GE Healthcare

Technical Publications

Direction 2055292-001
Revision 1

Centricity® PACS Reach v1.0

CONFORMANCE STATEMENT for DICOM

do not duplicate

Copyright© 2010 By General Electric Co.

THIS PAGE LEFT INTENTIONALLY BLANK

CONFORMANCE STATEMENT OVERVIEW

The Centricity® PACS Reach v1.0 product offers a compact, easy to use & deploy diagnostic image processing, review, distribution & reporting tool and uses DICOM standard for handling, storing and transmitting information.

Table 0.1 provides an overview of the network services supported by Centricity Reach product.

Table 0.1 – NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Computed Radiography Image Storage	Yes	Yes
CT Image Storage	Yes	Yes
MR Image Storage	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
X-Ray Angiographic Image Storage	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	Yes	Yes
Digital X-Ray Image Storage - For Presentation	Yes	Yes
Digital X-Ray Image Storage - For Processing	Yes	Yes
Digital Mammography X-Ray Image Storage - For Presentation	Yes	Yes
Digital Mammography X-Ray Image Storage - For Processing	Yes	Yes
Nuclear Medicine Image Storage	Yes	Yes
Standalone Curve Storage	Yes	Yes
Positron Emission Tomography Image Storage	Yes	Yes
Standalone PET Curve Storage	Yes	Yes
RT Structure Set Storage	Yes	Yes
GE Private DICOM RT Plan	Yes	Yes
NM Genie Private Data	Yes	Yes
PET Advance Private Data	Yes	Yes
GE Private DICOM 3D Object	Yes	Yes
Ultrasound Image Storage	Yes	Yes
Ultrasound Multi-frame Image Storage	Yes	Yes
Ultrasound Image Storage (Retired)	Yes	Yes
Ultrasound Multi-frame Image Storage (Retired)	Yes	Yes
Basic Text SR	Yes	Yes
Enhanced SR	Yes	Yes
Comprehensive SR	Yes	Yes
Enhanced XRF Image Storage	Yes	Yes
Verification SOP Class	Yes	Yes
Key Object Selection Document	Yes	Yes
Query/Retrieve		
Study Root Query/Retrieve Information Model - FIND	Yes	Yes

Study Root Query/Retrieve Information Model - MOVE	Yes	Yes
Workflow Management		
Storage Commitment Push Model SOP Class	Yes	No

Table 0.2 provides an overview of the Media Storage Application Profiles supported by Centricity PACS Reach.

Table 0.2 - MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC)	Read Files (FSR)
Compact Disk – Recordable		
General Purpose CD-R (STD-GEN-CD)	Yes	No
DVD		
CT/MR Studies on DVD Media (STD-CTMR-DVD)	Yes	No

REVISION HISTORY

ENGINEERING REVISION HISTORY

Engineering revisions and master for this document are archived in the MyWorkshop system under **DOC0837157**

Revision	Version	Date	Reason for change
1	1	2010-Sep-10	Initial Release
1	2	2010-Oct-08	Update after review 1
1	3	2010-Nov-09	Update after review 2
1	4	2010-Nov-16	Update after review 3

TECHNICAL PUBLICATION REVISION HISTORY

M3 release of this document is referenced in the Part Data Management (PDM) system in the Common Document Library as Direction **2055292-001**

Revision	Date	Reason for change

THIS PAGE LEFT INTENTIONALLY BLANK

TABLE OF CONTENTS

1. INTRODUCTION 10

1.1 OVERVIEW 10

1.2 OVERALL DICOM CONFORMANCE STATEMENT DOCUMENT STRUCTURE 11

1.3 INTENDED AUDIENCE 12

1.4 SCOPE AND FIELD OF APPLICATION 12

1.5 IMPORTANT REMARKS 12

1.6 REFERENCES 13

1.7 DEFINITIONS 13

1.8 SYMBOLS AND ABBREVIATIONS 15

2. NETWORK CONFORMANCE STATEMENT 19

2.1 INTRODUCTION 19

2.2 IMPLEMENTATION MODEL 19
2.2.1 Application Data Flow Diagram 19
2.2.2 Functional Definition of AE 21
2.2.3 Sequencing of Real-World Activities 22

2.3 AE SPECIFICATIONS 22
2.3.1 DICOM SERVER AE Specification 22

2.4 COMMUNICATION PROFILES 49
2.4.1 Supported Communication Stacks 49
2.4.2 OSI Stack 49
2.4.3 TCP/IP Stack 49

2.5 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS 49

2.6 CONFIGURATION 50
2.6.1 AE Title/Presentation Address Mapping 50
2.6.2 Configurable Parameters 50

2.7 SUPPORT OF EXTENDED CHARACTER SETS 50

2.8 CODES AND CONTROLLED TERMINOLOGY 50

2.9 SECURITY PROFILES 50

3. MEDIA STORAGE CONFORMANCE STATEMENT 52

3.1 Introduction 52

3.2 IMPLEMENTATION MODEL 52
3.2.1 Application Data Flow Diagram 52
3.2.2 Functional Definition of AE's 53
3.2.3 Sequencing of Real-World Activities 53
3.2.4 File Meta Information Options (See PS3.10) 54

3.3 AE Specifications 54
3.3.1 DICOM Media Interchange Archive Server AE Specification 54
3.3.2 Physical Media and Media Formats 58
3.3.3 Directory Information in DICOMDIR 58

3.4 Augmented and Private Application Profiles 58

3.5 EXTENTIONS/SPECIALISATIONS/PRIVATIZATIONS 58

3.6 CONFIGURATION 58

3.7 SUPPORT OF EXTENDED CHARACTER SETS 59

4. BASIC DIRECTORY INFORMATION OBJECT IMPLEMENTATION 60

4.1 IOD Module Table 60

4.2 Information Module Definitions 60
4.2.1 File Set identification Module 60
4.2.2 Directory Information Module 60
4.2.3 Definition of Specific Directory Records 61

5. STORAGE COMMITMENT PUSH MODEL IMPLEMENTATION 64

5.1 INTRODUCTION 64

5.2 IOD MODULE TABLE 64
5.2.1 Storage Commitment Module for N-ACTION 64
5.2.2 Storage Commitment Module For N-EVENT-REPORT 64
5.2.3 Processing of Failure Reasons Received in a N-Event-Report 65

THIS PAGE LEFT INTENTIONALLY BLANK

1. INTRODUCTION

1.1 OVERVIEW

This DICOM Conformance Statement is divided into Sections as described below:

Section 1 (Introduction) describes the overall structure, intent, and references for this Conformance Statement

Section 2 (Network Conformance Statement) specifies the GEHC equipment compliance to the DICOM requirements for the implementation of networking features.

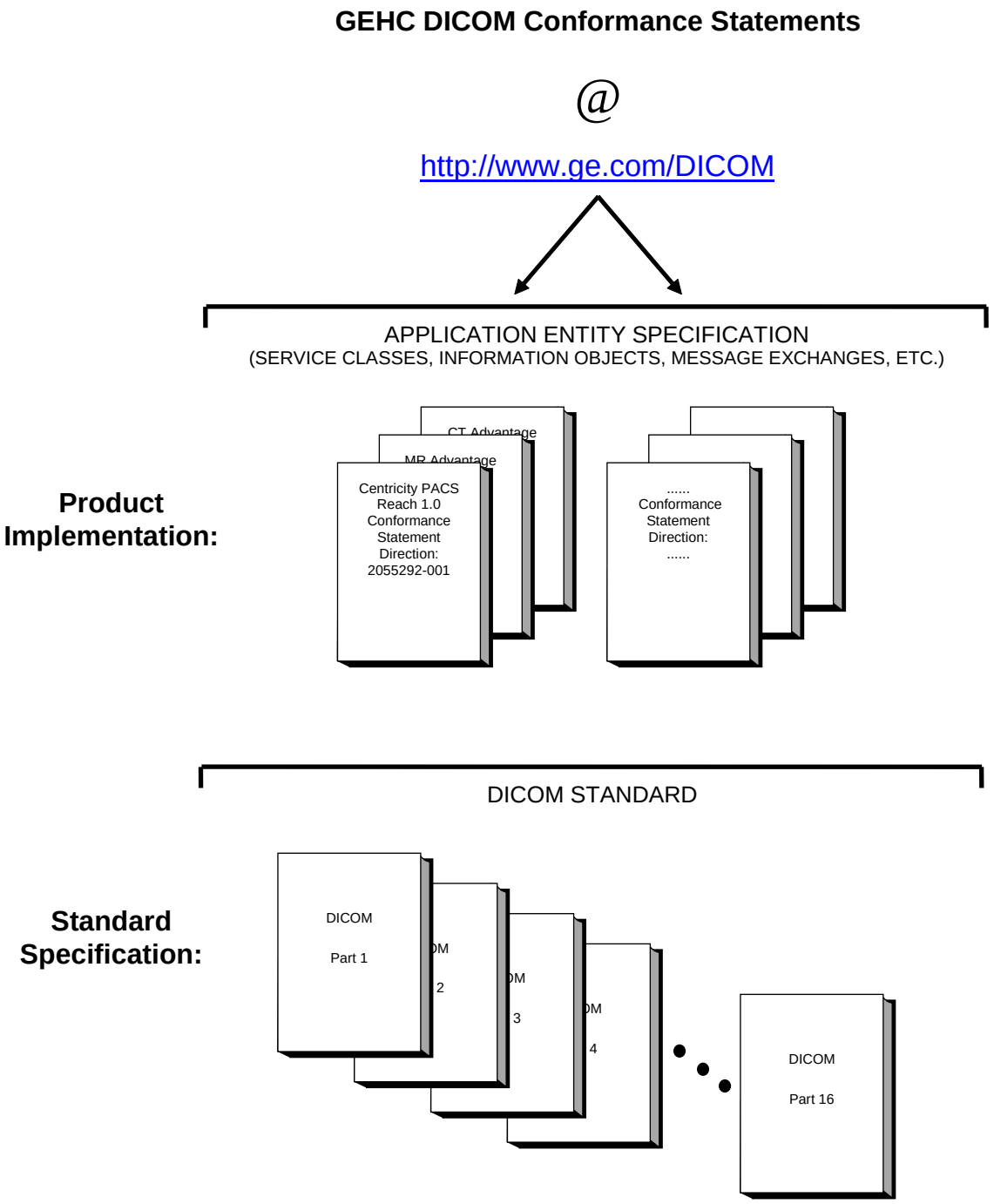
Section 3 (Media Storage Conformance Statement) specifies the GEHC equipment compliance to the DICOM requirements for the implementation of Media Storage features

Section 4 (Basic Directory Information Object Implementation) specifies the GEHC equipment compliance to the DICOM requirements for the Basic Directory IOD

Section 5 (Storage Commitment Push Model Implementation) specifies the GEHC equipment compliance to the DICOM requirements for Storage Commitment IOD

1.2 OVERALL DICOM CONFORMANCE STATEMENT DOCUMENT STRUCTURE

The Documentation Structure of the GEHC DICOM Conformance Statements is shown in the Illustration below.



