**OnePacs Gateway
DICOM Conformance Statement**

Version: 2.7

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Preface

OnePacs Gateway is a DICOM router and archive primarily used for securely transmitting DICOM imaging data to the OnePacs Cloud. It's capabilities include:

- Storage and retrieval of various kinds of DICOM Objects such as:

    1. Images from multiple modalities,

    2. Grayscale Presentation States [GSPS], which specifies the presentations of images as grayscaling, zoom, text and graphical annotations,

    3. Key Objects [KO], which specifies a particular selection of images for a specified reason and with an attached note,

    4. Structured Reports [SR].

- to process HL7 notification messages from the Order Filler, about Procedure Scheduling, Procedure Updates and Patient Information Updates and provide a DICOM Modality Worklist (MWL) interface for DICOM devices to query.

- to process DICOM Modality Performed Procedure Step [MPPS] messages from modalities and forward them to the Order Filler.

OnePacs Gateway is a server application. Its Web-based User Interface is intended for system configuration and troublshooting.

1   Overview

OnePacs Gateway is a system that provides services for safe storage and retrieve of DICOM evidence object such as Images, Key Image Notes, Presentation States, Structured Reports and others.

OnePacs Gateway supports the following IHE Integration Profiles:

–   Access to Radiology Information

–   Consistent Presentation of Images

–   Evidence Documents

–   Key Image Note

–   Patient Information Reconciliation

–   Simple Image and Numeric Report

–   Scheduled Workflow

–   Basic Security

OnePacs Gateway supports the following network services:

Table 1.1 NETWORK SERVICES

Networking SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
US Image Storage	Yes	Yes
US Multi-frame Storage	Yes	Yes
Computer Radiografy Image Storage	Yes	Yes
Digital X-Ray Image Storage – For Presentation	Yes	Yes
Digital X-Ray Image Storage – For Processing	Yes	Yes
Digital Mammografy X-Ray Image Storage - For Presentation	Yes	Yes
Digital Mammografy X-Ray Image Storage - For Processing	Yes	Yes
Digital Intra-oral X-Ray Image Storage – For Presentation	Yes	Yes
Digital Intra-oral X-Ray Image Storage – For Processing	Yes	Yes
CT Image Storage	Yes	Yes
Enhanced CT Image Storage	Yes	Yes
MR Image Storage	Yes	Yes

Networking SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Enhanced MR Image Storage	Yes	Yes
MR Spectroscopy Storage	Yes	Yes
Nuclear Medicine Image Storage	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
X-Ray Angiographic Image Storage	Yes	Yes
Enhanced X-Ray Angiographic image Storage	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	Yes	Yes
Enhanced X-Ray Radiofluoroscopic Image Storage	Yes	Yes
X-Ray Angiographic Bi-Plane Image Storage	Yes	Yes
VL Image Storage Retired	Yes	Yes
VL Multiframe Image Storage Retired	Yes	Yes
VL Endoscopic Image Storage	Yes	Yes
Video Endoscopic Image Storage	Yes	Yes
VL Microscopic Image Storage	Yes	Yes
Video Microscopic Image Storage	Yes	Yes
VL Slide-Coordinates Microscopic Image Storage	Yes	Yes
VL Photographic Image Storage	Yes	Yes
Video Photographic Image Storage	Yes	Yes
Ophthalmic Photography 8 Bit Image Storage	Yes	Yes
Ophthalmic Photography 16 Bit Image Storage	Yes	Yes
Encapsulated PDF Storage	Yes	Yes
Stereometric Relationship Storage	Yes	Yes
Positron Emission Tomography Image Storage	Yes	Yes
Standalone PET Curve Storage	Yes	Yes
RT Image Storage	Yes	Yes
RT Dose Storage	Yes	Yes
RT Structure	Yes	Yes
RT Beams Treatment Record Storage	Yes	Yes
RT Plan Storage	Yes	Yes
RT Brachy Treatment Record Storage	Yes	Yes
RT Treatment Summary Record Storage	Yes	Yes
RT Ion Plan Storage	Yes	Yes
RT Ion Beams Treatment Record Storage	Yes	Yes

