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DICOM Conformance Statement

SE Suite 2.0

Document no. 001394 - Revision 8

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Document Information

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Conformance Statement Overview

The SE Suite 2.0 is comprised of a storage facility, client review workstations and connectivity to DICOM modalities and other healthcare information systems.

The SE Suite 2.0 is comprised of two application entities (AE):

- the PACS application entity (PACS AE)
- the CLIENT application entity (Client AE)

The SE Suite 2.0:

- stores DICOM instances sent to it by service class users;
- takes responsibility for storage of the images;
- allows image queries based on several standard query models;
- retrieves and transmits requested images;
- displays images to a user;
- prints images to a printer;
- exports images to a CD-R Storage;
- and loads DICOM PS 3.10, 3.11 and 3.12 compliant files.

The SE Suite 2.0 acts as a service class user (SCU) for Verification, Storage, Query/Retrieve, Modality Worklist and Print Management Service Classes.

The SE Suite 2.0 acts as a service class provider (SCP) for Verification, Storage, Storage Commitment and Query/Retrieve Service Classes. It can also act in some cases as a Modality Worklist SCP thanks to a separate PACS component.

The SE Suite 2.0 conforms to the DICOM 3.0 standard 2008.

Table 1.1-1: Network Services Supported

SOP Classes	PACS AE		CLIENT AE	
	User of Service (SCU)	Provider of Service (SCP)	User of Service (SCU)	Provider of Service (SCP)
Verification				
Verification	NO	YES	YES	YES
Transfer				
Computed Radiography Image Storage	YES	YES	YES	YES
Digital X-Ray Image Storage – For Presentation	YES	YES	YES	YES
Digital X-Ray Image Storage – For Processing	YES	YES	YES	YES
Digital Mammography X-Ray Image Storage – For Presentation	YES	YES	YES	YES
Digital Mammography X-Ray Image Storage – For Processing	YES	YES	YES	YES
Computed Tomography Image Storage	YES	YES	YES	YES
Ultrasound Multi-frame Image Storage (Retired)	YES	YES	YES	YES
Ultrasound Multi-frame Image Storage	YES	YES	YES	YES
Magnetic Resonance Image Storage	YES	YES	YES	YES

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SOP Classes	PACS AE		CLIENT AE	
	User of Service (SCU)	Provider of Service (SCP)	User of Service (SCU)	Provider of Service (SCP)
Nuclear Medicine Image Storage (Retired)	YES	YES	YES	YES
Ultrasound Image Storage (Retired)	YES	YES	YES	YES
Ultrasound Image Storage	YES	YES	YES	YES
Secondary Capture Image Storage	YES	YES	YES	YES
Grayscale Softcopy Presentation State Storage	YES	YES	YES	YES
X-Ray Angiographic Image Storage	YES	YES	YES	YES
X-Ray Radio fluoroscopic Image Storage	YES	YES	YES	YES
X-Ray Angiographic Bi-plane Image Storage (Retired)	YES	YES	YES	YES
Nuclear Medicine Image Storage	YES	YES	YES	YES
Basic Text SR	YES	YES	YES	YES
Enhanced SR	YES	YES	YES	YES
Comprehensive SR	YES	YES	YES	YES
Mammography CAD SR	YES	YES	YES	YES
Key Object Selection	YES	YES	YES	YES
Positron Emission Tomography Image Storage SOP Class	YES	YES	YES	YES
Query/Retrieve				
Patient Root Query / Retrieve Information Model – MOVE	NO	YES	NO	YES
Patient Root Query / Retrieve Information Model – FIND	NO	YES	NO	YES
Study Root Query / Retrieve Information Model - MOVE	NO	YES	YES	YES
Study Root Query / Retrieve Information Model - FIND	NO	YES	YES	YES
Workflow Management				
Storage Commitment Push Model	NO	YES	NO	NO
Modality Worklist Information Model – FIND	NO	YES	YES	NO
Print Management				
Basic Grayscale Print Management Meta SOP Class	NO	NO	YES	NO
Basic Film Session SOP Class	NO	NO	YES	NO
Basic Film Box SOP Class	NO	NO	YES	NO
Basic Grayscale Image Box SOP Class	NO	NO	YES	NO
Presentation LUT SOP Class	NO	NO	YES	NO
Printer SOP Class	NO	NO	YES	NO

Table 1.1-2: Media Services Supported

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Media Storage Application Profile	PACS AE		CLIENT AE	
	Write Files (FSC)	**Read Files (FSR)**	**Write Files (FSC)**	**Read Files (FSR)**
Compact Disk - Recordable				
General Purpose CD-R	NO	NO	YES	YES

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1   INTRODUCTION

1.1   Revision Record

Revision Number	Date	Reason for Change
1.0	December 20, 2011	Initial version SE Suite 2.0, based on Document Node ID 28226198
1.1	May 30, 2013	Update Table 2.2-15: Film Label Session is now configurable via SE Central
5	October 15, 2018	Change "Agfa HealthCare" to "Agfa NV"
6	October 17, 2018	Replaced Agfa HealthCare logo with Agfa logo
7	May 28, 2019	Change value of Manufacturer (0008,0070) from "Agfa HealthCare" to "Agfa NV"
8	May 30, 2019	Update Service-related contact information worldwide to https://medimg.agfa.com/main/

1.2   Purpose and Intended Audience of this Document

This document is a DICOM Conformance Statement for the DICOM Services of the SE Suite 2.0.

The user of this document is involved with system integration and/or software design. We assume that the reader is familiar with the terminology and concepts that are used in the DICOM 3.0 standard and the IHE Technical Framework.

Readers not familiar with DICOM 3.0 terminology should first read the appropriate parts of the DICOM standard itself, prior to reading this conformance statement.

Although the use of this conformance statement in conjunction with the DICOM 3.0 standard is intended to facilitate communication between SE Suite 2.0 and other DICOM devices, it is not sufficient to guarantee the interoperation of the connection. Section 1.3 outlines issues that need to be considered to ensure interoperability.

1.3   General Remarks

1.3.1   Integration and Validation Activities

The integration of any device into a system of interconnected devices goes beyond the scope of the DICOM 3.0 standard and this conformance statement when *interoperability* is desired. The responsibility for analyzing the applications requirements and developing a solution that integrates the Agfa equipment with other vendors' systems is the user's responsibility and should not be underestimated.

In some circumstances it might be necessary to perform a validation to make sure that functional interoperability between the Agfa equipment and non-Agfa devices works as expected. The user should ensure that any non-Agfa provider accepts responsibility for any validation required for their connection with the Agfa equipment.

1.3.2   Future Evolution

As the DICOM 3.0 standard evolves to meet the user's growing requirements and to incorporate new features and technologies, Agfa will follow the evolution of the standard. This evolution of the standard may require changes to devices that have implemented DICOM 3.0. The user should ensure that any non-Agfa provider, who connects with Agfa devices, also

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plans for future evolution of the DICOM standard. A refusal to do so may result in the loss of functionality and/or connectivity between the different products.

1.4   Acronyms 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
AET	Application Entity Title
CD-R	Compact Disk Recordable
DICOM	Digital Imaging and Communications in Medicine
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
GSDF	Grayscale Standard Display Function
GSPS	Grayscale Softcopy Presentation State
IE	Information Entity
IOD	(DICOM) Information Object Definition
ISO	International Standard Organization
PDU	DICOM Protocol Data Unit
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair
UID	Unique Identifier
VR	Value Representation

1.5   Related Documents

➢ ACR-NEMA Digital Imaging and Communications in Medicine (DICOM) V3.0 2008.

➢ IHE Radiology Technical Framework Revision 6.0 – Final Text, May 20, 2005

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2   NETWORKING

2.1   Implementation Model

2.1.1   Application Data Flow Diagram

The Application Data Flow Diagram in Figure 2.1-1 depicts the DICOM data flow to and from the application entities included in the SE Suite 2.0. The tail of the arrow between a local AE and the remote real world activity indicates the party (AE or remote real world activity) that initiates the association negotiation.
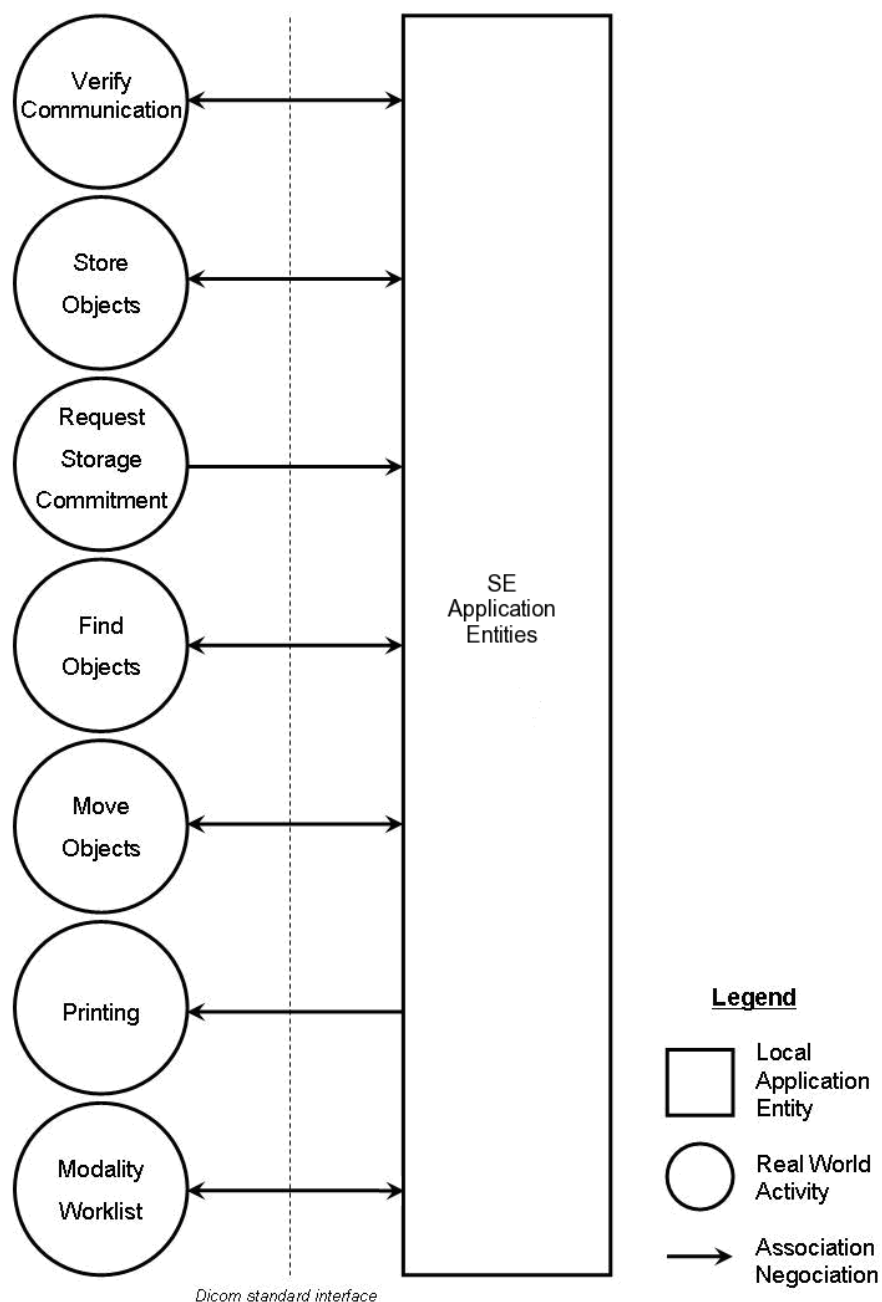
Figure 2.1-1: Functional Overview – Application Data Flow

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The following data flows are depicted in the diagram:

- In the remote real-world activity labeled "Verify Communication", a remote application entity (AE) can initiate an association and verify communications with the PACS or the Client AE.
  The Client AE can also initiate an association and verify communications with a remote AE.

