)	CS	PORTRAIT LANDSCAPE	ALWAYS	USER
Film Size ID	(2010,0050)	CS	8INX10IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN	ALWAYS	USER
Magnification Type	(2010,0060)	CS	REPLICATE, BILINEAR, CUBIC, NONE	ALWAYS	CONFIG
Smoothing Type	(2010,0080)	CS	SHARP SMOOTH MEDIUM	ALWAYS	CONFIG
Border Density	(2010,0100)	CS	BLACK WHITE 0-300	ALWAYS	USER
Max Density	(2010,0130)	US	360,300	ALWAYS	AUTO
Trim	(2010,0140)	CS	NO	ALWAYS	AUTO
Configuration Information	(2010,0150)	ST	“1” - “8”, “FINE1” - “FINE8”	ALWAYS	AUTO
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 4.2-64 FILM BOX SOP CLASS N-CREATE RESPONSE HANDLING BEHAVIOR

Service Status	Further Meaning	Error 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.

4.2.7.3.1.5.2 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 a N-ACTION response is summarized in the table below:

TABLE 4.2-65 FILM BOX SOP CLASS N-ACTION RESPONSE HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. The film has been accepted for printing.
*	*	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.

4.2.7.3.1.6 SOP Specific Conformance Basic Grayscale Image Box SOP Class

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

— N-SET

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

4.2.7.3.1.6.1 Basic Grayscale Image Box SOP Class Operation (N-SET)

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

TABLE 4.2-66 BASIC GRAYSCALE IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Smoothing Type	(2010,0080)	CS	SHARP SMOOTH MEDIUM	ALWAYS	CONFIG
Max Density	(2010,0130)	US	360,300	ALWAYS	AUTO
Configuration Information	(2010,0150)	ST	“1” - “8”, “FINE1” - “FINE8”	ALWAYS	AUTO
Image Position	(2020,0010)	US	1	ALWAYS	AUTO
Requested Image Size	(2020,0030)	DS	Depend on Image Size and Film Format.	ALWAYS	AUTO
Requested Decimate/ Crop Behavior	(2020,0040)	CS	“CROP” or with no tags.	ANAP	AUTO
Basic Grayscale Image Sequence	(2020,0110)	SQ		ALWAYS	AUTO
>Samples Per Pixel	(0028,0002)	US	1	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	MONOCHROME1	ALWAYS	AUTO
Rows	(0028,0010)	US	Depend on Image Size and Film Format.	ALWAYS	AUTO
Columns	(0028,0011)	US	Depend on Image Size and Film Format.	ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	16	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	10,12	ALWAYS	AUTO
High Bit	(0028,0102)	US	9,11	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 4.2-67 BASIC GRAYSCALE IMAGE BOX SOP CLASS N-SET RESPONSE HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. Image successfully stored in Image Box.
*	*	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.

4.2.7.4 Association Acceptance Policy

The Print-SCU AE does not accept any association.

4.2.8 Q/R-SCU Application Entity Specification

4.2.8.1 SOP Classes

DR-ID 300CL provides Standard Conformance to the following SOP Classes:

TABLE 4.2-68 META SOP CLASSES FOR THE PRINT-SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No

4.2.8.2 Association Policies

4.2.8.2.1 General

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

TABLE 4.2-69 DICOM APPLICATION CONTEXT FOR THE Q/R-SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.8.2.2 Number of Associations

DR-ID 300CL initiates Four Associations at a time for each destination to which a transfer request is being processed in the active job queue list. Four jobs will be active at a time, the other remains pending until the active job is completed or failed.

TABLE 4.2-70 NUMBER OF ASSOCIATIONS INITIATED FOR THE Q/R-SCU AE

Maximum number of simultaneous Associations	4

4.2.8.2.3 Asynchronous Nature

DR-ID 300CL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2-71 ASYNCHRONOUS NATURE FOR THE Q/R-SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.8.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

TABLE 4.2-72 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE Q/R-SCU AE

Implementation Class UID	1.2.392.200036.9125.5342.1
Implementation Version Name	A00

4.2.8.3 Association Initiation Policy

4.2.8.3.1 Activity – Query and Retrieve Image

4.2.8.3.1.1 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, Study Date, Accession Number and Modality. The user can select studies, series and images to be retrieved. The images will be received at the Storage-SCP AE.

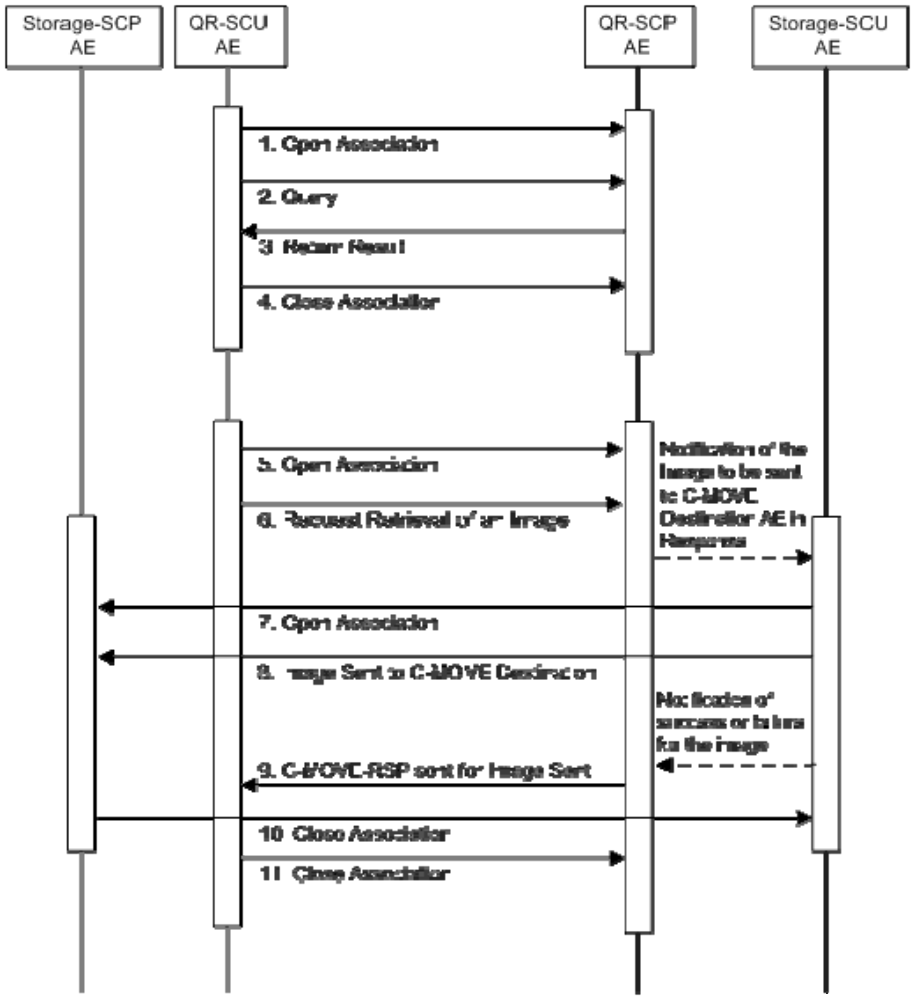


FIGURE 4.2-9 SEQUENCING OF ACTIVITY – QUERY AND RETRIEVE IMAGE

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 images 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.

4.2.8.3.1.2 Proposed Presentation Contexts

The Q/R-SCU AE is capable of proposing the Presentation Contexts shown in the following table:

TABLE 4.2- 73 PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY QUERY AND RETRIEVE IMAGE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

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

The Q/R-SCU AE provides standard conformance to the Q/R Find (=Study Root Query/Retrieve Information Model – FIND) SOP Class 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- 74 Q/R C-FIND RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the matches. Worklist items are available for display or further processing.
Pending	Matches are continuing - Current Match is supplied and any Optional Key were supported in the same manner as Required Keys	FF00	Behavior is continuing to receive the matching result.
Pending	Matches are continuing -Warning that one or more Optional Keys were not supported for existance and/or matching for this Identifier	FF01	Behavior is continuing.
Cancel	Matching terminated due to Cancel request	FE01	Behavior is cancelled.
*	*	Any other status code.	The association is aborted using A-ABORT and the status meaning is logged.

All queries are initiated at the highest level of the information model (the STUDY level), and then for each response received, recursively repeated at the next lower levels (the SERIES and then IMAGE levels), in order to completely elucidate the “tree” of instances available on the remote AE.
The table below provides a description of the Q/R-SCU AE C-FIND Request Identifier.

TABLE 4.2-75 STUDY ROOT REQUEST IDENTIFIER FOR C-FIND

Name	Tag	Types of Matching
SOP Common		
Specific Character Set	(0008,0005)	NONE
Query/Retrieve Level	(0008,0052)	NONE
Retrieve AE Title	(0008,0054)	NONE
Study Level		
Patient’s Name	(0010,0010)	S,*,U
Patient ID	(0010,0020)	S,*,U
Patient Birth Date	(0010,0030)	NONE
Patient Sex	(0010,0040)	NONE
Study Date	(0008,0020)	R,U
Study Time	(0008,0030)	NONE
Accession Number	(0008,0050)	S,*,U
Study ID	(0020,0010)	NONE
Modalities In Study	(0008,0061)	S,*,U/ NONE
Study Instance UID	(0020,000D)	NONE
Series Level		
Modality	(0008,0060)	S,U

Series Number	(0020,0011)	NONE
Series Instance UID	(0020,000E)	NONE
Image Level		
SOP Instance UID	(0008,0018)	U
Acquisition Device Processing Description	(0018,1400)	NONE
Instance Number	(0020,0013)	NONE

The tables should be read as follows:

Types of Matching: The types of Matching supported by the Q/R-SCU AE. An "S" indicates the identifier attribute can specify Single Value Matching, an “R” will indicate Range Matching, a “*” will denote wildcard matching, a ‘U’ will indicate universal matching. “NONE” indicates that no matching is supported, but that values for this Element in the database can be returned.

4.2.8.3.1.4 SOP Specific Conformance Study Root Query/Retrieve Information Model - MOVE SOP Classes

The Q/R-SCU AE provides standard conformance to the Q/R Move (=Study Root Query/Retrieve Information Model – MOVE) SOP Class 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- 76 Q/R C-MOVE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	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.
Pending	SubOperations are Continuing	FF00	Behavior is continuing to receive the SOP Instance until complete.
Warning	SubOperations Complete - One or More Failure	B000	Behavior ends normally, but logs events.
Cancel	SubOperations terminated due to Cance	FE00	Behavior is cancelled.
*	*	Any other status code.	The association is aborted using A-ABORT and the status meaning is logged.

4.2.8.4 Association Acceptance Policy

The Q/R-SCU AE does not accept any association.

4.2.9 Storage-SCP Application Entity Specification

4.2.9.1 SOP Classes

DR-ID 300CL provides Standard Conformance to the following SOP Classes:

TABLE 4.2- 77 SOP CLASSES FOR THE STORAGE-SCP AE

SOP Class Name	SOP Class UID	SCU	SCP
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes
FUJI Private Computed Radiography Image Storage	1.2.392.200036.9125.1.1.2	No	Yes
Digital X-ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Yes
Digital X-ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	No	Yes
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	No	Yes
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	No	Yes

4.2.9.2 Association Policies

4.2.9.2.1 General

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

TABLE 4.2- 78 DICOM APPLICATION CONTEXT FOR THE STORAGE-SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.9.2.2 Number of Associations

DR-IR 300CL initiates one Association at a time for each destination to which a transfer request is being processed in the active job queue list. Only one job will be active at a time, the other remains pending until the active job is completed or failed.

TABLE 4.2- 79 NUMBER OF ASSOCIATIONS INITIATED FOR THE STORAGE-SCP AE

Maximum number of simultaneous Associations	1

4.2.9.2.3 Asynchronous Nature

DR-ID 300CL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2- 80 ASYNCHRONOUS NATURE FOR THE STORAGE-SCP AE

Maximum number of outstanding asynchronous transactions	1

4.2.9.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

TABLE 4.2- 81 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE STORAGE-SCP AE

Implementation Class UID	1.2.392.200036.9125.5342.1
Implementation Version Name	A00

4.2.9.3 Association Initiation Policy

The Storage-SCP AE does not initiate associations.

4.2.9.4 Association Acceptance Policy

4.2.9.4.1 Activity - Receive Storage Request

When the Storage-SCP AE accepts an association, it will respond to storage requests.

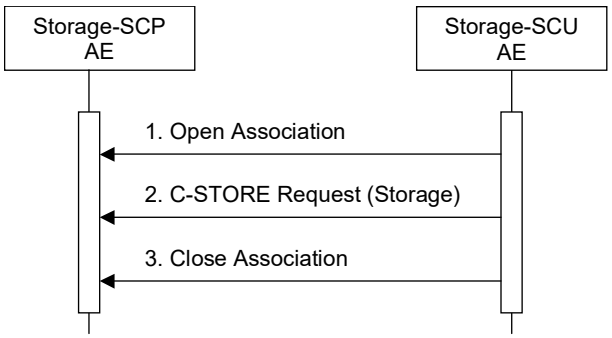


FIGURE 4.2-10 SEQUENCING OF ACTIVITY – STORE IMAGES TO THE LOCAL FILE SYSTEM

A possible sequence of interactions between the Storage-SCP AE and a Storage-SCU AE is illustrated in Figure above:

1. The Storage-SCU AE opens an association with the Storage-SCP AE.
2. The Storage SCU AE sends images to the Storage SCP AE using a storage request (C-STORE) and the Storage SCP AE replies with a C-STORE response (status success).
3. The Storage-SCU AE closes the association with the Storage-SCP AE.

4.2.9.4.1.1 Accepted Presentation Contexts

The default Behavior of the Storage-SCP AE supports the Implicit VR Little Endian and Explicit VR Little Endian Transfer Syntaxes for all Associations.

Any of the Presentation Contexts shown in the following table are acceptable to the Storage-SCP AE for receiving images.

TABLE 4.2- 82 PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY STORE IMAGES

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		
FUJI Private Computed Radiography Image Storage	1.2.392.200036.9125.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		
Digital X-ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		
Digital X-ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70		

NOTE: Multiple Transfer Syntax can be set in an Abstract Syntax, however only one setting that is set first is valid.

4.2.9.4.1.2 SOP Specific Conformance Image Storage SOP Classes

The associated Activity with the Storage service is the storage of medical image data received over the network on a designated hard disk. The Storage-SCP AE will return a failure status if it is unable to store the image on the local file system.

TABLE 4.2- 83 THE STORAGE-SCP AE C-STORE RESPONSE STATUS RETURN REASONS

Service Status	Further Meaning	Error 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	A700	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	A900	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.
*	*	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.

4.3 NETWORK INTERFACES

4.3.1 Physical Network Interface

DR-ID 300CL supports a single network interface. One of the following physical network interfaces will be available depending on installed hardware options:

TABLE 4.3-1 SUPPORTED PHYSICAL NETWORK INTERFACES

1000 Ethernet

4.3.2 Additional Protocols

The DR-ID 300CL Storage AE has no additional protocol.

