FUJIFILM

DICOM Conformance Statement

CR-IR 355CL / 355VCL
for
DICOM Storage
DICOM Print
DICOM MWM
DICOM MPPS
DICOM Media Storage

December, 2011

10th Edition

CONTENTS

1 CONFORMANCE STATEMENT OVERVIEW

Table 1-1 provides an overview of the network services supported by CR-IR 355CL / 355VCL.

The CR-IR 355CL / 355VCL implements the necessary DICOM services to save acquired CR 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
CT Image Storage	No	Yes
MR Image Storage	No	Yes
Ultrasound Image Storage	No	Yes
Secondary Capture Image Storage	No	Yes
X-Ray Angiographic Image Storage	No	Yes
X-Ray Radiofluoroscopic Image Storage	No	Yes
Ultrasound Multi-frame Image Storage	No	Yes
Multi-frame Single Bit Secondary Capture Image Storage	No	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	No	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	No	Yes
Multi-frame True Color Secondary Capture Image Storage	No	Yes
Print Management		
Basic Grayscale Print Management Meta	Yes	No
Workflow Management		
Modality Worklist Information Model - FIND	Yes	No
Modality Performed Procedure Step	Yes	No

Table 1-2 provides an overview of the Media Storage Application Profiles supported by CR-IR 355CL / 355VCL.

TABLE 1- 2 MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC)	Read Files (FSR)
Compact Disk - Recordable		
General Purpose CD-R	Yes	Yes
DVD-RAM		

General Purpose DVD-RAM	No	Yes
DVD		
General Purpose DVD Interchange with JPEG	Yes	Yes

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3 INTRODUCTION

3.1 REVISION HISTORY

Document Version	Date of Issue	Author	Description
1.0	May, 2007	FUJIFILM	Version for Final Text
2.0	November, 2007	FUJIFILM	Updated - Support US and SC Image Storage - Support General Purpose CD-R
2.1	January, 2008	FUJIFILM	Revised
3.0	February , 2008	FUJIFILM	Updated - Support CT, MR, XA and RF Image Storage - Support DX Image Storage for Presentation for Offline Media
4.0	March , 2008	FUJIFILM	Updated - Add Transfer Syntax for Offline Media
5.0	November, 2008	FUJIFILM	Updated - Support writing files to General Purpose DVD Interchange with JPEG (Support FSC)
6.0	April, 2009	FUJIFILM	Updated - Add Specific Character Set
7.0	January, 2010	FUJIFILM	Updated - Add Patient Module Attributes for Veterinary - Support Get Patient Information from the device supported MWM.
8.0	June, 2010	FUJIFILM	Updated - Support Multi-frame US/SC Image Storage
9.0	April, 2011	FUJIFILM	Updated - Support Computed Radiography Image Storage SCP - Support Update Worklist from the device supported MWM. - Support Modality Performed Procedure Step.
10.0	December, 2011	FUJIFILM	Updated - Add CR Image Module Attributes for Exposure Index / Deviation Index

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
MWM	Modality Worklist Management
MPPS	Modality Performed Procedure Step
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

US	Ultrasound
VM	Value Multiplicity
VR	Value Representation

3.5 REFERENCES

[DICOM]Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.18, 2008

4 NETWORKING

4.1 IMPLEMENTATION MODEL

4.1.1 Application Data Flow

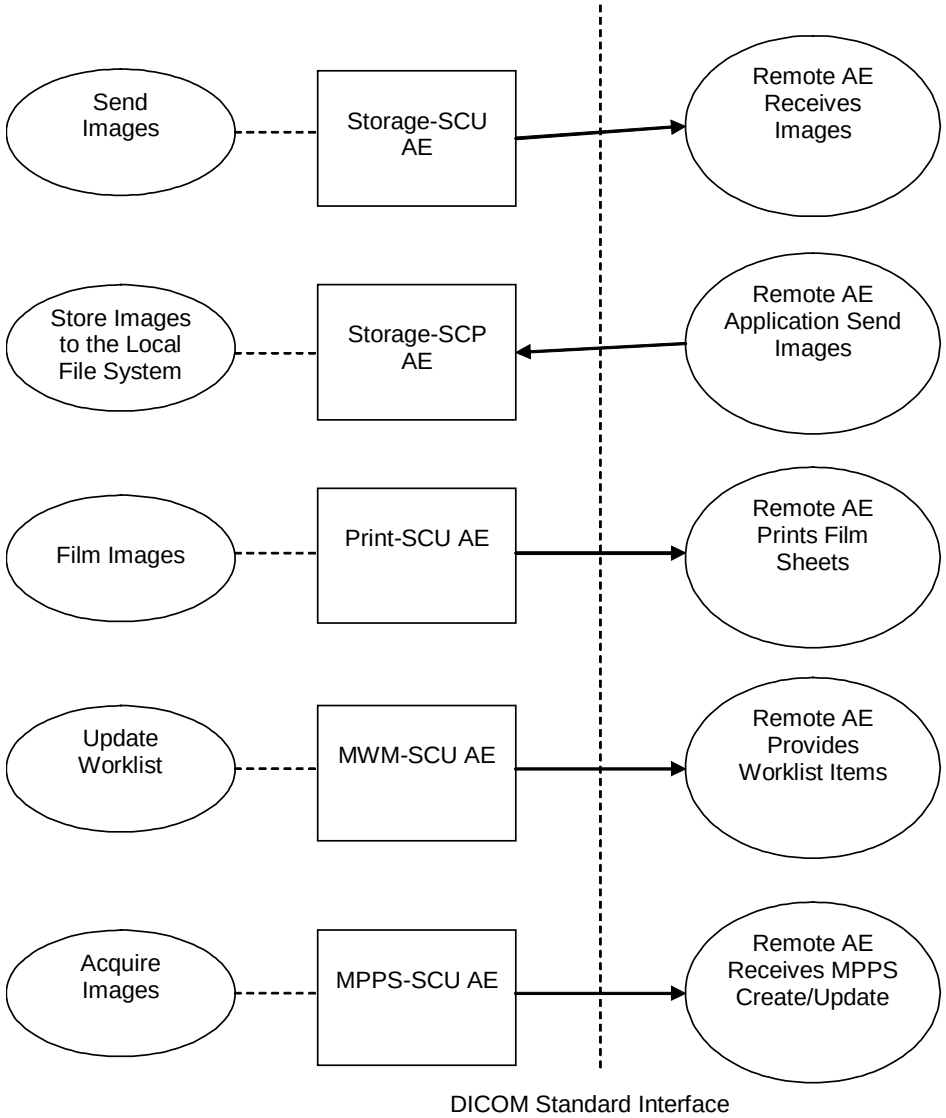

FIGURE 4.1- 1 APPLICATION DATA FLOW DIAGRAM

— 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.

— The Storage-SCP Application Entity receives incoming images. It is associated with the local real-world activity "Store Images to the Local File System" stores the received images to the local file system.

— 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 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.