- In the remote real-world activity "Store Objects", a remote AE initiates an association with the PACS or the Client AE and sends one or more objects. When the PACS AE (or the Client AE) receives an object, it stores the object in online storage area and registers the object in the database. The Client AE can also initiate an association and send one or more objects to a remote AE.

- In the remote real-world activity "Request Storage Commitment", a remote AE initiates an association with the PACS AE and requests commitment for the safekeeping of one or more composite SOP instances on the PACS AE. The PACS AE will open a new association with the remote AE to indicate success or failure.

- In the remote real-world activity "Find Objects", a remote AE initiates an association with the PACS AE and sends a query. The PACS AE will search the database for possible matches with composite SOP instances. The results of the query are returned to the remote AE using the same association. The Client AE can also initiate an association and send a query to a remote AE.

- In the remote real-world activity "Move Objects", a remote AE initiates an association with the PACS AE (or the Client AE) and requests some composite SOP instances be retrieved. The PACS AE (or the Client AE) will search the database for possible matches with composite SOP instances. The resulting composite SOP instances are transferred to either the same AE that requested the retrieval or to another AE over a new association. The Client AE can also initiate an association and request some composite SOP instances be retrieved from a remote AE.

- In the remote real-world activity "Printing", the Client AE initiates an association with a remote printer AE. The Client AE constructs and sends one or more composite SOP instances to the remote AE.

- In the remote real-world activity "Modality Worklist", the Client AE initiates an association with a remote AE and requests a DICOM Modality Worklist. The remote AE will query its database and return the Worklist results to the Client AE. The SE Solution can also:

  o Act as a Modality Worklist SCP thanks to a separate PACS component.

  o Act as a Modality Worklist SCU thanks to a separate CLIENT component which is able to add records in the Modality Worklist SCP component (proprietary).

2.1.2 Functional Definitions of AE's

The following sections contain a functional definition for the PACS Application Entity that is part of the SE Suite 2.0. These definitions describe the functions to be performed by the AE, and the DICOM services used to accomplish these functions (both DICOM service classes and lower level DICOM services such as Association Services).

2.1.2.1 Verify Communication

The PACS AE will respond to a DICOM C-ECHO request from a remote AE and verify communications.

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The Client AE can also initiate an association and request verification to a remote AE.

2.1.2.2 Receive instances

The PACS AE and the Client AE store a received instance in its entirety, compressed, in its internal data store. The PACS AE and the Client AE store each instance with the File Meta Information attached to it.

The PACS AE and the Client AE extract the information with respect to the patient, study, series, and object, and store this information within its internal database.

2.1.2.3 Commitment to Store Images Received

The PACS AE acts as a Service Class Provider of Storage Commitment to take responsibility explicitly for storing DICOM objects received.

2.1.2.4 Query from Other Devices

The PACS AE responds to queries based on the records stored in its database.

2.1.2.5 Retrieve to Other Devices

The PACS AE acts as a Service Class Provider of C-MOVE to retrieve DICOM objects. It does so by obtaining a reference from the database and then obtaining the object itself from the data store.

2.1.2.6 Transmit Images

The Client AE acts as a Service Class User of C-STORE to transmit objects to other compatible devices.

2.1.2.7 Print Images

The Client AE proposes a print context, constructs a Print Meta SOP class and transfers a DICOM print object to compatible devices.

2.1.2.8 Modality Worklist Requests

The Client AE requests DICOM Modality Worklist to an information system acting as DICOM Modality Worklist Service Class provider. Worklist information is cached in the Client AE's local database in order to manually or automatically consolidate patient data.

The PACS/Standalone AE can also act in some cases as a DICOM Modality Worklist Service Class provider thanks to a separate PACS/Standalone component and as a Modality Worklist SCU thanks to a separate CLIENT component which is able to add records in the Modality Worklist SCP component (proprietary).

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2.2 AE Specifications

2.2.1 SE Application Entities Specification

2.2.1.1 Default Transfer Syntaxes Supported

The SE AEs provide Standard Conformance to the default transfer syntaxes listed in Table 2.2-1.

Table 2.2-1 Default Transfer Syntax

Transfer Syntax	UID
Implicit VR Little Endian	1.2.840.10008.1.2

2.2.1.2 Extended Transfer Syntaxes Supported

The SE AEs provide Standard Conformance to the extended transfer syntaxes listed in Table 2.2-2 for the purposes of storage and retrieval.

Table 2.2-2 Extended Transfer Syntaxes

Transfer Syntax	UID
Explicit VR, Little Endian	1.2.840.10008.1.2.1
RLE Lossless, PackBits	1.2.840.10008.1.2.5
JPEG Process 1, baseline, lossy (8 bit)	1.2.840.10008.1.2.4.50
JPEG Process 2,4, extended lossy (12 bit)	1.2.840.10008.1.2.4.51
JPEG Process 14, selection value 1, lossless	1.2.840.10008.1.2.4.70
JPEG 2000 Image Compression (Lossless)	1.2.840.10008.1.2.4.90
JPEG 2000 Image Compression (Lossy)	1.2.840.10008.1.2.4.91

2.2.1.3 SOP Classes Supported

The SE AEs provide Standard Conformance to the SOP Classes listed in Table 2.2-3. This table lists the SOP Classes Supported as they appear in DICOM Part 4. The shaded items represent SOP Classes that have been retired (so no longer appear in Part 4) but are still supported by the SE AEs.

If the User of Service (SCU) or the Provider of Service (SCP) column has the value "Option", then the functionality is either configurable or can be purchased as an option. The Display column indicates whether or not the **Client AE** will display the DICOM objects. In some cases only storage of the object may be provided by the SE AEs.

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Table 2.2-3 SOP Classes for the SE AEs Storage

SOP Class Name	SOP Class UID	SCU	SCP	Display
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes	Yes
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes	Yes
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes	Yes
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes	Yes
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes	Yes
Computed Tomography Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes	Yes
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	Yes	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes	Yes
Magnetic Resonance Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes	Yes
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Yes	Yes	Yes
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Yes	Yes	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes	Yes
X-Ray Radio fluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes	Yes
X-Ray Angiographic Bi-plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Yes	Yes	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	Yes	Yes
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes	Yes
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes	Yes
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes	Yes
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Yes	Yes	Yes[1]
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes	Yes
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	Yes	Yes	Yes

2.2.1.4   Association Establishment Policies

2.2.1.4.1   General

The DICOM standard Application context shall be specified.

Table 2.2-4 DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

2.2.1.4.2   Number of Associations

There is no inherent limit to the number of associations other than limits imposed by the computer operating system.

2.2.1.4.3   Asynchronous Nature

The SE AEs allow a single outstanding operation on any association. Therefore, the SE AEs do not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

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[1] Display of Mammography CAD SR reports but not of CAD markers

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2.2.1.4.4 Implementation Identifying Information

The SE AEs will respond with the implementation identifying parameters listed in the following table.

Table 2.2-5 DICOM implementation Class and Version for the SE AEs

Implementation Class	Version
Implementation Class UID	`1.2.250.1.46.1`
Implementation Version Name	`n1_n2_n3` where `n1`, `n2`, `n3` are major, minor and revision numbers of current version of the internal DICOM engine (*TsiDicom* DLL version)

2.2.1.4.5 Called/Calling Titles

The PACS AE calling title is configured thanks to the Client AE. The PACS AE can be configured to validate the Called Title of the requesting SCU during association negotiation.

2.2.1.5 Association Initiation Policies

The PACS AE initiates associations for the following real-world activities:

- Move Object

The Client AE initiates associations for the following real-world activities:

- Verify Communication

- Store Objects

- Find Object

- Move Object

- Printing

- Modality Worklist

2.2.1.5.1 Real World Activity – Verify Communication (SCU)

2.2.1.5.1.1 Description and Sequencing of Activity

The Client AE will issue Verification requests in response to UI mediated requests from the user to test the validity of a DICOM connection.

2.2.1.5.1.2 Proposed Presentation Contexts

For the real world activity of Verification, the SE AEs requests the Presentation Contexts listed Table 2.2-6

Table 2.2-6 Presentation Contexts Proposed by the SE AEs

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Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.2.1.5.1.3 SOP Specific Conformance - Verify Communication

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

2.2.1.5.2 Real World Activity – Store Objects (SCU)

2.2.1.5.2.1 Description and Sequencing of Activity

The Client AE will transmit DICOM instances either automatically or driven by user requests. A single association is established to send a group of selected instances. The Client AE will establish an association automatically in response to a C-MOVE request.

2.2.1.5.2.2 Proposed Presentation Contexts

The Client AE may request any of the Presentation Contexts listed in Table 2.2-7 for Storage. The Client AE will propose the transfer syntax used when the object was initially accepted by the server and Implicit VR Little Endian.

