DICOM

Conformance Statement

Essenta RC Release 1.3

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1. DICOM CONFORMANCE STATEMENT OVERVIEW

This Essenta RC implements the necessary DICOM services to download work lists from an information system, send RF images to a PACS, export RF images to CD-R and print to a networked hardcopy device and inform the information system about the work actually done.

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

Table 1-1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
Transfer			
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Option	No
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Option	No
Workflow Management			
Modality Worklist Information Model – FIND (Purchased separately)	1.2.840.10008.5.1.4.31	Option	No
Modality Performed Procedure Step (Purchased separately)	1.2.840.10008.3.1.2.3.3	Option	No
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Option	No
Print Management			
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	Yes	No
> Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
> Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
> Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
> Printer	1.2.840.10008.5.1.1.16	Yes	No

Note: Modality Worklist Information Model – FIND and Modality Performed Procedure Step are Purchased separately.

Table 1-2: Media Services

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk – Recordable		
General Purpose CD-R Interchange	Yes|No	No

2. TABLE OF CONTENTS

3. INTRODUCTION

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

3.1. Revision History

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

Table 3-1: Revision History

Document Version	Date of Issue	Author	Description
1.0	2005-12-07	Sun hongwen	Create
1.01	2006-01-19	Sun hongwen	Add the attribute of Referring Physician's Name for Worklist.
1.05	2006-3-16	Sun hongwen	Specify Bit Allocated, Bit Stored and High Bit in the table of **N-SET-RQ - Pixel Presentation Module**
1.06	2006-06-14	Sun hongwen	Remove references to the internal name 'Xanadu' and create a version that refers to Essenta RC
1.07	2007-1-15	Sun hongwen	Add Presentation State into this document
1.08	2007-6-6	Sun hongwen	— Implementation Class UID: 1.3.46.670589.35.1.1.3 — Implementation Version Name: XanaduDICOM1.3 Change a lot according to Toine's letter(07-5-22)
1.09	2007-6-7	Yu renlong	Split Presentation State Module into 3 modules.
1.10	2007-6-18	Sun hongwen	Modify according to Toine's letter(07-6-15)

3.2. Audience

This Conformance Statement is intended for:

(potential) customers
system integrators of medical equipment
marketing staff interested in system functionality
software designers implementing DICOM interfaces

It is assumed that the reader is familiar with the DICOM standard.

3.3. Remarks

The DICOM Conformance Statement is contained in chapter 2 through 8 and follows the contents and structuring requirements of DICOM PS 3.2.

This Conformance Statement by itself does not guarantee successful interoperability of PNMS equipment with

non-PNMS equipment. The user (or user's agent) should be aware of the following issues:

Interoperability

Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of PNMS equipment with non-PNMS equipment. It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates PNMS equipment with non-PNMS equipment.

Validation

PNMS equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement. Where PNMS equipment is linked to non-PNMS equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

New versions of the DICOM Standard

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

3.4. Definitions, Terms and Abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3 and PS 3.4.

The following acronyms and abbreviations are used in the document.

ACC	American College of Cardiology
AE	Application Entity
ACR	American College of Radiology
ANSI	American National Standard Institute
DICOM	Digital Imaging and Communication in Medicine
DIMSE	DICOM Message Service Element
ELE	Explicit VR Little Endian
EBE	Explicit VR Big Endian
FSC	File Set Creator
FSR	File Set Reader
FSU	File Set Updater
ILE	Implicit VR Little Endian
IOD	Information Object Definition
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
RF	Radio Fluoroscopy
RIS	Radiology Information System
RWA	Real-World Activity
SCU	Service Class User
SCP	Service Class Provider
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet protocol
UID	Unique Identifier

3.5. References

[DICOM] Digital Imaging and Communications in Medicine (DICOM), Part 1 – 18 (NEMA PS 3.1-2004 – PS 3.18-2004),
National Electrical Manufacturers Association (NEMA)
Publication Sales 1300 N. 17th Street, Suite 1847
Rosslyn, Virginia. 22209, United States of America

4. NETWORKING

4.1. Implementation model

The implementation model consists of three sections:
-the application data flow diagram, specifying the relationship between the Application Entities and the "external world" or Real-World Activities,
-a functional description of each Application Entity, and
-the sequencing constraints among them.

4.1.1. Application Data Flow

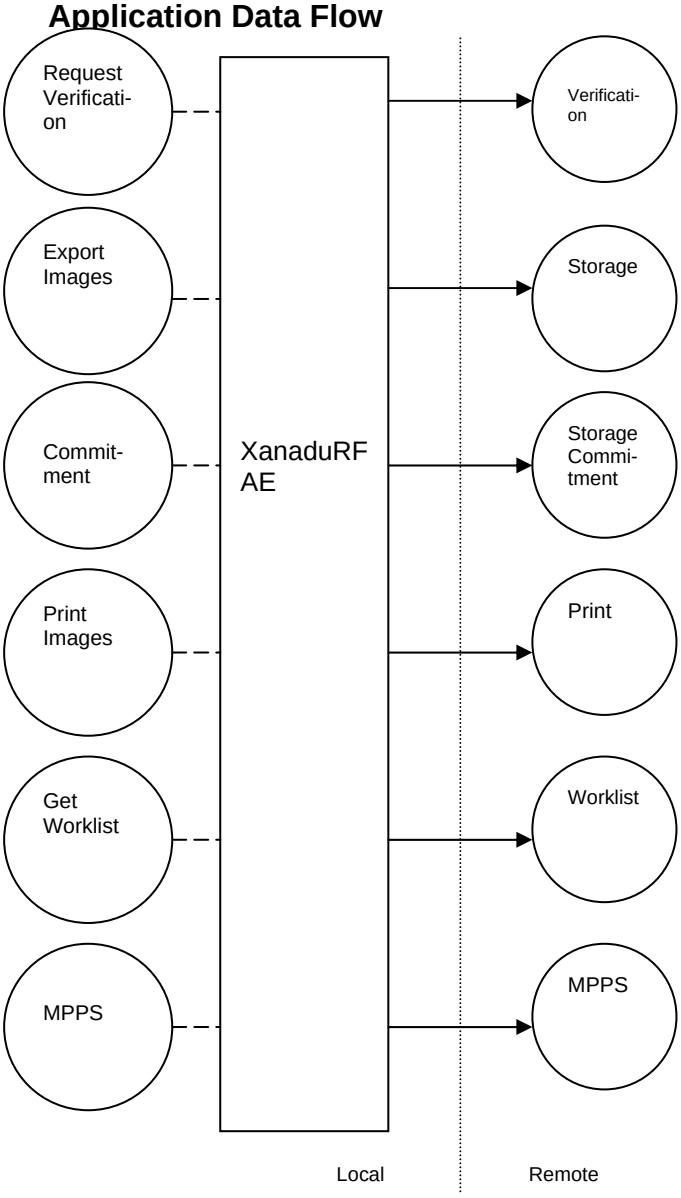

Figure 4-1: Application Data Flow Diagram

4.1.2. Functional Definition of AE's

4.1.2.1. Functional Definition of XanaduRF

The XanaduRF is the one and only application entity within Essenta RC. It includes the following service classes.

4.1.2.1.1. Verification Service Class

The XanaduRF can perform the Verification service as SCU (RWA Request Verification).

4.1.2.1.2. Storage Service Class

The XanaduRF can perform the Storage service as SCU (RWA Export Images).The XanaduRF shall request an association with the selected remote SCP for all applicable Storage SOP classes. When the association is accepted, the XanaduRF shall send the Storage requests, receive the Storage responses and act accordingly, and release the association.

4.1.2.1.3. Storage commitment

In synchronous process the XanaduRF can perform the Storage Commitment service as SCU.The XanaduRF shall request an association with the selected remote SCP for the Storage Commitment Push Model SOP class. When the association is accepted, the XanaduRF shall send the Storage Commitment requests, receive the Storage Commitment response and act accordingly, and release the association.
In asynchronous process the remote SCP requests an association with the XanaduRF (SCU). After accepting the association, the XanaduRF shall receive the Storage Commitment reports, and release the association when requested.
The Storage Commitment Service can be done in synchronous and asynchronous process.

4.1.2.1.4. Basic Worklist Management Service Class

The XanaduRF can perform the following activities:

Establish an association with a remote AE.
Issue a C-Find request to get the (modality) worklist.
Release an association with a remote AE.

4.1.2.1.5. Modality Performed Procedure Step service class

The XanaduRF can perform the following activities:

Establish an association with a remote AE.
Issue a N-Create and N-Set requests to notify HIS/RIS by means of MPPS Service Class.
Release an association with a remote AE.

4.1.2.1.6. Print Management Service Class

The XanaduRF can perform the Print service as SCU (RWA Print Images).The XanaduRF shall request an association with the selected remote SCP (printer) for all applicable SOP classes of the applicable Print Management Meta SOP class. When the association is accepted, the XanaduRF shall send the Print requests, receive the Print responses and act accordingly, and finally release the association.

4.1.3. Sequencing of Real World Activities

Examinations, identified with a new UID, are created inside the XanaduRF result of worklist management or on manual scheduling by the clinical user. Once a record from Worklist Server is Imported, MPPS CREATE messages are sent from the XanaduRF. When examination is finished, MPPS COMPLETED or DISCONTINUED message is sent from the XanaduRF on manual scheduling by the clinical user. Any Image and Storage Commitment produced can be stored to a remote server. Any Image can be printed.

4.2. AE Specifications

The next section in the DICOM Conformance Statement contains the specification of the one and only Essenta RC application entity: XanaduRF.

4.2.1. XanaduRF

Every detail of this specific Application Entity shall be completely specified under this section.

4.2.1.1. SOP Classes

XanaduRF provides Standard Conformance to the following SOP Classes.

Table 4-1: SOP Classes for XanaduRF

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	No
RF Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	No
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	No
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Yes	No
Basic Grayscale Print Management Meta SOP	1.2.840.10008.5.1.1.9	Yes	No
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No

4.2.1.2. Association Policies

4.2.1.2.1. General

The DICOM standard application context is specified in Table 4-2.

Table 4-2: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2. Number of Associations

Table 4-3: Number of Associations as an Association Initiator for XanaduRF

Maximum number of simultaneous associations	5

As a result of local activities, XanaduRF will initiate at most 5 simultaneous associations. One association may be used to issue **MPPS** requests, one associations may be used to issue **Store** requests or one synchronous Storage commitment, one association may be used to issue **Worklist** requests, one association may be used to issue **Verification** and one association may be used for **Print** requests.

Table 4-4: Number of Associations as an Association Acceptor for XanaduRF

Maximum number of simultaneous associations	1

One accepted association is used for asynchronous Storage commitment.