4.1.2 Functional Definition of AEs

4.1.2.1 Functional Definition of Storage-SCU Application Entity

The existence of a send-job queue entry with associated network destination will activate the Storage 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.

4.1.2.2 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.

4.1.2.3 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.

4.1.2.4 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.

4.1.2.5 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.

4.1.3 Sequencing of Real-World Activities

4.1.3.1 Send Images

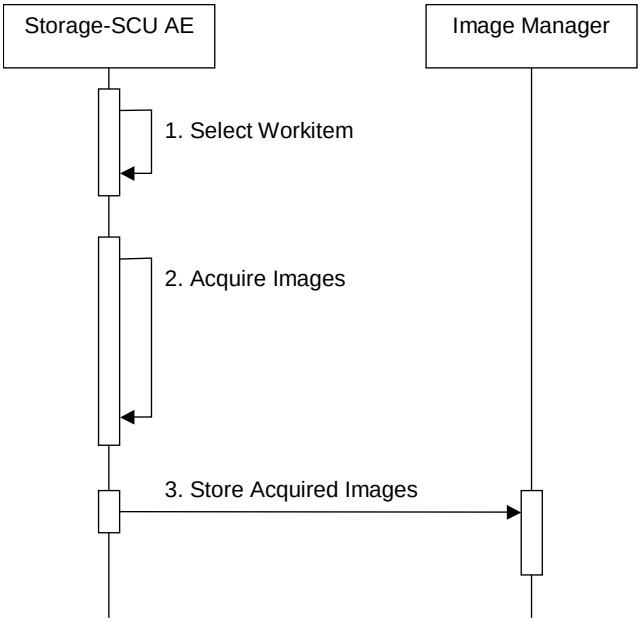

FIGURE 4.1- 2 SEQUENCING CONSTRAINTS – SEND IMAGES

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

1. Select Workitem
2. Acquire Images
3. Store acquired images

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

4.1.3.2 Store Images to the Local File System

SCP activities are performed asynchronously in the background and not dependent on any sequencing.

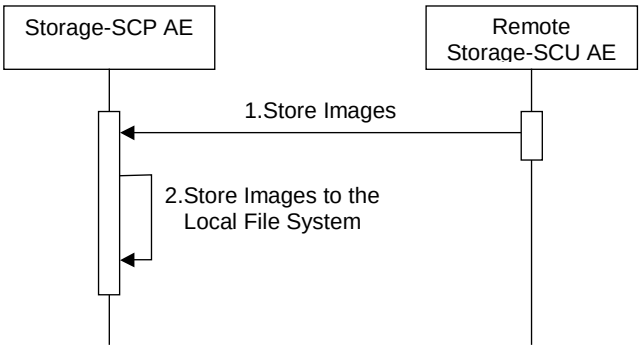

FIGURE 4.1- 3 SEQUENCING CONSTRAINTS – STORE IMAGES

4.2 AE SPECIFICATIONS

4.2.1 Storage-SCU Application Entity Specification

4.2.1.1 SOP Classes

CR-IR 355CL / 355VCL provides Standard Conformance to the following SOP Classes:

TABLE 4.2- 1 SOP CLASSES FOR AE STORAGE

SOP Class Name	SOP Class UID	SCU	SCP
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	No
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 AE STORAGE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2 Number of Associations

CR-IR 355CL / 355VCL 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 AE STORAGE

Maximum number of simultaneous Associations	1

4.2.1.2.3 Asynchronous Nature

CR-IR 355CL / 355VCL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2- 4 ASYNCHRONOUS NATURE AS A SCU FOR AE STORAGE

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 AE STORAGE

Implementation Class UID	1.2.392.200036.9125.5154.1
Implementation Version Name	V3.0

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 CR-IR 355CL / 355VCL 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.

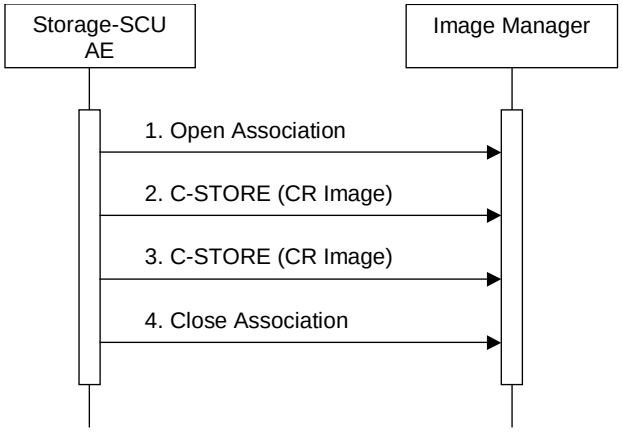

FIGURE 4.2- 1 SEQUENCING OF ACTIVITY – SEND IMAGES

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 Figure 4.2-1:

1. The Storage-SCU AE opens an association with the Image Manager
2. An acquired CR 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 CR 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.

4.2.1.3.1.2 Proposed Presentation Contexts

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

TABLE 4.2- 6 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		
Verification	1.2.840.10008.1.	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.1.3.1.3 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- 7 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.

4.2.1.4 Association Acceptance Policy

The Storage-SCU AE does not accept any association.

4.2.2 Storage-SCP Application Entity Specification

4.2.2.1 SOP Classes

CR-IR 355CL / 355VCL provides Standard Conformance to the following SOP Classes:

TABLE 4.2- 8 SOP CLASSES BY STORAGE-SCP

SOP Class Name	SOP Class UID	SCU	SCP
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	No	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	No	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	No	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	No	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	No	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	No	Yes
Verification	1.2.840.10008.1.1	No	Yes

4.2.2.2 Association Policies

4.2.2.2.1 General

The Storage-SCP AE will never initiate Associations; it only accepts Association Requests from external DICOM AEs.

TABLE 4.2- 9 MAXIMUM PDU SIZE RECEIVED AS A SCP FOR STORAGE-SCP

Maximum PDU size received	16384

4.2.2.2.2 Number of Associations

The Storage-SCP AE will accept Up to 3 simultaneous delivery Associations. If an attempt is made to open more than 3 simultaneous Associations, CR-IR 355CL / 355VCL will reject the additional Associations(A-ASSOCIATE-RJ).

TABLE 4.2- 10 NUMBER OF ASSOCIATIONS AS A SCP FOR STORAGE-SCP

Maximum number of simultaneous associations	3

4.2.2.2.3 Asynchronous Nature

The Storage-SCP AE will only allow a single outstanding operation on an Association. Therefore, Storage-SCP will not perform asynchronous operations window negotiation.

4.2.2.2.4 Implementation Identifying Information

TABLE 4.2- 11 DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE-SCP

Implementation Class UID	1.2.392.200036.9125.5154.1
Implementation Version Name	V3.0

4.2.2.3 Association Initiation Policy

The Storage-SCP AE does not initiate associations.