Networking SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Raw Data Storage	Yes	Yes
Spatial Registration Storage	Yes	Yes
Spatial Fiducials Storage	Yes	Yes
Deformable Spatial Registration Storage	Yes	Yes
Segmentation Storage	Yes	Yes
Real World Value Mapping Storage	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage	Yes	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	Yes	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	Yes	Yes
Multi-frame Color Secondary Capture Image Storage	Yes	Yes
Standalone Overlay Storage	Yes	Yes
Standalone Curve Storage	Yes	Yes
12-lead ECG Waveform Storage	Yes	Yes
General ECG Waveform Storage	Yes	Yes
Ambulatory ECG Waveform Storage	Yes	Yes
Hemodynamic Waveform Storage	Yes	Yes
Cardiac Electrophysiology Waveform Storage	Yes	Yes
Basic Voice Audio Waveform Storage	Yes	Yes
Standalone Modality LUT Storage	Yes	Yes
Standalone VOI LUT Storage	Yes	Yes
Grayscale Softcopy Presentation State Storage	Yes	Yes
Color Softcopy Presentation State Storage	Yes	Yes
Pseudo Color Softcopy Presentation State Storage	Yes	Yes
Blending Softcopy Presentation State Storage	Yes	Yes
Stored Print Storage	Yes	Yes
Hardcopy Grayscale Image Storage SOP Class	Yes	Yes
Hardcopy Color Image Storage SOP Class	Yes	Yes
Nuclear Medicine Image Storage Retired	Yes	Yes
Ultrasound Multiframe Image Storage Retired	Yes	Yes
Ultrasound Image Storage Retired	Yes	Yes
Basic Text SR	Yes	Yes
Enhanced SR	Yes	Yes
Comprehensive SR	Yes	Yes

Networking SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Procedure Log storage	Yes	Yes
Mammography CAD SR	Yes	Yes
Key Object Selection Document Storage	Yes	Yes
Chest CAD SR	Yes	Yes
X-Ray Radiation Dose	Yes	Yes
Storage Commitment Push Model	No	Yes
Workflow Management		
Modality Worklist FIND	No	Yes
Modality Performed Procedure Step	Yes	Yes
Instance Availability Notification	Yes	No
Basic Study Content Notification	Yes	No
Query/Retrieve		
Patient Root Q/R – FIND	No	Yes
Patient Roor Q/R – MOVE	No	Yes
Study Root Q/R – FIND	No	Yes
Study Root Q/R – MOVE	No	Yes
Patient/Study Only Q/R – FIND	No	Yes
Patient/Study Only Q/R – MOVE	No	Yes
Connectivity Verification		
Verification	Yes	Yes

2 Introduction

2.1 Revision History

Revision History

Revision 1.0   May 1, 2018   jf

2.2 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

2.3 Remarks

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a firstlevel validation for interoperability between different applications supporting the same DICOM functionality.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

The scope of this Conformance Statement is to facilitate communication with OnePacs Gateway and other medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, by itself it is not guaranteed to ensure the desired interoperability and successful interconnectivity with existing DICOM systems.

The user should be aware of the following important issues:

• The comparison of different conformance statements is the first step towards assessing interconnectivity between OnePacs Gateway and other equipment.

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

• The DICOM standard will evolve to meet the users' future requirements. OnePacs reserves the right to make changes to it's products or to discontinue it's delivery.

2.4 Definitions, Terms and Abbreviations

Definitions, terms and abbreviations used in this document are defined within the different parts of the DICOM standard.
Abbreviations and terms are as follows:

AE
    DICOM Application Entity

AET
    Application Entity Title

DICOM
    Digital Imaging and Communications in Medicine

DIMSE
    DICOM Message Service Element

FSC
    File Set Creator

GSDF
    Grayscale Standard Display Function

HIS/RIS
    Hospital Information System / Radiology Information System.