Table 2.2-7 Presentation Contexts Proposed by the PACS AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
All Table 2.2-3 SOP Classes for the SE AEs Storage		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		RLE LossLess, PackBits	1.2.840.10008.1.2.5	SCU	None
		JPEG Process 1, baseline, lossy (8 bit)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Process 2,4, extended lossy (12 bit)	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Process 14, selection value 1, lossless	1.2.840.10008.1.2.4.70	SCU	None
		JPEG 2000 Image Compression (Lossless)	1.2.840.10008.1.2.4.90	SCU	None
		JPEG 2000 Image Compression (Lossy)	1.2.840.10008.1.2.4.91	SCU	None

2.2.1.5.2.3 SOP Specific Conformance - Store Objects

The Client AE provides Standard conformance to the DICOM Storage Service Class as an SCU.

A successful C-STORE response status will not generate any actions. An unsuccessful C-STORE response will generate a warning and the operation will stop.

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2.2.1.5.3   Real World Activity – Find Object (SCU)

2.2.1.5.3.1   Description and Sequencing of Activity

The Client AE will negotiate Find requests to an SCP. The Client AE can query a remote AE for composite objects to the Study Level. An association is established when the user initiates a query from the graphical user interface of the Client. The Client AE will establish an association automatically to query a remote AE to obtain a list of relevant objects.

2.2.1.5.3.2   Proposed Presentation Contexts

The Client AE will initiate any of the Presentation Contexts listed in Table 2.2-8 for C-FIND requests. The Client AE will initiate one Find Presentation Context per association request.

Table 2.2-8 Presentation Contexts Proposed by the PACS AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root Query / Retrieve Information Model - Find	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.2.1.5.3.3   SOP Specific Conformance - Find Objects

The C-FIND operations are implemented with relational queries, allowing any combination of keys at any level in the hierarchy.

The Client AE provides standard conformance to the DICOM Query/Retrieve Service Class as an SCU. The Query/Retrieve Information Model used depends on the attributes used to constrain the query.

The Client AE may request any mandatory search keys during a relational query.

Table 2.2-9 Patient Level Attributes,

Table 2.2-10 Study Level Attributes

Table 2.2-11 Series Level Attributes

describe the search keys for the three levels of query that the Client AE requests.

Table 2.2-9 Patient Level Attributes

Description	Tag
Patient's Name	(0010,0010)
Patient ID	(0010,0020)
Patient's Birth Date	(0010,0030)

Table 2.2-10 Study Level Attributes

Description	Tag
Study Date	(0008,0020)
Accession Number	(0008,0050)
Study ID	(0020,0010)

Table 2.2-11 Series Level Attributes

Description	Tag
Modality	(0008,0060)
Series Number	(0020,0011)

For each level, Specific Character Set (0008,0005) is automatically filled depending on the current keyboard and mapped into DICOM Specific Character Set value.

Examples:

- if current keyboard is FR (French), then Specific Character set will be "ISO_IR 100"

- if current keyboard is EL (Greek), then Specific Character set will be "ISO_IR 126" etc.

The Client AE automatically adds a wildcard "*" to matching keys with a VR of PN. The user is not required to add one manually.

The following matching keys are available from the User Interface within the Client AE during a relational query:

- Patient name

- Patient ID

- Birth Date

- Accession Number

- Study ID

- Study Date

- Modality

- Series Number

To be conformant to DICOM Standard (See DICOM Standard Part 4 → C.2.2.2.4), wild card matching in C-Find query will be ignored in the case it is related to the following fields:
- STUDY |
  - Accession number
  - Study ID
- SERIES |
  - Modality
  - Series number
- Fields of type date-time

2.2.1.5.4   Real World Activity – Move Object (SCU)

2.2.1.5.4.1   Description and Sequencing of Activity

The Client AE can retrieve composite objects from a remote AE. An association is established when the user initiates a query from the graphical user interface. The Client AE will establish an association automatically to retrieve objects that were archived to the remote AE.

2.2.1.5.4.2   Proposed Presentation Contexts

The Client AE will initiate the Presentation Context listed in Table 2.2-12 for Move.

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Table 2.2-12 Presentation Contexts Proposed by the Client AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root Query / Retrieve Information Model - Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.2.1.5.4.3   SOP Specific Conformance - Move Objects

The Client AE provides standard conformance to the DICOM Query/Retrieve Service Class as an SCU. The Client AE supports the relational-retrieve extended SCU behavior.

The Client AE will try to establish an association with the move destination specified in the Move request. One or more of the Presentation Contexts listed in the Store section of this document may be negotiated in this association.

2.2.1.5.5   Real World Activity – Printing (SCU)

2.2.1.5.5.1   Description and Sequencing of Activity

The Client AE issues print requests based on user interface mediated (Print Layout Manager) requests.

The Client AE automatically justifies images at right depending on their laterality when printing. For this it uses the exact Print Server settings (Diagnostic Printable Area in pixels and Pixels Size in microns set up in the application).

2.2.1.5.5.2   Proposed Presentation Contexts

The Client AE may request any of the Presentation Contexts listed in Table 2.2-13 for Print Management.

Table 2.2-13 Presentation Contexts Proposed by the Client AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Printer SOP Class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.2.1.5.5.3   SOP Specific Conformance – Printing

The Client AE provides standard conformance to the DICOM Print Service Classes by supporting a number of distinct Service Classes described in the following subsections.

The Client AE supports the Presentation LUT for printing to a DICOM printer. This SOP Class is only negotiated if the user selects "Send of Presentation LUT"

2.2.1.5.5.3.1   SOP Specific Conformance – Presentation LUT

N-CREATE is used to create an instance of the Presentation LUT SOP Class. The Client AE uses the N-CREATE attributes listed in Table 2.2.14

Table 2.2-14 N-CREATE attributes for the Presentation LUT SOP Class

Tag	Attribute Name	Supported
(2050,0010)	Presentation LUT Sequence	
(2050,0020)	Presentation LUT Shape	IDENTITY

The Client AE uses N-DELETE to request the SCP to delete the Presentation LUT SOP Instance.

2.2.1.5.5.3.2   SOP Specific Conformance – Basic Film Session

N-CREATE is used to create an instance of the Basic Film Session SOP Class. The Client AE uses the N-CREATE attributes listed in Table 2.2-15.

Table 2.2-15 N-CREATE attributes for the Basic Film Session SOP Class

Tag	Attribute Name	Supported
(2000,0010)	Number of Copies	1-99
(2000,0020)	Print Priority	HIGH, MED, LOW
(2000,0030)	Medium Type	PAPER, CLEAR FILM, BLUE FILM
(2000,0040)	Film Destination	MAGAZINE, PROCESSOR
(2000,0050)	Film Session Label	Configurable via SE Central [2]. It can contain free text and/or one or more of the following tag values: - Patient's Name (0010,0010) - Patient ID (0010,0020) - Patient's Birth Date (0010,0030) - Patient's Sex (0010,0040) - Accession Number (0008,0050) - Study Date (0008,0020) The separator character is also configurable
(2000,0060)	Memory Allocation	

The Client AE uses N-DELETE to request the SCP to delete the Basic Film Session SOP Instance hierarchy.

2.2.1.5.5.3.3   SOP Specific Conformance – Basic Film Box

N-CREATE is used to create an instance of the Basic Film Box SOP Class. The Client AE uses the N-CREATE attributes listed in Table 2.2-16.

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[2] The tag (2000,0050) is available from SE Suite 2.0 SU2 and higher.

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Table 2.2-16 N-CREATE attributes for the Basic Film Box SOP Class

Tag	Attribute Name	Supported
(2010,0010)	Image Display Format	STANDARD\1,1
(2010,0040)	Film Orientation	PORTRAIT, LANDSCAPE
(2010,0050)	Film Size ID	8INX10IN, 10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN,
(2010,0060)	Magnification Type	NONE, REPLICATE, BILINEAR, CUBIC
(2010,0100)	Border Density	BLACK, WHITE
(2010,0110)	Empty Image Density	BLACK, WHITE
(2010,0140)	Trim	YES, NO
(2010,0130)	Max Density	Default: 300
(2010,015E)	Illumination	Default: 2000 (must be set to **4000** for mammo)
(2010,0160)	Reflected Ambient Light	Default:10 (must be set to **1** for mammo)
(2010,0500)	Referenced Film Session Sequence	
(0008,1150)	>Referenced SOP Class UID	
(0008,1155)	>Referenced SOP Instance UID	
(2050,0500)	Referenced Presentation LUT Sequence	Only if "send of Presentation LUT" selected
(0008,1150)	>Referenced SOP Class UID	
(0008,1155)	>Referenced SOP Instance UID	

N-ACTION is used to print one or more copies of a single film of the film session.

The Client AE uses N-DELETE to request the SCP to delete the Basic Film Box SOP Instance.

2.2.1.5.5.3.4   SOP Specific Conformance – Basic Grayscale Image Box

N-SET is used to update attributes of the Basic Image Box. The Client AE uses the N-SET attributes listed in Table 2.2-17.

Table 2.2-17 N-CREATE attributes for the Basic Grayscale Image Box SOP Class

Tag	Attribute Name	Supported
(2010,0020)	Image Position	1
(2010,0110)	Basic Grayscale Image Sequence	
(0028,0002)	>Samples Per Pixel	1
(0028,0004)	>Photometric Interpretation	MONOCHROME1, MONOCHROME2
(0028,0010)	>Rows	
(0028,0011)	>Columns	
(0028,0034)	>Pixel Aspect Ratio	
(0028,0100)	>Bits Allocated	8
(0028,0101)	>Bits Stored	8
(0028,0102)	>High Bit	7
(0028,0103)	>Pixel Representation	0
(7FE0,0010)	>Pixel Data	

2.2.1.5.5.3.5   SOP Specific Conformance – Printer SOP Class

When an association has been established, the Client AE uses the N-GET service to retrieve an instance of the Printer SOP Class. The Client AE requests the attributes listed in Table 2.2-18.

Table 2.2-18 N-GET Attributes for the Printer SOP Class

Tag	Attribute Name
(2110,0010)	Printer Status
(2110,0020)	Printer Status Info

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2.2.1.5.6   Real World Activity – Modality Worklist (SCU)

2.2.1.5.6.1   Description and Sequencing of Activity

The Client AE will initiate an association with a Modality Worklist SCP each time the worklist is requested (either automatically or manually).

2.2.1.5.6.2   Proposed Presentation Contexts

The Client AE will initiate any of the Presentation Contexts listed in Table 2.2-19.