This document specifies the DICOM implementation. It is entitled:

Centricity® PACS Reach v1.0
Conformance Statement for DICOM
Direction 2055292-001

This DICOM Conformance Statement documents the DICOM Conformance Statement and Technical Specification required to interoperate with the GEHC network interface.

The GEHC Conformance Statement, contained in this document, also specifies the Lower Layer communications which it supports (e.g., TCP/IP). However, the Technical Specifications are defined in the DICOM Part 8 standard.

For more information regarding DICOM, copies of the Standard may be obtained on the Internet at http://medical.nema.org. Comments on the Standard may be addressed to:

DICOM Secretariat
NEMA
1300 N. 17th Street, Suite 1752
Rosslyn, VA 22209
USA
Phone: +1.703.841.3200

1.3 INTENDED AUDIENCE

The reader of this document is concerned with software design and/or system integration issues. It is assumed that the reader of this document is familiar with the DICOM Standard and with the terminology and concepts which are used in that Standard.

1.4 SCOPE AND FIELD OF APPLICATION

It is the intent of this document to provide an unambiguous specification for GEHC implementations. This specification, called a Conformance Statement, includes a DICOM Conformance Statement and is necessary to ensure proper processing and interpretation of GEHC medical data exchanged using DICOM. The GEHC Conformance Statements are available to the public.

The reader of this DICOM Conformance Statement should be aware that different GEHC devices are capable of using different Information Object Definitions. For example, a GEHC CT Scanner may send images using the CT Information Object, MR Information Object, Secondary Capture Object, etc.

Included in this DICOM Conformance Statement are the Module Definitions which define all data elements used by this GEHC implementation. If the user encounters unspecified private data elements while parsing a GEHC Data Set, the user is well advised to ignore those data elements (per the DICOM standard). Unspecified private data element information is subject to change without notice. If, however, the device is acting as a "full fidelity storage device", it should retain and re-transmit all of the private data elements which are sent by GEHC devices.

1.5 IMPORTANT REMARKS

The use of these DICOM Conformance Statements, in conjunction with the DICOM Standards, is intended to facilitate communication with GE imaging equipment. However, **by itself, it is not sufficient to ensure that inter-operation will be successful**. The **user (or user's agent)** needs to proceed with caution and address at least four issues:

- **Integration** - The integration of any device into an overall system of interconnected devices goes beyond the scope of standards (DICOM), and of this introduction and associated DICOM Conformance Statements when interoperability with non-GE

equipment is desired. The responsibility to analyze the applications requirements and to design a solution that integrates GE imaging equipment with non–GE systems is the **user's** responsibility and should not be underestimated. The **user** is strongly advised to ensure that such an integration analysis is correctly performed.

- **Validation** - Testing the complete range of possible interactions between any GE device and non–GE devices, before the connection is declared operational, should not be overlooked. Therefore, the **user** should ensure that any non–GE provider accepts full responsibility for all validation required for their connection with GE devices. This includes the accuracy of the image data once it has crossed the interface between the GE imaging equipment and the non–GE device and the stability of the image data for the intended applications.

  Such a validation is required before any clinical use (diagnosis and/or treatment) is performed. It applies when images acquired on GE imaging equipment are processed/displayed on a non-GE device, as well as when images acquired on non-GE equipment is processed/displayed on a GE console or workstation.

- **Future Evolution** - GE understands that the DICOM Standard will evolve to meet the user's growing requirements. GE is actively involved in the development of the DICOM Standard. DICOM will incorporate new features and technologies and GE may follow the evolution of the Standard. The GEHC protocol is based on DICOM as specified in each DICOM Conformance Statement. Evolution of the Standard may require changes to devices, which have implemented DICOM. **In addition, GE reserves the right to discontinue or make changes to the support of communications features (on its products) reflected on by these DICOM Conformance Statements**. The **user** should ensure that any non–GE provider, which connects with GE devices, also plans for the future evolution of the DICOM Standard. Failures to do so will likely result in the loss of function and/or connectivity as the DICOM Standard changes and GE Products are enhanced to support these changes.

- **Interaction** - It is the sole responsibility of the **non–GE provider** to ensure that communication with the interfaced equipment does not cause degradation of GE imaging equipment performance and/or function.

1.6 REFERENCES

NEMA PS3 Digital Imaging and Communications in Medicine (DICOM) Standard, available free at http://medical.nema.org/

1.7 DEFINITIONS

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard is the authoritative source for formal definitons of these terms.

Abstract Syntax – the information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples : Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.

Application Entity (AE) – an end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title – the externally known name of an *Application Entity*, used to identify a DICOM application to other DICOM applications on the network.

Application Context – the specification of the type of communication used between *Application Entities*. Example: DICOM network protocol.

Association – a network communication channel set up between *Application Entities*.

Attribute – – a unit of information in an object definition; a data element identified by a *tag*. The information may be a complex data structure (Sequence), itself composed of lower level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

Information Object Definition (IOD) – the specified set of *Attributes* that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The *Attributes* may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Joint Photographic Experts Group (JPEG) – a set of standardized image compression techniques, available for use by DICOM applications.

Media Application Profile – the specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs)

Module – a set of *Attributes* within an *Information Object Definition* that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation – first phase of *Association* establishment that allows *Application Entities* to agree on the types of data to be exchanged and how that data will be encoded.

Presentation Context – the set of DICOM network services used over an *Association*, as negotiated between *Application Entities*; includes *Abstract Syntaxes* and *Transfer Syntaxes*.

Protocol Data Unit (PDU) – a packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.

Security Profile – a set of mechanisms, such as encryption, user authentication, or digital signatures, used by an *Application Entity* to ensure confidentiality, integrity, and/or availability of exchanged DICOM data

Service Class Provider (SCP) – role of an *Application Entity* that provides a DICOM network service; typically, a server that performs operations requested by another *Application Entity* (*Service Class User*). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).

Service Class User (SCU) – role of an *Application Entity* that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU)

Service/Object Pair (SOP) Class – the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

Service/Object Pair (SOP) Instance – an information object; a specific occurrence of information exchanged in a *SOP Class*. Examples: a specific x-ray image.

Tag – a 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]

Transfer Syntax – the encoding used for exchange of DICOM information objects and messages. Examples: *JPEG* compressed (images), little endian explicit value representation.

Unique Identifier (UID) – a globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

Value Representation (VR) – the format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

1.8 SYMBOLS AND ABBREVIATIONS

AE	Application Entity
AET	Application Entity Title
CAD	Computer Aided Detection
CDA	Clinical Document Architecture
CD-R	Compact Disk Recordable
CSE	Customer Service Engineer
CR	Computed Radiography
CT	Computed Tomography
DHCP	Dynamic Host Configuration Protocol
DICOM	Digital Imaging and Communications in Medicine
DIT	Directory Information Tree (LDAP)
DN	Distinguished Name (LDAP)
DNS	Domain Name System
DX	Digital X-ray
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
GSDF	Grayscale Standard Display Function
GSPS	Grayscale Softcopy Presentation State
HIS	Hospital Information System

HL7	Health Level 7 Standard
IHE	Integrating the Healthcare Enterprise
IOD	Information Object Definition
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Organization for Standards
IO	Intra-oral X-ray
JPEG	Joint Photographic Experts Group
LDAP	Lightweight Directory Access Protocol
LDIF	LDAP Data Interchange Format
LUT	Look-up Table
MAR	Medication Administration Record
MPEG	Moving Picture Experts Group
MG	Mammography (X-ray)
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance Imaging
MSPS	Modality Scheduled Procedure Step
MTU	Maximum Transmission Unit (IP)
MWL	Modality Worklist
NM	Nuclear Medicine
NTP	Network Time Protocol
O	Optional (Key Attribute)
OP	Ophthalmic Photography
OSI	Open Systems Interconnection
PACS	Picture Archiving and Communication System
PET	Positron Emission Tomography
PDU	Protocol Data Unit
R	Required (Key Attribute)
RDN	Relative Distinguished Name (LDAP)
RF	Radiofluoroscopy

RIS	Radiology Information System
RT	Radiotherapy
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
SPS	Scheduled Procedure Step
SR	Structured Reporting
TCP/IP	Transmission Control Protocol/Internet Protocol
U	Unique (Key Attribute)
UL	Upper Layer
US	Ultrasound
VL	Visible Light
VR	Value Representation
XA	X-ray Angiography

THIS PAGE LEFT INTENTIONALLY BLANK

2. NETWORK CONFORMANCE STATEMENT

2.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the compliance to DICOM conformance requirements for the relevant **Networking** features on this GEHC product. Note that the format of this section strictly follows the format defined in DICOM Standard PS 3.2 (Conformance). Please refer to that part of the standard while reading this section.

The Centricity PACS Reach is a diagnostic image processing, review, distribution & reporting tool. The system uses DICOM services to import images for possible further analysis or processing and to export images to other DICOM implementations. It also uses the DICOM Storage Commitment service to transfer ownership of images to a remote workstation supporting storage commitment such as an archive system.