IHE
    Integrating the Healthcare Enterprise

IHE-TF
    Integrating the Healthcare Enterprise Technical Framework

IAN
>Instance Availability Notification

IOD
>Information Object Definition

ISO
>International Standard Organization

PDU
>DICOM Protocol Data Unit

LUT
>Look-up Table

MPPS
>Modality Performed Procedure Step

MWL
>Modality Worklist

P-LUT
>Presentation Look-up Table

Q/R
>Query Retrieve

SCP
>Service Class Provider

SCU
>Service Class User

SCN
>Study Content Notification

SOP
>DICOM Service-Object Pair

TCP/IP
>Transmission Control Protocol/Internet Protocol

TLS
>Transport Layer Security

UID
>Unique Identifier

VR
>Value Representation

2.5   References

[DICOM]

Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1- 3.16, 2018b

[IHE-TF]
Integrating the Healthcare Enterprise Radiology Technical Framework, Revision 16.0, 2017

3 Networking

3.1 *Implementation Model*

3.1.1 Application Data Flow

OnePacs Gateway is logically divided in 4 different DICOM Application Entities: Storage Server, Query/Retrieve Server, MPPS Manager and IAN/SCN Service.
The Application Entities detailed in the Application Data Flow Diagram are all Java Enterprise Application and are designed to run in a J2EE compliant container (i.e. JBoss) on any Java Virtual Machine 1.5 capable Operating System.

The **Storage Server AE** implements the DICOM Storage Service Class, the Verification Service Class, the DICOM Storage Commitment Service and Query/Retrieve Services.
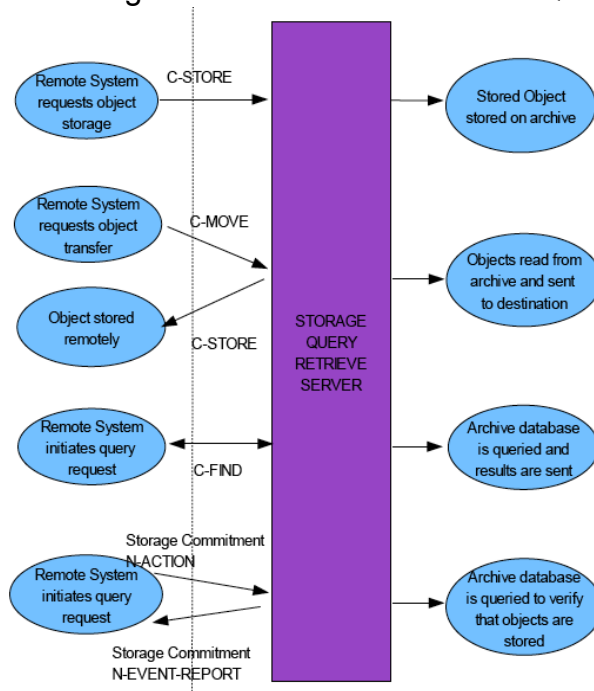
The **Modality Worklist Server AE** implements the Verification Service Class and the Basic Worklist Management Service Class.
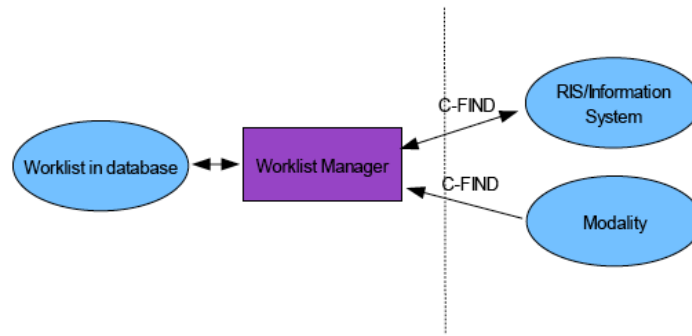
The **MPPS manager AE** implements the DICOM Modality Performed Procedure Step Service.
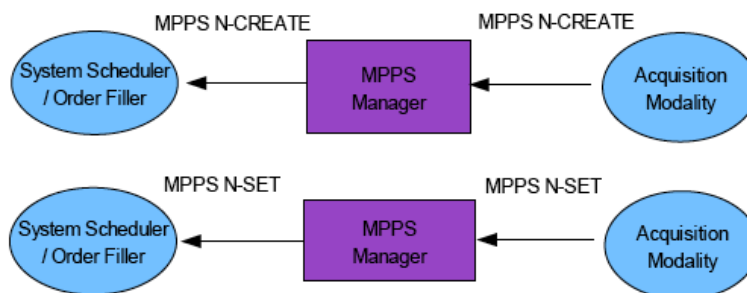
The **IAN/SCN service** implements the DICOM Instance Availability Notification and the Basic Study Content **Notification as SCU.**
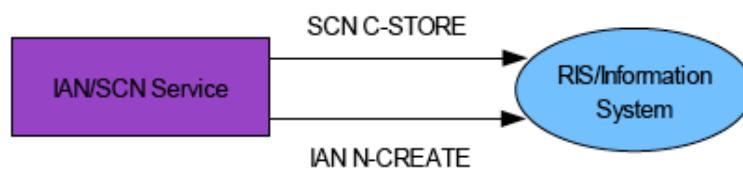
3.1.2 Functional Definition of AEs