4.3.3 IPv4 and IPv6 Support

DR-ID 300CL supports IPv4 and an IPv6 connection.

4.4 CONFIGURATION

4.4.1 AE Title/Presentation Address Mapping

4.4.1.1 Local AE Titles

The Field Service Engineer can configure the AE Title via the Service/Installation Tool.

TABLE 4.4-1 AE TITLE CONFIGURATION TABLE

Application Entity	Default AE Title	Default TCP/IP Port
Storage-SCU	FCR-CSL	104
Storage Commitment-SCU	FCR-CSL	104 (for receiving N-EVENT-REPORT)
MWM-SCU	FCR-CSL	104
MPPS-SCU	FCR-CSL	104
Print-SCU	FCR-CSL	104
Q/R-SCU	FCR-CSL	104
Storage-SCP	FCR-CSL	21760

*When using Referral Viewing Function(Option), Default AE Title and Default TCP/IP Port have to be set separately from those for FCR-CSL.

4.4.1.2 Remote AE Title/Presentation Address Mapping

4.4.1.2.1 Storage-SCU / Storage Commitment-SCU / Storage-SCP

The AE Title, host name, IP Address and port number of remote applications are configured using the DR-ID 300CL Service Tool. Associations from known AE Titles will be accepted and associations from unknown AE Titles will be rejected (an AE Title is known if it can be selected within the Service Tool). Multiple remote Storage-SCPs can be defined. Each Storage SCP can be configured to receive a storage commitment request.

4.4.1.2.2 MWM-SCU / MPPS-SCU

The DR-ID 300CL Service Tool must be used to set the AE Title, port-numbers, host-names and capabilities of the remote Modality Worklist SCP. Only a single remote Modality Worklist SCP can be defined.

The Service Tool must be used to set the AE Title, port-numbers, host-names and capabilities of the remote MPPS SCP. Only a single remote MPPS SCP can be defined.

4.4.1.2.3 Print-SCU

The DR-ID 300CL Service Tool must be used to set the AE Titles, port-numbers, host-names and capabilities for the remote Print-SCPs. Multiple remote Print-SCPs can be defined.

4.4.1.2.4 Q/R-SCU

The DR-ID 300CL Service Tool must be used to set the AE Titles, port-numbers, host-names and capabilities for the remote Q/R-SCPs. Multiple remote Q/R-SCPs can be defined.

4.4.2 Parameters

A large number of parameters related to acquisition and general operation can be configured using the Service Tool. The Table below only shows those configuration parameters relevant to DICOM communication.

TABLE 4.4-2 CONFIGURATION PARAMETERS TABLE

Parameter	Configurable (Yes/No)	Default Value
Storage-SCU Parameters		
Supported Transfer Syntaxes (separately configurable for each remote AE). One of Implicit VR Little Endian, Explicit VR Little Endian, or JPEG Lossless	Yes	Implicit VR Little Endian
Storage-SCU time-out waiting for a response to a C-STORE-RQ	Yes	15 s
Storage-SCU Maximum Output Image Density One of 'ST' or 'HQ / SH'. Here, 'ST' indicates the low image density, 'HQ / SH' indicates the original image density or the high image density for mammography.	Yes	ST
Storage-SCU Multi-Byte-Character (Remote Storage-SCP capable of using Multi-Byte-Character)	Yes	No
Maximum number of simultaneously accepted associations by the Storage-SCU AE	No	3
Storage Commitment-SCU Parameters		
Storage Commitment-SCU time-out waiting for a response to an N-ACTION-RQ	Yes	15 s
Storage-SCP Parameters		
Maximum number of simultaneously accepted associations by the Storage-SCP AE	No	1
MWM-SCU Parameters		
Supported Transfer Syntaxes	No	Implicit VR Little Endian
MWM-SCU time-out waiting for a response to a C-FIND-RQ	Yes	15 s
Maximum number of simultaneously accepted associations by the MWM-SCU AE	No	1
MPPS-SCU Parameters		
Supported Transfer Syntaxes	No	Implicit VR Little Endian
Maximum number of simultaneously accepted associations by the MPPS-SCU AE	No	1
Print-SCU Parameters		
Supported Transfer Syntaxes	No	Implicit VR Little Endian
Print-SCU time-out waiting for a response to each DIMSE	Yes	15 s

Parameter	Configurable (Yes/No)	Default Value
Print-SCU Multi-Byte-Character	Yes	No
Maximum number of simultaneously accepted associations by the Storage-SCU AE	No	1

5 MEDIA INTERCHANGE

5.1 IMPLEMENTATION MODEL

5.1.1 Application Data Flow

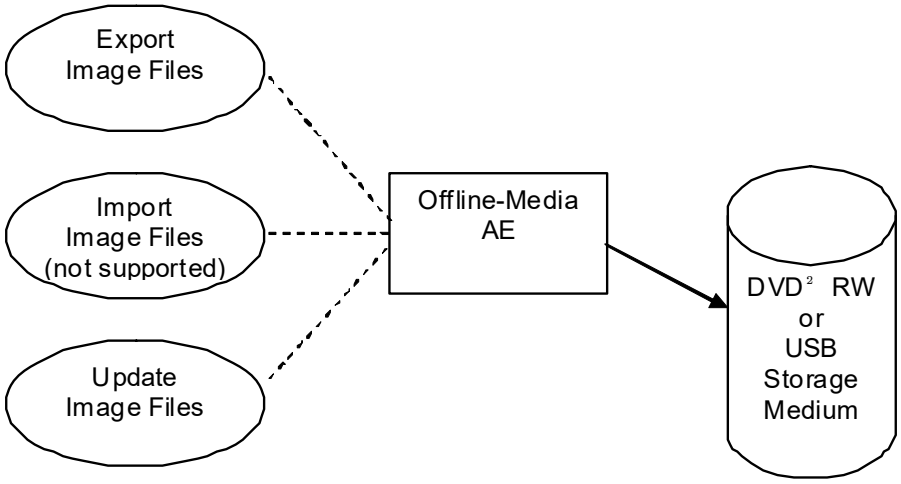


FIGURE 5.1-1 APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE

— The Offline-Media AE exports images to a DVD±RW or USB Storage medium. It is associated with the local real-world activity “Export Image Files”. “Export Image Files” is performed upon user request for selected studies.

— The DR-ID 300CL does not support Media Storage to import.

— The Offline-Media AE updates images on a DVD±RW or USB Storage medium. It is associated with the local real-world activity “Update Image Files”. “Update Image Files” is performed upon user request for selected studies.

5.1.2 Functional Definition of AEs

5.1.2.1 Functional Definition of Offline-Media Application Entity

Export Image Files:

The DR-ID300CL builds DICOM Information Objects for storage and creates a DICOMDIR file that represents the contents of the DICOM Information Objects to be recorded. Then the DR-ID300CL records DICOM Information Objects and the DICOMDIR file to the USB storage medium.

Update Image Files:

The DR-ID300CL reads a File-set of the medium and writes it to the local storage device. The DR-ID300CL adds the studies/images to the File-Set, then writes it to the medium and modifies the DICOMDIR file.

5.1.3 Sequencing of Real-World Activities

5.1.3.1 Activity – Export Image Files

5.1.3.1.1 Activity – Export Image Files to DVD² RW or USB storage medium

Operator requests to create new File-set(s) onto a storage medium. The requests are placed in a queue and are executed in the background.

The operations for "Export Image Files to Storage medium" are described below:

1. Insert a medium and start mounting media manually if the setting is not automatic
2. Select the studies on the study list of DR-ID300CL to store to the medium.
3. Request to send to the medium.

5.1.3.2 Activity – Import Image Files

The DR-ID 300CL does not support Media Storage to import.

5.1.3.3 Activity – Update Image Files

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

The operations for "Update Image Files" are described below:

1. Insert a medium that has File-set. And start mounting media manually if the setting is not automatic.
2. Select the studies on the study list of DR-ID300CL to add to the medium..
3. Request to send to the medium..

5.1.4 File Meta Information Options

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	1.2.392.200036.9125.5342.1
Implementation Version Name	A00

5.2 AE SPECIFICATIONS

5.2.1 Offline-Media Application Entity Specification

The Offline-Media Application Entity provides standard conformance to 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
AUG-GEN-DVD² RW	Export Image Files	FSC	Interchange
	Update Image Files	FSU	Interchange
AUG-GEN-USB	Export Image Files	FSC	Interchange
	Update Image Files	FSU	Interchange

5.2.1.1 File Meta Information for the Application Entity

The Source Application Entity Title included in the File Meta Header is configurable (see section 5.4).

5.2.1.2 Real-World Activities

5.2.1.2.1 Activity – Export Image Files

The Offline-Media Application Entity acts as an FSC when requested to export SOP Instances from the local database to a medium.

5.2.1.2.1.1 Media Storage Application Profiles

The Offline-Media Application Entity support the 'AUG-GEN-DVD±RW' or 'AUG-GEN-USB' Application Profile.

5.2.1.2.2 Activity – Import Image Files

The DR-ID 300CL does not support Media Storage to import.

5.2.1.2.3 Activity – Update Image Files

The Offline-Media Application Entity acts as an FSU when requested to update SOP Instances on a medium.

5.2.1.2.3.1 Media Storage Application Profiles

The Offline-Media Application Entity support the 'AUG-GEN-DVD±RW' or 'AUG-GEN-USB' Application Profile.

5.3 AUGMENTED AND PRIVATE APPLICATION PROFILES

5.3.1 Augmented Application Profiles

5.3.1.1 Augmented Application Profiles – AUG-GEN-DVD±RW and AUG-GEN-USB

Augmented Application Profiles support Standard Application Profiles, SC IOD and extended Transfer Syntax.

TABLE 5.3-1 AUGMENTED APPLICATION PROFILES

Application Profiles Supported	Standard Profiles Supported
AUG-GEN-DVD±RW	STD-GEN-DVD±RW
AUG-GEN-USB	STD-GEN-USB

5.3.1.1.1 SOP Class Augmentations

The aforementioned Application Profiles support following SOP Class UID and Transfer Syntax.

TABLE 5.3-2 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	1.2.840.10008.1.2.1
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70
Digital X-ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70
Digital Mammography Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless Hierarchical First-Order Prediction	1.2.840.10008.1.2.4.70

5.3.1.1.2 Directory Augmentations

Not applicable to this product.

5.3.1.1.3 Other Augmentations

Not applicable to this product.

5.3.2 Private Application Profiles

Not applicable to this product.

5.4 MEDIA CONFIGURATION

All local applications use the AE Titles configured via the Service/Installation Tool. The Application Entity Titles configurable for Media Services are listed in the Table below:

TABLE 5.4-1 AE TITLE CONFIGURATION TABLE

Application Entity	Default AE Title
Offline-Media	No Default

6 SUPPORT OF CHARACTER SETS

ISO-IR 100 (Latin Alphabet #1)

ISO-IR 101 (Latin Alphabet #2)

ISO-IR 13/14 (Japanese Katakana: JIS X 0201)

ISO-IR 87 (Japanese Kanji: JIS X 0208)

ISO_IR 192 (Unicode: UTF-8)

ISO-IR 149 (Korean: EUC-KR)

GB18030

7 SECURTIY

DR-ID 300CL does not support any specific security measures.

It is assumed that DR-ID 300CL 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 DR-ID 300CL.

b. Firewall or router protections to ensure that DR-ID 300CL 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 a CR Image transmitted by the Storage-SCU AE.

Table 8.1-2 specifies the attributes of a DX Image for Presentation 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 (attribute always sent zero length)

The abbreviations used in the “Source” column:

MWL	the attribute value source 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
OTHER	the attribute value source is from other modality

NOTE: All dates and times are encoded in the local configured calendar and time. Date, Time and Time zone are configured using the Service/Installation Tool.

The following tables describe just the attributes which DR-ID 300CL generates. The attributes which other modalities or the equipments generated is sent, if they exist, that way.

8.1.1.1 Computed Radiography Image IOD

TABLE 8.1-1 IOD OF CREATED CR IMAGE STORAGE SOP INSTANCES

IE	Module	Usage	Reference
Patient	Patient	M	Table 8.1-6
	Clinical Trial Subject	U	Not Supported
Study	General Study	M	Table 8.1-7
	Patient Study	U	Table 8.1-8
	Clinical Trial Study	U	Not Supported
Series	General Series	M	Table 8.1-9
	CR Series	M	Table 8.1-10
	Clinical Trial Series	U	Not Supported
Equipment	General Equipment	M	Table 8.1-13
Image	General Image	M	Table 8.1-15
	Image Pixel	M	Table 8.1-16
	Contrast/bolus	C - Required if contrast media was used in this image	Table 8.1-17
	Device	U	Not Supported
	CR Image	M	Table 8.1-19
	Overlay Plane	C - Required if graphic annotation is present	Table 8.1-32
	Modality LUT	U	Table 8.1-27
	VOI LUT	U	Table 8.1-28
	SOP Common	M	Table 8.1-30
Extended	DX Positioning	-	Table 8.1-23
	X-ray Tomo Acquisition	-	Table 8.1-24
	X-ray Acquisition Dose	-	Table 8.1-25
	X-ray Generation	-	Table 8.1-26

NOTE: In Extended module, type of all attributes is 3.
The IOD includes Private attributes and standard extended attributes documented in Section 8.2. See 8.2 and 8.5.

8.1.1.2 Digital X-ray Image IOD

TABLE 8.1-2 IOD OF CREATED DX IMAGE STORAGE SOP INSTANCES

IE	Module	Usage	Reference
Patient	Patient	M	Table 8.1-6
	Specimen Identification	U	Not Supported
	Clinical Trial Subject	U	Not Supported
Study	General Study	M	Table 8.1-7
	Patient Study	U	Table 8.1-8
	Clinical Trial Study	U	Not Supported
Series	General Series	M	Table 8.1-9
	Clinical Trial Series	U	Not Supported
	DX Series	M	Table 8.1-11
	Frame of Reference	U	Not Supported
Equipment	General Equipment	M	Table 8.1-13
Image	General Image	M	Table 8.1-15
	Image Pixel	M	Table 8.1-16
	Contrast/bolus	U	Table 8.1-17
	Display Shutter	U	Not Supported
	Device	U	Not Supported
	Intervention	U	Not Supported
	DX Anatomy Imaged	M	Table 8.1-18
	DX Image	M	Table 8.1-20
	DX Detector	M	Table 8.1-22
	X-ray Collimator	U	Not Supported
	DX Positioning	U	Table 8.1-23
	X-ray Tomo Acquisition	U	Table 8.1-24
	X-ray Acquisition Dose	U	Table 8.1-25
	X-ray Generation	U	Table 8.1-26
	X-ray Filtration	U	Table 8.1-31
	X-ray Grid	U	Not Supported
	Overlay Plane	C - Required if graphic annotation is present	Table 8.1-32
	VOI LUT	C - Required if Presentation Intent Type (0008,0068) is FOR PRESENTATION. Shall not be present otherwise.	Table 8.1-28
	Image Histogram	U	Not Supported
	Acquisition Context	M	Table 8.1-29
	SOP Common	M	Table 8.1-30

NOTE: The IOD includes Private attributes and standard extended attributes documented in Section 8.2. See 8.2 and 8.5.