Table 2.2-19 Presentation Contexts Proposed by the Client AE

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	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.2.1.5.6.3   SOP Specific Conformance – Modality Worklist

The Client AE provides standard conformance to the DICOM Modality Worklist Information Model Class as an SCU. The DICOM attributes that are utilized by the Client AE when issuing a DICOM Modality Worklist request are listed in Table 2.2-20.

Table 2.2-20 Attributes for the Modality Worklist Information Model

Tag	Attribute Name
(0008,0005)	Specific Character Set
(0008,0050)	Accession Number
(0008,0060)	Modality
(0008,0090)	Referring Physician's Name
(0008,0100)	Code Value
(0008,0102)	Coding Scheme Designator
(0010,0010)	Patient's Name
(0010,0020)	Patient ID
(0010,0030)	Patient's Birth Date
(0010,0032)	Patient's Birth Time
(0010,0040)	Patient's Sex
(0010,1000)	Other Patient IDs
(0010,1001)	Other Patient Names
(0010,1010)	Patient's Age
(0010,1020)	Patient's Size
(0010,1030)	Patient's Weight
(0010,2000)	Medical Alerts
(0010,2110)	Contrast Allergies
(0010,2160)	Ethnic Group
(0010,2180)	Occupation
(0010,21B0)	Additional Patient History
(0010,21C0)	Pregnancy Status
(0010,2201)	Patient Species Description
(0010,2292)	Patient Breed Description

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Tag	Attribute Name
(0010,2294)	Patient Breed Registration
(0010,2297)	Responsible Person
(0010,2298)	Responsible Person Role
(0010,2299)	Responsible Organization
(0010,2203)	Responsible Sex Neutered
(0020,000D)	Study Instance UID
(0032,1032)	Requesting Physician
(0032,1033)	Requesting Service
(0032,1070)	Requested Contrast Agent
(0038,0008)	Visit Status ID
(0038,0010)	Admission ID
(0038,0050)	Special Needs
(0038,0300)	Current Patient Location
(0038,0400)	Patient's Institution Residence
(0038,0500)	Patient State
(0040,0001)	Scheduled Station AE Title
(0040,0002)	Scheduled Procedure Step Start Date
(0040,0003)	Scheduled Procedure Step Start Time
(0040,0006)	Scheduled Performing Physician's Name
(0040,0007)	Scheduled Procedure Step Description
(0040,0009)	Scheduled Procedure Step ID
(0040,0010)	Scheduled Station Name
(0040,0011)	Scheduled Procedure Step Location
(0040,0012)	Pre-Medication
(0040,0020)	Scheduled Procedure Step Status
(0040,1001)	Requested Procedure ID
(0040,1003)	Requested Procedure Priority
(0040,1004)	Patient Transport Arrangements
(0040,1005)	Requested Procedure Location
(0040,3001)	Confidentiality Constraint on Patient Data Description
(0020,000D)	Study Instance UID
(0032,1060)	Requested Procedure Description

Specific Character Set (0008,0005) is automatically filled depending on the current keyboard and mapped into DICOM Specific Character Set value.

Examples:

- if current keyboard is FR (French), then Specific Character set will be "ISO_IR 100"
- if current keyboard is EL (Greek), then Specific Character set will be "ISO_IR 126"

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2.2.1.6 Association Acceptance Policies

The SE AEs accept associations for the following real world activities:

• Verify Communication

• Store Objects

• Request Storage Commitment

• Find Object

• Move Object

• Modality Worklist

2.2.1.6.1 Real World Activity – Verify Communication (SCP)

2.2.1.6.1.1 Description and Sequencing of Activity

Both PACS and Client AEs will respond to Verification requests to provide an SCU the ability to determine if the PACS or the Client AE is receiving DICOM requests.

2.2.1.6.1.2 Accepted Presentation Contexts

The SE AEs will accept any of the Presentation Contexts listed in Table 2.2-21 for Verification.

Table 2.2-21 Presentation Contexts Proposed by the SE AEs

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

2.2.1.6.1.3 SOP Specific Conformance - Verify Communication

The SE AEs provides standard conformance to the DICOM Verification Service Class as an SCU. They return one of the status codes listed in Table 2.2-22.

Table 2.2-22 Verification Response Status

Service status	Further Meaning	Error Code	Reason
Success	Success	0000	Operation performed properly.

2.2.1.6.1.4 Presentation Context Acceptance Criterion – Verify Communication

The SE AEs will always accept a Presentation Context for the Verification SOP Class with the default DICOM transfer syntax listed in Table 2.2-21.

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2.2.1.6.1.5　　Transfer Syntax Selection Policies - Verify Communication

Since no DICOM data object is associated with a Verification command, only the default DICOM transfer syntax is required and supported.

2.2.1.6.2　　Real World Activity – Store Object (SCP)

2.2.1.6.2.1　　Description and Sequencing of Activity

The SE AEs will store instances that are sent to it from an SCU. All instances received by the PACS or the Client AE can be retrieved at a later time from the PACS or the Client AE.

2.2.1.6.2.2　　Accepted Presentation Contexts

The SE AEs will accept any of the Presentation Contexts listed in Table 2.2-23 for Storage. For non image instances (e.g. GSPS, SR) only default presentation contexts are supported. For Positron Emission Tomography Images, the SE AEs accept default transfer syntax only.

Table 2.2-23 Presentation Contexts Accepted by the SE AEs

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
All Table 2.2-3 SOP Classes for the SE AEs Storage		Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		RLE LossLess, PackBits	1.2.840.10008.1.2.5	SCP	None
		JPEG Process 1, baseline, lossy (8 bit)	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Process 2,4, extended lossy (12 bit)	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Process 14, selection value 1, lossless	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless)	1.2.840.10008.1.2.4.90	SCP	None
		JPEG 2000 Image Compression (Lossy)	1.2.840.10008.1.2.4.91	SCP	None

2.2.1.6.2.3　　SOP Specific Conformance - Store Object

The SE AEs conform to the DICOM Storage Service Class as a Level 2 (Full) SCP. No elements are discarded or coerced by any of the AEs. All Type 1, Type 2 and Type 3 attributes will be retained. Private attributes will be stored and included when the object is sent out again.

Studies may be manually transferred, archived or deleted through the graphical user interface.

Both PACS and Client AEs can be configured to protect instances against modifications or deletions.

Both AEs will return the C-STORE status codes shown in Table 2.2-24.

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Table 2.2-24 Storage Response Status

Service status	Further Meaning	Error Code	Reason
Refused	Out of resources	A700	Indicates that there was not enough storage space to store the image. Recovery from this condition is left to the administrative functions.
Error	Failed	C000	The operation was not successful.
Success	Success	0000	Operation performed properly.

2.2.1.6.2.4   Presentation Context Acceptance Criterion – Store Object

Both AEs will accept any number of Storage Presentation Contexts per association request. Any single Abstract Syntax may be specified more than once in an association request, if the Transfer Syntaxes differ between the Presentation Contexts.

2.2.1.6.2.5   Transfer Syntax Selection Policies - Store Object

Both AEs supports all transfer syntaxes listed in Table 2.2-23. By default, they will choose the first compatible transfer syntax proposed by the SCU.

2.2.1.6.3   Real World Activity – Request Storage Commitment (SCP)

2.2.1.6.3.1   Description and Sequencing of Activity

The PACS AE stores images that are sent to it from an SCU. The request for storage commitment may then be transmitted to the PACS AE together with a list of references to one or more SOP instances. The PACS AE will receive and response to DIMSE N-ACTION. SE only supports Storage Commitment SCP in asynchronous mode.

2.2.1.6.3.2   Accepted Presentation Contexts

The PACS AE will accept any of the Presentation Contexts listed in Table 2.2-25 for Verification.

Table 2.2-25 Presentation Contexts Accepted by the PACS AE

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	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

2.2.1.6.3.3   SOP Specific Conformance - Request Storage Commitment

The PACS AE provides partial conformance to the DICOM Storage Commitment Service Class as an SCP. The PACS AE supports the elements listed in Table 2.2-26 for this SOP class. The PACS AE does not support the optional Storage Media and File-Set ID and UID Attributes in the N-ACTION.

Table 2.2-26 Storage Commitment Request – Action Information

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Action Type Name	Action Type ID	Attribute Name	Tag
Request Storage Commitment	1	Transaction UID	(0008,1195)
		Referenced SOP Sequence	(0008,1199)
		>Referenced SOP Class UID	(0008,1150)
		>Referenced SOP Instance UID	(0008,1155)

The PACS AE will store SOP Instances indefinitely unless the instances are manually deleted by a user with appropriate system permissions. The capacity is limited only by the availability of storage.

The PACS AE can be configured to not archive objects received from a remote AE. A successful storage commitment request will be returned to the remote AE. However the persistence of storage will be dependent on the amount of storage capacity available on the PACS AE and disk management configuration settings of the system.

2.2.1.6.3.4   Storage Commitment Result

If the PACS AE determines that it has successfully completed storage commitment, the PACS AE issues an N-EVENT-REPORT to the SCU including references to the successfully stored SOP Instances contained in the N-ACTION.

In the event that the PACS AE cannot commit to storing SOP Instances, the PACS AE issues an N-EVENT-REPORT to the SCU including references to the failed SOP Instances contained in the N-ACTION. The failure reasons are listed in Table 2.2-27.

Table 2.2-27 Storage Commitment Result – Failure reasons

Service Status	Further Meaning	Code	Explanation
Failure	Processing failure	0110H	A general failure in processing the operation was encountered. (e.g.: database access failed)
Failure	No such object instance	0112H	One or more of the elements in the Referenced SOP Instance Sequence was not available

The N-EVENT-REPORT contains the Transaction UID value contained in the initiating N-ACTION. The N-EVENT-REPORT is sent only in a separate association from the N-ACTION operation.

The PACS AE supports the Event Information as specified in Table 2.2-28. The PACS AE does not support the optional Storage Media and File-Set ID and UID or Retrieve AE Title (0008,0054) attributes in the N-EVENT-REPORT.

Table 2.2-28 Storage Commitment Result – Event Information

Action Type Name	Action Type ID	Attribute Name	Tag
Storage Commitment Request Successful	1	Transaction UID	(0008,1195)
		Referenced SOP Sequence	(0008,1199)
		>Referenced SOP Class UID	(0008,1150)
		>Referenced SOP Instance UID	(0008,1155)
Storage Commitment Request Complete - Failures Exist	2	Transaction UID	(0008,1195)
		Referenced SOP Sequence	(0008,1199)
		>Referenced SOP Class UID	(0008,1150)
		>Referenced SOP Instance UID	(0008,1155)
		Failed SOP Sequence	(0008,1198)
		>Referenced SOP Class UID	(0008,1150)
		>Referenced SOP Instance UID	(0008,1155)

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Action Type Name	Action Type ID	Attribute Name	Tag
		>Failure Reason	(0008,1197)

2.2.1.6.3.5   Operations – Storage Commitment

The PACS AE commits to storing a SOP Instance as long as there is available disk space.