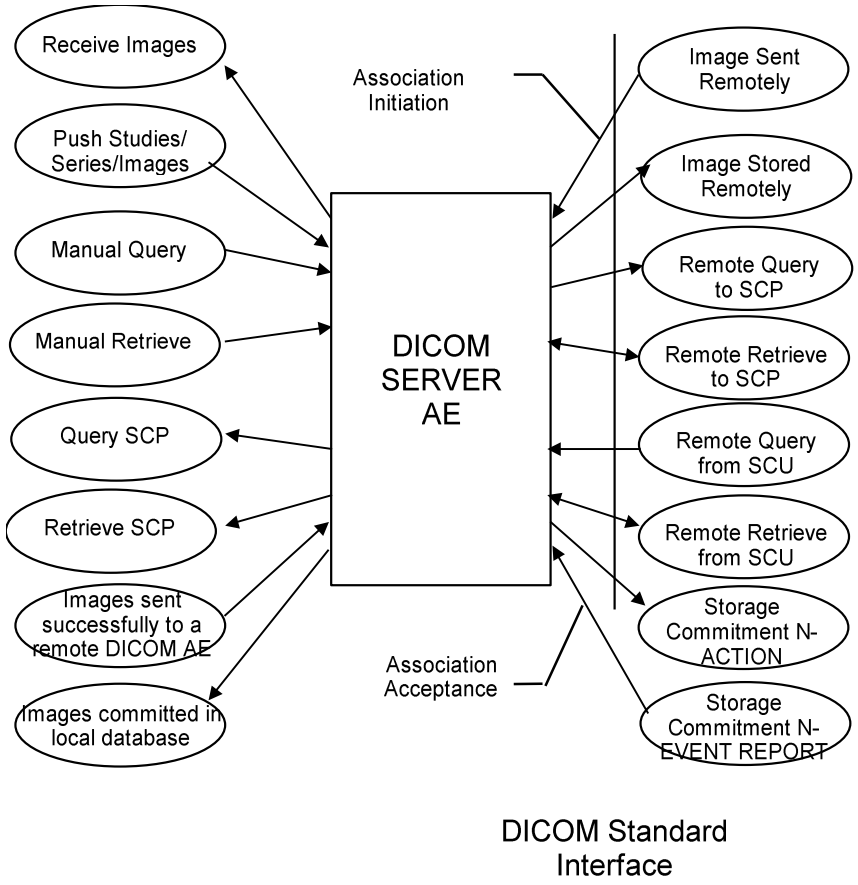
This DICOM conformance statement refers to the DICOM standard PS3.3 for the description of standard IODs.

2.2 IMPLEMENTATION MODEL

2.2.1 Application Data Flow Diagram

The Basic and Specific Application models for this station are shown in the following Illustration:

DICOM SERVER AE APPLICATION MODEL



Note: The DICOM SERVER AE accepts also the DICOM Verification SOP class as a SCP. It is not indicated on the illustration above.

The DICOM SERVER Application Entity (AE) is an application that handles DICOM protocol communication. The DICOM SERVER AE is automatically brought up when the Centricity® PACS Reach is powered on.

The DICOM SERVER AE is invoked by the following Real World Activities:

- Push Studies/Series/Images.

For this operation, the operator selects:

- some studies, series or images on the Centricity PACS Reach browser and then sends the selected studies, series or images on one or several remote DICOM AE by a drag and drop on the icon that represents the wanted remote DICOM AE.

The transfer activity is displayed on a specific icon.

The declaration of remote DICOM AE is done through a specific application (known as Service Tools).

- Manual Query

For this operation, the operator queries one or a set of remote DICOM databases to obtain a list of data at Study/Series/Image level by clicking on the icon that represents the wanted remote DICOM AE. The query is selective based on criteria described below in the document.

- Manual Retrieve

Once the remote browser is displayed (Manual Query), the operator can retrieve the SOP Classes supported by the Centricity PACS Reach from the remote DICOM AE. The data can be retrieved at the Study, Series and Image levels.

- Receive images from a Remote DICOM AE

When images are installed in the local database, the Patient List displays the content of the Centricity PACS Reach local database.

- Remote Query

For this operation, a remote DICOM AE asks to obtain the list of data at Study/Series/Image level.

- Remote Retrieve

For this operation, a remote DICOM AE asks to send data at Study/Series/Image level from the local AE to another DICOM Remote AE. The remote DICOM AE can ask to move the SOP Classes supported by the Centricity PACS Reach at the Study/Series/Image level. The Remote DICOM AE shall be declared locally on the Centricity PACS Reach. The declaration of remote DICOM AE is done through a specific application (known as Service Tools).

- Initiate Storage Commitment to a Remote DICOM AE.
- Listen to remote Storage Commitment SCP.

2.2.2 Functional Definition of AE

DICOM SERVER AE

The DICOM SERVER AE initiates the following operations:

Instance Push:

- Access to patient demographics and pixel data in the local database.
- Build a DICOM format data set.
- Initiate a DICOM association to send DICOM SOP Instances to a remote DICOM AE.

Query:

- Initiate a DICOM association to ask for remote patient demographics.

Retrieve

- Initiate a DICOM association to ask for transmitting images from a remote DICOM AE to Centricity PACS Reach.

The DICOM SERVER AE waits for association requests from Remote AE:

- Answer to DICOM associations transmitting DICOM SOP Instances to be stored on the Centricity PACS Reach.
- Answer to DICOM associations transmitting Verification SOP Instances to the Centricity PACS Reach.
- Answer to DICOM associations transmitting DICOM Query requests to the Centricity PACS Reach.

- Answer to DICOM associations transmitting Retrieve requests to the Centricity PACS Reach.

The DICOM SERVER AE initiates the following operations for storage commitment:

- Initiate a DICOM association to ask for the storage commitment of specific images and wait for a Storage Commitment Notification (N-EVENT-REPORT)

The DICOM SERVER AE waits for association requests from Remote Storage Commitment AE:

- Answer to DICOM associations transmitting Storage Commitment Notification (N-EVENT-REPORT)

2.2.3 Sequencing of Real-World Activities

DICOM SERVER AE:

This sequence applies in case the storage commitment is configured

1. The user selects the images and sends them to a remote host.

2. If the remote DICOM AE is associated with a Storage Commitment Provider AE and if the images are successfully sent to the DICOM AE, then a N-ACTION-RQ request is sent automatically and immediately to the associated (maybe different) Storage Commitment Provider AE.

3. Waits for N-ACTION-RSP from a remote Storage Commitment Provider AE.

4. On reception of failure in N-ACTION-RSP, the Storage Commitment AE logs the error.

5. On reception of success, Storage Commitment AE is ready to receive at any time from Storage Commitment Provider the N-EVENT-REPORT-RQ notification.

6. On reception of a successful N-EVENT-REPORT-RQ notification from Storage Commitment Provider, the images are flagged as committed in the database.

7. The Storage Commitment AE sends a N-EVENT-REPORT-RSP to the Storage Commitment Provider

2.3 AE SPECIFICATIONS

2.3.1 DICOM SERVER AE Specification

This Application Entity provides Standard Conformance to the following DICOM SOP Classes as a **SCU**:

SOP Class Name	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7

X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
GE Private DICOM RT Plan	1.2.840.113619.4.5.249
NM Genie Private Data	1.2.840.113619.4.27
PET Advance Private Data	1.2.840.113619.4.30
GE Private DICOM 3D Object	1.2.840.113619.4.26
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1
Verification SOP Class	1.2.840.10008.1.1
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
Storage Commitment Push Model	1.2.840.10008.1.20.1

Note: C-FIND is done using Study Root Information Model.

Note: The Centricity PACS Reach is able to push the GSPS SOP Class 1.2.840.10008.5.1.4.1.1.11.1.

This Application Entity provides Standard Conformance to the following DICOM SOP Classes as a **SCP**:

SOP Class Name	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
GE Private DICOM RT Plan	1.2.840.113619.4.5.249
NM Genie Private Data	1.2.840.113619.4.27
PET Advance Private Data	1.2.840.113619.4.30
GE Private DICOM 3D Object	1.2.840.113619.4.26
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22

Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Verification SOP Class	1.2.840.10008.1.1
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59

Note: The Centricity PACS Reach is able to store the GSPS SOP Class 1.2.840.10008.5.1.4.1.1.11.1 in its local database and is not able to render the content of the GSPS when viewing images.

2.3.1.1 Association Establishment Policies

2.3.1.1.1 General

The DICOM Application Context Name (ACN), which is always proposed, is:

Application Context Name	**1.2.840.10008.3.1.1.1**

The maximum length PDU negotiation is included in all association establishment requests.

The maximum length PDU for an association initiated by the DICOM SERVER AE is:

Maximum Length PDU	**64234 Bytes**

Note: The SOP Class Extended Negotiation is not supported.

Note: This length is not configurable

Note: The user information Items sent by this product are:

- Maximum PDU Length
- Implementation UID

2.3.1.1.2 Number of Associations

The DICOM SERVER AE will initiate only one DICOM association at a time to perform a DICOM store operation as a SCU to a Remote Host AE.

The DICOM SERVER AE will initiate only one DICOM association at a time to perform a DICOM Query/Retrieve operation as a SCU with a Remote Host AE.

The DICOM SERVER AE can have a maximum of 10 open DICOM associations at a time to perform a DICOM operation as a SCP.

Note: The number of associations is not configurable.

2.3.1.1.3 Asynchronous Nature

Asynchronous mode is not supported. All operations will be performed synchronously.

2.3.1.1.4 Implementation Identifying Information

The Implementation UID for this DICOM Implementation is:

Centricity PACS Reach Implementation UID	**1.2.840.113619.6.301**
Centricity PACS Implementation Version Name	**Not supported**

2.3.1.2 Association Initiation Policy

When the DICOM SERVER AE initiates an Association for any Real-World Activity, it will propose the Presentation Contexts for all Real-World Activities; i.e., there is only a single, comprehensive Presentation Context Negotiation proposed for the AE.

The DICOM SERVER AE proposes only a single Transfer Syntax in each Presentation Context; i.e., for each Abstract Syntax in the following Presentation Context Tables, the AE proposes one Presentation Context for each specified Transfer Syntax.

2.3.1.2.1 Real-World Activity: Push Studies/Series/Images to Remote AE

2.3.1.2.1.1 Associated Real-World Activity

The operator can select in the BROWSER one or several Studies (or Series) to be sent. Then, the user can either drag and drop the selection on the button representing then Remote DICOM AE or click on the button representing the Remote DICOM AE.