4.2.1.2.3. Asynchronous Nature

Asynchonous Nature is not supported.

4.2.1.2.4. Implementation Identifying Information

Table 4-5: DICOM Implementation Class UID and Version Name for XanaduRF AE

Implementation Class UID	1.3.46.670589.35.1.1.3
Implementation Version Name	XanaduDICOM1.3

4.2.1.3. Association Initiation Policy

XanaduRF shall initiate associations as a result of the following events.
-The operator requests to verify a connection to a remote system
-The operator requests to send some images to a remote system
-The operator requests to print selected images of the XanaduRF
-The operator requests to get worklist from HIS/RIS
-The operator requests to create MPPS in the HIS/RIS
-If storage commitment function is enabled, after storage XanaduRF shall send storage commitment to remote service.

The behavior of the XanaduRF during association rejection is summarized in Table 4-6.

Table 4-6: DICOM Association Rejection Handling

Result	Source	Reason/Diagnosis	Behavior
1 – rejected-permanent	1 – DICOM UL service-user	1 – no-reason-given	The user is notified via User Guidance Area.
		2 – application-context-name-not-supported	The user is notified via User Guidance Area.
		3 – calling-AE-title-not-recognized	The user is notified via User Guidance Area.
		7 – called-AE-title-not-recognized	The user is notified via User Guidance Area.
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	The user is notified via User Guidance Area.
		2 – protocol-version-not-supported	The user is notified via User Guidance Area.
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	The user is notified via User Guidance Area.
		2 – local-limit-exceeded	The user is notified via User Guidance Area.
2 – rejected-transient	1 – DICOM UL service-user	1 – no-reason-given	The user is notified via User Guidance Area.
		2 – application-context-name-not-supported	The user is notified via User Guidance Area.

Result	Source	Reason/Diagnosis	Behavior
		3 – calling-AE-title-not-recognized	The user is notified via User Guidance Area.
		7 – called-AE-title-not-recognized	The user is notified via User Guidance Area.
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	The user is notified via User Guidance Area.
		2 – protocol-version-not-supported	The user is notified via User Guidance Area.
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	The user is notified via User Guidance Area.
		2 – local-limit-exceeded	The user is notified via User Guidance Area.

The behavior of the XanaduRF on receiving an association abort is summarized in Table4-7.

Table4-7: DICOM Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	The user is notified via User Guidance Area.
2 – DICOM UL service-provider	0 – reason-not-specified	The user is notified via User Guidance Area.
	1 – unrecognized-PDU	The user is notified via User Guidance Area.
	2 – unexpected-PDU	The user is notified via User Guidance Area.
	4 – unrecognized-PDU parameter	The user is notified via User Guidance Area.
	5 – unexpected-PDU parameter	The user is notified via User Guidance Area.
	6 – invalid-PDU-parameter value	The user is notified via User Guidance Area.

The behavior of the XanaduRF for sending an association abort is summarized in Table 4-8.

Table 4-8: DICOM Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	The user is notified via User Guidance Area.
2 – DICOM UL service-provider	0 – reason-not-specified	The user is notified via User Guidance Area.
	1 – unrecognized-PDU	The user is notified via User Guidance Area.

Source	Reason/Diagnosis	Behavior
	2 – unexpected-PDU	The user is notified via User Guidance Area.
	4 – unrecognized-PDU parameter	The user is notified via User Guidance Area.
	5 – unexpected-PDU parameter	?
	6 – invalid-PDU-parameter value	?

4.2.1.3.1. Verification

4.2.1.3.1.1. Description and Sequencing of Activities

The XanaduRF can send C-Echo DIMSE service to a remote system to verify the connection

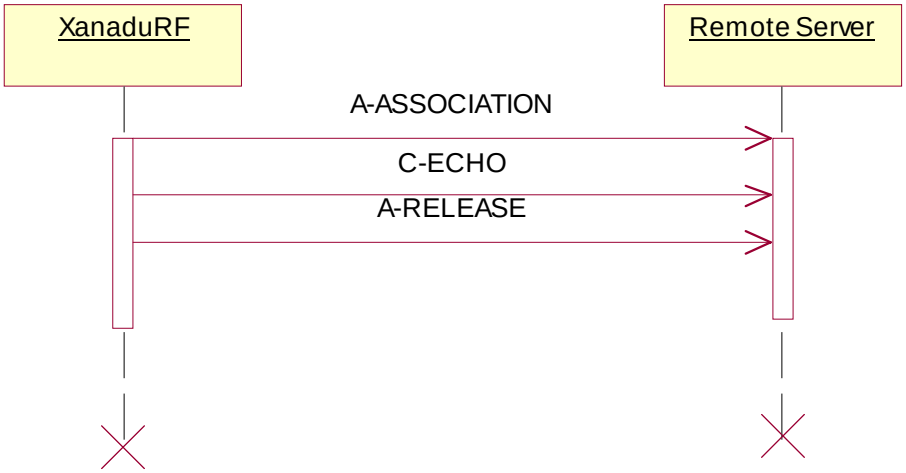

Figure 4-2: **Sequencing of Verification**

4.2.1.3.1.2. Proposed Presentation Contexts

In this subsection, the presentation contexts proposed by XanaduRF for Verification are defined in Table 4-9.

Table 4-9: Proposed Presentation Contexts for Verification

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

In the table the preferred transfer syntax is reduced sequentially from top to bottom.

4.2.1.3.1.3. SOP Specific Conformance for SOP Classes

Return 0 represent connect success.

4.2.1.3.2. Storage

4.2.1.3.2.1. Description and Sequencing of Activities

The XanaduRF can send Images to a remote system.

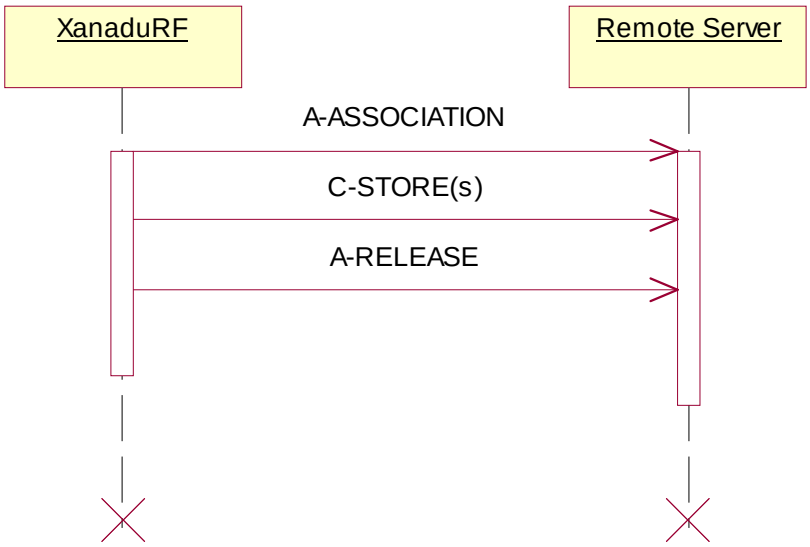

Figure 4-3: **Sequencing of Storage**

Note:Storage and Storage Commitment are sepatate RWA's.

4.2.1.3.2.2. Proposed Presentation Contexts

In this subsection, the presentation contexts proposed by XanaduRF for Storage are defined in Table 4-10.

Table 4-10: Proposed Presentation Contexts for Storage

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
RF Image Storage	1.2.840.10008.5.1.4.1.1.12.2	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

In the table the preferred transfer syntax is reduced sequentially from top to bottom.

4.2.1.3.2.3. SOP Specific Conformance for SOP Classes

Table 4-11: DICOM Command Response Status Handling Behavior

Status Code	Service Status	Further Meaning	Resulting Action
0000	Success	Success	
A7xx	Refused	Out of Resources	Release Association

			immediately and stop sending outstanding images
A9xx	Error	Data Set Does Not Match SOP Class	Release Association immediately and stop sending outstanding images
C000		Cannot Understand	
B000	Warning	Coercion of Data Elements	Continues Operation
B007		Data Set Does Not Match SOP Class	
B006		Elements Discarded	

(Note: In the event of a successful C-STORE operation, the image has been stored.The C-STORE is unsuccessful if XanaduRF returns one of the above status codes except 0000. On an association many images can be send.)

4.2.1.3.3. Print

4.2.1.3.3.1. Description and Sequencing of Activities

The XanaduRF uses the following sequence of actions to communicate a film session to a printer. For each N-CREATE action, the XanaduRF lets the Print SCP determine the SOP Instance UID of the created object.

Print Sequencing of Activities

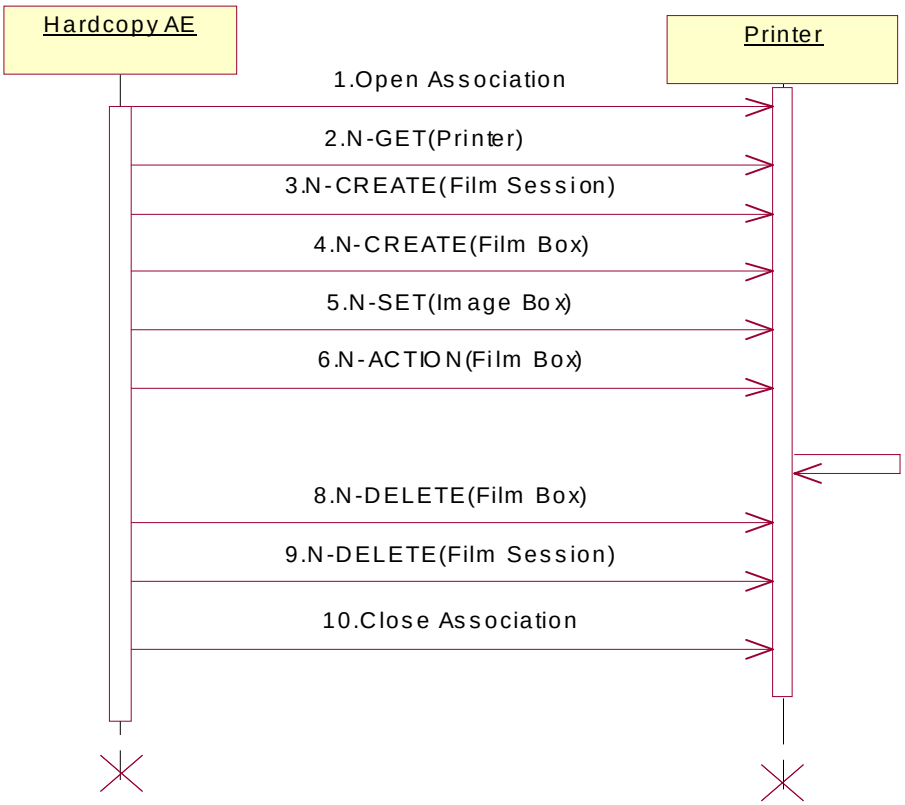

Figure 4-4: **Sequencing of Print**

4.2.1.3.3.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the presentation Contexts proposed by the XanaduRF for Print Images are defined in below table.