2.2.1.6.4   Real World Activity – Find Object (SCP)

2.2.1.6.4.1   Description and Sequencing of Activity

Both PACS and Client AEs will respond to query requests that are sent to it by an SCU.

2.2.1.6.4.2   Accepted Presentation Contexts

The PACS and Client AEs will accept any of the Presentation Contexts listed in Table 2.2-29 for Query.

Table 2.2-29 Presentation Contexts Accepted by the SE AEs

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Patient Root Query / Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query / Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

2.2.1.6.4.3   SOP Specific Conformance – Find Object

The PACS and Client AEs provide standard conformance to the DICOM Query/Retrieve Service Class as an SCP.

Both AEs support hierarchical queries and support relational queries. Table 2.2-30, Table 2.2-31, Table 2.2-32, Table 2.2-33 and Table 2.2-34 below contain detailed information on matching and returned keys:

Table 2.2-30 Patient Level Attributes for the Patient Root Query / Retrieve Information Model

Tag	Attribute Name	Support
(0008,0005)	Specific Character Set	Matching / Returned
(0008,0052)	Query / Retrieve Level	Matching / Returned
(0010,0010)	Patient's Name	Matching / Returned
(0010,0020)	Patient ID	Matching / Returned
(0010,0030)	Patient's Birth Date	Matching / Returned
(0010,0040)	Patient's Sex	Matching / Returned

Table 2.2-31 Study Level Attributes for the Patient Root Query / Retrieve Information Model

Tag	Attribute Name	Support
(0008,0005)	Specific Character Set	Matching / Returned
(0008,0020)	Study Date	Matching / Returned

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(0008,0030)	Study Time	Matching / Returned
(0008,0050)	Accession Number	Matching / Returned
(0008,0052)	Query / Retrieve Level	Matching / Returned
(0008,0090)	Referring Physician's Name	Matching / Returned
(0008,1030)	Study Description	Matching / Returned
(0010,0020)	Patient ID	Matching / Returned
(0020,000D)	Study Instance UID	Matching / Returned
(0020,0010)	Study ID	Matching / Returned

Table 2.2-32 Study Level Attributes for the Study Root Query / Retrieve Information Model

Tag	Attribute Name	Support
(0008,0005)	Specific Character Set	Matching / Returned
(0008,0020)	Study Date	Matching / Returned
(0008,0030)	Study Time	Matching / Returned
(0008,0050)	Accession Number	Matching / Returned
(0008,0052)	Query / Retrieve Level	Matching / Returned
(0008,0090)	Referring Physician's Name	Matching / Returned
(0008,1030)	Study Description	Matching / Returned
(0010,0020)	Patient ID	Matching / Returned
(0010,0030)	Patient's Birth Date	Matching / Returned
(0010,0040)	Patient's Sex	Matching / Returned
(0020,000D)	Study Instance UID	Matching / Returned
(0020,0010)	Study ID	Matching / Returned

Table 2.2-33 Series Level Attributes

Tag	Attribute Name	Support
(0008,0005)	Specific Character Set	Matching / Returned
(0008,0021)	Series Date	Matching / Returned
(0008,0031)	Series Time	Matching / Returned
(0008,0052)	Query / Retrieve Level	Matching / Returned
(0008,0060)	Modality	Matching / Returned
(0008,1010)	Station Name	Matching / Returned
(0008,103E)	Series Description	Matching / Returned
(0008,1050)	Performing Physician's Name	Matching / Returned
(0010,0020)	Patient ID	Matching / Returned
(0018,0015)	Body Part Examined	Matching / Returned
(0020,000D)	Study Instance UID	Matching / Returned
(0020,000E)	Series Instance UID	Matching / Returned
(0020,0011)	Series Number	Matching / Returned
(0020,1209)	Number of Series Related Instances	Matching / Returned

Table 2.2-34 Instance Level Attributes

Tag	Attribute Name	Support
(0008,0005)	Specific Character Set	Matching / Returned
(0008,0018)	SOP Instance UID	Matching / Returned
(0008,0023)	Image Date	Matching / Returned
(0008,0033)	Image Time	Matching / Returned
(0008,0052)	Query / Retrieve Level	Matching / Returned
(0010,0020)	Patient ID	Matching / Returned
(0020,000D)	Study Instance UID	Matching / Returned
(0020,000E)	Series Instance UID	Matching / Returned
(0020,0013)	Instance Number	Matching / Returned

Both AEs return one of the following status codes to a C-FIND request.

Table 2.2-35 C-FIND Status Codes

Service status	Further Meaning	Error Code	Reason

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Service status	Further Meaning	Error Code	Reason
Pending	Pending	FF00	All Optional Keys are supported in the same manner as Required Keys.
Success	Success	0000	Operation performed properly.

2.2.1.6.4.4   Presentation Context Acceptance Criterion – Find Object

Both AEs will accept any number of Find Presentation Contexts per association request. Any single Abstract Syntax may be specified more than once in an association request if the Transfer Syntaxes differ between the Presentation Contexts.

2.2.1.6.4.5   Transfer Syntax Selection Policies – Find Object

The PACS and Client AEs currently only support the default transfer syntax of Implicit VR Little Endian.

2.2.1.6.5   Real World Activity – Move Object (SCP)

2.2.1.6.5.1   Description and Sequencing of Activity

The PACS and Client AEs will respond to retrieve requests that are sent to it by an SCU.

Both AEs will establish a new Association with the Remote AE specified in the Move Destination for the C-STORE sub-operations. They will propose the transfer syntax used when the object was initially accepted by the server and Implicit VR Little Endian.

2.2.1.6.5.2   Accepted Presentation Contexts

The PACS and Client AEs will accept any of the Presentation Contexts listed in Table 2.2-36 for Query.

Table 2.2-36 Presentation Contexts Accepted by the PACS AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query / Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query / Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

2.2.1.6.5.3   SOP Specific Conformance - Move Object Contexts

The PACS and Client AEs will try to establish an association with the move destination specified in the Move request. One or more of the Presentation Contexts listed in the Store section of this document may be negotiated in this association.

Both AEs return one of the following status codes to a C-MOVE request.

Table 2.2-37 C-MOVE Status Codes

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Service status	Further Meaning	Error Code	Reason
Failed	Unable to process	C000	Indicates that the PACS AE cannot process this request at this time.
Warning	Warning	B000	Storage complete with one or more failures.
Pending	Pending	FF00	The storage operation is continuing.
Success	Success	0000	Operation performed properly.

2.2.1.6.5.4   Presentation Context Acceptance Criterion – Move Object

The PACS and Client AEs will accept any number of Move Presentation Contexts per association request. Any single Abstract Syntax may be specified more than once in an association request, if the Transfer Syntaxes differ between the Presentation Contexts.

2.2.1.6.5.5   Transfer Syntax Selection Policies - Move Object

By default, the PACS and Client AEs send the IOD using the transfer syntax that was used when the image was originally stored. It will convert the IOD to Implicit VR Little Endian if the original transfer syntax is not supported by the destination.

2.2.1.6.6   Real World Activity – Modality Worklist (SCP)

2.2.1.6.6.1   Description and Sequencing of Activity

PACS AE will respond to retrieve requests that are sent to it by a Modality Worklist SCU.

2.2.1.6.6.2   Proposed Presentation Contexts

PACS AE will accept any of the Presentation Contexts listed in Table 2.2-38 for Query.

Table 2.2-39 Presentation Contexts accepted by PACS AE

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	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

2.2.1.6.6.3   SOP Specific Conformance – Modality Worklist

PACS AE provides standard conformance to the DICOM Modality Worklist Information Model Class as an SCP. The DICOM attributes that can be queried to this external module of PACS AE when issuing a DICOM Modality Worklist request are the same as for Modality Worklist SCU in Table 2.2-20.

Note:

- DICOM Modality Worklist entries are added via HL7 messages described in HL7 Conformance Statement (Document ID# 001396/35647629) or via proprietary messages sent in TCP/IP with separate DICOM Modality Worklist component.

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- ▪ DICOM Modality Worklist is available for Server and Standalone component depending on a specific option.

2.3   Network Interfaces

The SE Solution provides DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the DICOM Standard. The SE Solution inherits its TCP/IP stack from the computer system upon which it executes.

2.3.1   Physical Medium Support

The SE Solution is indifferent to the physical medium over which TCP/IP executes; it inherits the medium from the computer system upon which it is being executed.

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2.4 Configuration

Any configuration of the SE Solution that affects DICOM conformance is described in this section.

2.4.1 AE Title/Presentation Mapping

This sub-section describes any configuration of the PACS and the Client AE that affects DICOM conformance.

2.4.1.1 Local AE Titles

The translation from Application Entity Title to Presentation Address is stored in the database. Along with this mapping, the database stores those AE titles that are allowed to communicate with the PACS or the Client AE.