2.3.1.2.1.2 Proposed Presentation Context

The following table shows the proposed presentation contexts for the DICOM Server AE after Real-World Activity "Push" Operation has been performed.

Presentation Context Table - Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Digital Mammography X-Ray Image Storage - For	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

Processing	.2.1				
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
NM Genie Private Data	1.2.840.113619.4.27	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
NM Genie Private Data	1.2.840.113619.4.27	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
NM Genie Private Data	1.2.840.113619.4.27	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

PET Advance Private Data	1.2.840.113619.4.30	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
PET Advance Private Data	1.2.840.113619.4.30	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
PET Advance Private Data	1.2.840.113619.4.30	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

2.3.1.2.1.2.1 SOP Specific DICOM Conformance Statement for Image Storage SOP Classes

This implementation can perform multiple C-STORE operations over a single association.

Upon receiving a C-STORE confirmation containing a successful status, this implementation will perform the next C-STORE operation. The association will be maintained if possible.

Upon receiving a C-STORE confirmation containing a Refused status, this implementation will terminate the association.

Upon receiving a C-STORE confirmation containing any status that is not Success or Refused, this implementation will consider the current request to be a failure and will terminate the association except if the C-STORE is invoked from a C-MOVE SCP. In this case it will continue to attempt to send the remaining images in the request on the same association.

Each C-STORE operation supports an “Association Timer”. This timer starts when the association request is sent and stops when the association is established. Default time-out is 60 seconds.

Each C-STORE operation supports an “Operation Inactivity Timer”. This timer starts when a C-STORE request is emitted and is reset each time a C-STORE response has been received, or when subsequent C-STORE are received. Default time-out is 300 seconds.

If any of the two timers mentioned above expires, the connection is aborted and the operation is considered as failed.

Following are the status codes that are more specifically processed when receiving messages from a Storage SCP equipment:

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	A700-A7FF	Refused: Out of resources	Error displayed in the Network status, in Centricity PACS Reach service tools
	A900-A9FF	Error: Data Set does not match SOP Class	Error displayed in the Network status, in Centricity PACS Reach service tools
	C000-CFFF	Error: Cannot Understand	Error displayed in the Network status, in Centricity PACS Reach service tools
	0122	SOP Class Not Supported	Error displayed in the Network status, in Centricity PACS Reach service tools
Warning	B000	Coercion of Data Elements	Log-files updated
	B006	Elements Discarded	Error displayed in the Network status, in Centricity PACS Reach service tools
	B007	Data Set does not match SOP Class	Error displayed in the Network status, in Centricity PACS Reach service tools
Success	0000		Success status displayed in the Network status, in Centricity PACS Reach service tools
*	*	Any other status code.	No action

2.3.1.2.2 Real-World Activity: Manual Query

2.3.1.2.2.1 Associated Real-World Activity

The operator queries a Remote database or a set of Remote databases by clicking on the corresponding icon. A new BROWSER (known as the REMOTE BROWSER) appears on the screen(s) upon successful query.

The *"Query"* operation will cause the DICOM Server AE to initiate an association to the selected Remote AE. Once a list of Study/Series/Image has been queried, the operator can invoke the *"Retrieve"* operation from the displayed REMOTE BROWSER (drag and drop the selection on the icon representing the local database of Centricity PACS Reach or click on the "Copy To Centricity PACS Reach Server" button).

2.3.1.2.2.2 Proposed Presentation Context Table

Presentation Context Table - Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name List**	**UID List**		**Negotiation**

Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

2.3.1.2.2.2.1 SOP Specific DICOM Conformance Statement for C-FIND-SCU

The C-FIND SCU will only perform hierarchical query (No extended negotiation supported)

Each C-FIND SCU supports an "Association Timer" and an "Operation Inactivity Timer". These timers are defaulted to 30 and 300 seconds.

The DICOM SERVER AE will parse each matching C-FIND-RSP reply and will abort the association if an entry does not contain a valid dataset.

During C-FIND SCU Centricity PACS Reach is able to generate a C-FIND-CANCEL.

Several filters type can be applied for the query, here is the list of the supported filter type:

Filter type	Filter description
Single Value Matching	This is to obtain an exact match on the value contained in a Key Attribute
List of UID Matching	This is to obtain a match on any of the UID items present in a list of UIDs in a Key Attribute.
Wild Card Matching	This is to obtain a match on any sequence of characters contained in a Key Attribute. "*" or "?" characters present in the Key Attribute, where "*" shall match any sequence of characters and "?" matches against a single character.
Range Matching	This is to obtain a match on values of date and time contained in the Key Attributes "<date1> - <date2>" to match against all values that fall in this date range "-<date>" to match against all values that are before this date "<date> -" to match against all values that are after this date

Following table shows the various fields that are requested at the Study level of the C-FIND request:

Description	Tag	Type	Value
Study Date	0008,0020	R	Study dates (supported filter: single value matching, range matching)
Study Time	0008,0030	R	Study times (supported filter: single value matching, range matching)
Accession Number	0008,0050	R	Accession Number (supported filter: single value matching, wild card matching)

Description	Tag	Type	Value
Patient's Name	0010,0010	R	Beginning of the patient's name: a "*" is automatically added at the end of the user query. If the user needs to do a query onto a criterion (last name, first name), s/he will have to put a caret between the last and the first name. (Supported filter: single value matching, wild card matching)
Patient ID	0010,0020	R	Patient ID (supported filter: single value matching, wild card matching)
Study ID	0020,0010	R	Zero length
Study Instance UID	0020,000D	U	Zero length
Modalities in Study	0008,0061	O	Requested modalities (supported filter: single value matching)
Study Description	0008,1030	O	Zero length
Patient's Birth Date	0010,0030	O	Zero length
Patient's Sex	0010,0040	O	Zero length
Patient's Birth Time	0010,0032	O	Zero length
Station Name	0008,1010	O	Zero length

Note: During C-FIND SCU Centricity PACS Reach requires setting up a filter before sending a query. At refresh the currently set filter will be applied.

Following table shows the various fields that are requested at the Series level of the C-FIND request when building the list of series of a given study.

Description	Tag	Type	Value
Series Number	0008,0011	R	Zero length
Modality	0008,0060	R	Zero length
Series Instance UID	0020,000E	U	Zero length
Series Description	0008,103E	O	Zero length
Series Date	0008,0021	O	Zero Length
Series Time	0008,0031	O	Zero length
Number Of Series Related Instances	0020,1209	O	Zero length
Image type (for legacy systems)	0008,0008	O	Zero length

Following table shows the various fields that are requested at the Image level of the C-FIND request when building the list of instances of a given series. The list of requested fields depends on the value returned for the Modality (0008,0060) in the C-FIND-RSP response at series level given by the remote AE.

Description	Tag	Type	Value	Modality
Instance Number	0020,0013	R	Zero length	All
SOP Instance UID	0008,0018	U	Zero length	All
SOP Class UID	0008,0016	O	Zero length	All
Image ID	0054,0400	O	Zero length	All
Modality	0008,0060	O	Zero length	All
Contrast Bolus Agent	0018,0010	O	Zero length	All
Slice Thickness	0018,0050	O	Zero length	All
Repetition Time	0018,0080	O	Zero length	All
Echo Time	0018,0081	O	Zero length	All
Inversion Time	0018,0082	O	Zero length	All
Number Of Averages	0018,0083	O	Zero length	All
Echo Number	0018,0086	O	Zero length	All
Spacing Between Slices	0018,0088	O	Zero length	All
Data Collection Diameter	0018,0090	O	Zero length	All

Trigger Time	0018,1060	O	Zero length	All
Reconstruction Diameter	0018,1100	O	Zero length	All
Gantry Detector Tilt	0018,1120	O	Zero length	All
Convolution Kernel	0018,1210	O	Zero length	All
Flip Angle	0018,1314	O	Zero length	All
Slice Location	0020,1041	O	Zero length	All
Rows	0028,0010	O	Zero length	All
Columns	0028,0011	O	Zero length	All

During the C-FIND SCU, the following status values supported by Centricity PACS Reach:

- 0xFF00: Study/Series/Image items contained in identifier is collected for later display or further processing and wait for the next response from the remote host.
- 0xFF01: Study/Series/Image items contained in identifier is collected for later display or further processing and wait for the next response from the remote host.

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	A700	Refused: Out of resources	Nuevo platform throws error: “No Resource error”
	A900	Error: Identifier does not match SOP Class	Nuevo platform throws error: “Identifier does not match sop error”
	C000-CFFF	Error: Unable to process	Nuevo platform throws error: “Processing failure”
	0122	SOP Class Not Supported	Ignored
Cancel	FE00	Matching terminated due to cancel	Processed by Nuevo platform and gracefully exits C-FIND request processing
Success	0000	Matching is complete - No final identifier is supplied	
Pending	FF00	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	Processed by Nuevo platform
	FF01	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier	Processed by Nuevo platform
*	*	Any other status code.	Ignored

2.3.1.2.3 Real-World Activity: Manual Retrieve

2.3.1.2.3.1 Associated Real-World Activity

The operator then has to perform the Real-World activity “Query” to get a list of Studies, Series and Images. Once the list of Studies, Series or Images is retrieved, the operator can

invoke the "Retrieve" operation from the displayed REMOTE BROWSER (drag and drop the selection on the icon representing the local database of Centricity PACS Reach or click on the "Copy To Centricity PACS Reach" button).Proposed Presentation Context Table

When the remote DICOM AE is declared as a Study Root Provider or the invoked operation is "Copy To Centricity PACS Reach", the presentation context shown in following table is proposed.

Presentation Context Table – Proposed					
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
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

2.3.1.2.3.1.1 SOP Specific DICOM Conformance Statement for the Study Root Query/Retrieve Information Model - MOVE SOP Classes

When the operator starts a *Move* operation at any level (Study, Series, Image) the DICOM Server AE will initiate a C-MOVE-RQ request to the Remote AE with the DICOM Server AE as the Destination AE. The Storage SCP ("Receive Images from Remote AE") will handle the incoming images.

Each C-MOVE SCU supports an "Association Timer" and an "Operation Inactivity Timer". These timers are defaulted to 60 and 300 seconds. These timers are not configurable.