3.1.2.1   Functional Definition of OnePacs Gateway Storage Server Application Entity

The OnePacs Gateway Storage Server Application Entity waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, the STORAGESCP AE expects it to be a DICOM application.

The STORAGE-SCP AE will accept Associations with Presentation Contexts for SOP Classes of the Verification, Storage, and Storage Commitment Service Classes.

DICOM Instances received in a Storage Request are filed on local (attached/mounted) file system(s). A subset of attributes from received Instances is also stored in records local database.

3.1.2.2   Functional Definition of OnePacs Gateway Query/Retrieve Server Application Entity

The OnePacs Gateway Query/Retrieve Server Application Entity waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, the Storage Server AE expects it to be a DICOM application.

The Query/Retrieve Server AE will accept Associations with Presentation Contexts for SOP Classes of the Verification and Query/Retrieve Service Classes.
Once received a Retrieve (Move) request, Query/Retrieve Server AE will initiate a new association and send the requested instances to the Move Destination AE.

3.1.2.3   Functional Definition of OnePacs Gateway Modality Worklist Server Application Entity

The OnePacs Gateway Modality Worklist Server Application Entity waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, the Modality Worklist Server AE expects it to be a DICOM application.

The Modality Worklist Server AE will accept Associations with Presentation Contexts for SOP Classes of the Verification and Modality Worklist Service Classes.

When a Modality Worklist Find request is received, Modality Worklist Server AE will query the local database for a list of Scheduled Procedure Steps matching the query and will return a pending C-Find response for each match.
Before patient and order information can be included in response to a Modality Worklist query, Modality Worklist items must be created by MPPS.

The Modality Worklist SCU establish an association automatically to verify an incoming patient every n seconds for prefetching (send old exams automatically to modality workstation).

3.1.2.4   Functional Definition of OnePacs Gateway MPPS Manager Application Entity

The OnePacs Gateway MPPS Manager Application Entity waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, the MPPS Manager AE expects it to be a DICOM application.

The MPPS Manager AE will accept Associations with Presentation Contexts for SOP Classes of the Verification and Modality Performed Procedure Step Service Classes.

The MPPS Manager stores the received MPPS instances in the local database and can be configured to forward them to a remote MPPS SCP.

3.1.2.5   Functional Definition of OnePacs Gateway IAN/SCN Application Entity

The OnePacs Gateway IAN/SCN Application Entity notifies a configurable list of remote DICOM peer application, about new instances received by the Storage Server AE, triggered by the release of the association to the Storage Server AE.

It will initiate a new association to the remote AE which shall be notified, offering a Presentation Context for the Instance Availibility Notification SOP Class or for the Basic Study Content Notification SOP Class or for both - dependend of its configuration and perform the notification for each study received by the Storage Server AE in the released association, using the accepted service.

3.1.3 Sequencing of Real-World Activities

Note that the only constraint is for the Composite SOP Instance to be received prior to the other events. All the other events (even MPPS Send) are not constrained and can happen at any time.