8.1.1.3 Digital Mammography X-Ray Image Radiography Image IOD

TABLE 8.1-3 IOD OF CREATED MG IMAGE STORAGE SOP INSTANCES

IE	Module	Usage	Reference
Patient	Patient	M	Table 8.1-6
	Specimen Identification	U	Not Supported
	Clinical Trial Subject	U	Not Supported
Study	General Study	M	Table 8.1-7
	Patient Study	U	Table 8.1-8
	Clinical Trial Study	U	Not Supported
Series	General Series	M	Table 8.1-9
	Clinical Trial Series	U	Not Supported
	DX Series	M	Table 8.1-11
	Mammography Series	M	Table 8.1-12
	Frame of Reference	U	Not Supported
Equipment	General Equipment	M	Table 8.1-13
Image	General Image	M	Table 8.1-15
	Image Pixel	M	Table 8.1-16
	Contrast/bolus	U	Table 8.1-17
	Display Shutter	U	Not Supported
	Device	U	Not Supported
	Intervention	U	Not Supported
	DX Anatomy Imaged	M	Table 8.1-18 Included in the Mammography Image Module.
	DX Image	M	Table 8.1-20
	DX Detector	M	Table 8.1-22
	X-ray Collimator	U	Not Supported
	DX Positioning	U	Table 8.1-23
	X-ray Tomo Acquisition	U	Table 8.1-24
	X-ray Acquisition Dose	U	Table 8.1-25
	X-ray Generation	U	Table 8.1-26
	X-ray Filtration	U	Table 8.1-31
	X-ray Grid	U	Not Supported
	Overlay Plane	C - Required if graphic annotation is present	Table 8.1-32
	VOI LUT	C - Required if Presentation Intent Type (0008,0068) is FOR PRESENTATION. Shall not be present otherwise.	Table 8.1-28
	Image Histogram	U	Not Supported
	Acquisition Context	M	Table 8.1-29
	SOP Common	M	Table 8.1-30

NOTE: The IOD includes Private attributes and standard extended attributes documented in Section 8.2. See 8.2 and 8.5.

8.1.1.4 SC Image IOD

TABLE 8.1-4 IOD OF CREATED SC IMAGE STORAGE SOP INSTANCES

IE	Module	Usage	Reference
Patient	Patient	M	Table 8.1-6
	Clinical Trial Subject	U	Not Supported
Study	General Study	M	Table 8.1-7
	Patient Study	U	Table 8.1-8
	Clinical Trial Study	U	Not Supported
Series	General Series	M	Table 8.1-9
	Clinical Trial Series	U	Not Supported
Equipment	General Equipment	U	Table 8.1-13
	SC Equipment	M	Table 8.1-43
Image	General Image	M	Table 8.1-15
	Image Pixel	M	Table 8.1-16
	Device	U	Not Supported
	Specimen	U	Not Supported
	SC Image	M	Table 8.1-44
	Overlay Plane	U	Not Supported
	Modality LUT	U	Not Supported
	VOI LUT	U	Not Supported
	ICC Profile	U	Not Supported
	SOP Common	M	Table 8.1-30

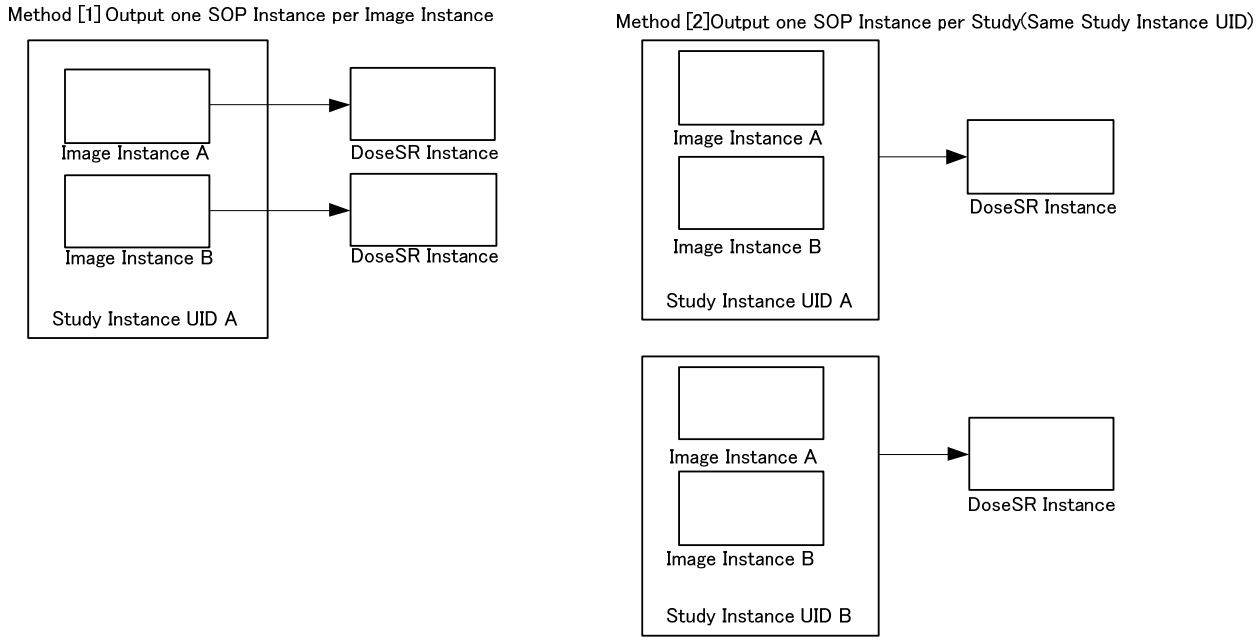
8.1.1.5 X-Ray Radiation Dose SR IOD

TABLE 8.1-5 IOD OF CREATED X-RAY RADIATION DOSE SR SOP INSTANCES

IE	Module	Usage	Reference
Patient	Patient	M	Table 8.1-6
	Specimen Identification	U	Not Supported
	Clinical Trial Subject	U	Not Supported
Study	General Study	M	Table 8.1-7
	Patient Study	U	Not Supported
	Clinical Trial Study	U	Not Supported
Series	SR Document Series	M	Table 8.1-32
	Clinical Trial Series	U	Not Supported
Frame of Reference	Synchronization	U	Not Supported
Equipment	General Equipment	M	Table 8.1-13
	Enhanced General Equipment	M	Table 8.1-14
Document	SR Document General	M	Table 8.1-35
	SR Document Content	M	Table 8.1-36
	SOP Common	U	Table 8.1-30

NOTE1: The IOD includes Private attributes and standard extended attributes documented in Section 8.2. See 8.2 and 8.5.

NOTE2: X-Ray Radiation Dose SR supported two methods of output. Each method is switching by Service Setting. One of the methods is output for each image. (This feature has supported so far) Other methods are output for each study. (This feature newly supported from V12.1)



It is determined by service setting which method(Method[1] or [2])does Console use to output DoseSR Instance. See 8.1.5.1. for details.

8.1.1.6 Patient Module

TABLE 8.1-6 PATIENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Patient's Name	(0010,0010)	2	Patient's full name.	VNAP	USER /MWL
Patient ID	(0010,0020)	2	Primary hospital identification number or code for the patient.	VNAP	USER /MWL
Patient's Birth Date	(0010,0030)	2	Birth date of the patient.	VNAP	USER /MWL
Patient's Sex	(0010,0040)	2	Sex of the named patient. Enumerated Values: M = male F = female O = other	VNAP	USER /MWL
Other Patient IDs	(0010,1000)	3	Other identification numbers or codes used to identify the patient.	ANAP	MWL
Ethnic Group	(0010,2160)	3	Ethnic group or race of patient.	ANAP	MWL
Patient Comments	(0010,4000)	3	User-defined comments about the patient.	ANAP	USER /MWL

8.1.1.7 General Study Module

TABLE 8.1-7 GENERAL STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Study Instance UID	(0020,000D)	1	Unique identifier for the Study.	ALWAYS	MWL /AUTO! /CONFIG
Study Date	(0008,0020)	2	Date the Study started.	ALWAYS	AUTO
Study Time	(0008,0030)	2	Time the Study started.	ALWAYS	AUTO
Referring Physician's Name	(0008,0090)	2	Name of the patient's referring physician	VNAP	MWL
Study ID	(0020,0010)	2	User or equipment generated Study identifier.	VNAP	MWL
Accession Number	(0008,0050)	2	A RIS generated number that identifies the order for the Study.	VNAP	USER /MWL
Study Description	(0008,1030)	3	Institution-generated description or classification of the Study (component) performed.	ANAP	MWL
Physician(s) of Record	(0008,1048)	3	Names of the physician(s) who are responsible for overall patient care at time of Study	ANAP	OTHER

8.1.1.8 Patient Study Module

TABLE 8.1-8 PATIENT STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Patient’s Age	(0010,1010)	3	Age of Patient.	ANAP	USER
Additional Patient’s History	(0010,21B0)	3	Additional information about the Patient's medical history.	ANAP	MWL

8.1.1.9 General Series Module

TABLE 8.1-9 GENERAL SERIES MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Modality	(0008,0060)	1	Type of equipment that originally acquired the data used to create the images in this Series.	ALWAYS	AUTO
Operators' Name	(0008,1070)	3	Name(s) of the operator(s) supporting the Series.	ANAP	CONFIG /USER
Series Instance UID	(0020,000E)	1	Unique identifier of the Series.	ALWAYS	AUTO
Series Number	(0020,0011)	2	A number that identifies this Series.	VNAP	AUTO
Laterality	(0020,0060)	2C	Laterality of (paired) body part examined. Required if the body part examined is a paired structure and Image Laterality (0020,0062) or Frame Laterality (0020,9072) are not sent. Enumerated Values: R = right L = left	VNAP	AUTO
Series Date	(0008,0021)	3	Date the Series started.	ANAP	AUTO
Series Time	(0008,0031)	3	Time the Series started.	ANAP	AUTO
Series Description	(0008,103E)	3	User provided description of the Series	ANAP	OTHER
Protocol Name	(0018,1030)	3	User-defined description of the conditions under which the Series was performed.	ANAP	OTHER
Body Part Examined	(0018,0015)	3	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 Values shown below are used. Body part definitions not existing in the DICOM definitions will be added. HEAD, NECK, CHEST, BREAST, ABDOMEN, PELVIS, UP_EXM, LOW_EXM, TEST	USER
Performed Procedure Step ID	(0040,0253)	3	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.	ANAP	AUTO
Performed Procedure Step Start Date	(0040,0244)	3	Date on which the Performed Procedure Step started.	ANAP	AUTO
Performed Procedure Step Start Time	(0040,0245)	3	Time on which the Performed Procedure Step started.	ANAP	AUTO
Performed Procedure Step Description	(0040,0254)	3	Institution-generated description or classification of the Procedure Step that was performed.	ANAP	AUTO

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Performed Protocol Code Sequence	(0040,0260)	3	Sequence describing the Protocol performed for this Procedure Step. One or more Items may be included in this Sequence.	ANAP	AUTO
>Code Value	(0008,0100)	1C	Required if a sequence item is present.	ANAP	AUTO
>Coding Scheme Designator	(0008,0102)	1C	Required if a sequence item is present.	ANAP	AUTO
>Coding Scheme Version	(0008,0103)	1C	Required if a sequence item is present.	ANAP	AUTO
>Code Meaning	(0008,0104)	1C	Required if a sequence item is present.	ANAP	AUTO
Request Attributes Sequence	(0040,0275)	3	Sequence that contains attributes from the Imaging Service Request. The sequence may have one or more Items.	ANAP	AUTO
>Requested Procedure ID	(0040,1001)	1	Identifier which identifies the Requested Procedure in the Imaging Service Request.	ANAP	MWL
>Scheduled Procedure Step ID	(0040,0009)	1	Identifier which identifies the Scheduled Procedure Step.	ANAP	MWL
>Scheduled Procedure Step Description	(0040,0007)	3	Institution-generated description or classification of the Scheduled Procedure Step to be performed.	ANAP	MWL
>Scheduled Protocol Code Sequence	(0040,0008)	3	Sequence describing the Scheduled Protocol following a specific coding scheme. This sequence contains one or more items.	ANAP	MWL
>>Code Value	(0008,0100)	1C	Required if a sequence item is present.	ANAP	MWL
>>Coding Scheme Designator	(0008,0102)	1C	Required if a sequence item is present.	ANAP	MWL
>>Coding Scheme Version	(0008,0103)	1C	Required if a sequence item is present.	ANAP	MWL
>>Code Meaning	(0008,0104)	1C	Required if a sequence item is present.	ANAP	MWL
>Referenced Study Sequence	(0008,1110)	3	Uniquely identifies the Study SOP Instances associated with this SOP Instance. One or more items may be included.	ANAP	MWL
>>Referenced SOP Class UID	(0008,1150)	1	Uniquely identifies the referenced SOP Class.	ANAP	MWL
>>Referenced SOP Instance UID	(0008,1155)	1	Uniquely identifies the referenced SOP Instance.	ANAP	MWL

8.1.1.10 CR Series Module

TABLE 8.1-10 CR SERIES MODULE OF CREATED CR IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Body Part Examined	(0018,0015)	2	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 Values shown below are used. Body part definitions not existing in the DICOM definitions will be added. HEAD, NECK, CHEST, BREAST, ABDOMEN, PELVIS, UP_EXM, LOW_EXM, TEST	USER
View Position	(0018,5101)	2	Radiographic view associated with Patient Position (0018,5100). Defined Terms: AP = Anterior/Posterior PA = Posterior/Anterior LL = Left Lateral RL = Right Lateral RLD = Right Lateral Decubitus LLD = Left Lateral Decubitus RLO = Right Lateral Oblique LLO = Left Lateral Oblique	VNAP	AUTO

8.1.1.11 DX Series Module

TABLE 8.1-11 DX SERIES MODULE OF CREATED DX IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Modality	(0008,0060)	1	Type of equipment that originally acquired the data used to create the images in this Series. Enumerated Values: DX,PX,IO,MG	ALWAYS Value is “DX”	AUTO
Referenced Performed Procedure Step Sequence	(0008,1111)	1C	Uniquely identifies the Performed Procedure Step SOP Instance to which the Series is related (e.g. a Modality or General-Purpose Performed Procedure Step SOP Instance). The Sequence shall have one Item. Required if the Modality Performed Procedure Step SOP Class, General Purpose Performed Procedure Step SOP Class is supported.	ANAP	AUTO
>Referenced SOP Class UID	(0008,1150)	1C	Uniquely identifies the referenced SOP Class. Required if Referenced Performed Procedure Step Sequence (0008,1111) is sent.	ANAP	AUTO
>Referenced SOP Instance UID	(0008,1155)	1C	Uniquely identifies the referenced SOP Instance. Required if Referenced Performed Procedure Step Sequence (0008,1111) is sent.	ANAP	AUTO
Presentation Intent Type	(0008,0068)	1	Identifies the intent of the images that are contained within this Series. Enumerated Values: FOR PRESENTATION FOR PROCESSING	ALWAYS	CONFIG