Table 4-12: Proposed Presentation Contexts for Print Management

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

In the table the preferred transfer syntax is reduced sequentially from top to bottom.

4.2.1.3.3.3. SOP Specific Conformance Printer SOP Class

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

N-GET

Table 4-13: GET Printer request identifier

Name	Tag	Presence of Value	Comments
Printer Status	0x2110 0010	ALWAYS	Printer status
Printer Status info	0x2110 0020	ALWAYS	

N-GET DIMSE does not create any Data Set Attributes.
The behavior on successful and unsuccessful transfer is given in the Table 4-14.

Table 4-14 The behavior on successful and unsuccessful transfer

Service Status	Further meaning	Error code	Behavior
Success	Successful operation	0000	The print job continues
Warning	Any warning	xxxx	The print job continues and the warning is displayed to the user
Failure	Any Failure	xxxx	The print job stops and the failure reason is displayed to the user

4.2.1.3.3.4. SOP Specific Conformance Basic Film Session SOP Class

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

N-CREATE
N-DELETE

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

Table 4-15: Basic Film Session Presentation Module

Name	Tag	Presence of Value	Comments
Number of Copies	0x2000 0010	ALWAYS	Number of copies to be printed for each film of the film session.
Print Priority	0x2000 0020	ALWAYS	Specifies the priority of the print job. Enumerated Values: HIGH, MED, LOW.

Medium Type	0x2000 0030	ALWAYS	Type of medium on which the print job will be printed. Defined Terms: PAPER CLEAR FILM BLUE FILM
Film Destination	0x2000 0040	ALWAYS	Film destination. Defined Terms: MAGAZINE = the exposed film is stored in film magazine. PROCESSOR = the exposed film is developed in film processor. BIN_i = the exposed film is deposited in a sorter bin where "I" represents the bin number. Film sorter BINs shall be numbered sequentially starting from one and no maximum is placed on the number of BINs. The encoding of the BIN number shall not contain leading zeros.
Film Session Label	0x2000 0050	ALWAYS	Label of the film session

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

Table 4-16: DICOM Command Response Status Handling Behavior for Basic Film Session N-CREATE

Service Status	Further meaning	Error code	Behavior
Success	Film Session Successful created	0000	The print job continues
Warning	Memory Allocation not supported	B600	The print job continues and g the warning is Displayed to the user

There are no specific status codes for N-DLETE DIMSE
The SCU uses the N-DELETE to request the SCP to delete the Basic Film Session SOP Instance hierarchy.

4.2.1.3.3.5. SOP Specific Conformance Basic Film Box SOP Class

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

N-CREATE
N-ACTION
N-DELETE

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

Table 4-17: Basic Film Box Presentation Module

Name	Tag	Presence of Value	Comments
Image Display Format	0x2010 0010	ALWAYS	Type of image display format. Enumerated Values: STANDARD\C, R: film contains equal size rectangular image boxes with R rows of image boxes and C columns of image boxes; C and R are integers. ROW\R1, R2, R3, etc.: film contains rows with equal size rectangular image boxes with R1 image boxes in the first row, R2 image boxes in second row, R3 image boxes in third row, etc.; R1, R2, R3, etc. are integers. COL\C1, C2, C3, etc.: film contains columns with equal size rectangular image boxes with C1 image boxes in the first column, C2 image boxes in second column, C3 image boxes in third column, etc.; C1, C2, C3, etc. are integers.

			SLIDE: film contains 35mm slides; the number of slides for a particular film size is configuration dependent. SUPERSLIDE: film contains 40mm slides; the number of slides for a particular film size is configuration dependent. CUSTOM\i: film contains a customized ordering of rectangular image boxes; i identify the image display format; the definition of the image display formats is defined in the Conformance Statement; i is an integer.
Film Orientation	0x2010 0040	ALWAYS	Film orientation. Enumerated Values: PORTRAIT = vertical film position. LANDSCAPE = horizontal film position.
Film Size ID	0x2010 0050	ALWAYS	Film size identification. Defined Terms: 8INX10IN 8_5INX11IN 10INX12IN 10INX14IN 11INX14IN 11INX17IN 14INX14IN 14INX17IN 24CMX24CM 24CMX30CM A4 A3 Note: 10INX14IN corresponds with 25.7CMX36.4CM. A4 corresponds with 210 x 297 millimeters. A3 corresponds with 297 x 420 millimeters.
Magnification Type	0x2010 0060	ALWAYS	Interpolation type by which the printer magnifies or decimates the image in order to fit the image in the image box on film. Defined Terms: REPLICATE BILINEAR CUBIC NONE
Max Density	0x2010 0130	ALWAYS	Maximum density of the images on the film, expressed in hundredths of OD. If Max Density is higher than maximum printer density than Max Density is set to maximum printer density.
Min Density	0x2010 0120	ALWAYS	
Configuration Information	0x2010 0150	ALWAYS	
Referenced Film Session Sequence	0x2010 0500	ALWAYS	
>Referenced SOP Class UID	0x0008 1150	ALWAYS	
> Referenced SOP Instance UID	0x0008 1150	ALWAYS	

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

Table 4-18: DICOM Command Response Status Handling Behavior for Basic Film Box N-CREATE

Service Status	Further meaning	Error code	Behavior
Success	Film Box Successful created	0000	The print job continues
Warning	Requested Min Density or Max Density outside of Printer's operating Range	B605	The print job continues and g the warning is Displayed to the user

Failure	There is an existing Film Box that has not been printed	C616	The print job stops and the failure reason is displayed to the user

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

Table 4-19: DICOM Command Response Status Handling Behavior for Basic Film Box N-ACTION

Service Status	Further meaning	Error code	Behavior
Success	Film accepted for printing	0000	The print job continues
Warning	Film Box SOP Instance Hierarchy does not contain Image Box SOP instances	B603	The print job continues and g the warning is Displayed to the user
	Image Size is larger than Image Box Size The Image has been demagnified	B604	The print job continues and g the warning is Displayed to the user
	Image Size is larger than Image Box Size The Image has been cropped to fit	B609	The print job continues and g the warning is Displayed to the user
	Image Size or combined Print Image Size is larger than Image Box Size The Image or combined Print Image has been decimated to fit	B60A	The print job continues and g the warning is Displayed to the user
Failure	Unable to create Print Job SOP Instance Print Queue is full	C602	The print job stops and the failure reason is displayed to the user
	Image Size is larger than Image Box Size	C603	The print job stops and the failure reason is displayed to the user
	Combined Print Image Size is larger than Image Box Size	C613	The print job stops and the failure reason is displayed to the user

There are no specific status codes for N-DLETE DIMSE
The SCU uses the N-DELETE to request the SCP to delete the Basic Film Box SOP Instance hierarchy.

4.2.1.3.3.6. SOP Specific Conformance Basic Grayscale Image Box SOP Class

The Printer process conforms to the Basic Grayscale Image Box Sop Class.
The following DIMSE service element is supported:
N-SET
The following table lists the supported attributes for the N-SET DIMSE

Table 4-20: Basic Grayscale Image Box SOP Class - N-SET-RQ - Pixel Presentation Module

Name	Tag	Presence of Value	Comments
Image Position	0x2020 0010	ALWAYS	The position of the image on the film, based on Image Display Format (2010,0010). See C.13.5.1 for specification.
Polarity	0x2020 0020	ALWAYS	Specifies whether minimum pixel values (after VOI LUT transformation) are to printed black or white. Enumerated Values: NORMAL = pixels shall be printed as specified by the Photometric Interpretation (0028,0004).

			REVERSE = pixels shall be printed with the opposite polarity as specified by the Photometric Interpretation (0028,0004) If Polarity (2020,0020) is not specified by the SCU, the SCP shall print with NORMAL polarity.
Basic Grayscale Image Sequence	0x2020 0110	ALWAYS	A sequence, which provides the content of the grayscale image pixel data to be printed. This is a specialization of the Image Pixel Module defined in C.7.6.3 of this part. It is encoded as a sequence of Attributes of the Image Pixel Module.
>Samples per Pixel	0x0028 0002	ALWAYS	
>Photometric Interpretation	0x0028 0004	ALWAYS	
>Rows	0x0028 0010	ALWAYS	
>Columns	0x0028 0011	ALWAYS	
>Pixel Aspect Ratio	0x0028 0034	ALWAYS	
>Bits Allocated	0x0028 0100	ALWAYS	8
>Bits Stored	0x0028 0101	ALWAYS	8
>High Bit	0x0028 0102	ALWAYS	7
>Pixel Representation	0x0028 0103	ALWAYS	
>Pixel Data	0x7FE0, 0010	ALWAYS	Image Pixel Module

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

Table 4-21: DICOM Command Response Status Handling Behavior for Basic Grayscale Image Box N-SET

Service Status	Further meaning	Error code	Behavior
Success	Image successfully stored in Image Box	0000	The print job continues
Warning	Image Size is larger than Image Box Size The Image has been demagnified	B604	The print job continues and g the warning is Displayed to the user
	Requested Min Density or Max Density outside of Printer's operating Range	B605	The print job continues and g the warning is Displayed to the user
	mage Size is larger than Image Box Size The Image has been cropped to fit	B609	The print job continues and g the warning is Displayed to the user
	Image Size or combined Print Image Size is larger than Image Box Size The Image or combined Print Image has been decimated to fit	B60A	The print job continues and g the warning is Displayed to the user
Failure	Image Size is larger than Image Box Size	C603	The print job stops and the failure reason is displayed to the user
	Insufficient Memory in Printer to store the Image	C605	The print job stops and the failure reason is displayed to the user
	Combined Print Image Size is larger than Image Box Size	C613	The print job stops and the failure reason is displayed to the user

4.2.1.3.4. Worklist

4.2.1.3.4.1. Description and Sequencing of Activities

XanaduRF can establish an association towards the Basic Worklist Management SCP and transmit a C-FIND

request. The query is triggered by the user.