2.4.1.2 Configuration Parameters

Table 2.4-1 PACS and Client AEs Configuration Parameter Table

Parameter	Description	Configurable (yes/no)	Default Value
Number of Simultaneous Associations	Maximum number of simultaneous associations accepted by the PACS AE / Client AE.	No	Theoretically unlimited. Limited by network and machine capabilities.
Calling AE Title	Calling title that the PACS AE will use.	Yes	Note : • One calling AE can be configured per allowed AE to communicate with the PACS AE. • PACS AE does not have any AE title: it can be what you want.
SCU Check	Check the SCU AE Title before accepting an association.	Yes	Disable.
Port	Listening port used by the remote AE users to accept DICOM communications.	Yes	104: Client AE 304: PACS AE
Read Timeout	How long a communication pause is tolerated before the connection is reset.	Yes	6000 ms
Connect Timeout	How long the PACS AE waits for a response when trying to establish communication with a remote AE.	Yes	6000 ms
Response delay	How long the PACS AE waits before reply N-EVENT to modality (for Storage Commitment)	Yes	6000 ms

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3 MEDIA INTERCHANGE

3.1 Implementation Model

3.1.1 Application Data Flow Diagram
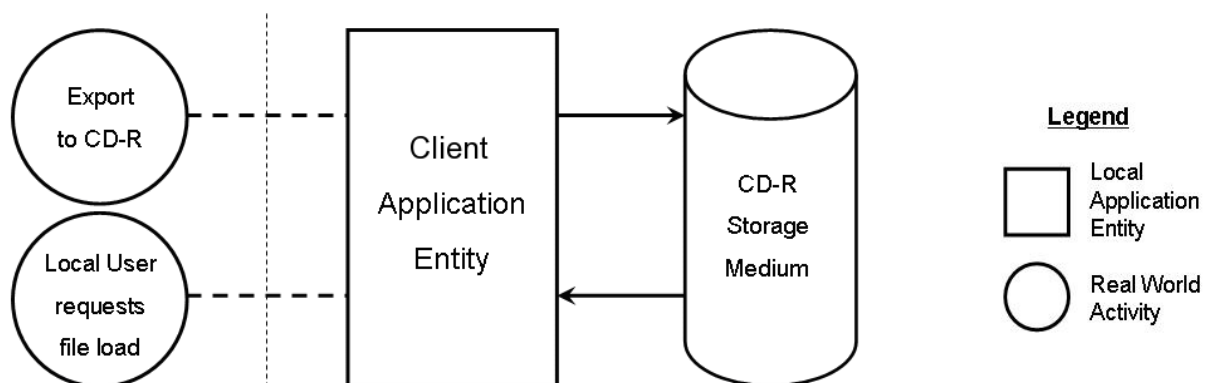
Figure 3.1-1 Functional Overview – Application Data Flow

3.1.2 Functional Definition of AE's

The following data flows are depicted in Figure 3.1-1.

The Client Application Entity exports images to a CD-R Storage medium. It is associated with the local real-world activity "Export to CD-R". "Export to CD-R" is performed upon user request for selected patients, studies or series.
Activation of the "Export to DicomDir Media" menu entry will pass the currently selected patients, studies and series to the Client AE. The SOP Instances associated with the selection will be collected into one job.

The SE Solution provides a user interface, network support and media support as a File Set Reader. The Client AE loads a user-selected PS 3.10 compliant file, which may be a DICOMDIR or an image, either from the local file system or from PS 3.12 compliant media according to one of the General Purpose Media Application Profiles of PS 3.11. The "Local User requests file load" activity is activated through the user interface to select a directory that contains a DICOMDIR file or at compliant media insertion.

3.1.3 Sequencing of Real World Activities

3.1.3.1 Sequencing of "Export to CD-R" activity

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

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3.1.3.2   Sequencing of "Local user requests file load" activity

All FSR activities are sequentially initiated in the user interface, and any other activity may be initiated until the prior activity has completed.

3.1.4   File Meta Information for Implementation Class and Version

The implementation information written to the File Meta Header in each file is described below in Table 3.1-2.

Table 3.1-2 DICOM implementation Class and Version for media storage

Implementation Class	Version
Implementation Class UID	`1.2.250.1.46.1`
Implementation Version Name	`n1_n2_n3` where `n1`, `n2`, `n3` are major, minor and revision numbers of current version of the internal DICOM engine (*TsiDicom* DLL version)

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3.2 AE Specifications

3.2.1 Client Application Entity Specification

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

Table 3.2-1 Application Profiles, Real World Activities and Roles for Client AE

Real-World Activity	Application Profiles Supported	Roles	SC Option
Export to CD-R	STD-GEN-CD	FSC	Interchange
Load directory or file	STD-GEN-CD	FSR	Interchange
Load directory or file	STD-GEN-DVD-RAM	FSR	Interchange

3.2.1.1 File Meta Information for the Client Application Entity

The Source Application Entity Title included in the File Meta Header is configurable via user interface.

3.2.1.2 Real-World Activities

3.2.1.2.1 Export to CD-R Real - World activity

The Client AE acts as an FSC using the interchange option when requested to export SOP Instances to a CD-R medium.

The contents of the export job will be written together with a corresponding DICOMDIR to a single volume CDR. Writing in multi-session mode is not supported.

3.2.1.2.1.1 Media Storage Application Profile

The Client AE supports the STD-GEN-CD Application Profile.

3.2.1.2.2 Local user request file - World activity

The Client AE is activated through the User Interface when a user selects the "Load DICOMDIR" operation in the browser window.

3.2.1.2.3 Application Profile Specific Conformance

There are no extensions or specializations.

3.3 Augmented and Private Application Profiles

The SE Solution does not support any augmented profiles or private application profiles.

3.4 Media Configuration

All local applications use the AE Titles configured via user interface.

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4   SUPPORT FOR EXTENDED CHARACTER SETS

4.1   SE Extended Character Set Support

The SE Solution supports the following character sets:

Table 4.1-1 SE AEs Extended Character Sets

Defined Term	Character Set
ISO-IR 100 (default)	Latin Alphabet No. 1
ISO_IR 101	Latin alphabet No. 2
ISO_IR 110	Latin alphabet No. 4 (Baltic)
ISO_IR 144	Cyrillic
ISO_IR 126	Greek
ISO_IR 148	Latin alphabet No. 5 (Turkish)
ISO_IR 138	Hebrew

5   SECURITY

5.1   Security profile

The SE Solution does not implement any DICOM security profiles defined in PS 3.15.

5.2   Association level security

The SE Solution provides for the PACS AE an association level security by restricting acceptance to association requests only from DICOM Application Entities configured in PACS authorized SCU directory.

Requests from unknown DICOM AEs can be rejected if option 'Check AE Title' is enabled.

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6 ANNEXES

6.1 IOD Contents

6.1.1 Usage of attributes from received IODs

The Client AE is able to apply linear VOI LUT function of type "sigmoïd" and "linear".

It also supports Pixel Padding Value (0028, 0120) but also Pixel Padding Range Limit (0028,0121) for image contrast adjustment / inversion of image contrast.

6.1.2 Created SOP Instances

When are DICOM instances created:

1. If it is a new patient, Specific Character Set (0008,0005) is automatically filled in depending on the current keyboard and mapped into DICOM Specific Character Set value. For Example:

   ▪ if current keyboard is FR (French), then Specific Character set will be "ISO_IR 100"

   ▪ if current keyboard is EL (Greek), then Specific Character set will be ISO_IR 126" etc.

2. If we want to modify existing instances, Specific Character Set (0008,0005) stays the same and modifications are only allowed if the current keyboard corresponds to this Specific Character Set,

3. If DICOM instances are generated from existing instances, their character set and data are based on the existing data without any DICOM data encoded in Unicode addition/modification.

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 with a value

➢ EMPTY   Attribute is sent without a value

➢ NO   Not supported

The abbreviations used in the "Source"-column:

➢ USER   the attribute value source is from User input

➢ AUTO   the attribute value is generated automatically

➢ MWL   the attribute value is the value received from the Modality Worklist

➢ CONFIG   the attribute value source is a configurable parameter

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6.1.2.1   GSPS IOD

IE	Module	Presence of Module
Patient	Patient	ALWAYS
	Clinical Trial Subject	NO
Study	General Study	ALWAYS
	Patient Study	NO
	Clinical Trial Study	NO
Series	General Series	ALWAYS
	Clinical Trial Series	NO
	Presentation Series	ALWAYS
Equipment	General Equipment	ALWAYS
Image	Presentation State Identification	ALWAYS
	Presentation State Relationship	ALWAYS
	Presentation State Shutter	NO
	Presentation State Mask	NO
	Mask	NO
	Display Shutter	NO
	Bitmap display shutter	NO
	Overlay plane	NO
	Overlay Activation	NO
	Displayed Area	ALWAYS
	Graphic Annotation	When graphic annotations or information on images are present
	Spatial Transformation	ALWAYS
	Graphic Layer	When graphic annotations or information on images are present
	Modality LUT	ALWAYS
	Softcopy VOI LUT	ALWAYS
	Softcopy Presentation LUT	ALWAYS
	SOP Common	ALWAYS

6.1.2.2   GSPS Modules

GSPS created might contain following items:

- Text notes in DISPLAY mode defined by bounding box,

- Text notes in DISPLAY mode defined by Anchor point,

- Text notes in PIXEL mode defined by bounding Box,

- Polyline Graphic objects (Pixel mode),

- Interpolated Graphic objects (Pixel mode),

- Ellipse Graphic objects (Pixel mode),

- Circle Graphic objects (Pixel mode),

- Spatial transformation,

- Window/Level modifications.

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Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient					
Patient Identification					
Patient's Name	(0010,0010)	PN		VNAP	User / MWL
Patient ID	(0010,0020)	LO		VNAP	User / MWL
Issuer of Patient ID	(0010,0021)	LO		NO	MWL
Other Patient IDs	(0010,1000)	LO		NO	MWL
Other Patient Names	(0010,1001)	PN		NO	MWL
Patient's Birth Name	(0010,1005)	PN		NO	MWL
Patient Demographic					
Patient's Birth Date	(0010,0030)	DA		VNAP	User / MWL
Patient's Sex	(0010,0040)	CS		VNAP	User / MWL
Patient Comments	(0010,4000)	LT		ANAP	User
Veterinary					
Patient Species Description	(0010,2201)	LO		VNAP(*)	User / MWL
Patient Breed Description	(0010,2292)	LO		VNAP(*)	User / MWL
Patient Breed Registration	(0010,2294)	SQ		VNAP(*)	User / MWL
Responsible Person	(0010,2297)	CS		VNAP(*)	User / MWL
Responsible Person Role	(0010,2298)	CS		VNAP(*)	User / MWL
Responsible Organization	(0010,2299)	LP		VNAP(*)	User / MWL
Responsible Sex Neutered	(0010,2203)	CS		VNAP(*)	User / MWL
Study					
General Study					
Study Instance UID	(0020,000D)	UI		ALWAYS	MWL / Auto
Study Date	(0008,0020)	DA		ALWAYS	Auto
Study Time	(0008,0030)	TM		ALWAYS	Auto
Referring Physician's Name	(0008,0090)	PN		VNAP	User / MWL
Study ID	(0020,0010)	SH		ALWAYS	Auto / MWL
Accession Number	(0008,0050)	SH		VNAP	User / MWL
Study Description	(0008,1030)	LO		ANAP	Auto
Name of Physician(s) Reading Study	(0008,1060)	PN		ANAP	MWL
Series					
General Series					
Modality	(0008,0060)	CS		ALWAYS	MWL/User
Series Instance UID	(0020,000E)	UI		ALWAYS	Auto
Series Number	(0020,0011)	IS		ALWAYS	Auto
Laterality	(0020,0060)	CS		ANAP	User / Auto
Performing Physicians' Name	(0008,1050)	PN		ANAP	User
Series Description	(0008,103E)	LO		ALWAYS	Auto
Operators' Name	(0008,1070)	PN		ALWAYS	Auto
Body Part Examined	(0018,0015)	CS		ANAP	User / Auto
Patient Position	(0018,5100)	CS		ANAP	Auto
Series Laterality	(0020,0060)	CS		ANAP	User / Auto
Presentation Series					
Modality	(0008,0060)	CS	PR	ALWAYS	Fixed
Series Instance UID	(0020,000E)	UI		ALWAYS	Auto
Series Number	(0020,0011)	IS		ALWAYS	AUTO/User
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Equipment					