8.1.1.12 Mammography Series Module

TABLE 8.1-12 MAMMOGRAPY SERIES MODULE OF CREATED MG IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Modality	(0008,0060)	1	Type of equipment that originally acquired the data used to create the images in this Series. Enumerated Values: MG	ALWAYS Value is “MG”	AUTO
Request Attributes Sequence	(0040,0275)	3	Sequence that contains attributes from the Imaging Service Request. The sequence may have one or more Items.	ANAP	MWL
>Reason for Requested Procedure Code Sequence	(0040,100A)	3	Coded Reason for requesting this procedure. One or more sequence items may be present.	ANAP	MWL

8.1.1.13 General Equipment Module

TABLE 8.1-13 GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Manufacturer	(0008,0070)	2	Manufacturer of the equipment that produced the composite instances.	ALWAYS Value is “FUJIFILM Corporation”	AUTO
Institution Name	(0008,0080)	3	Institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
Station Name	(0008,1010)	3	User defined name identifying the machine that produced the composite instances.	ALWAYS	CONFIG
Institutional Department Name	(0008,1040)	3	Department in the institution where the equipment that produced the composite instances is located.	ANAP	OTHER
Manufacturer's Model Name	(0008,1090)	3	Manufacturer’s model name of the equipment that produced the composite instances.	ANAP	AUTO
Software Versions	(0018,1020)	3	Manufacturer’s designation of software version of the equipment that produced the composite instances.	ANAP	AUTO
Date of Last Calibration	(0018,1200)	3	Date when the printer was last DXA calibrated.	Output only Secondary Capture Image Storage.	AUTO
Time of Last Calibration	(0018,1201)	3	Time when the printer was last DXA calibrated.	Output only Secondary Capture Image Storage.	AUTO

8.1.1.14 Enhanced General Equipment Module

TABLE 8.1-14 ENHANCED GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Manufacturer	(0008,0070)	1	Manufacturer of the equipment that produced the composite instances.	ALWAYS Value is “FUJIFILM Corporation”	AUTO
Manufacturer’s Model Name	(0008,1090)	1	Manufacturer’s model name of the equipment that produced the composite instances.	ALWAYS	AUTO
Device Serial Number	(0018,1000)	1	Manufacturer’s serial number of the equipment that produced the composite instances.	ALWAYS	AUTO
Software Versions	(0018,1020)	1	Manufacturer’s designation of software version of the equipment that produced the composite instances.	ALWAYS	AUTO

8.1.1.15 General Image Module

TABLE 8.1-15 GENERAL IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Instance Number	(0020,0013)	2	A number that identifies this image.	ALWAYS	AUTO
Patient Orientation	(0020,0020)	2C	Patient direction of the rows and columns of the image. Required if image does not require Image Orientation (Patient) (0020,0037) and Image Position (Patient) (0020,0032).	VNAP	CONFIG /USER
Content Date	(0008,0023)	2C	The date the image pixel data creation started. Required if image is part of a series in which the images are temporally related.	ALWAYS	AUTO
Content Time	(0008,0033)	2C	The time the image pixel data creation started. Required if image is part of a series in which the images are temporally related.	ALWAYS	AUTO
Image Type	(0008,0008)	3	Image identification characteristics.	ALWAYS See Note 1 below.	AUTO
Acquisition Number	(0020,0012)	3	A number identifying the single continuous gathering of data over a period of time that resulted in this image.	ANAP	AUTO
Acquisition Date	(0008,0022)	3	The date the acquisition of data that resulted in this image started	ALWAYS	AUTO
Acquisition Time	(0008,0032)	3	The time the acquisition of data that resulted in this image started	ALWAYS	AUTO
Derivation Description	(0008,2111)	3	A text description of how this image was derived.	ANAP	AUTO
Source Image Sequence	(0008,2112)	3	A Sequence that identifies the set of Image SOP Class/Instance pairs of the Images that were used to derive this Image. Zero or more Items may be included in this Sequence.	ANAP	AUTO
>Referenced SOP Class UID	(0008,1150)	1	Uniquely identifies the referenced SOP Class.	ANAP	AUTO
>Referenced SOP Instance UID	(0008,1155)	1	Uniquely identifies the referenced SOP Instance.	ANAP	AUTO
Image Comments	(0020,4000)	3	User-defined comments about the image.	ANAP	USER
Lossy Image Compression	(0028,2110)	3	Specifies whether an Image has undergone lossy compression. Enumerated Values: 00 = Image has NOT been subjected to lossy compression. 01 = Image has been subjected to lossy compression. See PS3.3 C.7.6.1.1.5	ALWAYS Value is “00”	AUTO
Pixel Spacing	(0028,0030)	3	Extended Attribute. Physical distance, within the patient, between the centers of each pixel. Expressed as a numerical set: space between adjoining rows (delimiter), space between adjoining columns. Unit: mm.	ALWAYS See Note 2 below.	AUTO

Note 1:

The Image Type consists of the following elements as per DICOM definitions.

Value 1: Pixel data Characteristics
Value 2: Patient Examination Characteristics
Value 3: Modality Specific Characteristics
Value 4 or after: Other Value "n" ("n" represents a numeric value.)

On the DR-ID 300CL, the above values should be interpreted as described below. Note that each of the elements may be omitted (only delimiters exist). When a portion after a certain element is fully omitted, even delimiters do not exist.

Because Value 1 and Value 2 have DICOM-defined meanings, they comply with the DICOM definitions. If omitted, they will be considered to be "ORIGINAL" or "PRIMARY".

Value 3 determines image data types such as pre-normalized image, normalized image or processed image. If omitted, it will be considered to be "NORMALIZED".

Value 4 (Other Value 1) represents processing purpose type of an image. When omitted, it will be considered to be "RT".

Value 5 (Other Value 2) determines a types of change processing performed on an original image. Value 5 will not be determined if no changes have been made.

Value 6 (Other Value 3) determines a date of the change made on an image with Value 5 (Other Value 2) above. Value 6 will not be determined if no changes have been made.

Value 7 (Other Value 4) determines a type of special processing performed on an image, which will not be determined if no special image processing has been performed.

Value 8 (Other Value 5) determines a date of the special image processing performed with Value 7 (Other Value 4) above. Value 8 will not be determined if no special image processing has been performed.

Value 9 (Other Value 6) determines the distance (nm) between the centers of each pixel when an IP is read.

Each of the values mentioned above will represent the following specific meaning.

Value 1: (as per DICOM definitions)

(In cases of Computed Radiography Image Storage and FUJI Private Computed Radiography Image Storage)

ORIGINAL An image whose pixel size is based on the original image (pre-normalized image or normalized image).

DERIVED An image derived from pixel size of one or more images according to a specific method. (processed image).

(In case of Digital X-ray Image Storage – For Presentation, Digital X-Ray Image Storage – For Processing, Digital Mammography X-ray Image Storage – For Presentation and Digital Mammography X-Ray Image Storage – For Processing)

ORIGINAL An image acquired from normal exposure (with or without image processing having been performed)

DERIVED An image created by morphological processing (image stitching, energy subtraction.)

Value 2: (as per DICOM definitions)

PRIMARY	An image generated as a direct result from a patient study.
SECONDARY	An image generated after the first patient study.

Value 3:

(In cases of Computed Radiography Image Storage and FUJI Private Computed Radiography Image Storage)

PRE_NORMALIZED	A pre-normalized image.
NORMALIZED	A normalized image.
POST_PROCESSED	An already processed image.

(In case of Digital X-ray Image Storage – For Presentation, Digital X-Ray Image Storage – For Processing, Digital Mammography X-ray Image Storage – For Presentation and Digital Mammography X-Ray Image Storage – For Processing)

No value

Value 4:

RT	Routine exposure image
ES_L	Low-pressure image for energy subtraction processing.
ES_H	High-pressure image for energy subtraction processing.
TO	Tomosynthesis exposure image

Value 5:

RENORMALIZED	A re-normalized image.
MODIFIED_PARAM	An image on which image processing parameters have been modified.

Value 6 and Value 8:

Determine in the “YYYYMMDDhhmmss” format a date when image processing was performed.

Value 7:

STICHED	Image composition processing that generates one image from multiple images.
BONE	A bone image based on the energy subtraction processing.
SOFT_TISSUE	Soft tissue image based on the energy subtraction processing.
SLICE	Tomosynthesis reconstruction image

Value 9:

The distance (nm) between the centers of each pixel when an IP is re
When “RENORMALIZED” has been determined for Value 5, what is determined will not be changed even if parameters were modified.

Note 2:

The CR and DX image is a projected image and Imager Pixel Spacing (0018,1164) must be used for the distance between the centers of each pixel. However, because some workstations perform necessary processing based on Pixel Spacing (0028,0030), such distance on the Detector surface is determined for it.

According to DICOM definitions, the Pixel Spacing (0028,0030) is to represent the distance between the centers of each pixel in the “patient’s body”. Because the CR and DX image is a projected image, it is not possible to calculate the distance between the centers of each pixel “in the patient’s body”.

Therefore, the value determined here is not correct in the light of the DICOM definitions. Note that even if the distance, area or dimensions are calculated based on the value presented here, the resultant values thus

calculated do not precisely reflect an object in the patient's body.

Remember that the CR and DX image is a projected image, which disables measurements of the dimensions of the object precisely reflected by actual dimensions in the patient's body.

The measurements embedded into the image by using Measurement in DR-ID 300CL also include errors.

8.1.1.16 Image Pixel Module

TABLE 8.1-16 IMAGE PIXEL MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Samples per Pixel	(0028,0002)	1	Number of samples (planes) in this image. See PS3.3 C.7.6.3.1.1 for further explanation.	ALWAYS In the case of SC, the value is "3". Otherwise, the value is "1".	AUTO
Photometric Interpretation	(0028,0004)	1	Specifies the intended interpretation of the pixel data. See PS3.3 C.7.6.3.1.2 for further explanation.	ALWAYS In the case of SC, the value is "RGB".	CONFIG
Rows	(0028,0010)	1	Number of rows in the image.	ALWAYS	AUTO
Columns	(0028,0011)	1	Number of columns in the image	ALWAYS	AUTO
Bits Allocated	(0028,0100)	1	Number of bits allocated for each pixel sample. Each sample shall have the same number of bits allocated. See PS 3.5 for further explanation.	ALWAYS	AUTO
Bits Stored	(0028,0101)	1	Number of bits stored for each pixel sample. Each sample shall have the same number of bits stored. See PS 3.5 for further explanation.	ALWAYS	AUTO
High Bit	(0028,0102)	1	Most significant bit for pixel sample data. Each sample shall have the same high bit. See PS 3.5 for further explanation.	ALWAYS	AUTO
Pixel Representation	(0028,0103)	1	Data representation of the pixel samples. Each sample shall have the same pixel representation. Enumerated Values: 0000H = unsigned integer. 0001H = 2's complement	ALWAYS Value is “0000H”	AUTO
Pixel Data	(7FE0,0010)	1C	A data stream of the pixel samples that comprise the Image. Required if Pixel Data Provider URL (0028,7FE0) is not present.	ALWAYS	AUTO

8.1.1.17 Contrast/Bolus Module

TABLE 8.1-17 CONTRAST/BOLUS MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Contrast/Bolus Agent	(0018,0010)	2	Contrast or bolus agent	EMPTY	AUTO

8.1.1.18 DX Anatomy Imaged Module

TABLE 8.1-18 DX ANATOMY IMAGED MODULE OF CREATED DX IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Image Laterality	(0020,0062)	1	Laterality of (possibly paired) body part (as described in Anatomic Region Sequence (0008,2218)) examined. Enumerated Values: R = right L = left U = unpaired B = both left and right	ALWAYS	USER
Anatomic Region Sequence	(0008,2218)	2	Sequence that identifies the anatomic region of interest in this Instance (i.e. external anatomy, surface anatomy, or general region of the body). Zero or one Item may be present in this Sequence.	VNAP	USER
>Code Value	(0008,0100)	1C	Required if a sequence item is present.	ANAP	AUTO
>Coding Scheme Designator	(0008,0102)	1C	Required if a sequence item is present.	ANAP	AUTO
>Coding Scheme Version	(0008,0103)	1C	Required if a sequence item is present.	ANAP	AUTO
>Code Meaning	(0008,0104)	1C	Required if a sequence item is present.	ANAP	AUTO

8.1.1.19 CR Image Module

TABLE 8.1-19 CR IMAGE MODULE OF CREATED CR IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Photometric Interpretation	(0028,0004)	1	Specifies the intended interpretation of the pixel data. Shall have one of the following Enumerated Values: MONOCHROME1 MONOCHROME2	ALWAYS	CONFIG
KVP	(0018,0060)	3	Peak kilo voltage output of the X-ray generator used.	ANAP	AUTO
Plate ID	(0018,1004)	3	The ID or serial number of the sensing plate upon which the image was acquired.	ANAP The Following format is applicable to FCR Images. Format is “a********c”	AUTO
Exposure Time	(0018,1150)	3	Time of X-ray exposure in msec.	ANAP	AUTO
X-ray Tube Current	(0018,1151)	3	X-ray Tube Current in mA.	ANAP	AUTO
Exposure	(0018,1152)	3	The exposure expressed in mAs, for example calculated from Exposure Time and X-ray Tube Current.	ANAP	AUTO
Exposure in µAs	(0018,1153)	3	The exposure expressed in µAs, for example calculated from Exposure Time and X-ray Tube Current.	ANAP	AUTO
Imager Pixel Spacing	(0018,1164)	3	Physical distance measured at the front plane of the Image Receptor housing between the center of each pixel. Specified by a numeric pair - row spacing value (delimiter) column spacing value - in mm.	ANAP	AUTO
Acquisition Device Processing Description	(0018,1400)	3	Describes device-specific processing associated with the image (e.g. Organ Description)	ALWAYS Sets menu name. Exposure menu name.	CONFIG /USER
Acquisition Device Processing Code	(0018,1401)	3	Code representing the device-specific processing associated with the image (e.g. CR Organ Filtering code)	ALWAYS Sets menu code. Codifies the body part, exposure method and exposure menu. Taken to be FFFF if no value exists.	CONFIG /USER
Sensitivity	(0018,6000)	3	Reading sensitivity.	ANAP	AUTO