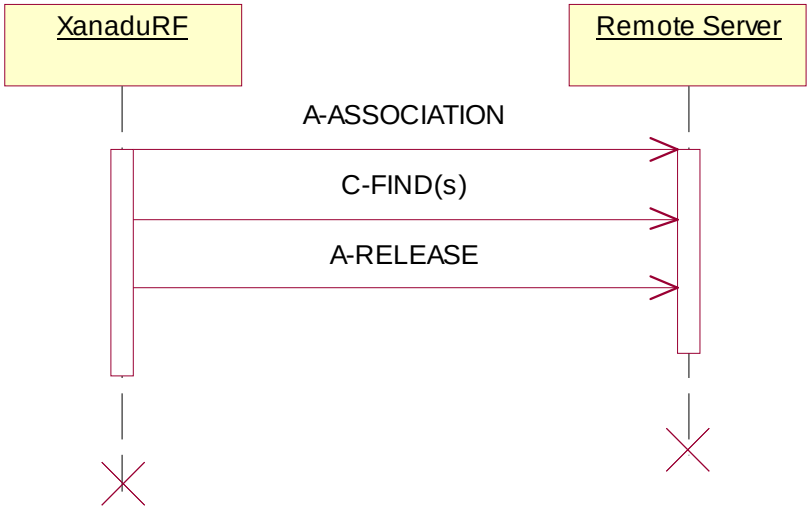

Figure 4-5: **Sequencing of Worklist**

4.2.1.3.4.2. Proposed Presentation Contexts

In this subsection, the presentation contexts proposed by XanaduRF for Worklist are defined in Table 4-22.

Table 4-22: Proposed Presentation Contexts for Worklist

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

In the table the preferred transfer syntax is reduced sequentially from top to bottom.

4.2.1.3.4.3. SOP Specific Conformance for SOP Classes

Table 4-23: DICOM Command Response Status Handling Behavior

Status Code	Service Status	Further Meaning	Resulting Action
0000	Success	Success	Continue
A700	Failure Failed	Out of Resources	Release Association
A900		Identifier Does Not Match SOP Class	Release Association
Cxxx		Unable to process	
FF00	Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	Continue

FF01		Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier.	Continue

Table 4-24: Worklist Request Identifier

Module Name Attribute Name	Tag	VR	M	*R*	*Q*	D	IOD
SOP Common							
Specific Character Set	(0008,0005)	CS				x	x
Scheduled Procedure Step							
Scheduled Procedure Step Sequence	(0040,0100)	SQ		x			
> Scheduled Station AET	(0040,0001)	AE			x	x	
> Scheduled Procedure Step Start Date	(0040,0002)	DA			x	x	
> Scheduled Procedure Step Start Time	(0040,0003)	TM		x		x	
> Modality	(0008,0060)	CS			x	x	
> Scheduled Performing Physician’s Name	(0040,0006)	PN			x	x	
> Scheduled Procedure Step Description	(0040,0007)	LO			x	x	
> Scheduled Procedure Step ID	(0040,0009)	SH			x	x	
Requested Procedure							
Requested Procedure ID	(0040,1001)	SH			x	x	
Requested Procedure Description	(0032,1060)	LO			x	x	
Study Instance UID	(0020,000D)	UI			x	x	x
Imaging Service Request							
Accession Number	(0008,0050)	SH			x	x	x
Referring Physician's Name	(0008,0090)	PN			x	x	x
Patient Identification							
Patient Name	(0010,0010)	PN			x	x	x
Patient ID	(0010,0020)	LO			x	x	x
Patient Demographic							
Patient’s Birth Date	(0010,0030)	DA			x	x	x
Patient’s Sex	(0010,0040)	CS			x	x	x

Note:
Module Name: The name of the associated module for supported worklist attributes.
Attribute Name: Attributes supported to build an XanaduRF Worklist Request Identifier.
Tag: DICOM tag for this attribute.
VR: DICOM VR for this attribute.
M: Matching keys for (automatic) Worklist Update. A "S" will indicate that XanaduRF will supply an attribute value for Single Value Matching, a “R” will indicate Range Matching and a “*” will denote wildcard matching. It can be configured if “Scheduled Station AE Title” is additionally supplied “(S)” and if Modality is set to RF or SC.
R: Return keys. An "x" will indicate that XanaduRF will supply this attribute as Return Key with zero length for Universal Matching.
Q: Interactive Query Key. An “x” " will indicate that XanaduRF will supply this attribute as matching key, if entered in the Query Patient Worklist dialog.
D: Displayed keys. An “x” indicates that this worklist attribute is displayed to the user during a patient registration dialog.
IOD: An "x" indicates that this Worklist attribute is included into all Object Instances created during performance of the related Procedure Step.

4.2.1.3.5. MPPS

4.2.1.3.5.1. Description and Sequencing of Activities

Modality Performed Procedure Step will be performed after a record from RIS server is imported into local database. And an initial MPPS IN PROGRESS message with N-CREATE is sent. After the study has been closed by the user, the system will change the MPPS status of the related study to “COMPLETED” and generate a MPPS COMPLETED message by N-SET. The closed study cannot be reopened. The N-CREATE and the N-SET are performed in different associations.

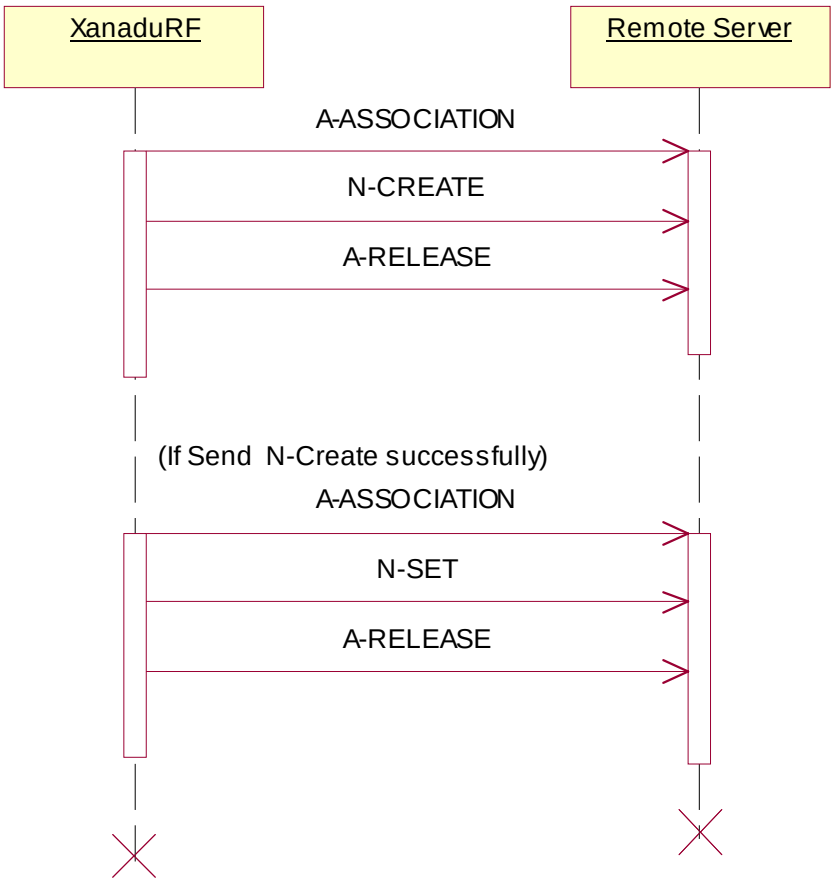

Figure 4-6: **Sequencing of MPPS**

4.2.1.3.5.2. Proposed Presentation Contexts

In this subsection, the presentation contexts proposed by XanaduRF for MPPS are defined in Table 4-25.

Table 4-25: Proposed Presentation Contexts for MPPS

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	ELE EBE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

In the table the preferred transfer syntax is reduced sequentially from top to bottom.

4.2.1.3.5.3. SOP Specific Conformance for SOP Classes

Table 4-26: DICOM Command Response Status Handling Behavior(N-Set)

Status Code	Service Status	Further Meaning	Resulting Action
0110H	Failure	Processing Failure	Release Association

Table 4-27 provides a description of the MPPS N-CREATE and N-SET request identifiers sent by XanaduRF. 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 4-27 MPPS N-CREATE / N-SET Request Identifier

Attribute Name	Tag	VR	N-CREATE	N-SET
Specific Character Set	(0008,0005)	CS	From Modality Worklist	
Modality	(0008,0060)	CS	Automatically created	
Referenced Patient Sequence	(0008,1120)	SQ	Zero length	
Patient’s Name	(0010,0010)	PN	From Modality Worklist	
Patient ID	(0010,0020)	LO	From Modality Worklist	
Patient’s Birth Date	(0010,0030)	DA	From Modality Worklist or Patient Registration	
Patient’s Sex	(0010,0040)	CS	From Modality Worklist	
Study ID	(0020,0010)	SH	Automatically created	
Performed Station AE Title	(0040,0241)	AE	Default: XanaduRF(Configurable)	
Performed Station Name	(0040,0242)	SH	From configuration	
Performed Location	(0040,0243)	SH	From configuration	
Performed Procedure Step Start Date	(0040,0244)	DA	Actual start date	
Performed Procedure Step Start Time	(0040,0245)	TM	Actual start time	
Performed Procedure Step End Date	(0040,0250)	DA	Zero length	Actual end date
Performed Procedure Step End Time	(0040,0251)	TM	Zero length	Actual end time
Performed Procedure Step Status	(0040,0252)	CS	IN PROGRESS	DISCONTINUED or COMPLETED
Performed Procedure Step ID	(0040,0253)	SH	Automatically created	
Performed Procedure Step Description	(0040,0254)	LO	From configuration	
Performed Procedure Type Description	(0040,0255)	LO	Zero length	
Performed Protocol Code Sequence	(0040,0260)	SQ	Zero length	
Procedure Code Sequence	(0008,1032)	SQ	Zero length	
Scheduled Step Attributes Sequence	(0040,0270)	SQ	Automatically created	
> Referenced Study Sequence	(0008,1110)	SQ	Zero length	
> Accession Number	(0008,0050)	SH	From Modality Worklist	
> Study Instance UID	(0020,000D)	UI	From Modality Worklist	
> Requested Procedure Description	(0032,1060)	LO	From Modality Worklist	
> Scheduled Procedure Step Description	(0040,0007)	LO	From Modality Worklist	
> Scheduled Procedure Step ID	(0040,0009)	SH	From Modality Worklist	
> Requested Procedure ID	(0040,1001)	SH	From Modality Worklist	
> Scheduled Protocol Code Sequence	(0040,0008)	SQ	Zero length	
Performed Series Sequence	(0040,0340)	SQ	Zero length	Automatically created

Attribute Name	Tag	VR	N-CREATE	N-SET
> Performing Physician's Name	(0008,1050)	PN		Automatically created
> Operator's Name	(0008,1070)	PN		Automatically created
> Protocol Name	(0018,1030)	LO		Automatically created
> Series Instance UID	(0020,000E)	UI		Automatically created
> Series Description	(0008,103E)	LO		Entered by user
> Retrieve AE Title	(0008,0054)	AE		Automatically created
> Referenced Image Sequence	(0008,1140)	SQ		Automatically created
>>Referenced SOP Class UID	(0008,1150)	UI		Automatically created
>> Referenced SOP Instance UID	(0008,1155)	UI		Automatically created
> Referenced NonImage Composite SOP Instance Sequence	(0040,0220)	SQ		Automatically created
>>Referenced SOP Class UID	(0008,1150)	UI		Automatically created
>> Referenced SOP Instance UID	(0008,1155)	UI		Automatically created

4.2.1.3.6. Storage Commitment

4.2.1.3.6.1. Description and Sequencing of Activities

Request Storage Commitment involves the storage commitment of images on a remote system. Storage Commitment will be initiated in a new association after closing the association of the related image storage (C-STORE). This new association will be open until the remote archive sends a storage commitment report (synchronous) or when the configured maximum time is passed. When this maximum configured period is passed, it is the responsibility of the remote archive to setup a new association with XanaduRF and send the storage commitment report (asynchronous).