4.2.2.4 Association Acceptance Policy

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

4.2.2.4.1 Activity - Receive Storage Request

4.2.2.4.1.1 Description and Sequencing of Activities

As instances are received they are copied to the local file system and a record inserted into the local database. If the received instance is a duplicate of a previously received instance, the represe, the received instance will be reject.

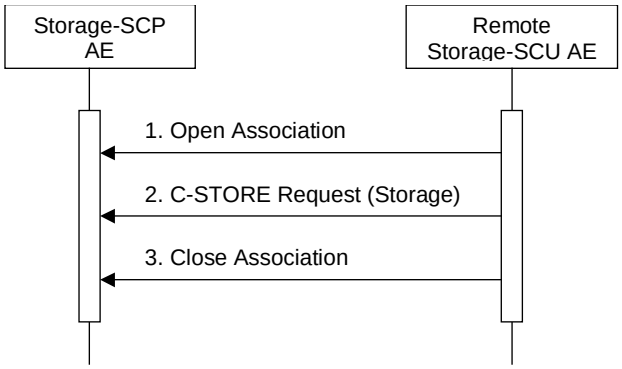

FIGURE 4.2- 2 SEQUENCING OF ACTIVITY – STORE IMAGES TO THE LOCAL FILE SYSTEM

The following sequencing constraints illustrated in Figure 4.2-2 apply to the Storage-SCP AE:

1. The Remote Storage-SCU AE opens an Association with the Storage-SCP AE.
2. The Remote Storage-SCU AE requests Storage of Composite SOP Instance(s).
3. The Remote Storage-SCU AE closes the Association.

4.2.2.4.1.2 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 Table 4.2-12 are acceptable to the Storage-SCP AE for receiving images.

TABLE 4.2- 12 ACCEPTABLE PRESENTATION CONTEXTS FOR STORAGE-SCP AND RECEIVE STORAGE REQUEST

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 Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		

		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	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	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		
X-Ray Radiofluoroscopic	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

Image Storage		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		

Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70		
Verification	1.2.840.10008.1.	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.2.4.1.3 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.

The Storage-SCP AE does not have any dependencies on the number of Associations used to send images to it. Images belonging to a single Study can also be sent over different Associations. There is no limit on either the number of SOP Instances or the maximum amount of total SOP Instance data that can be transferred over a single Association.

The Storage-SCP AE store the original attribute and image of receipt DICOM data except for following cases:

1. When received DICOM data in Implicit VR Little Endian or Explicit VR Little Endian Transfer Syntaxes, CR-IR 355CL / 355VCL modifies the image format into JPEG Lossless format when storing the image to external devices. Then some attributes concerned with the image format will be modified.

2. CR-IR 355CL / 355VCL modifies the Specific Character Set attribute according to language setting s for this system when storing the image to external devices, as follow:

Japanese	ISO 2022 IR 13\ISO 2022 IR 87
Western European	ISO_IR 100
Central European	ISO_IR 101
Russian, Turkish, Chinese(Traditional)	ISO_IR 192
Korean	\ISO 2022 IR 149

Chinese(Simplified)	GB18030
Other languages	DICOM default character set (ISO-IR 6)

The CR-IR 355CL / 355VCL returns an error Status Code when it conflicts with an existing SOP Instance UID on the local file system.

CR-IR 355CL / 355VCL supports the following photometric interpretations:

MONOCHROME1, MONOCHROME2, RGB, YBR_FULL, YBR_FULL_422

If CR-IR 355CL / 355VCL receive images with other photometric interpretations, the Storage-SCP AE will return a failure status in C-STORE-RSP (Error Code is 0xA900).

The CR-IR 355CL / 355VCL receive following attributes normally, this system can store the image(s) on the local file system. But Nonlinear Modality LUT processing is not supported. And the system applies Linear VOI LUT processing to the image on any value of attributes.

- VOI LUT Module (including Window Width / Center etc.)
- Modality LUT Module (including Rescale Intercept / Slope etc.)

TABLE 4.2- 13 STORAGE-SCP AE C-STORE RESPONSE STATUS RETURN REASONS

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The Composite SOP Instance was successfully received, verified, and stored in the system database.
Refused	Out of Resources	A700	Indicates that there was not enough disk space to store the image. Error message is output to the CR-IR 355CL / 355VCL Application Log. The SOP Instance will not be saved.
Error	Data Set does not match SOP Class	A900	Indicates that the Data Set does not encode a valid instance of the SOP Class specified. This status is returned if the DICOM Object stream can be successfully parsed but does not contain values for one or more mandatory Elements of the SOP Class. Error message is output to the CR-IR 355CL / 355VCL Application Log. The SOP Instance will not be saved.
Error	Cannot understand	C000-CFFF	Indicates that invalid (incorrect or unsupported) data set were received. Error indication message is output to CR-IR 355CL / 355VCL Application Log.
*	*	Any other status code.	This is treated as a permanent Failure. Error indication message is output to CR-IR 355CL / 355VCL Application Log.

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

TABLE 4.2- 14 STORAGE-SCP AE STORAGE SERVICE COMMUNICATION FAILURE REASONS

Exception	Behavior
Timeout expiry for an expected DICOM	The Association is aborted by issuing a DICOM A-ABORT.
Association aborted by the SCU or the network layers indicate communication loss	Error message is output to the CR-IR 355CL / 355VCL Application Log.

4.2.3 Print-SCU Application Entity Specification

4.2.3.1 SOP Classes

CR-IR 355CL / 355VCL provides Standard Conformance to the following SOP Classes:

TABLE 4.2- 15 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- 16 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

4.2.3.2 Association Policies

4.2.3.2.1 General

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

TABLE 4.2- 17 DICOM APPLICATION CONTEXT FOR THE PRINT-SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.3.2.2 Number of Associations

CR-IR 355CL / 355VCL 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- 18 NUMBER OF ASSOCIATIONS INITIATED FOR THE PRINT-SCU AE

Maximum number of simultaneous Associations	1

4.2.3.2.3 Asynchronous Nature

CR-IR 355 CL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2- 19 ASYNCHRONOUS NATURE FOR THE PRINT-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- 20 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE PRINT-SCU AE

Implementation Class UID	1.2.392.200036.9125.5154.1
Implementation Version Name	V3.0

4.2.3.3 Association Initiation Policy

4.2.3.3.1 Activity – Film Images

4.2.3.3.1.1 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.