8.1.1.20 DX Image Module

TABLE 8.1-20 DX IMAGE MODULE OF CREATED DX IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Image Type	(0008,0008)	1	Image identification characteristics.	ALWAYS See Note 1 below.	AUTO
Samples per Pixel	(0028,0002)	1	Number of samples in this image. Shall have an Enumerated Value of 1.	ALWAYS Value is “1”	AUTO
Photometric Interpretation	(0028,0004)	1	Specifies the intended interpretation of the pixel data. Shall have one of the following Enumerated Values: MONOCHROME1 MONOCHROME2	ALWAYS	CONFIG
Bits Allocated	(0028,0100)	1	Number of bits allocated for each pixel sample. Enumerated Values: 8, 16	ALWAYS Value is “16”	AUTO
Bits Stored	(0028,0101)	1	Number of bits stored for each pixel sample. Enumerated Values: 6 to 16	ALWAYS	AUTO
High Bit	(0028,0102)	1	Most significant bit for pixel sample data. Shall have an Enumerated Value of one less than the value in Bit Stored (0028,0101).	ALWAYS	AUTO
Pixel Representation	(0028,0103)	1	Data representation of the pixel samples. Shall have the Enumerated Value: 0000H = Unsigned Integer.	ALWAYS Value is “0000H”	AUTO
Pixel Intensity Relationship	(0028,1040)	1	The relationship between the Pixel sample values and the X-ray beam intensity. Enumerated Values: LIN = Linearly proportional to X-ray beam intensity LOG = Logarithmically proportional to X-ray beam intensity See PS3.3 C.8.11.3.1.2 for further explanation.	ALWAYS Value is “LOG”	AUTO
Pixel Intensity Relationship Sign	(0028,1041)	1	The sign of the relationship between the Pixel sample values stored in Pixel Data (7FE0,0010) and the X-ray beam intensity. Enumerated Values: 1 = Lower pixel values correspond to less X-ray beam intensity -1 = Higher pixel values correspond to less X-ray beam intensity See PS3.3 C.8.11.3.1.2 for further explanation.	ALWAYS Value is “1”	AUTO

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Rescale Intercept	(0028,1052)	1	The value b in the relationship between stored values (SV) in Pixel Data (7FE0,0010) and the output units specified in Rescale Type (0028,1054). Output units = m*SV + b. Enumerated Value: 0 See PS3.3 C.8.11.3.1.2 for further explanation.	ALWAYS Value is “0”	AUTO
Rescale Slope	(0028,1053)	1	m in the equation specified by Rescale Intercept (0028,1052). Enumerated Value: 1 See PS3.3 C.8.11.3.1.2 for further explanation.	ALWAYS Value is “1”	AUTO
Rescale Type	(0028,1054)	1	Specifies the output units of Rescale Slope (0028,1053) and Rescale Intercept (0028,1052). Enumerated Value: US = Unspecified See PS3.3 C.8.11.3.1.2 for further explanation.	ALWAYS Value is “US”	AUTO
Presentation LUT Shape	(2050,0020)	1	Specifies an identity transformation for the Presentation LUT, other than to account for the value of Photometric Interpretation (0028,0004), such that the output of all grayscale transformations defined in the IOD containing this Module are defined to be P-Values. Enumerated Values: IDENTITY - output is in P-Values - shall be used if Photometric Interpretation (0028,0004) is MONOCHROME2. INVERSE - output after inversion is in P-Values - shall be used if Photometric Interpretation (0028,0004) is MONOCHROME1. See PS3.3 C.8.11.3.1.2 for further explanation.	ALWAYS Value is “INVERSE”	AUTO
Lossy Image Compression	(0028,2110)	1	Specifies whether an Image has undergone lossy compression. Enumerated Values: 00 = Image has NOT been subjected to lossy compression. 01 = Image has been subjected to lossy compression. See PS3.3 C.7.6.1.1.5 for further explanation.	ALWAYS Value is “00”	AUTO
Derivation Description	(0008,2111)	3	A text description of how this image was derived.	ANAP	AUTO
Acquisition Device Processing Description	(0018,1400)	3	Indicates any visual processing performed on the images prior to exchange. See PS3.3 C.8.11.3.1.3 for further explanation.	ALWAYS Sets menu name. Exposure menu name.	CONFIG /USER

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Acquisition Device Processing Code	(0018,1401)	3	Code representing the device-specific processing associated with the image (e.g. Organ Filtering code)	ALWAYS Sets menu code. Codifies the body part, exposure method and exposure menu. Taken to be FFFF if no value exists.	CONFIG /USER
Patient Orientation	(0020,0020)	1	Patient direction of the rows and columns of the image. See PS3.3 C.7.6.1.1.1 for further explanation.	ALWAYS	CONFIG /USER
Burned In Annotation	(0028,0301)	1	Indicates whether or not image contains sufficient burned in annotation to identify the patient and date the image was acquired. Enumerated Values: YES NO	ALWAYS Value is “NO”	AUTO
VOI LUT Sequence	(0028,3010)	1C	Defines a sequence of VOI LUTs. See PS3.3 C.8.11.3.1.5 for further explanation. Required if Presentation Intent Type (0008,0068) is FOR PRESENTATION and Window Center (0028,1050) is not present. May also be present if Window Center (0028,1050) is present.	ANAP	AUTO
>LUT Descriptor	(0028,3002)	1C	Specifies the format of the LUT Data in this Sequence. See PS3.3 C.8.11.3.1.5 for further explanation. Required if the VOI LUT Sequence (0028,3010) is sent.	ANAP	AUTO
>LUT Explanation	(0028,3003)	3	Free form text explanation of the meaning of the LUT.	ANAP	AUTO
>LUT Data	(0028,3006)	1C	LUT Data in this Sequence. Required if the VOI LUT Sequence (0028,3010) is sent.	ANAP	AUTO
Window Center	(0028,1050)	1C	Defines a Window Center for display. See PS3.3 C.8.11.3.1.5 for further explanation. Required if Presentation Intent Type (0008,0068) is FOR PRESENTATION and VOI LUT Sequence (0028,3010) is not present. May also be present if VOI LUT Sequence (0028,3010) is present.	ALWAYS	AUTO
Window Width	(0028,1051)	1C	Window Width for display. See PS3.3 C.8.11.3.1.5 for further explanation. Required if Window Center (0028,1050) is sent.	ALWAYS	AUTO

Note 1:

See 8.1.1.10 Note however that Value 1 and Value 3 are as follows.

Value 1: (as per DICOM definitions)

ORIGINAL	Normalized image (an exposed image that has been subjected to image processing, such as gradation processing.)
DERIVED	An image created through morphological processing (long-view image, energy subtraction image).

Value 3:

None.

8.1.1.21 Mammography Image Module

TABLE 8.1-21 MAMMOGRAPHY IMAGE MODULE OF CREATED MG IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Positioner Type	(0018,1508)	1	Enumerated Values: MAMMOGRAPHIC NONE	ALWAYS Value is "MAMMOGRAPHIC"	AUTO
Positioner Primary Angle	(0018,1510)	3	Position in degrees of the X-Ray beam vector in the coronal anatomical plane as if the patient were standing where movement of the X-Ray source from right to vertical is positive, and vertical is zero.	EMPTY	AUTO
Positioner Secondary Angle	(0018,1511)	3	Position in degrees of the X-Ray beam vector in the sagittal anatomical plane as if the patient were standing where movement of the X-Ray source from anterior to posterior is positive, and vertical is zero.	EMPTY	AUTO
Image Laterality	(0020,0062)	1	Laterality of the region examined. Enumerated Values: R = right L = left B = both (e.g. cleavage)	ALWAYS	CONFIG /USER
Organ Exposed	(0040,0318)	1	Organ to which Organ Dose (0040,0316) applies. Enumerated Value: BREAST	ALWAYS Value is "BREAST"	AUTO
Implant Present	(0028,1300)	3	Whether or not an implant is present. Enumerated Values: YES NO	ANAP	USER
Anatomic Region Sequence	(0008,2218)	1	Sequence that identifies the anatomic region of interest in this Instance (i.e. external anatomy, surface anatomy, or general region of the body). Only a single Item shall be permitted in this sequence.	ALWAYS	CONFIG /USER
>Code Value	(0008,0100)	1C	Required if a sequence item is present.	ALWAYS	USER
>Coding Scheme Designator	(0008,0102)	1C	Required if a sequence item is present.	ALWAYS	USER
>Coding Scheme Version	(0008,0103)	1C	Required if a sequence item is present. Required if the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	USER

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
>Code Meaning	(0008,0104)	1C	Required if a sequence item is present.	ALWAYS	USER
Partial View	(0028,1350)	3	Indicates whether this image is a partial view, that is a subset of a single view of the breast. Enumerated Values: YES, NO If this Attribute is absent, then the image may or may not be a partial view.	ANAP Value is “NO”	AUTO
View Code Sequence	(0054,0220)	1	Sequence that describes the projection of the anatomic region of interest on the image receptor. Only a single Item shall be permitted in this Sequence.	ALWAYS	USER
>Code Value	(0008,0100)	1C	Required if a sequence item is present.	ALWAYS	USER
>Coding Scheme Designator	(0008,0102)	1C	Required if a sequence item is present.	ALWAYS	USER
>Coding Scheme Version	(0008,0103)	1C	Required if a sequence item is present. Required if the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	USER
>Code Meaning	(0008,0104)	1C	Required if a sequence item is present.	ALWAYS	USER
>View Modifier Code Sequence	(0054,0222)	2	View modifier. Zero or more Items may be included in this Sequence.	VNAP	USER
>>Code Value	(0008,0100)	1C	Required if a sequence item is present.	ANAP	USER
>>Coding Scheme Designator	(0008,0102)	1C	Required if a sequence item is present.	ANAP	USER
>>Coding Scheme Version	(0008,0103)	1C	Required if a sequence item is present. Required if the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ANAP	USER
>>Code Meaning	(0008,0104)	1C	Required if a sequence item is present.	ANAP	USER

8.1.1.22 DX Detector Module

TABLE 8.1-22 DX DETECTOR MODULE OF CREATED DX IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Detector Type	(0018,7004)	2	The type of detector used to acquire this image. Defined Terms: DIRECT = X-ray photoconductor SCINTILLATOR = Phosphor used STORAGE = Storage phosphor FILM = Scanned film/screen	ALWAYS	AUTO
Detector Configuration	(0018,7005)	3	The physical configuration of the detector. Defined Terms: AREA = single or tiled detector SLOT = scanned slot, slit or spot	ALWAYS Value is “AREA”	AUTO
Detector Description	(0018,7006)	3	Free text description of detector.	ANAP	CONFIG
Detector ID	(0018, 700A)	3	The ID or serial number of the detector used to acquire this image.	ANAP	CONFIG
Sensitivity	(0018,6000)	3	Detector sensitivity in manufacturer specific units.	ANAP	AUTO
Field of View Shape	(0018,1147)	3	Shape of the Field of View, that is the image pixels stored in Pixel Data (7FE0,0010). Enumerated Values: RECTANGLE ROUND HEXAGONAL	ALWAYS Value is “RECTANGLE”	AUTO
Field of View Dimension(s)	(0018,1149)	3	Dimensions in mm of the Field of View, that is the image pixels stored in Pixel Data (7FE0,0010). If Field of View Shape (0018,1147) is: RECTANGLE: row dimension followed by column. ROUND: diameter. HEXAGONAL: diameter of a circumscribed circle.	ALWAYS	AUTO
Imager Pixel Spacing	(0018,1164)	1	Physical distance measured at the front plane of the detector housing between the center of each image pixel specified by a numeric pair - row spacing value(delimiter) column spacing value in mm. See PS3.3 10.7.1.3 for further explanation of the value order. The value of this attribute shall never be adjusted to account for correction for the effect of geometric magnification or calibration against an object of known size; Pixel Spacing (0028,0030) is specified for that purpose.	ALWAYS	AUTO

8.1.1.23 DX Positioning Module

TABLE 8.1-23 DX POSITIONING MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Positioner Type	(0018,1508)	2	Defined Terms: CARM, COLUMN, MAMMOGRAPHIC, PANORAMIC, CEPHALOSTAT, RIGID, NONE	VNAP When CR or DX is used for Modality (0008,0060), value is “NONE” or “COLUMN” When MG is used for Modality (0008,0060), value is “MAMMOGRAPHIC”	AUTO
Distance Source to Patient	(0018,1111)	3	Distance in mm from source to the table, support or bucky side that is closest to the Imaging Subject, as measured along the central ray of the X-Ray beam. See C.8.11.7 Mammography Image Module for explanation if Positioner Type (0018,1508) is MAMMOGRAPHIC.	ANAP	AUTO
Distance Source to Detector	(0018,1110)	3	Distance in mm from source to detector center. See C.8.11.7 Mammography Image Module for explanation if Positioner Type (0018,1508) is MAMMOGRAPHIC.	ANAP	AUTO
Estimated Radiographic Magnification Factor	(0018,1114)	3	Ratio of Source Image Receptor Distance (SID) over Source Object Distance (SOD).	ANAP	AUTO
Body Part Thickness	(0018,11A0)	3	The average thickness in mm of the body part examined when compressed, if compression has been applied during exposure.	ANAP	AUTO
Compression Force	(0018,11A2)	3	The compression force applied to the body part during exposure, measured in Newtons.	ANAP	AUTO

8.1.1.24 X-ray Tomo Acquisition Module

TABLE 8.1-24 X-RAY TOMO ACQUISITION MODULE OF CREATED DX IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Tomo Layer Height	(0018,1460)	1	Distance in mm between the table surface and the sharp image plane.	ALWAYS	AUTO
Tomo Angle	(0018,1470)	3	Angle span in degrees of rotation of X-ray Source during X-ray acquisition.	ANAP	AUTO

Tomo Time	(0018,1480)	3	Time in seconds the source has taken to rotate the Tomo Angle during X-ray acquisition.	ANAP	AUTO
Tomo Type	(0018,1490)	3	Type of tomography. Defined Terms: LINEAR SPIRAL POLYCYCLOIDAL CIRCULAR	ANAP Only in case of Tomosynthesis. Value is “LINEAR”	AUTO
Tomo Class	(0018,1491)	3	Form of tomography: Defined Terms: MOTION TOMOSYNTHESIS	ANAP Only in case of Tomosynthesis. Value is “TOMOSYNTHESIS”	AUTO
Number of Tomosynthesis Source Images	(0018,1495)	3	The number of source images used to construct this tomosynthetic image. Only meaningful if Tomo Class (0018,1491) is TOMOSYNTHESIS. These may be listed in Source Image Sequence (0008,2112) of the General Image Module.	ANAP	AUTO

8.1.1.25 X-ray Acquisition Dose Module

TABLE 8.1-25 X-RAY ACQUISITION DOSE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
KVP	(0018,0060)	3	Peak kilo voltage output of the X-ray generator used.	ANAP	AUTO
X-ray Tube Current	(0018,1151)	3	X-ray Tube Current in mA.	ANAP	AUTO
X-Ray Tube Current in µA	(0018,8151)	3	X-Ray Tube Current in µA.	ANAP	AUTO
Exposure Time	(0018,1150)	3	Duration of X-ray exposure in msec.	ANAP	AUTO
Exposure Time in µS	(0018,8150)	3	Duration of X-Ray exposure in µsec.	ANAP	AUTO
Exposure	(0018,1152)	3	The exposure expressed in mAs, for example calculated from Exposure Time and X-ray Tube Current.	ANAP	AUTO
Exposure in µAs	(0018,1153)	3	The exposure expressed in µAs, for example calculated from Exposure Time and X-ray Tube Current.	ANAP	AUTO
Distance Source to Detector	(0018,1110)	3	Distance in mm from source to detector center.	ANAP	AUTO