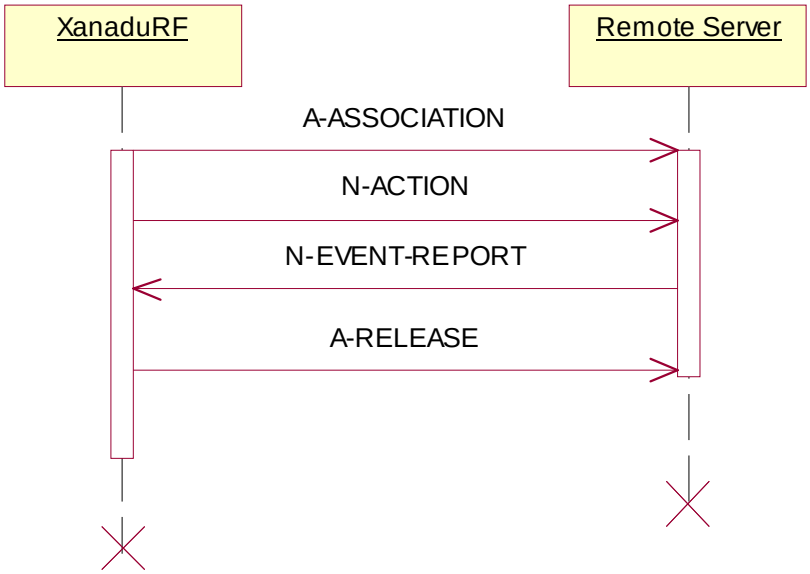

Figure 4-7: **Sequencing of Synchronous Request Storage Commitment**

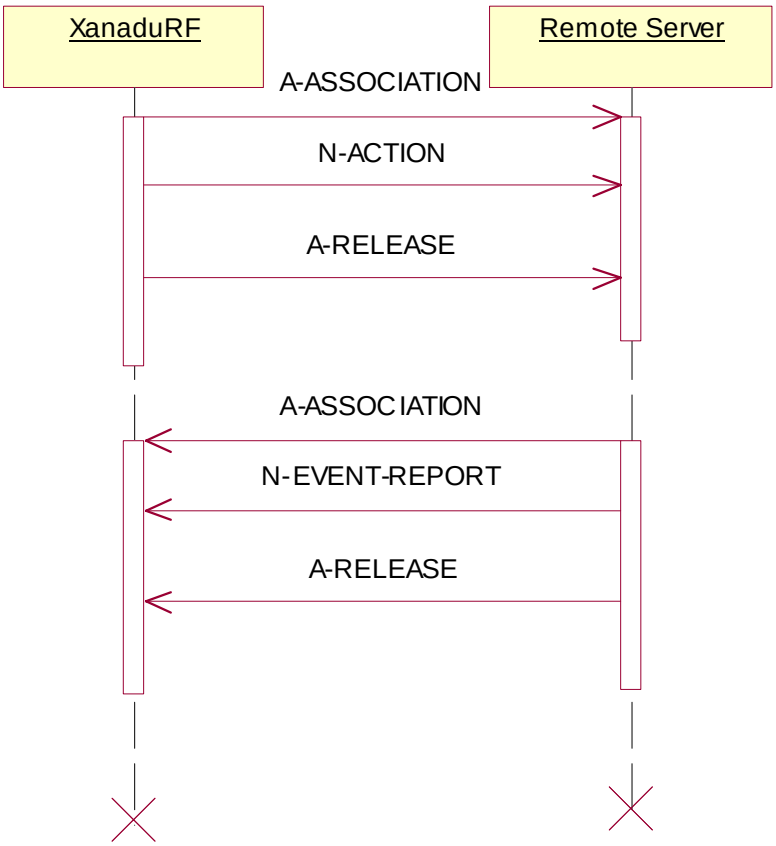

Figure 4-8: Sequencing of Asynchronous Request Storage Commitment

Note:Storage and Storage Commitment are sepatate RWA's.

4.2.1.3.6.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the XanaduRF for Request Storage Commitment are defined in below table.

.

Table 4-28: Proposed Presentation Contexts for Request Storage Commitment

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

In the table the preferred transfer syntax is reduced sequentially from top to bottom.

4.2.1.3.6.3 SOP Specific Conformance for SOP Classes

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

Table 4-29: DICOM Command Response Status Handling Behavior

Service Status	Further meaning	Error code	Behavior
Success	Operation complete	0000	Display success message
Failure	Any failure	xxxx	The reason is displayed

The XanaduRF does not take any more actions on receiving the N-EVENTREPORT,even when failures exist (Event Type ID 2).

Table 4-30: DICOM Command Communication Failure Behavior

Exception	Behavior
Reply Time-out	The association is released. Continues with waiting for storage commitment.
Association Time-out SCU	The association is released. Continues with waiting for storage commitment.
Association aborted	Continues with waiting for storage commitment.

4.2.1.4. Association Acceptance Policy

The behavior of the XanaduRF during association rejection is summarized in Table 4-31.

Table 4-31: DICOM Association Rejection Handling

Result	Source	Reason/Diagnosis	Behavior
1 – rejected-permanent	1 – DICOM UL service-user	1 – no-reason-given	The user is notified via User Guidance Area.
		2 – application-context-name-not-supported	The user is notified via User Guidance Area.
		3 – calling-AE-title-not-recognized	The user is notified via User Guidance Area.
		7 – called-AE-title-not-recognized	The user is notified via User Guidance Area.
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	The user is notified via User Guidance Area.

Result	Source	Reason/Diagnosis	Behavior
		2 – protocol-version-not-supported	The user is notified via User Guidance Area.
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	The user is notified via User Guidance Area.
		2 – local-limit-exceeded	The user is notified via User Guidance Area.
2 – rejected-transient	1 – DICOM UL service-user	1 – no-reason-given	The user is notified via User Guidance Area.
		2 – application-context-name-not-supported	The user is notified via User Guidance Area.
		3 – calling-AE-title-not-recognized	The user is notified via User Guidance Area.
		7 – called-AE-title-not-recognized	The user is notified via User Guidance Area.
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	The user is notified via User Guidance Area.
		2 – protocol-version-not-supported	The user is notified via User Guidance Area.
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	The user is notified via User Guidance Area.
		2 – local-limit-exceeded	The user is notified via User Guidance Area.

The behavior of the XanaduRF on receiving an association abort is summarized in Table 4-32.

Table 4-32: DICOM Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	The user is notified via User Guidance Area.
2 – DICOM UL service-provider	0 – reason-not-specified	The user is notified via User Guidance Area.
	1 – unrecognized-PDU	The user is notified via User Guidance Area.
	2 – unexpected-PDU	The user is notified via User Guidance Area.
	4 – unrecognized-PDU parameter	The user is notified via User Guidance Area.

Source	Reason/Diagnosis	Behavior
	5 – unexpected-PDU parameter	The user is notified via User Guidance Area.
	6 – invalid-PDU-parameter value	The user is notified via User Guidance Area.

The behavior of the XanaduRF for sending an association abort is summarized in Table 4-33.

Table 4-33: DICOM Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	The user is notified via User Guidance Area.
2 – DICOM UL service-provider	0 – reason-not-specified	The user is notified via User Guidance Area.
	1 – unrecognized-PDU	The user is notified via User Guidance Area.
	2 – unexpected-PDU	The user is notified via User Guidance Area.
	4 – unrecognized-PDU parameter	The user is notified via User Guidance Area.
	5 – unexpected-PDU parameter	The user is notified via User Guidance Area.
	6 – invalid-PDU-parameter value	The user is notified via User Guidance Area.

4.2.1.4.1. Activity – Receive Storage Commitment Response

4.2.1.4.1.1. Description and Sequencing of Activities

The XanaduRF will accept associations in order to receive responses to a Storage Commitment Request.

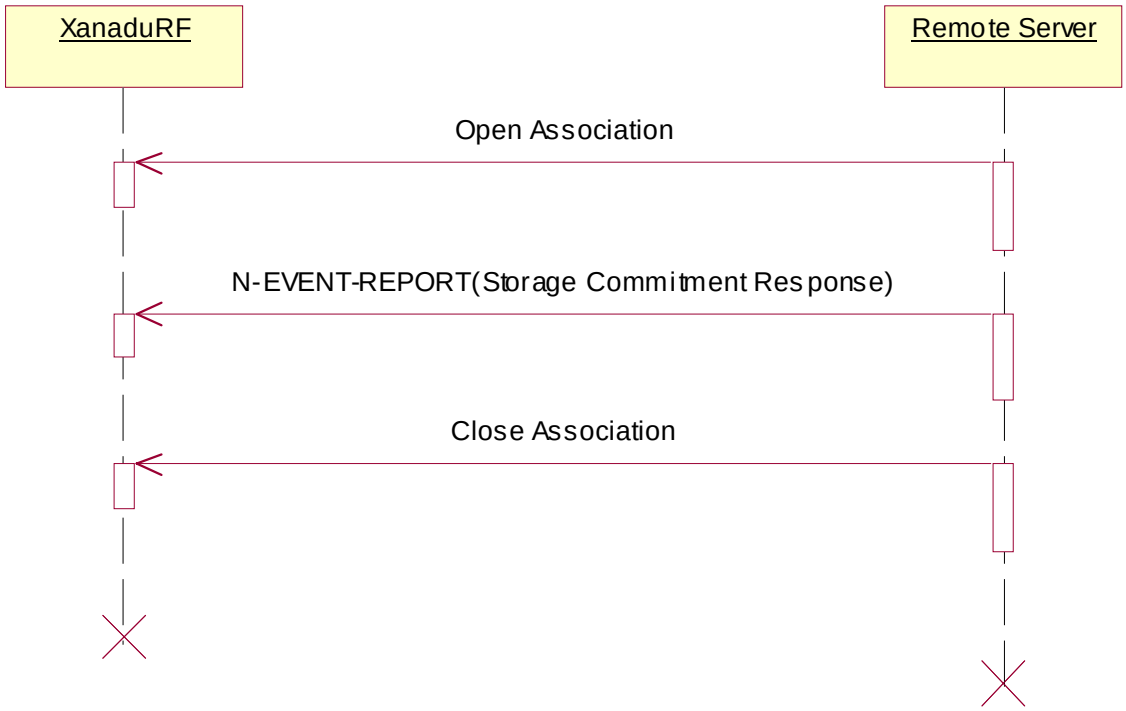

Figure 4-9: SEQUENCING OF ACTIVITY - RECEIVE STORAGE COMMITMENT RESPONSE

4.2.1.4.2. Accepted Presentation Contexts

Table 4-34 Acceptable Presentation Contexts For Activity Receive Storage Commitment Response

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

In the table the preferred transfer syntax is reduced sequentially from top to bottom.