If the C-MOVE SCU receives a status different from success (0x0000) or pending (0xFF00) during the association, the DICOM Server AE will release the association. This information will be logged in the system log files; in Centricity PACS Reach service tools, the network queue will be updated accordingly.

During C-MOVE SCU Centricity PACS Reach is able to generate a C-MOVE-CANCEL.

When receiving a Cancel request response (0xFE00), the DICOM Server AE will release the association. This information will be logged in the system log files.

2.3.1.2.4 Real-World Activity: Initiate Storage Commitment to a Remote AE

2.3.1.2.4.1 Associated Real-World Activity

The operator can associate a DICOM Storage Commitment Provider AE to a Remote AE.

The user selects in the BROWSER one or several studies, series or images to be sent. Then, the user can either drag and drop the selection on the button representing then Remote DICOM AE, or click on the "Copy to <REMOTE AE Name>" button.

This operation will cause the following actions:

- The Centricity PACS Reach retrieves the appropriate DICOM images to push from its database.

- The DICOM SERVER AE initiates a DICOM association, negotiates with the Remote AE an appropriate Abstract and Transfer Syntax.
- If the negotiation is successful, the DICOM SERVER AE emits C-STORE command to send the images to the Remote AE.
- When the images have been sent, the DICOM SERVER AE emits a N-ACTION request (immediately after the C-STORE request) to ask for a commitment on images previously sent (The AE Title may be different from the storage location). Only one N-ACTION request is sent for all images to be committed. N-ACTION is on different association than the C-STORE request

Note: The table in section 2.3.1.2.1.2 (Proposed Presentation Context) has the full list of SOP Classes that can be Storage Committed.

2.3.1.2.4.2 Proposed Presentation Context

Presentation Context Table – Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.3.1.2.4.2.1 SOP Specific DICOM Conformance Statement for the Storage Commitment Push Model SOP Class (N-ACTION)

If the received N-ACTION Response from the Storage Commitment Provider has a failure status, an error file is logged, the Storage Commitment is abandoned. The Network activity icon will change in order to show the error condition.

If the received N-ACTION Response from the Storage Commitment Provider has a success status, the DICOM SERVER AE waits for an N-EVENT-REPORT during a configurable period of time. This period is set to 10s by default. There is no other timeout. This timeout is not configurable.

The DICOM SERVER AE can receive a N-EVENT-REPORT from the Storage Commitment Provider at any time (See section Real-World Activity: Listen to remote Storage Commitment SCP").

2.3.1.2.5 Real-World Activity: Verify Connectivity

2.3.1.2.5.1 Associated Real-World Activity

The operator can choose to verify a remote Application Entity. Centricity PACS Reach sends out a verification request to a Remote AE.

2.3.1.2.5.2 Proposed Presentation Context

Presentation Context Table – Proposed

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

2.3.1.2.5.2.1 SOP Specific DICOM Conformance Statement for Verification SOP Class

The DICOM SERVER AE provides standard conformance. In case of failure the verification is not retried.

2.3.1.3 Association Acceptance Policy

The DICOM SERVER AE rejects the association if there are too many open connections.

The DICOM SERVER AE rejects the association if the Remote DICOM AE is not declared on the local Centricity PACS Reach.

The DICOM SERVER AE sends the association rejection error. Status will be “transient rejection" for the cases below.

2.3.1.3.1 Real-World Activity: Receive Images from Remote AE

This AE is indefinitely listening for associations. No operator action is required to receive an image.

2.3.1.3.1.1 Associated Real-World Activity

The Real-World Activity associated with the Receive Images operation is the storage of the images on the disk drive of the Centricity PACS Reach and the declaration of the images in the database of the same station.

2.3.1.3.1.2 Presentation Context Table

Acceptable Presentation Contexts for DICOM Server AE and Real-World Activity Receive Images from Remote AE.

Presentation Context Table - Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None

CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
GE Private DICOM RT Plan	1.2.840.113619.4.5.249	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

NM Genie Private Data	1.2.840.113619.4.27	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
NM Genie Private Data	1.2.840.113619.4.27	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
NM Genie Private Data	1.2.840.113619.4.27	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
PET Advance Private Data	1.2.840.113619.4.30	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
PET Advance Private Data	1.2.840.113619.4.30	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
PET Advance Private Data	1.2.840.113619.4.30	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
GE Private DICOM 3D Object	1.2.840.113619.4.26	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

Note: The Grayscale Softcopy Presentation State Storage abstract syntax is accepted but the basic Centricity PACS Reach applications do not manage this object.

2.3.1.3.1.2.1 SOP Specific Conformance to Storage SOP Classes

Centricity PACS Reach is Storage Level 2.

Private elements are not discarded from the image when receiving images containing non-GE private data elements.

Each C-STORE SCP operation supports an “Operation Inactivity Timer” with time out values of 15-seconds. This timer is not configurable.

Image Reception phase:

In case of failure, the image will not be installed in the local database and the DICOM Server AE will return one of the following status codes for the C-STORE:

- C000 (Cannot understand) indicates that the processing failed during the reception of the image.

- A700 (No Resources) Indicates that probably there was not enough disk space to store the image. The user should attempt recovery by removing some images from the Centricity PACS Reach.

In the event of a successful C-STORE operation, the image has successfully been declared in the database.

The image will then be accessed in the same manner as any other image by the applications on the Centricity PACS Reach.

Images may be deleted when instructed to do so by the user. The users of the Centricity PACS Reach determine the duration of the storage of the image.

When a C-STORE operation returns Error, the network status indicator icon will change in the browser informing the user of a failure. The details of the problem can be checked in the DICOM Queue tool of Service Tools.

2.3.1.3.1.3 Presentation Context Acceptance Criterion

Only known SOP Classes are accepted.

2.3.1.3.1.4 Transfer Syntax Selection Policies

The transfer syntax selection policy is the following:

- Only the following transfer syntaxes are accepted: Implicit VR Little Endian (1.2.840.10008.1.2), Explicit VR Little Endian (1.2.840.10008.1.2.1), Explicit VR Big Endian (1.2.840.10008.1.2.2)

- Among all the remaining proposed transfer syntaxes, the explicit transfer syntaxes are chosen first.

- Among all the remaining proposed transfer syntaxes, the little endian transfer syntaxes are chosen first.

2.3.1.3.2 Real-World Activity: Query Request from Remote AE

This AE is indefinitely listening for associations. No operator action is required to respond to a *query* request.

2.3.1.3.2.1 Associated Real-World Activity

The Real-World Activity associated with the query request is to search the local database for entries that match the request and send a C-FIND response message with a status of “pending” for each matching entry and send a C-FIND response message with a status of "success" after the last "pending" response.

If the C-FIND SCP receives a C-FIND-CANCEL request, it sends a C-FIND response message with a status of "cancel".

2.3.1.3.2.2 Presentation Context Table

Acceptable Presentation Contexts for DICOM Server AE and Real-World Activity Query Request.

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	SCP	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

2.3.1.3.2.2.1 SOP Specific Conformance to C-FIND SCP

Each C-FIND SCP operation supports an "Operation Inactivity Timer" with a time out value of 15 seconds. This timer corresponds to the number of seconds to wait when data between TCP/IP packets are transferred. It is not configurable.

All Required (R) and Unique (U) study, series, and image level keys for the Study-Root Query/Retrieve information model are supported. Some optional (O) keys are also supported as described in the following tables.

Following is the supported study level keys:

Description	Tag	Type	Usage
Study Date	(0008,0020)	R	Matched
Study Time	(0008,0030)	R	Matched
Accession Number	(0008,0050)	R	Matched
Patient's Name	(0010,0010)	R	Matched
Patient ID	(0010,0020)	R	Matched
Study ID	(0020,0010)	R	Matched
Study Instance UID	(0020,000D)	U	Matched
Modalities In Study	(0008,0061)	O	Matched
Referring Physicians Name	(0008,0090)	O	Matched
Study Description	(0008,1030)	O	Returned
Patients Sex	(0010,0040)	O	Returned

Note: Patient Name matching is case sensitive.

Note: Wildcard query is supported for Patient's Name, Patient ID and Accession Number.

Note: Caret Symbol needs to be passed by the user for Patient Name matching

Note: Range matching is supported on Date & time

Following is the supported series level keys:

Description	Tag	Type	Usage

Modality	(0008,0060)	R	Matched
Series Number	(0020,0011)	R	Matched
Series Instance UID	(0020,000E)	U	Matched
Series Description	(0008,103E)	O	Returned

Following is the supported image level keys:

Description	Tag	Type	Usage	Modality
Instance Number	(0020,0013)	R	Matched	All
SOP Instance UID	(0008,0018)	U	Matched	All
Rows	(0028,0010)	O	Returned	All
Columns	(0028,0011)	O	Returned	All

Only keys with Usage type *Matched* will be matched against values in the database.

Values in keys of type *Returned* will be ignored and will be filled in with data from the database.

If an optional key is requested that does not appear in any of the tables above, that key will be ignored and no corresponding element will be returned.

If the database does not have a value corresponding to any requested optional key a zero-length element will be returned.

Sequence matching is not supported.

Range matching is supported for attributes of type date and time.

Only hierarchical query is supported. The C-FIND SCP will not perform any extended negotiation.

During the C-FIND SCP, the DICOM Server AE can send the following status:

- 0xFE00 when the DICOM remote AE sent a DICOM C-FIND CANCEL request
- 0xFF00: for pending messages
- 0xFF01: for pending messages when the DICOM remote AE asked for optional key
- 0xA700 when refused due to unavailable resources.
- 0xA900 when the DICOM Server AE processes an invalid data set.
- 0xC001 when the DICOM Server AE processes an internal error or a decoding error
- 0x0000 in case of success

2.3.1.3.2.3 Transfer Syntax Selection Policy

The transfer syntax selection policy is the following:

- Only the following transfer syntaxes are accepted: Implicit VR Little Endian (1.2.840.10008.1.2), Explicit VR Little Endian (1.2.840.10008.1.2.1), Explicit VR Big Endian (1.2.840.10008.1.2.2)
- Among all the remaining proposed transfer syntaxes, the explicit transfer syntaxes are chosen first.
- Among all the remaining proposed transfer syntaxes, the little endian transfer syntaxes are chosen first.