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Distance Source to Patient	(0018,1111)	3	Distance in mm from source to the table, support or bucky side that is closest to the Imaging Subject, as measured along the central ray of the X-Ray beam.	ANAP	AUTO
Image and Fluoroscopy Area Dose Product	(0018,115E)	3	X-ray dose, measured in dGy*cm*cm, to which the patient was exposed for the acquisition of this image plus any nondigitally recorded fluoroscopy which may have been performed to prepare for the acquisition of this image.	ANAP	AUTO
Body Part Thickness	(0018,11A0)	3	The average thickness in mm of the body part examined when compressed, if compression has been applied during exposure.	ANAP	AUTO
Entrance Dose	(0040,0302)	3	Average entrance dose value measured in dGy at the surface of the patient during the acquisition of this image.	ANAP	AUTO
Entrance Dose in mGy	(0040,8302)	3	Average entrance dose value measured in mGy at the surface of the patient during the acquisition of this image.	ANAP	AUTO
Organ Dose	(0040,0316)	3	Average organ dose value measured in dGy during the acquisition of this image.	ANAP	AUTO
Anode Target Material	(0018,1191)	3	The primary material in the anode of the X-ray source. Defined Terms: TUNGSTEN MOLYBDENUM RHODIUM	ANAP	AUTO
Filter Material	(0018,7050)	3	The X-Ray absorbing material used in the filter. May be multi-valued. Defined Terms: MOLYBDENUM ALUMINUM COPPER RHODIUM NIOBIUM EUROPIUM LEAD	ANAP	AUTO
Filter Thickness Minimum	(0018,7052)	3		ANAP	AUTO
Filter Thickness Maximum	(0018,7054)	3		ANAP	AUTO

8.1.1.26 X-ray Generation Module

TABLE 8.1-26 X-RAY GENERATION MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
KVP	(0018,0060)	3	Peak kilo voltage output of the X-ray generator used.	ANAP	AUTO
X-ray Tube Current	(0018,1151)	3	X-ray Tube Current in mA.	ANAP	AUTO
X-Ray Tube Current in µA	(0018,8151)	3	X-Ray Tube Current in µA.	ANAP	AUTO
Exposure Time	(0018,1150)	3	Duration of X-ray exposure in msec.	ANAP	AUTO
Exposure Time in µS	(0018,8150)	3	Duration of X-Ray exposure in µsec.	ANAP	AUTO
Exposure	(0018,1152)	3	The exposure expressed in mAs, for example calculated from Exposure Time and X-ray Tube Current.	ANAP	AUTO
Exposure in µAs	(0018,1153)	3	The exposure expressed in µAs, for example calculated from Exposure Time and X-ray Tube Current.	ANAP	AUTO
Exposure Control Mode	(0018,7060)	3	Type of exposure control. Defined Terms: MANUAL AUTOMATIC	ANAP	AUTO
Exposure Control Mode Description	(0018,7062)	3	Text description of the mechanism of exposure control. May describe the number and type of exposure sensors or position of the sensitive area of the imaging detector.	ANAP	AUTO
Anode Target Material	(0018,1191)	3	The primary material in the anode of the X-ray source. Defined Terms: TUNGSTEN MOLYBDENUM RHODIUM	ANAP	AUTO

8.1.1.27 Modality LUT Module

TABLE 8.1-27 MODALITY LUT MODULE OF CREATED CR IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Rescale Intercept	(0028,1052)	1C	The value b in relationship between stored values (SV) and the output units specified in Rescale Type (0028,1054). Output units = m*SV + b. Required if Modality LUT Sequence (0028,3000) is not present. Shall not be present otherwise.	ALWAYS Value is “0”	AUTO
Rescale Slope	(0028,1053)	1C	m in the equation specified by Rescale Intercept (0028,1052). Required if Rescale Intercept is present.	ALWAYS Value is “1”	AUTO

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Rescale Type	(0028,1054)	1C	Specifies the output units of Rescale Slope (0028,1053) and Rescale Intercept (0028,1052). See PS3.3 C.11.1.1.2 for further explanation. Required if Rescale Intercept is present.	ALWAYS Value is “US”	AUTO

8.1.1.28 VOI LUT Module

TABLE 8.1-28 VOI LUT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
VOI LUT Sequence	(0028,3010)	1C	Defines a sequence of VOI LUTs. One or more Items shall be present. Required if Window Center (0028,1050) is not present. May be present otherwise.	ANAP	AUTO
>LUT Descriptor	(0028,3002)	1	Specifies the format of the LUT Data in this Sequence. See C.11.2.1.1 for further explanation.	ANAP 2^n \0\16 *n*: Bit Depth of image	AUTO
>LUT Explanation	(0028,3003)	3	Free form text explanation of the meaning of the LUT.	ANAP	AUTO
>LUT Data	(0028,3006)	1	LUT Data in this Sequence.	ANAP	AUTO

8.1.1.29 Acquisition Context Module

TABLE 8.1-29 ACQUISITION CONTEXT MODULE OF CREATED DX IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Acquisition Context Sequence	(0040,0555)	2	A sequence of Items that describes the conditions present during the acquisition of the data of the SOP Instance. Zero or more items may be included in this sequence.	EMPTY	AUTO

8.1.1.30 SOP Common Module

TABLE 8.1-30 SOP COMMON MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
SOP Class UID	(0008,0016)	1	Uniquely identifies the SOP Class. See PS3.3 C.12.1.1.1 for further explanation. See also PS 3.4.	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	1	Uniquely identifies the SOP Instance. See PS3.3 C.12.1.1.1 for further explanation. See also PS 3.4.	ALWAYS	AUTO

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Specific Character Set	(0008,0005)	1C	Character Set that expands or replaces the Basic Graphic Set. Required if an expanded or replacement character set is used. See PS3.3 C.12.1.1.2 for Defined Terms.	ANAP European languages: ISO_IR 100 \ ISO_IR 101 Alphanumerics: No Tag Japanese (Backslash is half-size): Half-size kana only: ISO_IR 13 Half-size kana + kanji: ISO 2022 IR 13 \ ISO 2022 IR 87 Unicode (UTF-8): ISO_IR 192 Korean(EUC-KR): ISO 2022 IR 149 Chinese Simplified: GB18030	CONFIG

8.1.1.31 X-ray Filtration Module

TABLE 8.1-31 X-RAY FILATRATION MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Filter Material	(0018,7050)	3	The X-Ray absorbing material used in the filter. May be multi-valued. Defined Terms: MOLYBDENUM ALUMINUM COPPER RHODIUM NIOBIUM EUROPIUM LEAD	ANAP	CONFIG
Filter Thickness Minimum	(0018,7052)	3	The minimum thickness in mm of the X-Ray absorbing material used in the filters. May be multi-valued, with values corresponding to the respective values in Filter Material (0018,7050).	ANAP	CONFIG
Filter Thickness Maximum	(0018,7054)	3	The maximum thickness in mm of the Xray absorbing material used in the filters. May be multi-valued, with values corresponding to the respective values in Filter Material (0018,7050).	ANAP	CONFIG

8.1.1.32 Overlay Plane Module

TABLE 8.1-32 OVERLAY PLANE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Overlay Rows	(60xx,0010)	1	Number of Rows in Overlay.	ALWAYS	AUTO
Overlay Columns	(60xx,0011)	1	Number of Columns in Overlay.	ALWAYS	AUTO
Overlay Type	(60xx,0040)	1	Indicates whether this overlay represents a region of interest or other graphics. Enumerated Values: G = Graphics R = ROI.	ALWAYS Value is “G”	AUTO
Overlay Origin	(60xx,0050)	1	Location of first overlay point with respect to pixels in the image, given as row\column. The upper left pixel of the image has the coordinate 1\1. Column values greater than 1 indicate the overlay plane origin is to the right of the image origin. Row values greater than 1 indicate the overlay plane origin is below the image origin. Values less than 1 indicate the overlay plane origin is above or to the left of the image origin. Note: Values of 0\0 indicate that the overlay pixels start 1 row above and one column to the left of the image pixels.	ALWAYS Value is “1\1”	AUTO
Overlay Bits Allocated	(60xx,0100)	1	Number of Bits Allocated in the Overlay. The value of this Attribute shall be 1. Note: Formerly the standard described embedding the overlay data in the Image Pixel Data (7FE0,0010), in which case the value of this Attribute was required to be the same as Bits Allocated (0028,0100). This usage has been retired. See PS 3.3 2004.	ALWAYS Value is “1”	AUTO

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Overlay Bit Position	(60xx,0102)	1	The value of this Attribute shall be 0. Note: Formerly the standard described embedding the overlay data in the Image Pixel Data (7FE0,0010), in which case the value of this Attribute specified the bit in which the overlay was stored. This usage has been retired. See PS 3.3 2004.	ALWAYS Value is “0”	AUTO
Overlay Data	(60xx,3000)	1	Overlay pixel data. The order of pixels sent for each overlay is left to right, top to bottom, i.e., the upper left pixel is sent first followed by the remainder of the first row , followed by the first pixel of the 2nd row, then the remainder of the 2nd row and so on. Overlay data shall be contained in this Attribute. See C.9.2.1.1 for further explanation.	ALWAYS	AUTO

8.1.1.33 Exposure Index Module

TABLE 8.1-33 EXPOSURE INDEX MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Exposure Index	(0018,1411)	3	Measure of the detector response to radiation in the relevant image region of an image acquired with a digital x-ray imaging system as defined in IEC 62494-1. Notes: 1. A string rather than binary Value Representation is used for this Attribute, in order to allow the sender to control the precision of the value as suggested in the report of AAPM Task Group 116. 2. This index value is scaled as defined by IEC 62494-1.	ALWAYS	AUTO
Target Exposure Index	(0018,1412)	3	The target value used to calculate the Deviation Index (0018,1413) as defined in IEC 62494-1.	ALWAYS	AUTO
Deviation Index	(0018,1413)	3	A scaled representation of the difference of the Exposure Index compared to the Target Exposure Index as defined in IEC 62494-1 and the report of AAPM TG 116.	ALWAYS	AUTO

8.1.1.34 X-Ray Radiation Dose SR Module

TABLE 8.1-34 SR SERIES MODULE OF CREATED X-RAY RADIATION DOSE SR SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Modality	(0008,0060)	1	Modality type. Enumerated Value: SR = SR Document	ALWAYS	AUTO

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Referenced Study Component Sequence	(0008,1111)	2	Uniquely identifies the Performed Procedure Step SOP Instance for which the Series is created. Zero or one item shall be present in the sequence. Notes: 1. The Performed Procedure Step referred to by this Attribute is the Step during which this Document is generated. 2. If this Document is generated during the same Modality or General Purpose Performed Procedure Step as the evidence in the current interpretation procedure, this attribute may contain reference to that Modality or General Purpose Performed Procedure Step. 3. This Attribute is not used to convey reference to the evidence in the current interpretation procedure. See Current Requested Procedure Evidence Sequence (0040,A375). 4. This Sequence may be sent zero length if the Performed Procedure Step is unknown.	VNAP	AUTO
Series Instance UID	(0020,000E)	1	Unique identifier of the Series. Note: No SR-specific semantics are specified.	ALWAYS	AUTO
Series Number	(0020,0011)	1	A number that identifies the Series. Note: No SR-specific semantics are specified.	ALWAYS	AUTO

TABLE 8.1-35 SR DOCUMENT GENERAL MODULE OF CREATED X-RAY RADIATION DOSE SR SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Content Date	(0008,0023)	1	The date the document content creation started.	ALWAYS	AUTO
Content Time	(0008,0033)	1	The time the document content creation started.	ALWAYS	AUTO
Instance Number	(0020,0013)	1	A number that identifies the SR Document.	ALWAYS	AUTO
Performed Procedure Code Sequence	(0040,A372)	2	A Sequence that conveys the codes of the performed procedures pertaining to this SOP Instance. Zero or more Items may be included in this sequence.	EMPTY	AUTO
Completion Flag	(0040,A491)	1	The estimated degree of completeness of this SR Document with respect to externally defined criteria in a manner specified in the Conformance Statement. Note: It may be desirable to make these criteria adaptable to local policies or user decisions. Enumerated Values: PARTIAL = Partial content. COMPLETE = Complete content.	ALWAYS Value is “COMPLETE”	AUTO

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Verification Flag	(0040,A493)	1	Indicates whether this SR Document is Verified. Enumerated Values: UNVERIFIED = Not attested to. VERIFIED = Attested to by a Verifying Observer Name (0040,A075) who is accountable for its content. Note: The intent of this specification is that the "prevailing final version" of an SR Document is the version having the most recent Verification DateTime (0040,A030), Completion Flag (0040,A491) of COMPLETE and Verification Flag (0040,A493) of VERIFIED.	ALWAYS Value is “VERIFIED”	AUTO

TABLE 8.1-36 SR DOCUMENT CONTENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Include Document Content Macro TABLE 8.1-35. with a Value Type (0040,A040) of CONTAINER					
Include Document Relationship Macro TABLE 8.1-36.					

TABLE 8.1-37 DOCUMENT CONTENT MACRO ATTRIBUTES

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
Value Type	(0040,A040)	1	The type of the value encoded in this Content Item.	ALWAYS Defined terms: "TEXT" "NUM" "CODE" "DATETIME" "UIDREF" "IMAGE" “CONTAINER”	AUTO
Concept Name Code Sequence	(0040,A043)	1C	Code describing the concept represented by this Content Item. Also conveys the value of Document Title and section headings in documents. Only a single Item shall be permitted in this sequence. Required if Value Type (0040,A040) is TEXT, NUM, CODE, DATETIME, DATE, TIME, UIDREF or PNAME. Required if Value Type (0040,A040) is CONTAINER and a heading is present, or this is the Root Content Item. Required if Value Type (0040,A040) is COMPOSITE, IMAGE, WAVEFORM, SCOORD, SCOORD3D or TCOORD, and the Purpose of Reference is conveyed in the Concept Name.	ALWAYS	AUTO
Text Value	(0040,A160)	1C	This is the value of the Content Item. Required if Value Type (0040,A040) is TEXT.	ANAP	AUTO

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
			Text data which is unformatted and whose manner of display is implementation dependent. The text value may contain spaces, as well as multiple lines separated by either LF, CR, CR LF or LF CR, but otherwise no format control characters (such as horizontal or vertical tab and form feed) shall be present, even if permitted by the Value Representation of UT. The text shall be interpreted as specified by Specific Character Set (0008,0005) if present in the SOP Common Module. Note: The text may contain single or multibyte characters and use code extension techniques as described in PS 3.5 if permitted by the values of Specific Character Set (0008,0005).		
DateTime	(0040,A120)	1C	This is the value of the Content Item. Required if Value Type (0040,A040) is DATETIME.	ANAP	AUTO
UID	(0040,A124)	1C	This is the value of the Content Item. Required if Value Type (0040,A040) is UIDREF.	ANAP	AUTO
Include 'Numeric Measurement Macro' TABLE 8.1-37 if and only if Value Type (0040,A040) is NUM.					
Include 'Code Macro' TABLE 8.1-38 if and only if Value Type (0040,A040) is CODE.					
Include 'Image Reference Macro' TABLE 8.1-39 if and only if Value Type (0040,A040) is IMAGE.					
Include 'Container Macro' TABLE 8.1-40 if and only if Value Type (0040,A040) is CONTAINER.					