4.3. Network Interfaces

4.3.1. Physical Network Interface

The XanaduRF application provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of [DICOM]

XanaduRF inherits its TCP/IP stack from Windows XP (i.e. the operating system platform). XanaduRF supports a single network interface Ethernet ISO. 8802-3.

With standard supported physical medium include:
IEEE 802.3 10BASE-TX
IEEE 802.3 100BASE-TX (Fast Ethernet)
IEEE 802.3 1000BASE-X (Fiber Optic Gig)

4.3.2. Additional Protocols

No Additional Protocols.

4.4. Configuration

The XanaduRF1.0 system is configured by means of a configuration module.

4.4.1. AE Title/Presentation Address Mapping

4.4.1.1. Local AE Titles

The local Application Entity Title and local (System) IP Address are set by the service setting program.

Table 4-35: AE Title Configuration Table

Application Entity	Application Entity Title (Default)	Default TCP/IP Port(Default)
XanaduRF	None	None

4.4.1.2. Remote AE Title/Presentation Address Mapping

All remote applications to be selected as image export destination or as Storage Commitment server or as Worklist Supplier or as MPPS server or as Print server are configurable for the following items:
The Application Entity Title of the remote application.
The IP Address and Port Number at which the remote application should accept Association requests.

4.4.1.3. Attributes for the modality Worklist and MPPS

All attributes supported for the modality Worklist and MPPS can be send or not send. They are set by the service setting program.

4.4.2. Parameters

The specification of important operational parameters is specified in Table 4-36

Table 4-36 Parameters

Parameter	Configurable	Default Value
General Parameters		
Max PDU receive size	No	128k
Max PDU send size	No	128k
Enable Storage	Yes	Disable
Enable Storage Committment (synchronous)	Yes	Disable
Enable Worklist	Yes	Disable
Enable MPPS	Yes	Disable
Storage Parameters		
General DIMSE level time-out values	Yes	20s
Time-out waiting for response to TCP/IP connect request. (Lowlevel timeout)	No	Current Operation System Default Value
Time-out for waiting for data between TCP/IP packets.(Low-level timeout)	Yes	20s
Storage SCU time-out waiting for a response to a C-STORE-RQ	Yes	20s
Number of times a failed send job may be retried	No	0(Failed send jobs are not retried)
Maximum number of simultaneously initiated Associations by the Storage AE	No	1
Supported Transfer Syntaxes (separately	No	ELE EBE ILE

configurable for each remote AE)		
Storage Commitment Parameters		
General DIMSE level time-out values(synchronous)	Yes	20s
Time-out waiting for response to TCP/IP connect request. (Lowlevel timeout)	No	Current Operation System Default Value
Time-out for waiting for data between TCP/IP packets.(Low-level timeout)	Yes	20s
Storage Commitment SCU time-out waiting for a response (synchronous)	Yes	20s
Enable Storage Commitment SCU time-out waiting for a response (asynchronous)	Yes	Not waiting for a response (asynchronous)
DIMSE level time-out values (asynchronous)	Yes	2s
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout) (asynchronous)	Yes	2s
Time-out for waiting for data between TCP/IP packets.(Low-level timeout) (asynchronous)	Yes	2s
Timeout waiting for a Storage Commitment Notification . (asynchronous)	No	All the time
Maximum number of simultaneously accepted Associations by the Storage AE	No	1
Storage Commitment request must be sent after Storage request	Yes	Not be sent
Supported Transfer Syntaxes for Storage Commitment Notification	No	ELE EBE ILE
Modality Worklist Parameters		
General DIMSE level time-out values	Yes	20s
Time-out waiting for response to TCP/IP connect request. (Lowlevel timeout)	No	Current Operation System Default Value
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	Yes	20s
Modality Worklist SCU time-out waiting for the final response to a C-FIND-RQ	Yes	20s
Maximum number of simultaneously initiated Associations by the Modality Worklist AE	No	1
Supported Transfer Syntaxes for Modality Worklist	No	ELE EBE ILE
Query Worklist for specific Modality Value	Yes	RF
Query Worklist for specific Scheduled Station AE Title	Yes	None
MPPS Parameters		
General DIMSE level time-out values	Yes	20s
Time-out waiting for response to TCP/IP connect request. (Lowlevel timeout)	No	Current Operation System Default Value
Time-out for waiting for data between TCP/IP packets.(Low-level timeout)	Yes	20s
MPPS SCU time-out waiting for a response to a N-CREATE-RQ and MPPS SCU time-out waiting for a response to a N-SET-RQ	Yes	20s
Supported Transfer Syntaxes for MPPS	No	ELE EBE ILE

Print Parameters		
Medium type	Yes	BLUE FILM
Film size ID (i.e. Media size)	Yes	14INX17IN
Destination	Yes	PROCESSOR
Magnification	Yes	CUBIC
Priority	Yes	MED
Film Format	Yes	STANDARD\2,3
Orientation	Yes	PORTRAIT
Min Density	Yes	10
Max Density	Yes	300
Supported Transfer Syntaxes for MPPS	No	ELE EBE ILE

5. MEDIA INTERCHANGE

5.1. Implementation Model

5.1.1. Application Data Flow Diagram

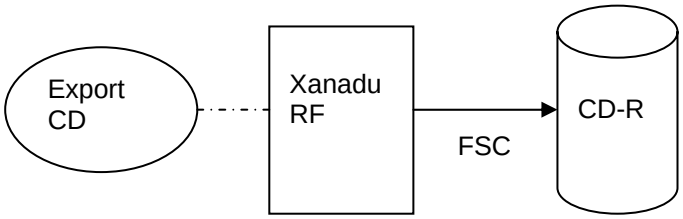

Figure 5-1: Application Data Flow Diagram

5.1.2. Functional Definitions of AE's

XanaduRF has FSC's function.

5.1.3. Sequencing of Real World Activities

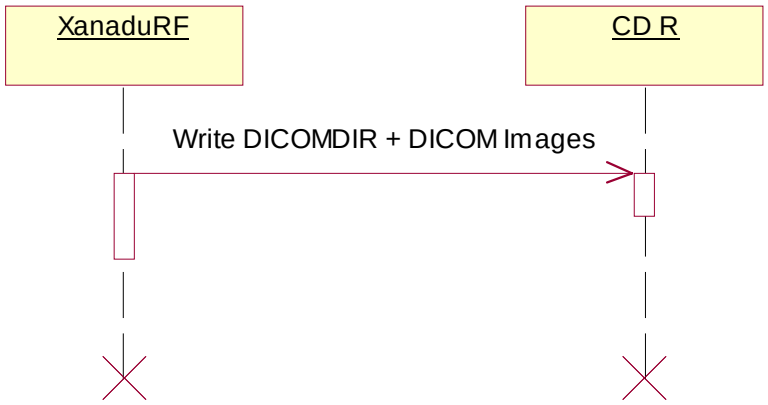

Figure 5-2: Sequencing of Real World Activities

5.1.4. File Meta Information for Implementation Class and Version

These are:

— File Meta Information Version: 00/01
— Implementation Class UID: 1.3.46.670589.35.1.1.3
— Implementation Version Name: XanaduDICOM1.3

5.2. AE Specifications

The next section in the DICOM Conformance Statement contains the specification of the one and only Essenta RC application entity: XanaduRF.

5.2.1. XanaduRF – Specification

XanaduRF provides Standard Conformance to
The DICOM Media Storage Service and File Format ([DICOM PS 3.10]),
The Media Storage Application Profiles STD-GEN-CD ([DICOM PS 3.11])

For Writing.
XanaduRF supports multi-patient and multi-session CD-R for writing.

The supported Application Profiles, their Roles and the Service Class(SC) options,all defined in DICOM terminology, are listed in Table 5-1.

Table 5-1 AE Related Application Profiles, Real-World Activities and Role for CD-R

Supported Application Rrofile	Real-World Activity	Role	SC Option
STD-GEN-CD	Export CD	FSC	Interchange

5.2.1.1. File Meta Information for the XanaduRF

Source Application Entity Title is XanaduRF.

5.2.1.2. Real-World Activities

5.2.1.2.1. Export CD

The XanaduRF can perform the CD-R Media Storage service with capabilities for:
RWA Export CD (as FSC).

5.3. Augmented and Private Application Profiles

5.3.1. Augmented Application Profiles

None.

5.3.2. Private Application Profiles

None.

5.4. Media Configuration

None.

6. SUPPORT OF CHARACTER SETS

In english version,the XanaduRF support character set ISO_IR100. In chinese version ,the XanaduRF support character set GB18030.An unknown character will not be displayed correctly in the user interface.

7. SECURITY

Not Applicable.