2.3.1.3.3 Real-World Activity: Retrieve Request From Remote AE

This AE is indefinitely listening for associations. No operator action is required to respond to a *retrieve* request.

2.3.1.3.3.1 Associated Real-World Activity

The Real-World Activity associated with the Retrieve Request is to send all images corresponding to the C-MOVE request to the destination AE through a separate association.

If the C-MOVE SCP receives a C-MOVE-CANCEL request, it closes the separate association.

2.3.1.3.3.2 Presentation Context Table

Acceptable Presentation Contexts for DICOM Server AE and Real-World Activity Retrieve Request.

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	SCP	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

2.3.1.3.3.2.1 SOP Specific Conformance to C-MOVE SCP

The DICOM Server AE provides standard conformance to the baseline Study-root C-MOVE Service Class SCP.

Each C-MOVE SCP operation supports an “Operation Inactivity Timer” with a time out value of 15 seconds. This timer corresponds to the number of seconds to wait when data between TCP/IP packets are transferred.

All images requested in a C-MOVE-RQ will be sent over a single association. A C-MOVE-RSP with a “pending” status will be returned to the requester after every C-STORE request sub-operation.

Note: Move destination AE can be different than the AE requesting the C-MOVE

The C-MOVE SCP will invoke C-STORE requests for the following SOP classes:

SOP Class Name	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129
RT Structure Set Information Storage	1.2.840.10008.5.1.4.1.1.481.3
GE Private DICOM RT Plan	1.2.840.113619.4.5.249
NM Genie Private Data	1.2.840.113619.4.27
PET Advance Private Data	1.2.840.113619.4.30
GE Private DICOM 3D Object	1.2.840.113619.4.26
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59

During the C-MOVE SCP, the DICOM Server AE can send the following status:

- 0xFE00: (C-Move Cancel Request Received) when the C-MOVE SCU cancelled the operation
- 0xA702: when the association with the C-STORE SCP was rejected
- 0xA801: when the destination unknown
- 0xA900: when the dataset is invalid
- 0xFF00: for pending messages.
- 0xB000 when one or more failure occurred
- 0x0000 when the whole C-MOVE operation was successful

2.3.1.3.3.3 Presentation Context Acceptance Criteria

No criterion.

2.3.1.3.3.4 Transfer Syntax Selection Policy

The transfer syntax selection policy is the following:

- Only the following transfer syntaxes are accepted: Implicit VR Little Endian (1.2.840.10008.1.2), Explicit VR Little Endian (1.2.840.10008.1.2.1), Explicit VR Big Endian (1.2.840.10008.1.2.2)
- Among all the remaining proposed transfer syntaxes, the explicit transfer syntaxes are chosen first.
- Among all the remaining proposed transfer syntaxes, the little endian transfer syntaxes are chosen first.

2.3.1.3.4 Real-World Activity: Listen to remote Storage Commitment SCP

The DICOM SERVER AE is indefinitely listening for associations. No operator action is required to receive a Storage Commitment notification (N-EVENT-REPORT).

2.3.1.3.4.1 Associated Real-World Activity

The Real-World Activity associated consists into:

- Flag the images that have been committed (transfer of ownership) in the database.
- Pop up an error when some images of a patient existing in the database have not been committed.

2.3.1.3.4.2 Proposed Presentation Context

Presentation Context Table – Proposed					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

2.3.1.3.4.2.1 SOP Specific DICOM Conformance Statement for the Storage Commitment Push Model SOP Class (N-EVENT-REPORT)

Following are the status codes the Application may send back to the SCP Equipment after receiving the N-EVENT-REPORT:

Service Status	Status Codes	Further Meaning	Status Code sending explanation	Related Fields sent back to the SCU
Error	0110	Processing Failure	Indicates that an internal error occurs while processing.	None
Success	0000			None

The DICOM SERVER AE parses all the items present in the N-EVENT-REPORT.

For each image successfully committed, the image is flagged as "Committed" into the database. An error is logged for any image that cannot be committed and a pop up is displayed to the user when the image still exists in the database.

There is no timeout related to this module: the DICOM SERVER AE is listening indefinitely the N-EVENT-REPORT event. If such event is received, some processing is immediately executed.

2.3.1.3.4.3 Transfer Syntax Selection Policy

The transfer syntax selection policy is the following:

- Only the following transfer syntaxes are accepted: Implicit VR Little Endian (1.2.840.10008.1.2), Explicit VR Little Endian (1.2.840.10008.1.2.1), Explicit VR Big Endian (1.2.840.10008.1.2.2)
- Among all the remaining proposed transfer syntaxes, the explicit transfer syntaxes are chosen first.
- Among all the remaining proposed transfer syntaxes, the little endian transfer syntaxes are chosen first.

2.3.1.3.5 Real-World Activity: Receive Connectivity Verification

2.3.1.3.5.1 Associated Real-World Activity

A remote Application Entity verifies its ability to communicate with Centricity PACS Reach by sending a verification request.

2.3.1.3.5.2 Proposed Presentation Context

Presentation Context Table – Proposed			
Abstract Syntax	**Transfer Syntax**	**Role**	**Extended**

Name	UID	Name List	UID List		Negotiation
Verification	1.2.840.10008.1.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

2.3.1.3.5.2.1 SOP Specific DICOM Conformance Statement for Verification SOP Class

The DICOM SERVER AE provides standard conformance.

2.3.1.3.5.3 Transfer Syntax Selection Policy

The transfer syntax selection policy is the following:

- Only the following transfer syntaxes are accepted: Explicit VR Little Endian (1.2.840.10008.1.2.1), Implicit VR Little Endian (1.2.840.10008.1.2)
- Among all the remaining proposed transfer syntaxes, the explicit transfer syntaxes are chosen first.
- Among all the remaining proposed transfer syntaxes, the little endian transfer syntaxes are chosen first.

2.4 COMMUNICATION PROFILES

2.4.1 Supported Communication Stacks

DICOM Upper Layer (PS 3.8) is supported using TCP/IP.

2.4.2 OSI Stack

OSI stack not supported

2.4.3 TCP/IP Stack

The TCP/IP stack is inherited from a UNIX Operating System.

2.4.3.1 API

Not applicable to this product.

2.4.3.2 Physical Media Support

DICOM is indifferent to the Physical medium over which TCP/IP executes (e.g. Ethernet V2.0, IEEE 802.3, ATM, FDDI, Ethernet 100Mb)

Note: For more information about the Physical Media available for Centricity PACS Reach, please refer to the Product Data Sheet.

2.5 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS

Not applicable to this product.

2.6 CONFIGURATION

2.6.1 AE Title/Presentation Address Mapping

The GE Field Engineer must configure the hostname of the station during installation. The hostname will then be used for the AET address mapping.

The local DICOM SERVER AE Title is set to the first 16 bytes of the hostname.

2.6.2 Configurable Parameters

The following fields are configurable for the DICOM SERVER AE (local):

- Local AE Title
- Local IP Address (defined by the station)
- Local IP Netmask (defined by the station)

The Local Listening Port Number is not configurable and set to **4006**.

The following fields are configurable for every remote DICOM AE:

- Remote AE Title
- Remote IP Address
- Listening TCP/IP Port Number

A **default router** IP Address for **all remote nodes** can be configured as well as some specific routes.

The following fields are configurable:

- Association Establishment Timer
- Store, Find, Move, Timers
- Inactivity Timers
- Maximum Length PDU

Note: A GE Field Engineer must perform all configurations.

2.7 SUPPORT OF EXTENDED CHARACTER SETS

The Centricity PACS Reach will support only the ISO_IR 100 (ISO 8859-1:1987 Latin alphabet N 1. supplementary set) as extended character sets.

2.8 CODES AND CONTROLLED TERMINOLOGY

Not applicable to this product.

2.9 SECURITY PROFILES

The product does not conform to any defined DICOM Security Profiles.

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

1. Firewall or router protections to ensure that only approved external hosts have network access to the product.
2. Firewall or router protections to ensure that the product only has network access to approved external hosts and services.

Any communications with external hosts and services outside the locally secured environment use appropriate secure network channels (such as a Virtual Private Network (VPN))

3. MEDIA STORAGE CONFORMANCE STATEMENT

3.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the compliance to the DICOM Media Interchange. It details the DICOM Media Storage Application Profiles and roles which are supported by this product.

The system provides capabilities to DICOM Media Interchange on CD-R (Compact Disc-Recordable) and DVD-R(Digital Video Disc –Recordable). The system works with most of the IOD's like Computed Tomography (CT), Magnetic Resonance (MR), Computed Radiography (CR), Positron Emission Tomography (PET), and Digital X-Ray images.

3.2 IMPLEMENTATION MODEL

The DICOM Media Interchange Archive Server Application Entity (AE) handles all DICOM media storage functionality on the GE MR system. The DICOM Media Interchange Archive Server AE is commanded to perform DICOM services through the buttons and menu selections on the user interface. It also uses the appropriate recorders to provide the service Interchange Media profiles.

3.2.1 Application Data Flow Diagram

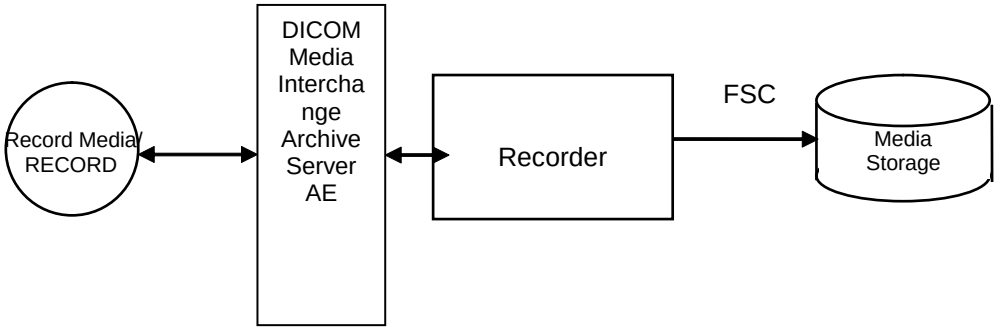
The DICOM Media Interchange Archive Server Application Entity (AE) handles the DICOM CREATE CD (/DVD) functionality for the CD-R/DVD-R media. The DICOM Media Interchange Archive Server Application Entity (AE) is commanded by the user to perform DICOM services operating on the DICOM media through the use of buttons and menu selections on the graphical user interface of the platform.