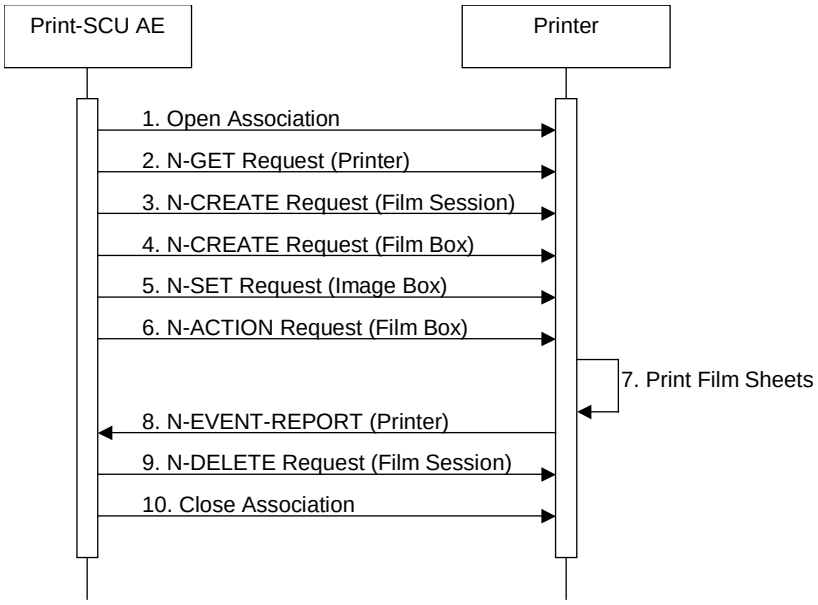

FIGURE 4.2- 3 SEQUENCING OF ACTIVITY – FILM IMAGES

A typical sequence of DIMSE messages sent over an association between Print-SCU AE and a Printer is illustrated in 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.

4.2.3.3.1.2 Proposed Presentation Contexts

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

TABLE 4.2- 21 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

4.2.3.3.1.3 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.

4.2.3.3.1.3.1 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- 22 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- 23 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.

4.2.3.3.1.3.2 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- 24 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 an N-EVENT-REPORT response are summarized in the table below.

TABLE 4.2- 25 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).

4.2.3.3.1.4 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.

4.2.3.3.1.4.1 Film Session SOP Class Operation (N-CREATE)

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

TABLE 4.2- 26 FILM SESSION SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	(2000,0010)	IS	1-9	ALWAYS	USER
Print Priority	(2000,0020)	CS	Specifies the priority of the print job. Enumerated Values: HIGH 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- 27 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.

4.2.3.3.1.4.2 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- 28 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.

4.2.3.3.1.5 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.

4.2.3.3.1.5.1 Film Box SOP Class Operation (N-CREATE)

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

TABLE 4.2- 29 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	CONFIG
Empty Image Density	(2010,0110)	CS	0	ALWAYS	AUTO
Max Density	(2010,0130)	US	300	ALWAYS	AUTO
Trim	(2010,0140)	CS	NO	ALWAYS	AUTO
Configuration Information	(2010,0150)	ST	“1” - “8”, “FINE1” - “FINE8”	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- 30 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.

4.2.3.3.1.5.2 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 an N-ACTION response is summarized in the table below:

TABLE 4.2- 31 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.

4.2.3.3.1.6 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.

4.2.3.3.1.6.1 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- 32 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	300	ALWAYS	AUTO
Configuration Information	(2010,0150)	ST	“1” - “8”, “FINE1” - “FINE8”	ALWAYS	AUTO
Image Position	(2020,0010)	US	1	ALWAYS	AUTO
Polarity	(2020,0020)	CS	“0” or with no tags.	ANAP	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- 33 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.

4.2.3.4 Association Acceptance Policy

The Print-SCU AE does not accept any association.

4.2.4 MWM-SCU Application Entity Specification

4.2.4.1 SOP Classes

CR-IR 355CL / 355VCL provides Standard Conformance to the following SOP Classes:

TABLE 4.2- 34 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

4.2.4.2 Association Policies

4.2.4.2.1 General

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

TABLE 4.2- 35 DICOM APPLICATION CONTEXT FOR THE MWM-SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.4.2.2 Number of Associations

CR-IR 355CL / 355VCL 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- 36 NUMBER OF ASSOCIATIONS INITIATED FOR THE MWM-SCU AE

Maximum number of simultaneous Associations	1

4.2.4.2.3 Asynchronous Nature

CR-IR 355CL / 355VCL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2- 37 ASYNCHRONOUS NATURE FOR THE MWM-SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.4.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

TABLE 4.2- 38 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE MWM-SCU AE

Implementation Class UID	1.2.392.200036.9125.5154.1
Implementation Version Name	V1.0

4.2.4.3 Association Initiation Policy

4.2.4.3.1 Activity – Update Worklist

4.2.4.3.1.1 Description and Sequencing of Activities

The request for a 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.

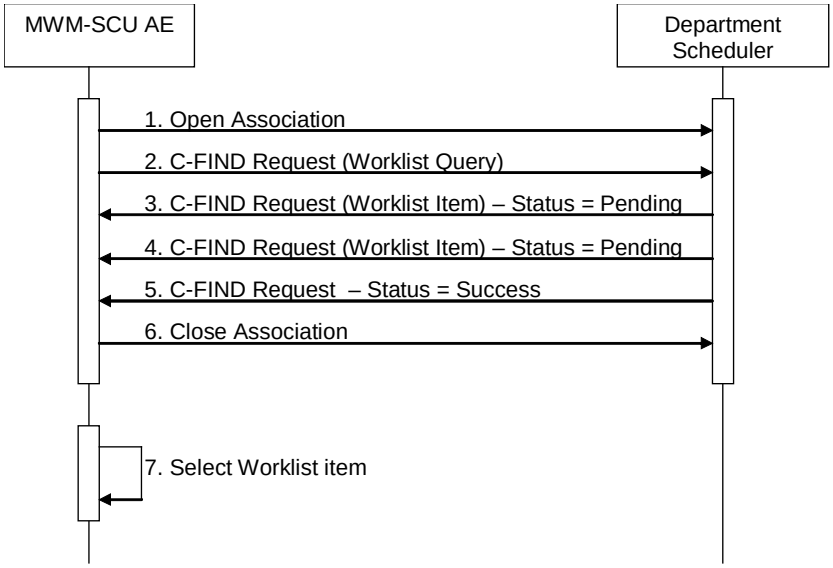

FIGURE 4.2- 4 SEQUENCING OF ACTIVITY – UPDATE WORKLIST

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 the 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 for the Worlklist and prepares to acquire new images.