TABLE 8.1-38 DOCUMENT RELATIONSHIP MACRO ATTRIBUTES

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
Observation DateTime	(0040,A032)	1C	The date and time on which this Content Item was completed. For the purpose of recording measurements or logging events, completion time is defined as the time of data acquisition of the measurement, or the time of occurrence of the event. Required if the date and time are different from the Content Date (0008,0023) and Content Time (0008,0033) or the Observation DateTime (0040,A032) defined in higher items. May be present otherwise. Note: When Content Items are	ALWAYS	AUTO

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
			copied into successor reports, the Content Date(0008,0023) and Content Time(0008,0033) of the new report are likely to be different than the date and time of the original observation. Therefore this attribute may need to be included in any copied Content Items to satisfy the condition.		
Content Sequence	(0040,A010)	1C	A potentially recursively nested Sequence of Items that conveys content that is the Target of Relationships with the enclosing Source Content Item. One or more Items shall be included in this sequence. Required if the enclosing Content Item has relationships. Notes: 1. If this Attribute is not present then the enclosing Item is a leaf. 2. The order of Items within this Sequence is semantically significant for presentation.	ALWAYS	AUTO
>Relationship Type	(0040,A010)	1	The type of relationship between the (enclosing) Source Content Item and the Target Content Item. IODs specify additional constraints on Relationships (including lists of Enumerated Values). Defined Terms: CONTAINS HAS PROPERTIES HAS OBS CONTEXT HAS ACQ CONTEXT INFERRED FROM SELECTED FROM HAS CONCEPT MOD	ALWAYS VALUE is "HAS CONCEPT MOD" or "CONTAINS"	AUTO
>Include Document Relationship Macro TABLE 8.1-37 if the Target Content Item is included by-value in the Source Content Item. The Macro shall not be present if the relationship is by-reference.					
>Include Document Content Macro TABLE 8.1-36 if the Target Content Item is included by-value in the Source Content Item. The Macro shall not be present if the relationship is by-reference.					

TABLE 8.1-39 NUMERIC MESUREMENET MACRO ATTRIBUTES

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
Measured Value Sequence	(0040,A300)	2	This is the value of the Content Item. Shall consist of a Sequence of Items conveying the measured value(s), which represent	ALWAYS	AUTO

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
			integers or real numbers and units of measurement. Zero or one Item shall be included in this sequence.		
>Numeric Value	(0040,A30A)	1	Numeric measurement value. Only a single value shall be present.	ALWAYS	AUTO
>Measurement Units Code Sequence	(0040,08EA)	1	Units of measurement. Only a single Item shall be included in this sequence.	ALWAYS	AUTO
>>Code Value	(0008,0100)	1	Required if a sequence item is present.	ALWAYS	AUTO
>>Coding Scheme Designator	(0008,0102)	1	Required if a sequence item is present.	ALWAYS	AUTO
>>Coding Scheme Version	(0008,0103)	1C	Required if a sequence item is present. Required if the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ALWAYS	AUTO
>> Code Meaning	(0008,0104)	1	Required if a sequence item is present.	ALWAYS	AUTO

TABLE 8.1-40 CODE MACRO ATTRIBUTES

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
Concept Code Sequence	(0040,A168)	1	This is the value of the Content Item. Only a single Item shall be included in this sequence.	ALWAYS	AUTO/ USER
>Code Value	(0008,0100)	1	Required if a sequence item is present.	ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	1	Required if a sequence item is present.	ALWAYS	AUTO
>Coding Scheme Version	(0008,0103)	1C	Required if a sequence item is present. Required if the value of Coding Scheme Designator (0008,0102) is not sufficient to identify the Code Value (0008,0100) unambiguously.	ALWAYS	AUTO
> Code Meaning	(0008,0104)	1	Required if a sequence item is present.	ALWAYS	AUTO

TABLE 8.1-41 IMAGE REFERENCE MACRO ATTRIBUTES

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
Referenced SOP Sequence	(0008,1199)	1	References to Composite Object SOP Class/SOP Instance pairs. Only a single Item shall be included in this Sequence.	ALWAYS	AUTO
>Referenced SOP Class UID	(0008,1150)	1	Uniquely identifies the referenced SOP Class.	ANAP	AUTO

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
>Referenced SOP Instance UID	(0008,1155)	1	Uniquely identifies the referenced SOP Instance.	ANAP	AUTO

TABLE 8.1-42 CONTAINER MACRO ATTRIBUTES

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
Continuity of Content	(0040,A050)	1	This flag specifies for a CONTAINER whether or not its contained Content Items are logically linked in a continuous textual flow, or are separate items. Enumerated Values: SEPARATE CONTINUOUS	ALWAYS VALUE is SEPARATE	AUTO
Content Template Sequence	(0040,A504)	1C	Template that describes the content of this Content Item and its subsidiary Content Items. Only a single Item shall be included in this sequence. Required if a template was used to define the content of this Item, and the template consists of a single CONTAINER with nested content, and it is the outermost invocation of a set of nested templates that start with the same CONTAINER	ALWAYS	AUTO
>Mapping Resource	(0008,0105)	1	Mapping Resource that defines the template. See Section 8.4. Defined Terms: DCMR = DICOM Content Mapping Resource	ALWAYS	AUTO
>Template Identifier	(0040,DB00)	1	Template identifier.	ALWAYS	AUTO

8.1.1.35 SC Image Module

TABLE 8.1-43 SC EQUIPMENT MODULE OF CREATED SC IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
Conversion Type	(0008,0064)	1	Describes the kind of image conversion. Defined Terms: **DV** Digitized Video **DI** Digital Interface **DF** Digitized Film **WSD** Workstation **SD** Scanned Document	ALWAYS Value is “WSD”	AUTO

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
			SI Scanned Image **DRW** Drawing **SYN** Synthetic Image		
Modality	(0008,0060)	3	Source equipment for the image. This type definition shall override the definition in the General Series Module.	ALWAYS VALUE is “CR” , "DX" , "OT" or "BMD"	CONFIG
Secondary Capture Device ID	(0018,1010)	3	User defined identification of the device that converted the image.	ALWAYS	AUTO
Secondary Capture Device Manufacturer	(0018,1016)	3	Manufacturer of the Secondary Capture Device.	ALWAYS	AUTO
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	3	Manufacturer's model number of the Secondary Capture Device.	ALWAYS	AUTO
Secondary Capture Device Software Versions	(0018,1019)	3	Manufacturer's designation of software version of the Secondary Capture Device.	ALWAYS	AUTO

TABLE 8.1-44 SC IMAGE MODULE OF CREATED SC IMAGE STORAGE SOP INSTANCES

Attribute Name	Tag	Type	DICOM Attribute Description	Presence of Value	Source
Date of Secondary Capture	(0018,1012)	3	The date the Secondary Capture Image was captured.	ALWAYS	AUTO
Time of Secondary Capture	(0018,1014)	3	he time the Secondary Capture Image was captured.	ALWAYS	AUTO

8.1.2 Used Fields in received IOD by application

The DR-ID 300CL storage application does not receive SOP Instances.

8.1.3 Attribute mapping

The relationships between attributes received via Modality Worklist, stored in acquired images and communicated via MPPS are summarized in the following table.

TABLE 8.1-45 ATTRIBUTE MAPPING BETWEEN MODALITY WORKLIST, IMAGE AND MPPS

Modality Worklist	Image IOD	MPPS IOD
Specific Character Set	Specific Character Set	Specific Character Set
-	-	Scheduled Step Attribute Sequence
Study Instance UID	Study Instance UID	>Study Instance UID
Referenced Study Sequence	>Referenced Study Sequence	>Referenced Study Sequence
>Referenced SOP Class UID	>>Referenced SOP Class UID	>>Referenced SOP Class UID
>Referenced SOP Instance UID	>>Referenced SOP Instance UID	>>Referenced SOP Instance UID
Accession Number	Accession Number	>Accession Number
Requested Procedure ID	Requested Procedure ID	>Requested Procedure ID
Requested Procedure Description	-	>Requested Procedure Description
>Scheduled Procedure Step ID	>Scheduled Procedure Step ID	>Scheduled Procedure Step ID
>Scheduled Procedure Step Description	>Scheduled Procedure Step Description	>Scheduled Procedure Step Description
>Scheduled Protocol Code Sequence	>Scheduled Protocol Code Sequence	>Scheduled Protocol Code Sequence
>>Code Value	>>Code Value	>>Code Value
>>Coding Scheme Designator	>>Coding Scheme Designator	>>Coding Scheme Designator
>>Coding Scheme Version	>>Coding Scheme Version	>>Coding Scheme Version
>>Code Meaning	>>Code Meaning	>>Code Meaning
Patient's Name	Patient's Name	Patient's Name
Patient ID	Patient ID	Patient ID
Patient's Birth Data	Patient's Birth Data	Patient's Birth Data
Patient's Sex	Patient's Sex	Patient's Sex
Referenced Patient Sequence	-	Referenced Patient Sequence
>Referenced SOP Class UID	-	>Referenced SOP Class UID
>Referenced Instance UID	-	>Referenced Instance UID
Modality	Modality	Modality
Requested Procedure ID	Study ID	Study ID
>Scheduled Protocol Code Sequence	Performed Protocol Code Sequence	Performed Protocol Code Sequence
>>Code Value	>Code Value	>Code Value
>>Coding Scheme Designator	>Coding Scheme Designator	>Coding Scheme Designator
>>Coding Scheme Version	>Coding Scheme Version	>Coding Scheme Version
>>Code Meaning	>Code Meaning	>Code Meaning

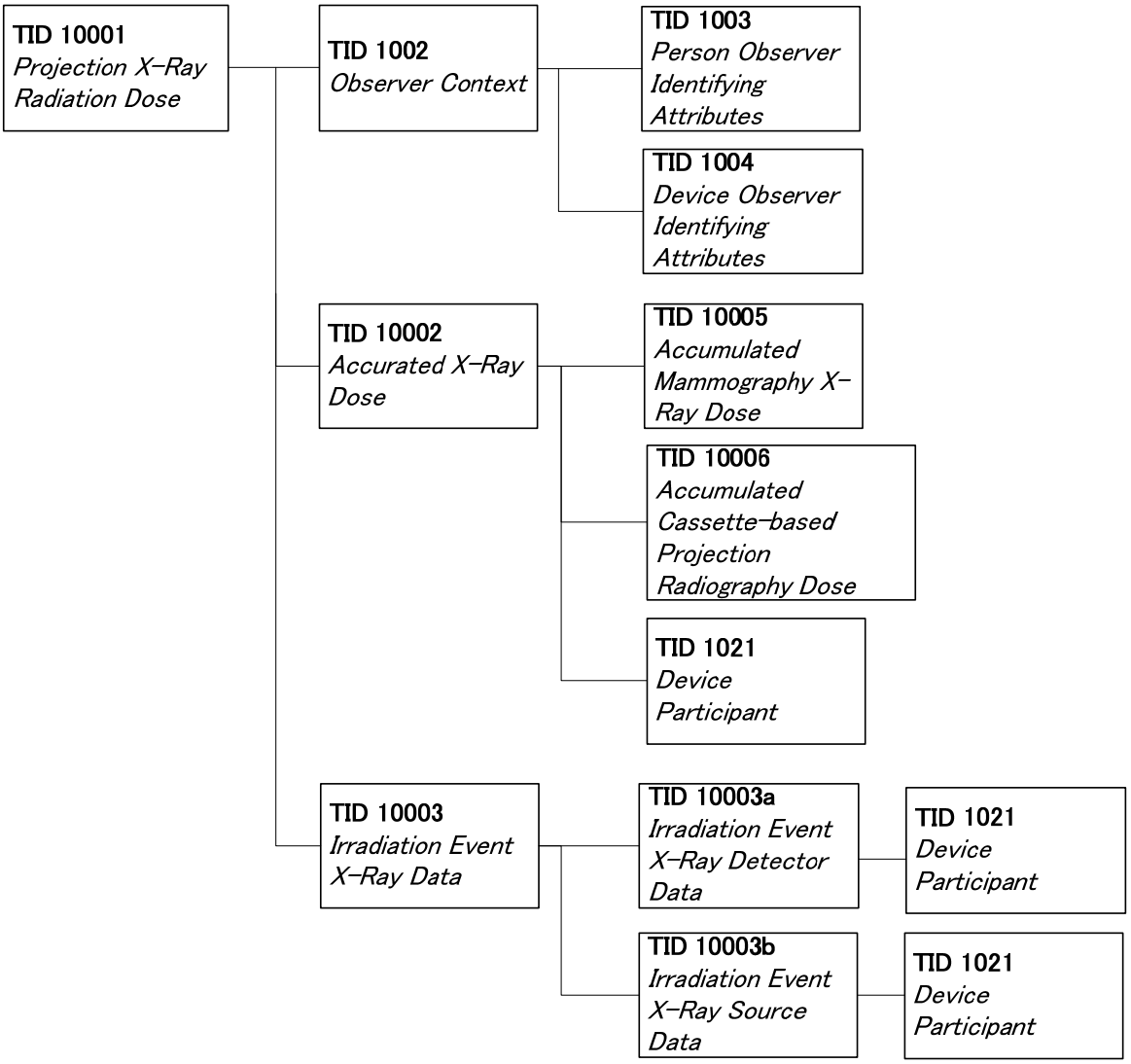
8.1.4 Coerced/Modified Fields

Not applicable.