The user requests the creation of a DICOM File Set and the writing of this DICOM File Set on blank Interchange Media by selecting images in the local Browser and selecting the Interchange Media as being the selected device. Then, the iso9660 image of the CD/DVD to burn will be generated. Once the generation has been done, it burns the complete set of data on the selected Interchange Media.

The Media Interchange Application Model for the system is shown in the Illustration below:

ILLUSTRATION 3-1

CENTRICITY PACS REACH MEDIA INTERCHANGE APPLICATION MODEL AND DATA FLOW DIAGRAM



The DICOM Media Interchange Archive Server AE has a local storage that may contain various SOP instances. These may have been obtained by original creation, network (DICOM or proprietary) or by removable media using other application entities. These instances are external to this conformance claim and the origin of SOP instances is outside the scope of this claim.

The DICOM Media Interchange Archive Server AE can initialize Media by acting as an FSC to create a new DICOM File-set on a 700MB/4.7GB blank Interchange Media. It initializes the DICOM File-set and writes all the specified SOP instances onto the Interchange Media at once. The SOP instances written will be limited to instances that match the criteria of one of the Application Profiles that is supported. Updating the media is not supported.

3.2.2 Functional Definition of AE's

3.2.2.1 Functional Definition of the CD-R/DVD-R DICOM Media Interchange Archive Server AE

The CD-R/DVD-R DICOM Media Interchange Archive Server Application Entity supports the following functions:

- Generate and write a DICOM File Set (FSC) in a one shot activity. (SAVE).

3.2.3 Sequencing of Real-World Activities

The save function can only be performed on a blank (unused) Interchange Media. Updates to an already recorded Interchange Medium are not supported.

There are no other sequencing requirements.

3.2.4 File Meta Information Options (See PS3.10)

The File Meta-Information for this implementation is:

File Meta-Information Version	**1**
Implementation UID	**See Section 2.3.1.1.4**
Implementation Version Name	**CPR_<Itr>_<Date>**

3.3 AE SPECIFICATIONS

3.3.1 DICOM Media Interchange Archive Server AE Specification

The DICOM CD-R/DVD-R Interchange Archive Server AE provides standard conformance to DICOM Media Interchange Option of the Media Storage Service Class. The supported Application Profiles and roles are listed below.

Table DICOM CD-R/DVD-R Supported Application Profiles

Supported Application Profile	Real world Activity	Role	Option
STD-GEN-CD	CREATE CD	FSC	Interchange
STD-CTMR-DVD	CREATE DVD	FSC	Interchange

3.3.1.1 File Meta Information for the DICOM Media Interchange Archive Server AE

Following are the values set in the File Meta Information for this AE Title:

Implementation UID	1.2.840.113619.6.301
Implementation version name	Not supported

3.3.1.2 Real-World Activities for the DICOM Media Interchange Archive Server Application Entity

3.3.1.2.1 Real-World Activity (RWA) Create (Generate and Write) CD

The DICOM Media Server acts as an FSC using the interchange option when requested to copy SOP Instances from the local database to a CD-R.

The user selects the entries in the local database that he/she wants the DICOM Media Server to copy onto Interchange Media.

The graphic interface allows the user to select the entries (studies) in the local database to be copied onto to the selected Interchange Media.

The DICOM Media Server creates one File Set per generated Interchange Media.

- A user can only create one copy of CD image for a drive at a time; any other attempt of creation will wait until the first one is complete.
- A DICOM CD-Viewer is provided along with the selected object instances on the interchange media. This viewer can be loaded on a standard PC running Windows2000 or WindowsXP.

Before writing on the Interchange Medium, the DICOM Media Server checks for the following condition:

- The inserted media is blank and write-able. If the condition is not met, an error is displayed and the user needs to replace it with a blank media.

3.3.1.2.1.1 Media Storage Application Profile for the RWA: Create CD

3.3.1.2.1.1.1 Options for STD-GEN-CD Application Profile

Following are the optional SOP Classes supported by this AE. All SOP Instances use the Explicit VR Little Endian Uncompressed Transfer Syntax, UID 1.2.840.10008.1.2.1.

SOP Class	SOP Class UID
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Ultrasound Storage	1.2.840.10008.5.1.4.1.1.6
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128

Common DICOMDIR Directory Records created by this AE will include key attributes as described in Section 4 Basic Directory Information Object Implementation.

The following additional DICOMDIR keys are supported for this profile in IMAGE Directory Records.

Key	Tag	Type	Attribute Description
Image Type	(0008,0008)	1C	If present in composite object instances it will be set to same value, otherwise not sent
Referenced Image Sequence	(0008,1140)	1C	If present in composite object instances it will be set to same value, otherwise not sent
>Referenced SOP Class UID	(0008,1150)	1C	If present in composite object instances it will be set to same value, otherwise not sent
>Referenced SOP Instance UID	(0008,1155)	1C	If present in composite object instances it will be set to same value, otherwise not sent
Rows	(0028,0010)	3	If present in composite object instances it will be set to same value, otherwise an error is returned
Columns	(0028,0011)	3	If present in composite object instances it will be set to same value, otherwise an error is returned
Frame of Reference UID	(0020,0052)	3	If present in composite object instances it will be set to same value, otherwise not sent
Image Position Patient	(0020,0032)	3	If present in composite object instances it will be set to same value, otherwise not sent
Image Orientation Patient	(0020,0037)	3	If present in composite object instances it will be set to same value, otherwise not sent
Pixel Spacing	(0028,0030)	3	If present in composite object instances it will be set to same value, otherwise not sent

3.3.1.2.2 Real-World Activity (RWA) Create (Generate and Write) DVD

The DICOM Media Server acts as an FSC using the interchange option when requested to copy SOP Instances from the local database to a DVD-R.

The user selects the entries in the local database that he/she wants the DICOM Media Server to copy onto Interchange Media.

The graphic interface allows the user to select the entries (studies) in the local database to be copied onto to the selected Interchange Media.

The DICOM Media Server creates one File Set per generated Interchange Media.

- A user can only create one copy of DVD image for a drive at a time; any other attempt of creation will wait until the first one is complete.

- A DICOM DVD-Viewer is provided along with the selected object instances on the interchange media. This viewer can be loaded on a standard PC running Windows2000 or WindowsXP.

Before writing on the Interchange Medium, the DICOM Media Server checks for the following condition:

- The inserted media is blank and write-able. If the condition is not met, an error is displayed and the user needs to replace it with a blank media.

3.3.1.2.2.1 Media Storage Application Profile for the RWA: Create DVD

3.3.1.2.2.1.1 Options for STD-CTMR-DVD Application Profile

Common DICOMDIR Directory Records created by this AE will include key attributes as described in Section 4 Basic Directory Information Object Implementation.

The following additional DICOMDIR keys are supported for this profile in IMAGE Directory Records.

Key	Tag	Type	Attribute Description
Image Type	(0008,0008)	3	If present in composite object instances it will be set to same value, otherwise not sent
Referenced Image Sequence	(0008,1140)	1C	If present in composite object instances it will be set to same value, otherwise not sent
>Referenced SOP Class UID	(0008,1150)	1C	If present in composite object instances it will be set to same value, otherwise not sent
>Referenced SOP Instance UID	(0008,1155)	1C	If present in composite object instances it will be set to same value, otherwise not sent
Rows	(0028,0010)	1	If present in composite object instances it will be set to same value, otherwise an error is returned
Columns	(0028,0011)	1	If present in composite object instances it will be set to same value, otherwise an error is returned
Frame of Reference UID	(0020,0052)	1C	If present in composite object instances it will be set to same value, otherwise not sent
Image Position Patient	(0020,0032)	1C	If present in composite object instances it will be set to same value, otherwise not sent
Image Orientation Patient	(0020,0037)	1C	If present in composite object instances it will be set to same value, otherwise not sent
Pixel Spacing	(0028,0030)	1C	If present in composite object instances it will be set to same value, otherwise not sent

For CT image files, the attribute values specified in the following table are supported by this profile:

Key Attribute	Tag	Notes
Modality	(0008,0060)	CT
Photometric interpretation	(0028,0004)	MOCHROME2

For MR image files, the attribute values specified in the following table are supported by this profile:

Key Attribute	Tag	Notes
Modality	(0008,0060)	MR
Photometric interpretation	(0028,0004)	MOCHROME2
Bits Stored	(0028,0101)	FSC: 16
High Bit	(0028,0102)	(0028,0101) Bits Stored - 1

For Grayscale Secondary Capture image files, the attribute values specified in the following table are supported by this profile:

Key Attribute	Tag	Notes
Samples per Pixel	(0028,0002)	1
Photometric interpretation	(0028,0004)	MOCHROME2
Bits Allocated	(0028,0100)	FSC: 16
Bits Stored	(0028,0101)	(0028,0100) Bits Allocated
High Bit	(0028,0102)	(0028,0101) Bits Stored - 1

3.3.2 Physical Media and Media Formats

The STD-GEN-CD application profile requires the 120 mm CD-R physical medium with the ISO/IEC 9660 Media Format, as defined in PS3.12. The physical format of DICOM CD-R discs shall comply with the applicable definitions within ISO/IEC 10149, Part II: CD-WO and CD-ROM-XA (extended Architecture).

The STD-CTMR-DVD application profile requires any of the 120 mm DVD media with the ISO/IEC 9660 Media Format, as defined in PS 3.12.

3.3.3 Directory Information in DICOMDIR

Refer to Basic Directory Information Object Implementation for a complete listing of all the optional modules and optional attributes used in the DICOMDIR definition. Please note that the mandatory attributes in each of the directory records as mentioned in Part 3 Addendum (Basic Directory Information Object Definition) are not listed in the section, but are supported by the implementation.

3.4 AUGMENTED AND PRIVATE APPLICATION PROFILES

No augmented/private profile is implemented

3.5 EXTENTIONS/SPECIALISATIONS/PRIVATIZATIONS

None specified.