4.2.4.3.1.2 Proposed Presentation Contexts

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

TABLE 4.2- 39 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

4.2.4.3.1.3 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- 40 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- 41 WORKLIST REQUEST IDENTIFIER

Module Name Attribute Name	Tag	VR	M	R	D	IOD
SOP Common						
Specific Character Set	(0008,0005)	CS		x		
Scheduled Procedure Step						
Scheduled Procedure Step Sequence	(0040,0100)	SQ		x		
>Scheduled Station AE Title	(0040,0001)	AE	S	x		
>Scheduled Procedure Step Start Date	(0040,0002)	DA	S/R	x		
>Scheduled Procedure Step Start Time	(0040,0003)	TM		x		
>Modality	(0008,0060)	CS	S	x		
>Scheduled Procedure Step Description	(0040,0007)	LO		x		
>Scheduled Protocol Code Sequence	(0040,0008)	SQ		x		

>>Code Value	(0008,0100)	SH		x		
>>Coding Scheme Version	(0008,0103)	SH		x		
>>Coding Scheme Designator	(0008,0102)	SH		x		
>>Code Meaning	(0008,0104)	LO		x		
>Scheduled Procedure Step ID	(0040,0009)	SH		x		
Requested Procedure						
Requested Procedure ID	(0040,1001)	SH	S	x		
Requested Procedure Description	(0032,1060)	LO		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
Imaging Service Request						
Referring Physician's Name	(0008,0090)	PN		x		
Requesting Service	(0032,1033)	LO		x		
Patient Identification						
Patient's Name	(0010,0010)	PN	S/*	x	x	x
Patient ID	(0010,0020)	LO	S	x	x	x
Patient Species Description	(0010,2201)	LO		x		x
Patient Breed Description	(0010,2292)	LO		x		x
Responsible Person	(0010,2297)	PN		x		x
Responsible Organization	(0010,2299)	LO		x		x
Patient Demographic						
Patients Birth Date	(0010,0030)	DA		x	x	x
Patient's Sex	(0010,0040)	CS		x	x	x
Patient's Size	(0010,1020)	DS		x		x
Patient's Weight	(0010,1030)	DS		x		x
Patient Comments	(0010,4000)	LT		x		x
Patient Medical						
Patient's Sex Neutered	(0010,2203)	LT		x		x
CR Series Module(Extended)						
Body Part Examined	(0018,0015)	CS		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, an “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.
IOD:	An "x" indicates that this worklist attribute is included into all Object Instances created during performance of the related Procedure Step.

4.2.4.4 Association Acceptance Policy

The MWM-SCU AE does not accept any association.

4.2.5 MPPS-SCU Application Entity Specification

4.2.5.1 SOP Classes

CR-IR 355CL / 355VCL provides Standard Conformance to the following SOP Classes:

TABLE 4.2- 42 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

4.2.5.2 Association Policies

4.2.5.2.1 General

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

TABLE 4.2- 43 DICOM APPLICATION CONTEXT FOR THE MPPS-SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.5.2.2 Number of Associations

CR-IR 355CL / 355VCL 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- 44 NUMBER OF ASSOCIATIONS INITIATED FOR THE MPPS-SCU AE

Maximum number of simultaneous Associations	1

4.2.5.2.3 Asynchronous Nature

CR-IR 355CL / 355VCL does not support asynchronous communication (multiple outstanding transactions over a single Association).

TABLE 4.2- 45 ASYNCHRONOUS NATURE FOR THE MPPS-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- 46 DICOM IMPLEMENTATION CLASS AND VERSION FOR THE MPPS-SCU AE

Implementation Class UID	1.2.392.200036.9125.5154.1
Implementation Version Name	V1.0

4.2.5.3 Association Initiation Policy

4.2.5.3.1 Activity –Acquire Images

4.2.5.3.1.1 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.

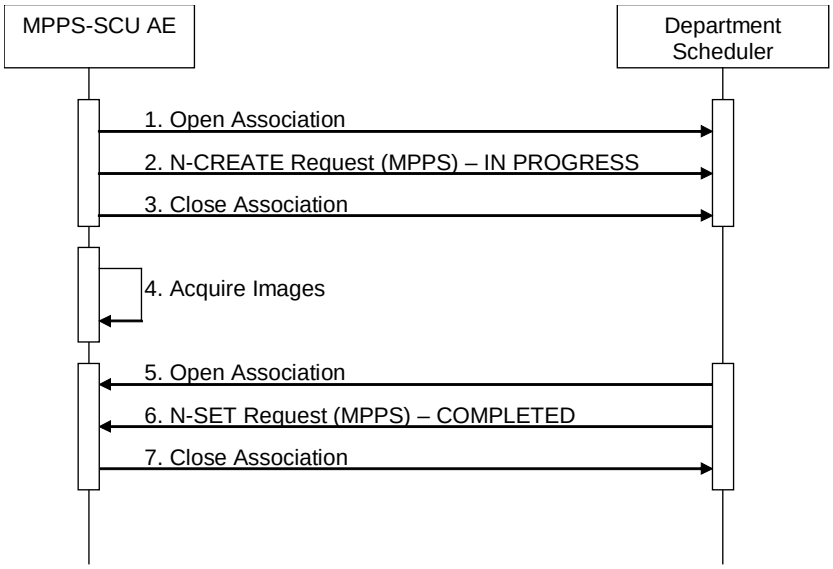

FIGURE 4.2- 5 SEQUENCING OF ACTIVITY – ACQUIRE IMAGES

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.

4.2.5.3.1.2 Proposed Presentation Contexts

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

TABLE 4.2- 47 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

4.2.5.3.1.3 SOP Specific Conformance for MPPS 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- 48 MPPS N-CREATE / N-SET RESPONSE STATUS 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- 49 MPPS N-CREATE / N-SET REQUEST IDENTIFIER

Attribute Name	Tag	VR	N-CREATE	N-SET
SOP Common				
Specific Character Set	(0008,0005)	CS	x	
Performed Procedure Step Relationship				
Scheduled Step Attribute Sequence	(0040,0270)	SQ	From MWM	
>Study Instance UID	(0020,000D)	UI	From MWM	
>Scheduled Procedure Step ID	(0040,0009)	SH	From MWM	
Patient's Name	(0010,0010)	PN	From MWM or User Input	
Patient ID	(0010,0020)	LO	From MWM or User Input	
Patients Birth Date	(0010,0030)	DA	From MWM or User Input	
Patient's Sex	(0010,0040)	CS	From MWM or User Input	

Performed Procedure Step Information				
Performed Procedure Step ID	(0040,0253)	SH	Automatically created.	
Performed Station AE Title	(0040,0241)	AE	MPPS AE Title	
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
Imaging Acquisition Results				
Modality	(0008,0060)	SH	x	
Performed Series Sequence	(0040,0340)	SQ	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

4.2.5.4 Association Acceptance Policy

The MPPS-SCU AE does not accept any association.

4.3 NETWORK INTERFACES

4.3.1 Physical Network Interface

CR-IR 355CL / 355VCL 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

10 / 100 / 1000 Ethernet

4.3.2 Additional Protocols

The CR-IR 355CL / 355VCL Storage AE has no additional protocol.

4.3.3 IPv4 and IPv6 Support

The CR-IR 355CL / 355VCL only supports IPv4 connections.

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	Not Applicable
Storage-SCP	FCR-SCP	5001
Print-SCU	FCR-CSL	Not Applicable
MWM-SCU	FCR-MWM-U	Not Applicable
MPPS-SCU	FCR-MPPS-U	Not Applicable

4.4.1.2 Remote AE Title/Presentation Address Mapping

4.4.1.2.1 Storage

The AE Title, host name, IP Address and port number of remote applications are configured using the CR-IR 355CL / 355VCL Service/Installation Tool.