8. ANNEXES

8.1. IOD Contents

8.1.1. Created SOP Instances

This section specifies RF Image Storage IOD created by the XanaduRF AE

For module and macro Usage:
ALWAYS the module is always present
CONDITIONAL the module is used under specified condition

For attribute Definition:

Presence of Value
ALWAYS the attribute is always present with a value
EMPTY the attribute is always present without any value (attribute sent zero length)
VNAP the attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP the attribute is present under specified condition – if present then it will always have a value
ANAPCV the attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
ANAPEV the attribute is present under specified condition – if present then it will not have any value

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

8.1.1.1. Radiofluoroscopic Image Storage SOP Class

Table 8-1: IOD of Created X-Ray Radiofluoroscopic image storage SOP Instances

IE	Module	Reference	Reference of Module
Patient	Patient	Table 8-2	ALWAYS
Study	General Study	Table 8-3	ALWAYS
	Patient Study	Table 8-4	ALWAYS
Series	General Series	Table 8-5	ALWAYS
Equipment	General Equipment	Table 8-6	ALWAYS
Image	General Image	Table 8-7	ALWAYS
	Image Pixel	Table 8-8	ALWAYS
	Display Shutter	Table 8-9	ALWAYS
	X-ray Image	Table 8-10	ALWAYS

	X-ray Acquisition	Table 8-11	ALWAYS
	XRF Positioner	Table 8-12	ALWAYS
	Overlay Plane	Table 8-13	CONDITIONAL
	VOI LUT Module	Table 8-14	ALWAYS
	SOP Common	Table 8-15	ALWAYS

Table 8-2: X-Ray Radiofluoroscopic Image Storage SOP Class -Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN	From Modality Worklist or user input	ALWAYS	USER/ MWL
Patient ID	0010,0020	LO	From Modality Worklist or user input	ALWAYS	USER/ MWL
Patient's Birth Date	0010,0030	DA	From Modality Worklist or user input	VNAP	USER/ MWL
Patient's Sex	0010,0040	CS	From Modality Worklist or user input	VNAP	USER/ MWL
Other Patient IDs	0010,1000	LO	Entered by operator. If not entered, they are empty	VNAP	USER
Other Patient Names	0010,1001	PN	Entered by operator. If not entered, they are empty	VNAP	USER
Ethnic Group	0010,2160	SH	Entered by operator. If not entered, they are empty	VNAP	USER
Patient Comments	0010,4000	LT	Entered by operator. If not entered, they are empty	VNAP	USER

Table 8-3: X-Ray Radiofluor. Image Storage SOP Class -General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance	0020,000D	UI	From	ALWAYS	MWL/AUTO

UID			Modality Worklist or generated by device		
Study Date	0008,0020	DA	Generated by device	ALWAYS	AUTO
Study Time	0008,0030	TM	Generated by device	ALWAYS	AUTO
Accession Number	0008,0050	SH	Zero length if not received from Modality Worklist.	VNAP	MWL
Referring Physician's Name	0008,0090	PN	Zero length if not received from Modality Worklist.	VNAP	MWL
Study Description	0008,1030	LO	Entered by operator. If not entered, they are empty	VNAP	USER
Study ID	0020,0010	SH	Generated by device	ALWAYS	AUTO

Table 8-4: X-Ray Radiofluor. Image Storage SOP Class -Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Admitting Diagnoses Description	0008,1080	LO	Entered by operator. If not entered, they are empty	VNAP	USER
Patient's Size	0010,1020	DS	Entered by operator. If not entered, they are empty	VNAP	USER
Patient's Weight	0010,1030	DS	Entered by	VNAP	USER

			operator. If not entered, they are empty		
Occupation	0010,2180	SH	Entered by operator. If not entered, they are empty	VNAP	USER
Additional Patient's History	0010,21B0	LT	Entered by operator. If not entered, they are empty	VNAP	USER

Table 8-5: X-Ray Radiofluor. Image Storage SOP Class -General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA	Generated by device	ALWAYS	AUTO
Series Time	0008,0031	TM	Generated by device	ALWAYS	AUTO
Operators' Name	0008,1070	PN	Entered by operator. If not entered, they are empty	VNAP	USER
Modality	0008,0060	CS	Applied Value(s): RF	ALWAYS	AUTO
Performing Physician's Name	0008,1050	PN	From Modality Worklist, entered by operator. If not entered, they are empty	VNAP	USER
Body Part Examined	0018,0015	CS	Applied Value(s): SKULL, CSPINE, TSPINE, LSPINE,SSPINE, COCCYX, CHEST, CLAVICLE,BREAST, ABDOMEN,	VNAP	USER

			PELVIS, HIP,SHOULDER, ELBOW, KNEE, ANKLE,HAND, FOOT, EXTREMITY, HEAD, HEART,NECK, LEG, ARM, JAW		
Protocol Name	0018,1030	LO	Entered by operator. If not entered, they are empty	VNAP	USER
Series Instance UID	0020,000E	UI	Generated by device	ALWAYS	AUTO
Series Number	0020,0011	IS	Generated by device	ALWAYS	AUTO
Laterality	0020,0060	CS	Always zero length value.	Empty	AUTO
Performed Procedure Step Start Date	0040,0244	DA	Generated by device	VNAP	AUTO
Performed Procedure Step Start Time	0040,0245	TM	Generated by device	VNAP	AUTO
Performed Procedure Step ID	0040,0253	SH	Generated by device	VNAP	AUTO
Performed Procedure Step Description	0040,0254	LO	Generated by device	VNAP	AUTO

Table 8-6: X-Ray Radiof. Image Storage SOP Class-General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Generated by device	ALWAYS	AUTO
Institution Name	0008,0080	LO	Generated by device	ALWAYS	AUTO
Station Name	0008,1010	SH	Always zero length value.	Empty	AUTO
Manufacturer's	0008,1090	LO	Generated by	ALWAYS	AUTO

Model Name			device		
Device Serial Number	0018,1000	LO	Generated by device	ALWAYS	AUTO
Software Version(s)	0018,1020	LO	Generated by device	ALWAYS	AUTO

Table 8-7: X-Ray Radiofluor. Image Storage SOP Class -General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Date	0008,0022	DA	Generated by device	ALWAYS	AUTO
Content Date	0008,0023	DA	Generated by device	ALWAYS	AUTO
Acquisition Time	0008,0032	TM	Generated by device	ALWAYS	AUTO
Content Time	0008,0033	TM	Generated by device	ALWAYS	AUTO
Acquisition Number	0020,0012	IS	Generated by device	ALWAYS	AUTO
Instance Number	0020,0013	IS	Generated by device	ALWAYS	AUTO
Patient Orientation	0020,0020	CS	Always zero length value.	Empty	AUTO

Table 8-8: X-Ray Radiofluor. Image Storage SOP Class –Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Rows	0028,0010	US	Applied Value(s): 1000	ALWAYS	AUTO
Columns	0028,0011	US	Applied Value(s): 1000	ALWAYS	AUTO
Pixel Data	7FE0,0010	OW	Generated by device	ALWAYS	AUTO

Table 8-9: X-Ray Radiofluor. Image Storage SOP Class-Display Shutter Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Shutter Shape	0018,1600	CS	Applied Value(s): CIRCULAR /RECTANGULAR. Generated by device	ALWAYS	AUTO
Shutter Left Vertical Edge	0018,1602	IS	Generated by device	ALWAYS	AUTO
Shutter Right	0018,160	IS	Generated by device	ALWAYS	AUTO

Vertical Edge	4				
Shutter Upper Horizontal Edge	0018,1606	IS	Generated by device	ALWAYS	AUTO
Shutter Lower Horizontal Edge	0018,1608	IS	Generated by device	ALWAYS	AUTO
Center of Circular Shutter	0018,1610	IS	Generated by device	ALWAYS	AUTO
Radius of Circular Shutter	0018,1612	IS	Generated by device	ALWAYS	AUTO

Table 8-10: X-Ray Radiofluor. Image Storage SOP Class -X-ray Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	0008,0008	CS	ORIGINAL\PRIMARY\SINGLE PLANE(acquired images) DERIVED \ PRIMARY \SINGLE PLANE(saved images after DSA)	ALWAYS	AUTO
Pixel Intensity Relationship	0028,1040	CS	LOG	ALWAYS	AUTO
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO
Bits Stored	0028,0101	US	12	ALWAYS	AUTO
High Bit	0028,0102	US	11	ALWAYS	AUTO
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO

Table 8-11: X-Ray Radiofl. Image Storage SOP Class -X-ray Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
KVP	0018,0060	DS	Generated by device	ALWAYS	AUTO
Exposure	0018,1152	IS	Generated by device	ALWAYS	AUTO
Radiation Setting	0018,1155	CS	Applied Value(s): GR, SC	ALWAYS	AUTO
Intensifier Size	0018,1162	DS	Generated by device	VNAP	AUTO

Grid	0018,1166	CS	IN	ALWAYS	AUTO
Focal Spot	0018,1190	DS	Generated by device	VNAP	AUTO
Field View Shape	0018,1147	CS	ROUND	ALWAYS	AUTO

Table 8-12: X-Ray Radiofluor. Image Storage SOP Class - XRF Positioner Module

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

Table 8-13: X-Ray Radiofl. Image Storage SOP Class - Overlay Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Overlay Rows	6000,0010	US	Rows of the image	ALWAYS	AUTO
Overlay Columns	6000,0011	US	Columns of the image	ALWAYS	AUTO
Overlay Type	6000,0040	CS	G	ALWAYS	AUTO
Overlay Origin	6000,0050	SS	1\1	ALWAYS	AUTO
Overlay Bits Allocated	6000,0100	US	1	ALWAYS	AUTO
Overlay Bit Position	6000,0102	US	0	ALWAYS	AUTO
Overlay Data	6000,3000	OW/OB		ALWAYS	AUTO
Overlay Description	6000,0022	LO	PNMS	ALWAYS	AUTO
Overlay Label	6000,1500	LO	PNMS_OVERLAY	ALWAYS	AUTO

Table 8-14: X-Ray Radiofluoroscopic Image Storage SOP Class -VOI Lut Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	0028,1050	DS	Generated by	ALWAYS	AUTO

			device		
Window Width	0028,1051	DS	Generated by device	ALWAYS	AUTO

Table 8-15: X-Ray Radiofluor. Image Storage SOP Class -Sop Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	From Modality Worklist or generated by device	ALWAYS	AUTO
SOP Class UID	0008,0016	UI	Applied Value(s): 1.2.840.10008.5.1.4.1.1.12.2	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI	Generated by device	ALWAYS	AUTO

8.1.1.2. Grayscale Softcopy Presentation State

Table 8-16 Grayscale Softcopy Presentation State IOD Module

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8-17	ALWAYS
Study	General Study	Table 8-18	ALWAYS
Series	General Series	Table 8-19	ALWAYS
	Presentation Series	Table 8-20	ALWAYS
Equipment	General Equipment	Table 8-21	ALWAYS
Presentation State	Modality LUT	Table 8-22	CONDITIONAL
	Presentation State Identification	Table 8-23	ALWAYS
	Presentation State Relationship	Table 8-24	ALWAYS
	Presentation State Shutter	Table 8-25	CONDITIONAL
	Display Shutter	Table 8-26	CONDITIONAL
	Displayed Area	Table 8-27	CONDITIONAL
	Graphic Layer	Table 8-28	CONDITIONAL
	Graphic Annotation	Table 8-29	CONDITIONAL
	Spatial Transformation	Table 8-30	CONDITIONAL
	Softcopy VOI LUT	Table 8-31	CONDITIONAL