8.1.5 STRUCTURED REPORT DOCUMENT INFORMATIONS

8.1.5.1X-Ray Radiation Dose Report

8.1.5.1.1 Template Structure



8.1.5.1.2 TID10001 Projection X-Ray Radiation Dose Structure

TABLE 8.1-46 PROJECTION X-RAY RADIATION DOSE STRUCTURE

NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113701, DCM, 3 X-Ray Radiation Dose Report")	1	ALWAYS	

NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
↳	HAS CONCEPT MOD	EV (121058, DCM, Procedure reported")	1	ALWAYS	DT (113704, DCM, Projection X-Ray") <before 2019d> DT (P5-40010, SRT,"Mammography") <2019d or later> DT (71651007, SCT,"Mammography")
↳ ↳	HAS CONCEPT MOD	EV (G-C0E8, SRT, Has Intent")	1	ALWAYS	<before 2019d> DT (R-408C3, SRT, "Diagnostic Intent") <2019d or later> DT (261004008, SCT, "Diagnostic Intent")
↳	CONTAINS	EV(122142, DCM, "Acquisition Device Type")	1	ALWAYS	DT(113959, DCM, "Cassette-based Projection Radiography System")
↳		DTID (1002) Observer Context	1-n	ALWAYS	
↳	CONTAINS	EV (113945, DCM, "X-Ray Detector Data Available")	1	ANAP	DCID 230 "Yes-No"
↳	CONTAINS	EV (113943, DCM, "X-Ray Source Data Available")	1	ANAP	DCID 230 "Yes-No"
↳	CONTAINS	EV (113944, DCM, "X-Ray Mechanical Data Available")	1	ANAP	DCID 230 "Yes-No"
↳	CONTAINS	DTID (10002) Accumulated X-Ray Dose	1	ALWAYS	$Plane=EV(113622, DCM, "Single Plane")
↳	CONTAINS	DTID (10003) Irradiation Event X-Ray Data	1-n	ALWAYS	
↳	CONTAINS	EV (113854, DCM, Source of Dose Information")	1-n	ALWAYS	DCID (10020) Source of Projection X-Ray Dose Information DT(113856, DCM, "Automated Data Collection")

8.1.5.1.3 TID1002 Observer Context

Table 8.1-47 OBSERVER CONTEXT Structure**NL**	**Rel with Parent**	**Concept Name**	**VM**	**Presence of Value**	**Value**
	HAS OBS CONTEXT	EV (121005,DCM, “Observer Type”)	1	ALWAYS	DCID 270 “Observer Type” Defaults to (121006, DCM, "Person")
	HAS OBS CONTEXT	DTID 1003 “Person Observer Identifying Attributes”	1	ALWAYS	
	HAS OBS CONTEXT	DTID 1004 “Device Observer Identifying Attributes”	*1*	ALWAYS	

8.1.5.1.4 TID1003 Person Observer Identifying Attributes

TABLE 8.1-48 PERSON OBSERVER IDENTIFYING ATTRIBUTES

NL	**Rel with Parent**	**Concept Name**	**VM**	**Presence of Value**	**Value**
		EV (121008,DCM, “Person Observer Name”)	1	ANAP	

8.1.5.1.5 TID1004 Device Observer Identifying Attributes

TABLE 8.1-49 DEVICE OBSERVERE IDENTIFYING ATTRIBUTES

NL	**Rel with Parent**	**Concept Name**	**VM**	**Presence of Value**	**Value**
		EV (121012,DCM, “Device Observer UID”)	1	ALWAYS	
		EV (121013,DCM, “Device Observer Name”)	1	ALWAYS	Defaults to value of Station Name (0008,1010) in General Equipment Module
		EV (121014,DCM, “Device Observer Manufacturer”)	1	ALWAYS	"FUJIFILM Corporation"
		EV (121015,DCM, “Device Observer Model Name”)	1	ALWAYS	Defaults to value of Manufacturer's Model Name (0008,1090) in General Equipment Modul
		EV (121016,DCM, “Device Observer Serial Number”)	1	ALWAYS	Defaults to value of Device Serial Number (0018,1000) in General Equipment Module
	HAS OBS CONTEXT	EV (113705,DCM, “Scope of Accumulation”)	1	ALWAYS	

NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
↳	HAS PROPERTIES	DCID(10001)UIDType	1	ALWAYS	
	CONTAINS	EV (113945,DCM, "X-Ray Detector Data Available")	1	ALWAYS	
	CONTAINS	EV (113943,DCM, "X-Ray Source Data Available")	1	ALWAYS	
	CONTAINS	EV (113944,DCM, "X-Ray Mechanical Data Available")	1	ALWAYS	

8.1.5.1.6 TID10002 Accumulated X-Ray Dose

TABLE 8.1-50 ACCUMULATED X-RAY DOSE STRUCTURE

NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113702, DCM, "Accumulated X-Ray Dose Data")	1	ALWAYS	
↳	HAS CONCEPT MOD	EV (113764, DCM, "Acquisition Plane"	1	ALWAYS	DT (163622, DCM, "Single Plane")
↳	CONTAINS	DTID (10005) Accumulated Mammography X-Ray Dose	1	ANAP	
↳	CONTAINS	DTID (10006) Accumulated Cassette-based Projection Radiography Dose	1	ALWAYS	

8.1.5.1.7 TID10005 Accumulated Mammography X-Ray Dose

TABLE 8.1-51 ACCUMULATED MAMMOGRAPHT X-RAY DOSE STRUCTURE

NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (111637, DCM, “Accumulated Average Glandular Dose”)	1-2	ANAP	UNITS = EV (mGy, UCUM, "mGy") If the DoseSR instance consists of study units, this value is accumulated for each laterality. The number of VM is the same as the number of laterality. But the VM is 1 if at least one unknown or both is included in the study. See 8.1.1.5 in output structure.
↳	HAS CONCEPT MOD	<before 2019d> EV (G-C171, SRT, “Laterality") <2019d or later> EV (272741003, SCT, "Laterality")	1	ANAP	DCID 6022 “Side” The value is present laterality including study when output Dose Report per study. This value is “Left breast” or “Right breast” if Dose SR Instance is constructed by one laterality as Left or Right. This value is “Both breasts” if Dose SR Instance is including both or unknown in the study. See 8.1.1.5 in output structure.

8.1.5.1.8 TID10006 Accumulated Cassette-based Projection Radiography Dose

TABLE 8.1-52 ACCUMULATED CASSETTE-BASED PROJECTION RADIOGRAPHT DOSE STRUCTURE

NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113947, DCM, “Detector Type”	1	ALWAYS	
		EV (113731, DCM, “Total Number of Radiographic Frames”	1	ALWAYS	

8.1.5.1.9 TID10003 Irradiation Event X-Ray Data

TABLE 8.1-53 IRRADIATION EVENT X-RAY DATA

NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113706, DCM, “Irradiation Event X-Ray Data”)	1	ALWAYS	
↳	HAS CONCEPT MOD	EV (113764, DCM, “Acquisition Plane”	1	ALWAYS	DCID (10003) Equipment Plane Identification DT (163622, DCM, “Single Plane”)
↳	CONTAINS	DT (111526, DCM, “DateTime Started”)	1	ALWAYS	
↳	CONTAINS	EV (113721, DCM, “Irradiation Event Type”)	1	ALWAYS	DCID (10002) Irradiation Event Types "Stationary Acquisition"
↳	CONTAINS	EV (113769, DCM, “Irradiation Event UID”)	1	ALWAYS	(0043,xx10)>(0043,xx0E)>(0008,3010) Irradiation Event ID
↳	CONTAINS	EV (122130, DCM, “Dose Area Product”	1	ANAP	Units = EV (Gym2, UCUM, "Gym2")
↳	CONTAINS	EV (111636, DCM, “Entrance Exposure at RP”	1	ANAP	Units = EV (mGy, UCUM, “mGy”)
↳	CONTAINS	EV (123014, DCM, (”Target Region”)	1	ANAP	DCID (4031) Common Anatomic Regions 0008,2218
↳	CONTAINS	EV(113780, DCM, ”Reference Point Definition”)	1	ANAP	"UNKNOWN"
↳	CONTAINS	DTID (10003A) Irradiation Event X-Ray Detector Data	1	ANAP	
↳	CONTAINS	DTID (10003B) Irradiation Event X-Ray Source Data	1	ALWAYS	
>	CONTAINS	EV (121106, DCM, "Comment")	1	ANAP	

8.1.5.1.10 TID10003A Irradiation Event X-Ray Detector Data

TABLE 8.1-54 IRRADIATION EVENT X-RAY DETECTOR DATA

NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
	CONTAINS	EV(113845, DCM, ”Exposure Index”)	1	ALWAYS	
	CONTAINS	EV(113846, DCM, ”Target Exposure Index”)	1	ALWAYS	
	CONTAINS	EV(113847, DCM, ”Deviation Index”)	1	ALWAYS	
	CONTAINS	DTID(1021) Device Participant	1	ALWAYS	
	CONTAINS	EV(113795, DCM, ”Acquired Image”)	1	ALWAYS	

8.1.5.1.11 TID10003B Irradiation Event X-Ray Source Data

TABLE 8.1-55 IRRADIATION EVENT X-RAY SOURCE DATA

NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV(113738, DCM, ”Dose(RP)”)	1	ANAP	UNITS = EV (Gy, UCUM, "Gy")
		EV(113780, DCM, “Reference Point Definition”)	1	ANAP	"UNKNOWN"
		EV(111631, DCM, ”Average Glandular Dose”)	1	ANAP	UNITS = EV (dGy, UCUM, "mGy")
		EV(113733, DCM, ”KVP”)	1-n	ANAP	Units = EV (kV, UCUM, “kV”)
		EV(113734, DCM, ”X-Ray Tube Current”)	1-n	ANAP	Units = EV (mA, UCUM, “mA”)
		<before 2019d> EV(113735, DCM, ”Exposure Time”) <2019d or later> EV (113824, DCM, "Exposure Time")	1	ANAP	Units = EV (ms, CUM,“ms”)
		EV(113736,DCM, ”Exposure”)	1-n	ANAP	Units = EV (uAs, UCUM, “uAs”)
		DTID 1021 “Device Participant”)	1	ALWAYS	

8.1.5.1.12 TID1021 Device Participant

TABLE 8.1-56 DEVICE PARTICIPANT

NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113876, DCM, 3 Device Role in Procedure”)	1	ALWAYS	
↳	HAS PROPERTIES	EV (113878, DCM, 3 Device Manufacturer”)	1	ALWAYS	
↳	HAS PROPERTIES	EV (113879, DCM, 3 Device Model Name”)	1	ALWAYS	
↳	HAS PROPERTIES	EV (113880, DCM, 3 Device Serial Number”)	1	ALWAYS	
↳	HAS PROPERTIES	EV (121012, DCM, “Device Observer UID”	1	ALWAYS	

8.2 DATA DICTIONARY OF PRIVATE ATTRIBUTES

TABLE 8.2-1 DATA DICTIONARY OF PRIVATE ATTRIBUTES

Attribute Name	Tag	VR	VM	Notes
Private Creator	(0009,00xx)	LO	1	Value is “FDMS 1.0”
Image UID	(0009,xx05)	OW	1	
Route Image UID	(0009,xx06)	OW	1	
Image Display Information Version No.	(0009,xx08)	UL	1	
Patient Information Version No.	(0009,xx09)	UL	1	
Exposure Unit Type Code	(0009,xx10)	CS	1	
Kanji Hospital Name	(0009,xx80)	LO	1	
Distribution Code	(0009,xx90)	ST	1	
Kanji Department Name	(0009,xx92)	SH	1	
Blackening Process Flag	(0009,xxF0)	CS	1	
Processing Information Flag	(0009,xxF1)	ST	1	
Normalization Flag	(0009,xxF2)	CS	1	
Tone characteristic	(0009.xxF3)	CS	1	
Window Value Fixed Flag	(0009,xxF4)	CS	1	
Referenced Image for Tomo Preset Sequence	(0009,xxF8)	SQ	1	
>Referenced SOP Class UID	(0008,1150)	UI	1	
>Referenced SOP Instance UID	(0008,1155)	UI	1	
Private Creator	(0019,00xx)	LO	1	Value is “FDMS 1.0”
Kanji Body Part for Exposure	(0019,xx15)	LO	1	
Stereo Angle	(0019,xx20)	FL	1	
Kanji Menu Name	(0019,xx32)	LO	1	
Image Processing Type	(0019,xx40)	CS	1	
Height of the center slice	(0019,xx45)	DS	1	
Slice range	(0019,xx46)	DS	1	
Spacing of the slices	(0019,xx47)	DS	1	
EDR Mode	(0019,xx50)	CS	1	
Radiographer’s Code	(0019,xx60)	SH	1	
Split Exposure Format	(0019,xx70)	IS	1	
No. of Split Exposure Frames	(0019,xx71)	IS	1	
Reading Position Specification	(0019,xx80)	IS	1	
Reading Sensitivity Center	(0019,xx81)	IS	1	
Film Annotation Character String 1	(0019,xx90)	SH	1	
Film Annotation Character String 2	(0019,xx91)	SH	1	
Private Creator	(0021,00xx)	LO	1	Value is “FDMS 1.0”
FCR Image ID	(0021,xx10)	CS	1	Applicable only to FCR Images.
Set No.	(0021,xx30)	CS	1	
Image No. in the Set	(0021,xx40)	IS	1	
Pair Processing Information	(0021,xx50)	CS	1	
Equipment Type-Specific Information	(0021,xx80)	OB	1	
Private Creator	(0025,00xx)	LO	1	Value is “FDMS 1.0“
Relative Light Emission Amount Sk	(0025,xx10)	US	1	

Attribute Name	Tag	VR	VM	Notes
Term of Correction for Each IP Type St	(0025,xx11)	US	1	
Reading Gain Gp	(0025,xx12)	US	1	
Private Creator	(0029,00xx)	LO	1	Value is “FDMS 1.0”
Image Scanning Direction	(0029,xx20)	CS	1	
Extended Reading Size Value	(0029,xx30)	CS	1	
Mag./Reduc. Ratio	(0029,xx34)	US	1	
Line Density Code	(0029,xx44)	CS	1	
Data Compression Code	(0029,xx50)	CS	1	
Requesting Physician	(0032,1032)	PN	1	
Requesting Service	(0032,1033)	LO	1	
Study Comments	(0032,4000)	LT	1	
Protocol Context Sequence	(0040,0440)	SQ	1	
Value Type	(0040,A040)	CS	1	
Verifying Observer Name	(0040,A075)	PN	1	
Image Display Format	(2010,0010)	ST	1	
Annotation Display Format ID	(2010,0030)	CS	1	
Film Orientation	(2010,0040)	CS	1	
Border Density	(2010,0100)	CS	1	
Trim	(2010,0140)	CS	1	
Private Creator	(2011,00xx)	LO	1	Value is “FDMS 1.0”
Image Position Specifying Flag	(2011,xx11)	CS	1	
Image Position	(2020,0010)	US	1	
Private Creator	(50F1,00xx)	LO	1	Value is “FDMS 1.0”
Subtraction Registration Result	(50F1,xx07)	CS	1	
Energy Subtraction Param.2	(50F1,xx08)	CS	1	
Afin Conversion Coefficient	(50F1,xx09)	SL	4	
FNC Parameters	(50F1,xx0A)	ST	1	Type of attribute is “1C” in FUJI Private CR Image Storage SOP Class.
CRF Parameters	(50F1,xx0B)	SS	1	Type of attribute is “1C” in FUJI Private CR Image Storage SOP Class
Film Output Format	(50F1,xx10)	CS	1	
Image Processing Modification Flag	(50F1,xx20)	CS	1	

8.3 CODED TERMINOLOGY AND TEMPLATES

The DR-ID 300CL CR Storage AE does not support the use of Coded Terminology and Templates.

8.4 GRAYSCALE IMAGE CONSISTENCY

DR-ID300CL is capable of Perceptual Linear display by using the high-resolution monitor.
DR-ID300CL can output Perceptual-Linear- calibrated images to external devices.

8.5 STANDARD EXTENDED / SPECIALIZED / PRIVATE SOP CLASSES

8.5.1 Standard Extended SOP Class – Computed Radiography Image Storage

The Computed Radiography Image Storage SOP Class is extended to create a Standard Extended SOP Class by addition of standard and private attributes to the created SOP Instances as documented in Sections 8.1 and 8.2.

8.5.2 Standard Extended SOP Class – Digital X-ray Image Storage for Presentation

The Digital X-ray Image Storage SOP Class is extended to create a Standard Extended SOP Class by addition of standard and private attributes to the created SOP Instances as documented in Sections 8.1 and 8.2.

8.5.3 Standard Extended SOP Class – Digital Mammography X-Ray Image Storage

The Digital Mammography X-Ray Image Storage SOP Class is extended to create a Standard Extended SOP Class by addition of standard and private attributes to the created SOP Instances as documented in section 8.1 and 8.2.

8.6 PRIVATE TRANSFER SYNTAXES

No Private Transfer Syntaxes are supported.

FUJIFILM

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