4.4.1.2.2 Print-SCU

The CR-IR 355CL / 355VCL Service/Installation 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.

4.4.1.2.3 MWM-SCU / MPPS-SCU

The CR-IR 355CL / 355VCL Service/Installation 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/Installation 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.

4.4.1.3 Parameters

The table below indicates other configuration parameters relevant to Storage AE.

TABLE 4.4- 2 CONFIGURATION PARAMETERS TABLE

Parameter	Configurable (Yes/No)	Default Value
Storage-SCU Parameters		
Storage SCU time-out waiting for a response to a C-STORE-RQ	Yes	300 s
Whether or not the job is retried, when failing of sending	Yes	Yes
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 SCP Maximum Image Density One of 'ST' or 'HQ'. Here, 'ST' indicates the low image density, 'HQ' indicates the original image density.	Yes	HQ
Storage SCP Capability of Multi-Byte-Character	Yes	No
Storage-SCP Parameters		
Maximum number of simultaneously accepted Associations by the Storage-SCP AE	Yes [1-3]	3

5 MEDIA INTERCHANGE

5.1 IMPLEMENTATION MODEL

5.1.1 Application Data Flow

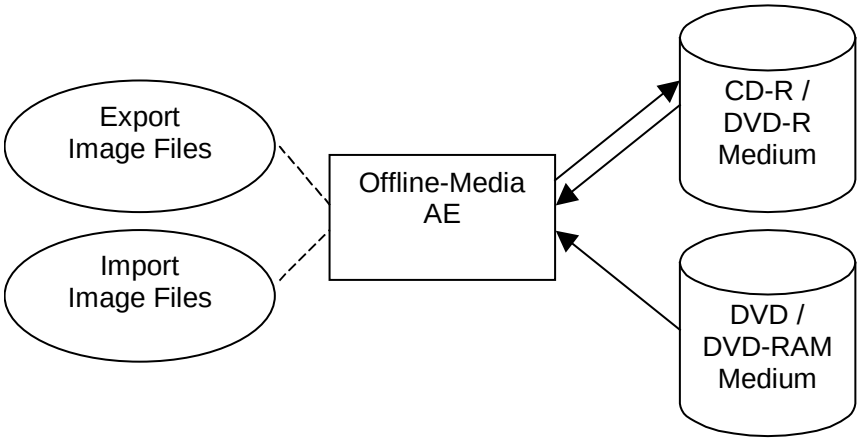

FIGURE 5.1-1 APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE

— The Offline-Media AE exports images to a CD-R / DVD-R 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 Offline-Media AE Imports images from a CD-R / DVD / DVD-RAM Storage medium. It is associated with the local real-world activity “Import Image Files”. “Import Image Files” is performed upon user request for selected studies.

NOTE: “DVD” medium includes DVD-R, DVD+R, DVD-RW and DVD+RW. “DVD-RAM” is supported in Japan only.

5.1.2 Functional Definition of AEs

5.1.2.1 Functional Definition of Offline-Media Application Entity

Activation of the “Export Image Files” icon or menu entry will pass the currently selected studies to the Offline-Media Application Entity. The SOP Instances associated with the selection will be collected into one or more export jobs. The contents of each export job will be written to a single CD-R or DVD-R media.

The CR-IR 355CL / 355VCL reads the DICOMDIR file and displays the ordered list of studies and images, identifying information. The Offline-Media Application Entity loads the selected studies/images from the CD-R / DVD / DVD-RAM medium. It is associated with the local real-world activity “Import Image Files”.

5.1.3 Sequencing of Real-World Activities

5.1.3.1 Activity – Export Image Files

At least one image or presentation state must exist and be selected before the Offline-Media Application Entity can be invoked. The operator can insert a new CD-R or DVD-R media at any time before after invocation of the Offline-Media Application Entity. The Offline-Media Application Entity will wait indefinitely for a media to be inserted before starting to write to the CD-R or DVD-R device.

The operations for Export Image Files are describe below:

1. Select the studies on the study list of CR-IR 355CL / 355VCL to be created to the CD-R or DVD-R medium.
2. Request to create to the CD-R or DVD-R, then the burning wizard is displayed.
3. Insert a new CD-R or DVD-R media, and burning process is started.

5.1.3.2 Activity – Import Image Files

Operator requests to retrieve File-set(s) on the CD-R / DVD / DVD-RAM.

The operations for Import Image Files are described below:

1. Select “Retrieve study from the Media” and insert a CD-R / DVD / DVD-RAM media that has File-set.
2. Select the studies from list on the CD-R / DVD / DVD-RAM medium.
3. Request to copy to the local storage device.

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	1.2.392.200036.9125.5154.1
Implementation Version Name	V3.0

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
STD-GEN-CD	Export Image Files	FSC	Interchange
	Import Image Files	FSR	Interchange
STD-GEN-DVD-RAM	Import Image Files	FSR	Interchange
STD-GEN-DVD-JPEG	Export Image Files	FSC	Interchange
	Import Image Files	FSR	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 CD-R or DVD-R medium.

A dialogue will be presented allowing the user to modify the suggested media label and provides control over the available media capacity. If the contents of the current selection do not fit on a single

media, CR-IR 355CL / 355VCL cancel the export job and eject inserted CD-R or DVD-R medium automatically.

The user will be prompted to insert an empty CD-R or DVD-R for each export job. The contents of the export job will be written together with a corresponding DICOMDIR to a single-session CD-R or DVD-R. Writing in multi-session mode is not supported. The user can cancel an export job in the job queue.

5.2.1.2.1.1 Media Storage Application Profiles

The Offline-Media Application Entity support the STD-GEN-CD Application Profile.

5.2.1.2.2 Activity – Import Image Files

The Offline-Media Application Entity acts as an FSR when requested to import SOP Instances from a CD-R / DVD / DVD-RAM medium to the local database.

5.2.1.2.2.1 Media Storage Application Profiles

The Offline-Media Application Entity support the “STD-GEN-CD”, “STD-GEN-DVD-RAM” and “STD-GEN-DVD-JPEG” Application Profile.

5.2.1.2.2.1.1 Options

The Offline-Media Application Entity support following SOP Class UID and Transfer Syntax.

TABLE 5.2-2 IODS, SOP CLASSES AND TRANSFER SYNTAXES FOR OFFLINEMEDIA

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
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	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	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50

		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian	1.2.840.10008.1.2.1

		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50

5.3 AUGMENTED AND PRIVATE APPLICATION PROFILES

The CR-IR 355CL / 355VCL does not support any augmented for private application profiles.

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	MEDIA

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)

GB18030

7 SECURTIY

CR-IR 355CL / 355VCL does not support any specific security measures.

It is assumed that CR-IR 355CL / 355VCL 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 CR-IR 355CL / 355VCL.
b. Firewall or router protections to ensure that CR-IR 355CL / 355VCL only has network access to approved external hosts and services.
c. Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN))

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

8 ANNEXES

8.1 IOD CONTENTS

8.1.1 Created SOP Instances

Table 8.1-1 specifies the attributes of an CR Image transmitted by the CR-IR 355CL / 355VCL storage application.