IE	Module	Reference	Presence of Module
	Softcopy Presentation LUT	Table 8-32	ALWAYS
	SOP Common	Table 8-33	ALWAYS

Table 8-17 Patient Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN		ALWAYS	COPY
Patient ID	0010,0020	LO		ALWAYS	COPY
Patient's Birth Date	0010,0030	DA		ALWAYS	COPY
Patient's Sex	0010,0040	CS	F,M,O	ALWAYS	COPY

Table8-18 General Study Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Study Date	0008,0020	DA		ALWAYS	COPY
Study Time	0008,0030	TM		ALWAYS	COPY
Accession number	0008,0050	SH		VNAP	COPY
Referring Physician's Name	0008,0090	PN		ALWAYS	COPY
Study Instance UID	0020,000d	UI		ALWAYS	COPY
Study ID	0020,0010	SH		ALWAYS	COPY

Table 8-19 General Series Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Series Instance UID	0020,000E	UI		ALWAYS	COPY
Series Number	0020,0011	IS		ALWAYS	COPY

Table 8-20 Presentation Series Module

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

Table 8-21 General Equipment Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO		ALWAYS	COPY

Table 8-22 Modality LUT Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Modality LUT Sequence	0028,3000	SQ		VNAP	COPY
>LUT Descriptor	0028,3002	US/SS		VNAP	COPY
>LUT Explanation	0028,3003	LO		VNAP	COPY
>Modality LUT Type	0028,3004	LO		VNAP	COPY
>LUT Data	0028,3006	US/SS/OW		VNAP	COPY
>Series Instance UID	(0020,000E)	UI		ALWAYS	COPY
>Referenced Image Sequence	(0008,1140)	SQ		ALWAYS	AUTO
>>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	COPY
>>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	COPY
>>Referenced Frame Number	(0008,1160)	IS		VNAP	COPY

Table 8-23 Presentation State Identification Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	1	ALWAYS	AUTO
Content Label	(0070,0080)	CS	“UNNAMED”	ALWAYS	AUTO
Content Description	(0070,0081)	LO		EMPTY	FIXED
Presentation Creation Date	(0070,0082)	DA	Current Date	ALWAYS	AUTO

Presentation Creation Time	(0070,0083)	TM	Current Time	ALWAYS	AUTO
Presentation Creator's Name	(0070,0084)	PN		EMPTY	FIXED

Table 8-24 Presentation State Relationship Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Referenced Series Sequence	(0008,1115)	SQ		ALWAYS	AUTO
>Series Instance UID	(0020,000E)	UI		ALWAYS	COPY
>Referenced Image Sequence	(0008,1140)	SQ		ALWAYS	AUTO
>>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	COPY
>>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	COPY
>>Referenced Frame Number	(0008,1160)	IS		VNAP	COPY

Table 8-25 Presentation State Shutter Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Shutter Presentation Value	(0018,1622)	IS		ANAP	COPY/USER

Table 8-26 Display Shutter Module

Attribute name	Tag	VR	Value	Presence of Value	Source

Shutter Shape	(0018,1600)	CS	RECTANGULAR CIRCULAR POLYGONAL	ALWAYS	COPY(RECTANGULAR, CIRCULAR, POLYGONAL) / USER(RECTANGULAR, CIRCULAR)
Shutter Left Vertical Edge	(0018,1602)	IS		ANAP	COPY/USER
Shutter Right Vertical Edge	(0018,1604)	IS		ANAP	COPY/USER
Shutter Upper Horizontal Edge	(0018,1606)	IS		ANAP	COPY/USER
Shutter Lower Horizontal Edge	(0018,1608)	IS		ANAP	COPY/USER
Center of Circular Shutter	(0018,1610)	IS		ANAP	COPY/USER
Radius of Circular Shutter	(0018,1612)	IS		ANAP	COPY/USER
Vertices of the Polygonal Shutter	(0018,1620)	IS		ANAP	COPY/USER
Shutter Presentation Value	(0018,1622)	IS		ANAP	COPY/USER

Table 8-27 Displayed Area Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Displayed Area Selection Sequence	(0070,005A)	SQ		ALWAYS	AUTO

>Referenced Image Sequence	(0008,1140)	SQ		ALWAYS	AUTO
>>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	COPY
>>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	COPY
>>Referenced Frame Number	(0008,1160)	IS		ALWAYS	COPY
>Displayed Area Top Left Hand Corner	(0070,0052)	SL		ALWAYS	COPY
>Displayed Area Bottom Right Hand Corner	(0070,0053)	SL		ALWAYS	COPY
>Presentation Size Mode	(0070,0100)	CS	SCALE TO FIT/ MAGNIFY/	ALWAYS	COPY
>Presentation Pixel Spacing	(0070,0101)	DS		ALWAYS	COPY
>Presentation Pixel Magnification Ratio	(0070,0103)	IS	0.1 – 10.0	ANAP	USER

Table 8-28 Graphic Layer Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Graphic Layer Sequence	(0070,0060)	SQ		ALWAYS	AUTO
> Graphic Layer	(0070,0002)	CS	ANNOTATIONS	ALWAYS	AUTO
> Graphic Layer Order	(0070,0062)	IS	1	ALWAYS	AUTO

> Graphic Layer Description	(0070,0068)	LO	ANNOTATIONS ON THE IMAGE	ALWAYS	AUTO

Table 8-29 Graphic Annotation Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Graphic Annotation Sequence	(0070,0001)	SQ		ANAP	AUTO
>Referenced Image Sequence	(0008,1140)	SQ		ALWAYS	AUTO
>>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	COPY
>>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	COPY
>>Referenced Frame Number	(0008,1160)	IS		ALWAYS	COPY
>Graphic Layer	(0070,0002)	CS	ANNOTATIONS	ALWAYS	AUTO
>Text Object Sequence	(0070,0008)	SQ		ANAP	USER
>>Bounding Box Annotation Units	(0070,0003)	CS	PIXEL DISPLAY	ALWAYS	USER
>>Anchor Point Annotation Units	(0070,0004)	CS		ALWAYS	USER
>>Unformatted Text Value	(0070,0006)	ST		ALWAYS	USER
>>Bounding Box Top Left Hand Corner	(0070,0010)	FL		ALWAYS	USER

>>Bounding Box Bottom Right Hand Corner	(0070,0011)	FL		ALWAYS	USER
>>Bounding Box Text Horizontal Justification	(0070,0012)	CS	LEFT RIGHT CENTER	ALWAYS	USER
>Graphic Object Sequence	(0070,0009)	SQ		ANAP	USER
>>Graphic Annotation Units	(0070,0005)	CS	PIXEL	ALWAYS	USER
>>Graphic Dimensions	(0070,0020)	US	2	ALWAYS	AUTO
>>Number of Graphic Points	(0070,0021)	US		ALWAYS	USER
>> Graphic Data	(0070,0022)	FL		ALWAYS	USER
>>Graphic Type	(0070,0023)	CS	ELLIPSE, POLYLINE	ALWAYS	USER
>>Graphic Filled	(0070,0024)	CS	N	ALWAYS	AUTO

Table 8-30 Spatial Transformation Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Image Rotation	(0070,0042)	US	0, 90 180 270	ANAP	USER
Image Horizontal Flip	(0070,0041)	CS	Y N	ANAP	USER

Table 8-31 Softcopy VOI LUT Module

Attribute name	Tag	VR	Value	Presence of Value	Source

Softcopy VOI LUT Sequence	(0028,3110)	SQ		ALWAYS	COPY
>Referenced Image Sequence	(0008,1140)	SQ		ALWAYS	COPY
>>Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	COPY
>>Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	COPY
>>Referenced Frame Number	(0008,1160)	IS		VNAP	COPY
>Window Center	(0028,1050)	DS		VNAP	COPY/USER
>Window Width	(0028,1051)	DS		VNAP	COPY/USER

Table 8-32 Softcopy Presentation LUT Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Presentation LUT Sequence	(2050,0010)	SQ		ANAP	AUTO
>LUT Descriptor	(0028,3002)	SS		ANAP	AUTO
>LUT Explanation	(0028,3003)	LO		ANAP	AUTO
>LUT Data	(0028,3006)	OW		ANAP	AUTO
Presentation LUT Shape	(2050,0020)	CS	IDENTITY, INVERSE	ANAP	AUTO/USER

Table 8-33 Sop Common Module

Attribute name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS		ANAP	COPY

SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.11.1	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO

8.1.2. Attribute Mapping

The relationships between attributes received via Modality Worklist, stored in acquired images and communicated via MPPS are summarized in Table 8-34.

Table 8-34 Attribute Mmpping Between Modality WORKLIST, MPPS and Image

MWL	MPPS	RF Image
Patient's Name	Patient's Name	Patient's Name
Patient ID	Patient ID	Patient ID
Patient's Birth Date	Patient's Birth Date	Patient's Birth Date
Patient's Sex	Patient's Sex	Patient's Sex
	Scheduled Step Attributes Sequence	
Study Instance UID	>Study Instance UID	Study Instance UID
Accession Number	>Accession Number	Accession Number
Requested Procedure ID	>Requested Procedure ID	
Requested Procedure Description	>Requested Procedure Description	
Scheduled Procedure Step ID	> Scheduled Procedure Step ID	
Scheduled Procedure Step Description	> Scheduled Procedure Step Description	
	Study ID	Study ID
	Performed Procedure Step ID	Performed Procedure Step ID
	Performed Procedure Step Start Date	Performed Procedure Step Start Date
	Performed Procedure Step Start Time	Performed Procedure Step Start Time
	Performed Procedure Step Description	Performed Procedure Step Description
		Referenced Study Component Sequence
	SOP Class UID	>Referenced SOP Class UID
	SOP Instance UID	>Referenced SOP

		Instance UID
	Performed Series Sequence	
	>Protocol Name	Protocol Name
Referring Phisician's Name		Referring Phisician's Name
Specific Character Set		Specific Character Set

8.1.3. Coerced/Modified fields

Not applicable.

8.2. Data Dictionary of Private Attributes

Not applicable.

8.3. Coded Terminology and Templates

Not applicable.

8.4. Grayscale Image consistency

Not applicable.

8.5. Standard Extended/Specialized/Private SOPs

Not applicable.

8.6. Private Transfer Syntaxes

None.