3.6 CONFIGURATION

None specified.

3.7 SUPPORT OF EXTENDED CHARACTER SETS

The CD/DVD Archive Application will support copy of SOP instances containing the ISO IR 100 (Latin alphabet No. 1, supplementary set) and DICOM default character sets as defined in PS3.5.

4. BASIC DIRECTORY INFORMATION OBJECT IMPLEMENTATION

4.1 IOD MODULE TABLE

Table 4-1 identifies the defined modules within the entities which comprise the Basic Directory IOD. Modules are identified by Module Name.

See DICOM Part 3 for a complete definition of the entities, modules, and attributes.

TABLE 4-1
BASIC DIRECTORY IOD MODULES

Entity Name	Module Name	Reference
File Set Identification	File Set Identification	File Set identification Module
Directory Information	Directory Information	Directory Information Module

4.2 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the Basic Directory Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and where these values are obtained from. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions). Also note that Attributes not present in tables are not supported.

4.2.1 File Set identification Module

TABLE 4-2
FILE-SET IDENTIFICATION MODULE

Attribute Name	Tag	Type	Attribute Description
File-set ID	(0004,1130)	2	Set by application

4.2.2 Directory Information Module

TABLE 4-3
DIRECTORY INFORMATION MODULE

Attribute Name	Tag	Type	Attribute Description
Offset of the First Directory Record of the Root Directory Entity	(0004,1200)	1	Set by application
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	1	Set by application
File-set Consistency Flag	(0004,1212)	1	0000H: no known inconsistencies
Directory Record Sequence	(0004,1220)	2	Supported
>Offset of the Next Directory Record	(0004,1400)	1C	Set by application
>Record In-use Flag	(0004,1410)	1C	FFFFH: record is in use

>Offset of Referenced Lower-Level Directory Entity	(0004,1420)	1C	Set by application
>Directory Record Type	(0004,1430)	1C	PATIENT, STUDY, SERIES,IMAGE, PRESENTATION and SR DOCUMENT
>Private Record UID	(0004,1432)	1C	Not supported
>Referenced File ID	(0004,1500)	1C	Generated only for Image Directory Record, starting with A/A/A/A/Z01
>Referenced SOP Class UID in File	(0004,1510)	1C	Generated only for Image, Presentation and SR Document Directory Records
>Referenced SOP Instance UID in File	(0004,1511)	1C	Generated only for Image, Presentation and SR Document Directory Records. Set to SOP Instance UID (0008,0018) during save to media.
>Referenced Transfer Syntax UID in File	(0004,1512)	1C	Generated only for Image, Presentation and SR Document Directory Records
> Referenced Related General SOP Class UID in File	(0004,151A)	1C	Not supported
>Record Selection Keys			See 4.2.3.

4.2.3 Definition of Specific Directory Records

4.2.3.1 Patient Directory Record Definition

TABLE 4-4
PATIENT KEYS

Key	Tag	Type	Attribute Description
Specific Character Set	(0008,0005)	1C	ISO_IR 100
Patient's Name	(0010,0010)	2	If present in composite object instances it will be set to same value, otherwise set to NULL
Patient ID	(0010,0020)	1	If present in composite object instances it will be set to same value, otherwise computed
Patient Birth Date	(0010,0030)	3	If present in composite object instances it will be set to same value, otherwise not present
Patient Birth Time	(0010,0032)	3	If present in composite object instances it will be set to same value, otherwise not present
Patient Sex	(0010,0040)	3	If present in composite object instances it will be set to same value, otherwise not present

4.2.3.2 Study Directory Record Definition

TABLE 4-5
STUDY KEYS

Key	Tag	Type	Attribute Description
Specific Character Set	(0008,0005)	1C	ISO_IR 100
Study Date	(0008,0020)	1	If present in composite object instances it will be set to same value, otherwise computed
Study Time	(0008,0030)	1	If present in composite object instances it will be set to same value, otherwise an error is returned and the object is put on media
Study Description	(0008,1030)	2	If present in composite object instances it will be set to same value, otherwise set to NULL

Study Instance UID	(0020,000D)	1C	This is set to value that is present in the composite object instances, otherwise composite object instances are not Archived
Study ID	(0020,0010)	1	If present in composite object instances it will be set to same value, otherwise computed
Accession Number	(0008,0050)	2	If present in composite object instances it will be set to same value, otherwise set to NULL

4.2.3.3 Series Directory Record Definition

TABLE 4-6
SERIES KEYS

Key	Tag	Type	Attribute Description
Specific Character Set	(0008,0005)	1C	ISO_IR 100
Modality	(0008,0060)	1	If present in composite object instance it will be set to same value, otherwise an error is returned and the object not put on media
Series Instance UID	(0020,000E)	1	This is set to value that is present in the composite object instance, otherwise check for presence of Referenced SOP Instance UID in File (0004,1511), if both not present, instance is not put on media.
Series Number	(0020,0011)	1	If present in composite object instance it will be set to same value, otherwise computed
Icon Image Sequence	(0088,0200)	3	Not supported
Manufacturer	(0008,0070)	3	If present in composite object instances it will be set to same value, otherwise not sent
Series Description	(0008,103E)	3	Not included
Manufacturer's Model Name	(0008,1090)	3	If present in composite object instances it will be set to same value, otherwise not sent
Series Date	(0008,0021)	3	Not included
Performing Physician's Name	(0008,1050)	3	If present in composite object instances it will be set to same value, otherwise not sent
Institution Name	(0008,0080)	3	If present in composite object instances it will be set to same value, otherwise not sent
Institution Address	(0008,0081)	3	If present in composite object instances it will be set to same value, otherwise not sent
Series Type	(0054,1000)	3	Not included

4.2.3.4 Image Directory Record Definition

TABLE 4-7
IMAGE KEYS

Key	Tag	Type	Attribute Description
Specific Character Set	(0008,0005)	1C	ISO_IR 100
Acquisition Datetime	(0008,002A)	3	If present in composite object instances it will be set to same value, otherwise not sent
Instance Number	(0020,0013)	1	If present in composite object instance it will be set to same value, otherwise computed
Acquisition Time Synchronized	(0018,1800)	3	If present in composite object instances it will be set to same value, otherwise not sent
Synchronization Frame of Reference UID	(0020,0200)	3	If present in composite object instances it will be set to same value, otherwise not sent
Number of Frames	(0028,0008)	3	If present in composite object instances it will be set to same value, otherwise not sent
Lossy Image Compression Ratio	(0028,2112	3	If present in composite object instances it will be set to same value, otherwise not sent
Calibration Image	(0050,0004)	3	If present in composite object instances it will be set to same value, otherwise not sent

5. STORAGE COMMITMENT PUSH MODEL IMPLEMENTATION

5.1 INTRODUCTION

This section describes the Centricity PACS Reach storage commitment information object definition. The storage commitment information object is used both for N-ACTION storage commitment request by the SCU and N-EVENT-REPORT storage commitment notifications by the SCP.

5.2 IOD MODULE TABLE

5.2.1 Storage Commitment Module for N-ACTION

Table 5-1. Storage Commitment Module for N-action

Attribute Name	Tag	Attribute Description
Transaction UID	(0008,1195)	Internally generated
Referenced SOP Sequence	(0008,1199)	
>Referenced SOP Class UID	(0008,1150)	Storage SOP classes supported as SCU. Refer section 2.3.1.2.1.2
>Referenced SOP Instance UID	(0008,1155)	

5.2.2 Storage Commitment Module For N-EVENT-REPORT

Table 5-2. Storage Commitment Module For N-EVENT-REPORT

Event Type Name	Event Type ID	Attribute Name	Tag	Requirement Type SCU/SCP
Storage Commitment Request Successful	1	Transaction UID	(0008,1195)	-/1
		Retrieve AE Title	(0008,0054)	-/3
		Storage Media File-Set ID	(0088,0130)	-/3
		Storage Media File-Set UID	(0088,0140)	-/3
		Referenced SOP Sequence	(0008,1199)	-/1
		>Referenced SOP Class UID	(0008,1150)	-/1
		>Referenced SOP Instance UID	(0008,1155)	-/1
		>Retrieve AE Title	(0008,0054)	-/3
		>Storage Media File-Set ID	(0088,0130)	-/3
		>Storage Media File-Set UID	(0088,0140)	-/3
Storage Commitment Request	2	Transaction UID	(0008,1195)	-/1
		Retrieve AE Title	(0008,0054)	-/3
		Storage Media File-Set ID	(0088,0130)	-/3

Complete - Failures Exist		Storage Media File-Set UID	(0088,0140)	-/3
		Referenced SOP Sequence	(0008,1199)	-/1C
		>Referenced SOP Class UID	(0008,1150)	-/1
		>Referenced SOP Instance UID	(0008,1155)	-/1
		>Retrieve AE Title	(0008,0054)	-/3
		>Storage Media File-Set ID	(0088,0130)	-/3
		>Storage Media File-Set UID	(0088,0140)	-/3
		Failed SOP Sequence	(0008,1198)	-/1
		>Referenced SOP Class UID	(0008,1150)	-/1
		>Referenced SOP Instance UID	(0008,1155)	-/1
		>Failure Reason	(0008,1197)	-/1

Note: Among the attributes in table 5-2, the following are used and the rest are ignored: Transaction UID, Referenced SOP Sequence and all its contents.

5.2.3 Processing of Failure Reasons Received in a N-Event-Report

When a N-Event-Report request with a Event Type ID equal to 2 is received, this indicates that Storage Commitment is complete, but a failure exists. The following table lists the set of value that this Storage Commitment SCU AE is able to process.

Table 5-3. Storage Commitment Failure Reasons for N-EVENT-REPORT

Failure Reason	Meaning	Application Behavior When Receiving Reason Code
0110H	Processing failure	Log file updated: Processing Failure
0112H	No such object instance	Log file updated: No such object instance
0213H	Resource limitation	Log file updated: resource limitation
0122H	Referenced SOP Class not supported	Log file updated: reference SOP class not supported
0119H	Class / Instance conflict	Log file updated: class/instance conflict
0131H	Duplicate transaction UID	Log file updated: duplicate transaction UID
*	Other Failure Reason code values	Log file updated: unknown failure