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:

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
MWM	the attribute value source is from MWM

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 CR-IR 355CL / 355VCL 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 8.1-2
	Clinical Trial Subject	U	Not Supported
Study	General Study	M	Table 8.1-3
	Patient Study	U	Table 8.1-4
	Clinical Trial Study	U	Not Supported
Series	General Series	M	Table 8.1-5
	CR Series	M	Table 8.1-6
	Clinical Trial Series	U	Not Supported
Equipment	General Equipment	M	Table 8.1-7
Image	General Image	M	Table 8.1-8
	Image Pixel	M	Table 8.1-9
	Contrast/bolus	C	Table 8.1-10
	Device	U	Not Supported
	CR Image	M	Table 8.1-11
	Overlay Plane	U	Not Supported
	Modality LUT	U	Table 8.1-12
	VOI LUT	U	Table 8.1-13
	SOP Common	M	Table 8.1-14

8.1.1.2 Patient Module

TABLE 8.1- 2 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 /MWM
Patient ID	(0010,0020)	2	Primary hospital identification number or code for the patient.	ALWAYS	USER /MWM
Patient's Birth Date	(0010,0030)	2	Birth date of the patient.	VNAP	USER /MWM
Patient's Sex	(0010,0040)	2	Sex of the named patient. Enumerated Values: M = male F = female O = other	VNAP	USER /MWM
Patient Comments	(0010,4000)	3	User-defined additional information about the patient.	ANAP	USER /MWM
Patient Species Description	(0010,2201)	1C	The species of the patient. Required if the patient is an animal and if Patient Species Code Sequence (0010,2202) is not present. May be present otherwise.	ANAP The value is set only in the system for veterinary.	USER /MWM
Patient Species Code Sequence	(0010,2202)	1C	The species of the patient. One Item shall be present. Required if the patient is an animal and if Patient Species Description (0010,2201) is not present. May be present otherwise.	ANAP The value is set only in the system for veterinary.	AUTO
>Code Value	(0008,0100)	1	Defined Context ID is 7454 in PS3.16.	ANAP The comparable value is set automatically if user input a value defined by DICOM Standard into Patient Species Description.	USER

>Coding Scheme Designator	(0008,0102)	1	Defined Context ID is 7454 in PS3.16.	ANAP The comparable value is set automatically if user input a value defined by DICOM Standard into Patient Species Description.	USER
>Code Meaning	(0008,0104)	1	Defined Context ID is 7454 in PS3.16.	ANAP The comparable value is set automatically if user input a value defined by DICOM Standard into Patient Species Description.	USER
Patient Breed Description	(0010,2292)	2C	The breed of the patient. Required if the patient is an animal and if Patient Breed Code Sequence (0010,2293) is empty. May be present otherwise.	ANAP The value is set only in the system for veterinary.	USER /MWM
Patient Breed Code Sequence	(0010,2293)	2C	The breed of the patient. Zero or more Items shall be present. Required if the patient is an animal.	ANAP The value is set only in the system for veterinary.	AUTO
>Code Value	(0008,0100)	1	Defined Context ID is 7480 in PS3.16.	ANAP The comparable value is set automatically if user input a value defined by DICOM Standard into Patient Breed Description.	USER
>Coding Scheme Designator	(0008,0102)	1	Defined Context ID is 7480 in PS3.16.	ANAP The comparable value is set automatically if user input a value defined by DICOM Standard into Patient Breed Description.	USER
>Code Meaning	(0008,0104)	1	Defined Context ID is 7480 in PS3.16.	ANAP The comparable value is set automatically if user input a value defined by DICOM Standard into Patient Breed Description.	USER

Responsible Person	(0010,2297)	2C	Name of person with medical decision making authority for the patient. Required if the patient is an animal. May be present otherwise.	ANAP The value is set only in the system for veterinary.	USER /MWM
Responsible Person Role	(0010,2298)	1C	Relationship of Responsible Person to the patient. Defined Terms: OWNER Required if Responsible Person is present and has a value.	ANAP If Responsible Person (0010,2297) is present, value is “OWNER”.	AUTO
Responsible Organization	(0010,2299)	2C	Name of organization with medical decision making authority for the patient. Required if patient is an animal. May be present otherwise.	ANAP The value is set only in the system for veterinary.	USER /MWM

8.1.1.3 General Study Module

TABLE 8.1- 3 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	AUTO
Study Date	(0008,0020)	2	Date the Study started.	ALWAYS	AUTO /MWM
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	AUTO
Study ID	(0020,0010)	2	User or equipment generated Study identifier.	EMPTY	AUTO
Accession Number	(0008,0050)	2	A RIS generated number that identifies the order for the Study.	EMPTY	AUTO
Study Description	(0008,1030)	3	Institution-generated description or classification of the Study (component) performed.	VNAP	CONFIG

8.1.1.4 Patient Study Module

TABLE 8.1- 4 PATIENT STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Patient's Size	(0010,1020)	3	Patient's height or length in meters.	ANAP	USER /MWM
Patient's Weight	(0010,1030)	3	Weight of the patient in kilograms.	ANAP	USER /MWM
Patient's Sex Neutered	(0010,2203)	2C	Whether or not a procedure has been performed in an effort to render the patient sterile. Enumerated value: ALTERED = Altered /Neutered UNALTERED = Unaltered/intact Note: If this Attribute is present but has no value then the status is unknown. Required if patient is an animal. May be present otherwise.	ANAP The value is set only in the system for veterinary.	USER /MWM

8.1.1.5 General Series Module

TABLE 8.1- 5 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. See PS3.3 C.7.3.1.1.1 for Defined Terms.	ALWAYS Value is “CR”.	AUTO
Series Instance UID	(0020,000E)	1	Unique identifier of the Series.	ALWAYS	AUTO
Series Number	(0020,0011)	2	A number that identifies this Series.	ALWAYS	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	EMPTY	AUTO
Series Date	(0008,0021)	3	Date the Series started.	ALWAYS	AUTO
Series Time	(0008,0031)	3	Time the Series started.	ALWAYS	AUTO
Performing Physicians’ Name	(0008,1050)	3	Name of the physician(s) administering the Series.	ALWAYS	CONFIG /USER
Operators' Name	(0008,1070)	3	Name(s) of the operator(s) supporting the Series.	ALWAYS	CONFIG /USER
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

8.1.1.6 CR Series Module

TABLE 8.1- 6 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	EMPTY	AUTO

8.1.1.7 General Equipment Module

TABLE 8.1- 7 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 “FUJI PHOTO FILM Co., ltd.”	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
Manufacturer's Model Name	(0008,1090)	3	Manufacturer’s model name of the equipment that produced the composite instances.	ALWAYS	AUTO
Software Versions	(0018,1020)	3	Manufacturer’s designation of software version of the equipment that produced the composite instances.	ANAP	AUTO

8.1.1.8 General Image Module

TABLE 8.1- 8 GENERAL IMAGE MODULE OF CREATED CR IMAGE STORAGE 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). See PS3.3 C.7.6.1.1.1 for further explanation.	EMPTY	AUTO
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. See PS3.3 C.7.6.1.1.2 for Defined Terms and further explanation.	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.	ALWAYS	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
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	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 FCR system, 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)

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).