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Attribute Name	Tag	VR	Value	Presence of Value	Source
General Equipment					
Manufacturer	(0008,0070)	LO	AGFA NV	ALWAYS	Auto
Manufacturer Model's name	(0008,1090)	LO	SE	ALWAYS	Auto
Image					
Presentation State Identification					
Instance Number	(0020,0013)	IS		ALWAYS	Auto
Content Label	(0070,0080)	CS	GSPS if Auto	ALWAYS	Auto/USER
Content Description	(0070,0081)	LO		EMPTY	Empty
Presentation Creation Date	(0070,0082)	DA		ALWAYS	Auto
Presentation Creation Time	(0070,0083)	TM		ALWAYS	Auto
Content Creator's Name	(0070,0084)	PN		EMPTY	Auto
Presentation State Relationship					
Referenced Series Sequence	(0008,1115)	SQ		ALWAYS	Auto
>Series Instance UID	(0020,000E)	UI		ALWAYS	Auto
>Referenced Image Sequence	(0008,1140)	SQ		ALWAYS	Auto
>> Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	Auto
>> Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	Auto
Displayed Area					
Displayed Area Selection Sequence	(0070,005A)	SQ		ALWAYS	Auto
>Referenced Image Sequence	(0008,1140)	SQ		ANAP	Auto
>>Referenced SOP Class UID	(0008,1150)	UI		ANAP	Auto
>>Referenced SOP Instance UID	(0008,1155)	UI		ANAP	Auto
>Displayed Area Top Left Hand Corner	(0070,0052)	SL		ALWAYS	Auto
>Displayed Area Bottom Right Hand Corner	(0070,0053)	SL		ALWAYS	Auto
>Presentation Size Mode	(0070,0100)	CS	MAGNIFY, FIT TO SCALE, TRUE SIZE	ALWAYS	Auto
>Presentation Pixel Spacing	(0070,0101)	DS		ANAP	Auto
> Presentation Pixel Aspect Ratio	(0070,0102)	IS	1 or empty if TRUE SIZE	VNAP	Auto
> Presentation Pixel Magnification Ratio	(0070,0103)	FL	Present if Presentation size mode = MAGNIFY	ANAP	Auto
Graphic Annotation					
Graphic Annotation Sequence	(0070,0001)	SQ		ANAP	User
>Graphic Layer	(0070,0002)	CS		ALWAYS	Auto
>Text Object Sequence	(0070,0008)	SQ		ANAP	Auto
>>Bounding Box Annotation Units	(0070,0003)	CS		ANAP	Auto
>>Anchor Point Annotation Units	(0070,0004)	CS		ANAP	Auto
>>Unformatted Text Value	(0070,0006)	ST		ANAP	Auto
>>Bounding Box Top Left Hand Corner	(0070,0010)	FL		ANAP	Auto
>>Bounding Box Bottom Right Hand Corner	(0070,0011)	FL		ANAP	Auto
>>Bounding Box Text Horizontal Justification	(0070,0012)	CS		ANAP	Auto
>>Anchor Point	(0070,0014)	FL		ANAP	Auto
>>Anchor Point Visibility	(0070,0015)	CS	NO	ANAP	Auto
>Graphic Object Sequence	(0070,0009)	SQ		ANAP	Auto
>>Graphic Annotation Units	(0070,0005)	CS	PIXEL	ANAP	Auto
>>Graphic Dimensions	(0070,0020)	US	2	ANAP	Auto

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Attribute Name	Tag	VR	Value	Presence of Value	Source
>>Number of Graphic Points	(0070,0021)	US		ANAP	Auto
>>Graphic Data	(0070,0022)	FL		ANAP	Auto
>>Graphic Type	(0070,0023)	CS	Cannot be POINT	ANAP	Auto
>>Graphic Filled	(0070,0024)	CS		ANAP	Auto
Spatial Transformation					
Image Rotation	(0070,0042)	US		ALWAYS	User
Image Horizontal Flip	(0070,0041)	CS		ALWAYS	User
Graphic Layer					
Graphic Layer Sequence	(0070,0060)	SQ		ALWAYS	Auto
>Graphic Layer	(0070,0002)	CS		ALWAYS	Auto
>Graphic Layer Order	(0070,0062)	IS		ALWAYS	Auto
>Graphic Layer Recommended Display RGB Value	(0070,0067)	US		ALWAYS	Auto
Modality LUT					
Modality LUT Sequence	(0028,3000)	SQ		ANAP	Auto
>LUT Descriptor	(0028,3002)	US or SS		ANAP	Auto
>LUT Explanation	(0028,3003)	LO		ANAP	Auto
>Modality LUT Type	(0028,3004)	LO		ANAP	Auto
>LUT Data	(0028,3006)	US or SS or OW		ANAP	Auto
Rescale Intercept	(0028,1052)	DS		ANAP	Auto
Rescale Slope	(0028,1053)	DS		ANAP	Auto
Rescale Type	(0028,1054)	LO		ANAP	Auto
Softcopy VOI LUT					
VOI LUT Sequence	(0028,3010)	SQ		ANAP	Auto
>LUT Descriptor	(0028,3002)	SS		ANAP	Auto
>LUT Explanation	(0028,3003)	LO		ANAP	Auto
>LUT Data	(0028,3006)	SS		ANAP	Auto
Window Center	(0028,1050)	DS		ANAP	Auto
Window Width	(0028,1051)	DS		ANAP	Auto
Window Center & Width Explanation	(0028,1055)	LO		ANAP	Auto
VOI LUT Function	(0028,1056)	CS		ANAP	Auto
Softcopy Presentation LUT					
Presentation LUT Sequence	(0028,3010)	SQ		ANAP	Auto
>LUT Descriptor	(0028,3002)	SS		ANAP	Auto
>LUT Explanation	(0028,3003)	LO		ANAP	Auto
>LUT Data	(0028,3006)	SS		ANAP	Auto
Presentation LUT Shape	(2050,0020)	CS		ANAP	Auto
SOP Common					
SOP Class UID	(0008,0016)	UI		ALWAYS	Auto
SOP Instance UID	(0008,0018)	UI		ALWAYS	Auto
Instance Creation Date	(0008,0012)	DA		ANAP	Auto
Instance Creation Time	(0008,0013)	TM		ANAP	Auto
Instance Creator UID	(0008,0014)	UI		ANAP	Auto
Instance Number	(0020,0013)	IS		ALWAYS	Auto

(*) VET license option needed.

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6.2   Grayscale Image Consistency

The display monitors of review workstations must be calibrated according to the Grayscale Standard Display Function (GSDF).

6.3   Basic Text SR IOD

IE	Module	Presence of Module
Patient	Patient	ALWAYS
	Specimen Identification	NO
	Clinical Trial Subject	NO
Study	General Study	ALWAYS
	Patient Study	ALWAYS
	Clinical Trial Study	NO
Series	SR Document Series	ALWAYS
	Clinical Trial Series	NO
Equipment	General Equipment	ALWAYS
Document	SR Document General	ALWAYS
	SR Document Content	ALWAYS
	SOP Common	ALWAYS
	Private Application	ALWAYS

6.3.1.1   Basic Text SR Modules

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient					
Patient Identification					
Patient's Name	(0010,0010)	PN		VNAP	User / MWL
Patient ID	(0010,0020)	LO		VNAP	User / MWL
Issuer of Patient ID	(0010,0021)	LO		NO	MWL
Other Patient IDs	(0010,1000)	LO		NO	MWL
Other Patient Names	(0010,1001)	PN		NO	MWL
Patient's Birth Name	(0010,1005)	PN		NO	MWL
Patient Demographic					
Patient's Birth Date	(0010,0030)	DA		VNAP	User / MWL
Patient's Sex	(0010,0040)	CS		VNAP	User / MWL
Patient Comments	(0010,4000)	LT		ANAP	User
Veterinary					
Patient Species Description	(0010,2201)	LO		VNAP(*)	User / MWL
Patient Breed Description	(0010,2292)	LO		VNAP(*)	User / MWL
Patient Breed Registration	(0010,2294)	SQ		VNAP(*)	User / MWL
Responsible Person	(0010,2297)	CS		VNAP(*)	User / MWL
Responsible Person Role	(0010,2298)	CS		VNAP(*)	User / MWL
Responsible Organization	(0010,2299)	LP		VNAP(*)	User / MWL
Responsible Sex Neutered	(0010,2203)	CS		VNAP(*)	User / MWL
Study					
General Study					
Study Instance UID	(0020,000D)	UI		ALWAYS	MWL / Auto
Study Date	(0008,0020)	DA		ALWAYS	Auto
Study Time	(0008,0030)	TM		ALWAYS	Auto

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Attribute Name	Tag	VR	Value	Presence of Value	Source
Referring Physician's Name	(0008,0090)	PN		VNAP	User / MWL
Study ID	(0020,0010)	SH		ALWAYS	Auto / MWL
Accession Number	(0008,0050)	SH		VNAP	User / MWL
Study Description	(0008,1030)	LO		ANAP	Auto
Name of Physician(s) Reading Study	(0008,1060)	PN		ANAP	MWL
Series					
General Series					
Modality	(0008,0060)	CS		ALWAYS	MWL/User
Series Instance UID	(0020,000E)	UI		ALWAYS	Auto
Series Number	(0020,0011)	IS		ALWAYS	Auto
Laterality	(0020,0060)	CS		ANAP	User / Auto
Performing Physicians' Name	(0008,1050)	PN		ANAP	User
Series Description	(0008,103E)	LO		ALWAYS	Auto
Operators' Name	(0008,1070)	PN		ALWAYS	Auto
Body Part Examined	(0018,0015)	CS		ANAP	User / Auto
Patient Position	(0018,5100)	CS		ANAP	Auto
Series Laterality	(0020,0060)	CS		ANAP	User / Auto
Presentation Series					
Modality	(0008,0060)	CS	SR	ALWAYS	Fixed
Series Instance UID	(0020,000E)	UI		ALWAYS	Auto
Series Number	(0020,0011)	IS		ALWAYS	AUTO/User
Series Date	(0008,0021)	DA		ALWAYS	AUTO
Series Time	(0008,0031)	TM		ALWAYS	AUTO
Equipment					
General Equipment					
Manufacturer	(0008,0070)	LO	AGFA NV	ALWAYS	Auto
Manufacturer Model's name	(0008,1090)	LO	SE	ALWAYS	Auto
Document					
General					
Content Date	(0008,0023)	DA		ALWAYS	Auto
Content Time	(0008,0033)	TM		ALWAYS	Auto
Instance Number	(0020,0013)	IS		ALWAYS	Auto
Performed Procedure Code Sequence	(0040,A372)	SQ		ALWAYS	Auto
Completion Flag	(0040,A491)	CS	PARTIAL or COMPLETE	ALWAYS	Auto
Verification Flag	(0040,A493)	CS	VERIFIED or UNVERIFIED	ALWAYS	Auto
Content					
Value Type	(0040,A040)	CS	CONTAINER	ALWAYS	Auto
Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	Auto
>Code Value	(0008,0100)	SH	C000	ALWAYS	Auto
>Coding Scheme Designator	(0008,0102)	SH	99AGFAHCES	ALWAYS	Auto
>Code Meaning	(0008,0104)	LO	Report	ALWAYS	Auto
Continuity of Content	(0040,A050)	CS	SEPARATE	ALWAYS	Auto
Content sequence	(0040,A730)	SQ		ALWAYS	Auto
>Relationship Type	(0040,A010)	CS	CONTAINS	ALWAYS	Auto
>Value Type	(0040,A040)	CS	TEXT or IMAGE	ALWAYS	Auto

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Attribute Name	Tag	VR	Value	Presence of Value	Source
>Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	Auto
>>Code Value	(0008,0100)	SH	C100, C200, C300, C400 or C500	ALWAYS	Auto
>>Coding Scheme Designator	(0008,0102)	SH	99AGFAHCES	ALWAYS	Auto
>>Code Meaning	(0008,0104)	LO	Request, History, Procedure, Finding, or Conclusion	ALWAYS	Auto
>Text Value	(0040,A160)	UT		ALWAYS	Auto
>Referenced SOP Sequence	(0008,1199)	SQ		ALWAYS	Auto
>> Referenced SOP Class UID	(0008,1150)	UI		ALWAYS	Auto
>> Referenced SOP Instance UID	(0008,1155)	UI		ALWAYS	Auto
SOP Common					
Specific Character Set	(0008,0005)	CS	Default = ISO_IR 100	ALWAYS	Auto
SOP Class UID	(0008,0016)	UI		ALWAYS	Auto
SOP Instance UID	(0008,0018)	UI		ALWAYS	Auto
Instance Creation Date	(0008,0012)	DA		ANAP	Auto
Instance Creation Time	(0008,0013)	TM		ANAP	Auto
Instance Creator UID	(0008,0014)	UI		ANAP	Auto
Instance Number	(0020,0013)	IS		ALWAYS	Auto
Private Application					
Agfa SR Version Number	(0019,1020)	CS	1.0	ALWAYS	Auto

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6.4   CR Image from acquisition module

6.4.1.1   CR Image IOD

IE	Module	Presence of Module
Patient	Patient	ALWAYS
	Clinical Trial Subject	NO
Study	General Study	ALWAYS
	Patient Study	ALWAYS
	Clinical Trial Study	NO
Series	General Series	ALWAYS
	CR Series	ALWAYS
	Clinical Trial Series	NO
Equipment	General Equipment	ALWAYS
Image	General Image	ALWAYS
	Image Pixel	ALWAYS
	Contrast/bolus	NO
	Display Shutter	NO
	Device	NO
	CR Image	ALWAYS
	Overlay Plane	NO
	Modality LUT	NO
	VOILUT	NO
	SOP Common	ALWAYS

6.4.1.2   CR Image Modules

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient					
Patient Identification					
Patient's Name	(0010,0010)	PN		ALWAYS	User / MWL
Issuer of Patient ID	(0010,0021)	LO		NO	MWL
Other Patient IDs	(0010,1000)	LO		NO	MWL
Other Patient Names	(0010,1001)	PN		NO	MWL
Patient's Birth Name	(0010,1005)	PN		NO	MWL
Patient ID	(0010,0020)	LO		VNAP	User / MWL
Patient Demographic					
Patient's Birth Date	(0010,0030)	DA		VNAP	User / MWL
Patient's Sex	(0010,0040)	CS		VNAP	User / MWL
Patient Comments	(0010,4000)	LT		ANAP	User
Veterinary					
Patient Species Description	(0010,2201)	LO		VNAP(*)	User / MWL
Patient Breed Description	(0010,2292)	LO		VNAP(*)	User / MWL
Patient Breed Registration	(0010,2294)	SQ		VNAP(*)	User / MWL
Responsible Person	(0010,2297)	CS		VNAP(*)	User / MWL
Responsible Person Role	(0010,2298)	CS		VNAP(*)	User / MWL

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Attribute Name	Tag	VR	Value	Presence of Value	Source
Responsible Organization	(0010,2299)	LP		VNAP(*)	User / MWL
Responsible Sex Neutered	(0010,2203)	CS		VNAP(*)	User / MWL
Study					
General Study					
Study Instance UID	(0020,000D)	UI		ALWAYS	MWL / Auto
Study Date	(0008,0020)	DA		ALWAYS	Auto
Study Time	(0008,0030)	TM		ALWAYS	Auto
Referring Physician's Name	(0008,0090)	PN		VNAP	User / MWL
Study ID	(0020,0010)	SH		ALWAYS	Auto / MWL
Accession Number	(0008,0050)	SH		VNAP	User / MWL
Study Description	(0008,1030)	LO		ANAP	User
Series					
General Series					
Modality	(0008,0060)		FIXED: CR	ALWAYS	Auto
Series Instance UID	(0020, 000D)	UI		ALWAYS	Auto
Series Date	(0008,0021)	DA		ALWAYS	Auto
Series Time	(0008,0031)	TM		ALWAYS	Auto
Series Number	(0020,0011)	IS		ALWAYS	Auto
Laterality	(0020,0060)	CS		ANAP	User
Performing Physicians' Name	(0008,1050)	PN		ANAP	User / MWL
Series Description	(0008,103E)	LO		ANAP	User
Body Part Examined	(0018,0015)	CS		ANAP	User / Auto
Protocol Name	(0018,1030)	LO		EMPTY	Auto
CR Series					
Plate Type	(0018,1260)	SH		ALWAYS	Auto
View Position	(0018,5101)	CS		ALWAYS	User
Equipment					
General Equipment					
Manufacturer	(0008,0070)	LO	AGFA NV	ALWAYS	Auto
Station Name	(0008,1010)	SH		EMPTY	Auto
Manufacturer Model's name	(0008,1090)	LO	CR30-X or CR10-x	ALWAYS	Auto
Device Serial Number	(0018,1000)	LO		ALWAYS	Auto
Software Versions	(0018,1020)	LO		ALWAYS	Auto
Image					
SOP Common					
SOP Class UID	(0008,0016)	UI		ALWAYS	Auto
SOP Instance UID	(0008,0018)	UI		ALWAYS	Auto
Specific Character Set	(0008,0005)	CS		ALWAYS	Auto
Instance Creation Date	(0008,0012)	DA		ANAP	Auto
Instance Creation Time	(0008,0013)	TM		ANAP	Auto
Patient Orientation	(0020,0020)	CS		ANAP	User
Image Type	(0008,0008)	CS	ORIGINAL/SECONDARY		
Acquisition Date	(0008,0022)	DA		ANAP	Auto
Acquisition Time	(0008,0032)	TM		ANAP	Auto
Image Comments	(0020,4000)	LT		ANAP	Auto
Sample per pixel	(0028,0002)	US	1	ANAP	Auto
Photometric interpretation	(0028,0004)	CS	MONOCHROME 1	ANAP	Auto
Rows	(0028,0010)	US		ANAP	Auto

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Attribute Name	Tag	VR	Value	Presence of Value	Source
Columns	(0028,0011)	US		ANAP	Auto
Bit allocated	(0028,0100)	US		ANAP	Auto
Bit stored	(0028,0101)	US		ANAP	Auto
High bit	(0028,0102)	US		ANAP	Auto
Pixel representation	(0028,0103)	US	0	ANAP	Auto
Pixel Data	(7FE0,0010)	OW		ANAP	Auto
CR Image					
Plate ID	(0018,1004)	LO		ALWAYS	Auto
Imager Pixel Spacing	(0018,1164)	DS		ALWAYS	Auto
Cassette Orientation	(0018,1402)	CS	LANDSCAPE, PORTRAIT	ALWAYS	User/Auto
Cassette Size	(0018,1403)	CS		ALWAYS	Auto
Exposure on Plate	(0018,1404)	US		ALWAYS	Auto
Sensitivity	(0018,6000)	DS		ALWAYS	Auto
Instance Number	(0020,0013)	IS		ALWAYS	Auto
Softcopy VOI LUT					
Window Center	(0028,1050)	DS		ANAP	Auto
Window Width	(0028,1051)	DS		ANAP	Auto
Modality LUT					
Rescale Intercept	(0028,1052)	DS		ALWAYS	Auto
Rescale Slope	(0028,1053)	DS		ALWAYS	Auto
Rescale Type	(0028,1054)	LO		ALWAYS	Auto
Softcopy Presentation LUT					
Presentation LUT Shape	(2050,0020)		INVERSE	ALWAYS	Auto

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This document was approved by:

Signatures:

1. Bruno Laffin (nawyv) on 2019-06-03 08:43 AM CET
2. Jianhua Wang (awyuk) on 2019-05-30 08:49 AM CET
3. Quan Li (axkex) on 2019-05-30 08:34 AM CET
4. Neil Taylor (apxzu) on 2019-06-04 08:21 AM CET
5. Catia Ferrao Marques (apyae) on 2019-06-04 10:00 AM CET
6. Lieselot Kerremans (apydh) on 2019-06-03 09:00 AM CET

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