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:

PRE_NORMALIZED A pre-normalized image.

NORMALIZED A normalized image.

POST_PROCESSED An already processed image.

Value 4:

RT Routine exposure image

ES_L Low-pressure image for energy subtraction processing.

ES_H High-pressure image for energy subtraction processing.

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.

Value 9:

The distance (nm) between the centers of each pixel when an IP is read.

When “RENORMALIZED” has been determined for Value 5, what is determined will not be changed even if parameters were modified.

8.1.1.9 Image Pixel Module

TABLE 8.1- 9 IMAGE PIXEL MODULE OF CREATED CR IMAGE STORAGE 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	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	AUTO
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	AUTO

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Pixel Data	(7FE0,0010)	1C	A data stream of the pixel samples that comprise the Image. See PS3.3 C.7.6.3.1.4 for further explanation. Required if Pixel Data Provider URL (0028,7FE0) is not present.	ALWAYS	AUTO

8.1.1.10 Contrast/Bolus Module

TABLE 8.1- 10 CONTRAST/BOLUS MODULE OF CREATED CR IMAGE STORAGE 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

8.1.1.11 CR Image Module

TABLE 8.1- 11 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	AUTO
Plate ID	(0018,1004)	3	The ID or serial number of the sensing plate upon which the image was acquired.	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. In the case of CR, the front plane is defined to be the external surface of the CR plate closest to the patient and radiation source.	ALWAYS See Note 1 below.	AUTO
Pixel Spacing	(0028,0030)	1C	Physical distance in the patient between the center of each pixel, specified by a numeric pair - adjacent row spacing (delimiter) adjacent column spacing in mm. See PS3.3 10.7.1.1 and 10.7.1.3.	ALWAYS See Note 1 below.	AUTO
Acquisition Device Processing Description	(0018,1400)	3	Describes device-specific processing associated with the image (e.g. Organ Description)	ALWAYS	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
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.	ALWAYS	AUTO

Attribute Name	Tag	Type	Dicom Attribute Description	Presence of Value	Source
Target Exposure Index	(0018,1412)	3	The target value used to calculate the Deviation Index (0018,1413) as defined in IEC 62494-1.	ALWAYS Value is set on every exposure menu.	CONFIG /USER
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.	ALWAYS	AUTO
Sensitivity	(0018,6000)	3	Read out sensitivity.	ALWAYS	AUTO /USER

Note 1: The CR 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 IP 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 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 image is a projected image, which disables measurements of the dimensions of the object precisely reflected by actual dimensions in the patient’s body.)

8.1.1.12 Modality LUT Module

TABLE 8.1- 12 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	AUTO
Rescale Slope	(0028,1053)	1C	m in the equation specified by Rescale Intercept (0028,1052). Required if Rescale Intercept is present.	ALWAYS	AUTO
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	AUTO

8.1.1.13 VOI LUT Module

TABLE 8.1- 13 VOI LUT MODULE OF CREATED CR IMAGE STORAGE 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
Window Center	(0028,1050)	1C	Defines a Window Center for display. See PS3.3 C.11.2.1.2 for further explanation. Required if VOI LUT Sequence (0028,3010) is not present. May be present otherwise.	ANAP	AUTO
Window Width	(0028,1051)	1C	Window Width for display. See PS3.3 C.11.2.1.2 for further explanation. Required if Window Center (0028,1050) is sent.	ANAP	AUTO

8.1.1.14 SOP Common Module

TABLE 8.1- 14 SOP COMMON MODULE OF CREATED CR IMAGE STORAGE 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 Value is '1.2.840.10008.5.1.4.1.1.1'	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 Value is set to the belows according to Language Configuration. Alphanumerics: No Tag Unicode (UTF-8): ISO_IR 192 Japanese: ISO 2022 IR 13\ISO 2022 IR 87 Western European: ISO_IR 100 Central European: ISO_IR 101 Korean: \ISO 2022 IR 149 Chinese Simplified: GB18030 Even though Japanese, if SCP is configured 'Not supported multi-byte', the value set to ISO_IR 13. Even though Korean, Chinese Simplified and Chinese Traditional, if SCP is configured 'Not supported multi-byte', the value set to No Tag.	CONFIG
Instance Number	(0020,0013)	3	A number that identifies this Composite object instance.	ALWAYS	AUTO

8.1.2 Used Fields in received IOD by application

The CR-IR 355CL / 355VCL 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 following table.

TABLE 8.1- 15 ATTRIBUTE MAPPING BETWEEN MODALITY WORKLIST, IMAGE AND MPPS

Modality Worklist	Image IOD	MPPS IOD
-	-	Scheduled Step Attribute Sequence
Study Instance UID	Study Instance UID	>Study Instance UID
Scheduled Procedure Step Sequence	-	-
>Scheduled Procedure Step ID	-	>Scheduled Procedure Step ID
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

8.1.4 Coerced/Modified Fields

8.1.4.1 Storage-SCP AE Element Use

Not applicable.

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	
Film UID	(0009,xx0C)	OW	1	
Exposure Unit Type Code	(0009,xx10)	CS	1	
Kanji Hospital Name	(0009,xx80)	LO	1	
Kanji Department Name	(0009,xx92)	SH	1	
Private Creator	(0019,00xx)	LO	1	Value is “FDMS 1.0“
Kanji Body Part for Exposure	(0019,xx15)	LO	1	
Kanji Menu Name	(0019,xx32)	LO	1	
Image Processing Type	(0019,xx40)	CS	1	
EDR Mode	(0019,xx50)	CS	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	
Private Creator	(0021,00xx)	LO	1	Value is “FDMS 1.0“
FCR Image ID	(0021,xx10)	CS	1	
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	
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	

Attribute Name	Tag	VR	VM	Notes
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	
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“
FNC Parameters	(50F1,xx0A)	ST	1	
Film Output Format	(50F1,xx10)	CS	1	
Image Processing Modification Flag	(50F1,xx20)	CS	1	

8.3 CODED TERMINOLOGY AND TEMPLATES

The CR-IR 355CL / 355VCL CR Strorage AE do not support the use of Coded Terminology and Templates.

8.4 GRAYSCALE IMAGE CONSISTENCY

The CR-IR 355CL / 355VCL do not support DICOM Grayscale Standard Display Function.

8.5 STANDARD EXTENDED / SPECIALIZED / PRIVATE SOP CLASSES

No Specialized or Private SOP Classes are supported.

8.6 PRIVATE TRANSFER SYNTAXES

No Private Transfer Syntaxes are supported.