3.2   Application Entity Specifications

3.2.1 Association Policies

3.2.1.1   General

Each application entity of the OnePacs Gateway archive accepts and proposes the DICOM standard application context name for DICOM:

Table 3.1: DICOM Application context name

Application Context Name	1.2.840.10008.3.1.1.1

3.2.1.2   Implementation identifying information

Each application entity of the OnePacs Gateway provides the following implementation class UID and implementation version name:

Table 3.2: DICOM Implementation Class and Version for OnePacs Storage Server AE

Implementation Class UID	1.3.6.1.4.1.50304
Implementation Version Name	dcm4che-1.4.34

3.2.2 DICOM Server Application Entity Specification

3.2.2.1   Association Establishment Policy

3.2.2.1.1   General

The DICOM standard application context name for DICOM is always accepted and proposed (see table 3.1).

The OnePacs Gateway Storage Server AE can both accept and propose Association Requests. The OnePacs Gateway Storage Server AE will accept Association Requests for the Verification, Storage, and Storage Commitment Push Model Services, Query/Retrieve and MPPS Services.

3.2.2.1.2 Number of Associations

OnePacs Gateway Storage Server can support multiple simultaneous Associations requested by peer AEs. Default is 128. This value can be configured through the attribute "MaxClients" in the Application Server configuration file (i.e. jboss-service.xml for JBoss application server).

Table 3.3: Number of Associations accepted for OnePacs Gateway Storage Server AE

Maximum number of simultaneous Associations	128 (Configurable)

3.2.2.1.3 Asynchronous Nature

OnePacs Gateway Storage Server supports asynchronous communication. Multiple outstanding transactions are supported. It allows more than one invoked and more than one performed operation on an Association. Asynchronous mode of operation is supported.

Table 3.4: Asynchronous Nature as SCP for OnePacs Gateway AE

Maximum number of outstanding asynchronous transactions	4 (Configurable)

3.2.2.1.4 Implementation Identifying Information

The DICOM Server AE Provides the implementation class UID and the implementation version name listed in table 3.2.

3.2.3 OnePacs Gateway Storage Server Application Entity Specification

3.2.3.1 SOP Classes

OnePacs Gateway Storage Server Application Entity provides Standard Conformance to the following SOP Classes:

Table 3.5: SOP Classes for OnePacs Gateway Storage Server AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	No	Yes
Stored Print Storage	1.2.840.10008.5.1.1.27	No	Yes
Hardcopy Grayscale Image Storage SOP Class	1.2.840.10008.5.1.1.29	No	Yes
Hardcopy Color Image Storage SOP Class	1.2.840.10008.5.1.1.30	No	Yes
Computer Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Yes
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	No	Yes
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	No	Yes
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	No	Yes
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	No	Yes
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	No	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	No	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	No	Yes
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	No	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	No	Yes
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	No	Yes
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	No	Yes
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	No	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	No	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	No	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	No	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	No	Yes
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	No	Yes
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	No	Yes
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	No	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	No	Yes
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	No	Yes
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	No	Yes
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	No	Yes
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	No	Yes
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	No	Yes
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	No	Yes
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	No	Yes
Color Sortcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	No	Yes
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	No	Yes
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	No	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	No	Yes
Enhanced X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	No	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Yes
Enhanced X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	No	Yes
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	No	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	No	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	No	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	No	Yes
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	No	Yes
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	No	Yes
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	No	Yes
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	No	Yes
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	No	Yes
VL Multiframe Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	No	Yes
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	No	Yes
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	No	Yes
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	No	Yes
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	No	Yes
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	No	Yes
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	No	Yes
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	No	Yes
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	No	Yes
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	No	Yes
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	No	Yes
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	No	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	No	Yes
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	No	Yes
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	No	Yes
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	No	Yes
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	No	Yes
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	No	Yes
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	No	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	No	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	No	Yes
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	No	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	No	Yes
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	No	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	No	Yes
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	No	Yes
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	No	Yes
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	No	Yes
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	No	Yes
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	No	Yes
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	No	Yes

3.2.3.2   Association Initiation Policy

3.2.3.2.1   Activity - Send Storage Commitment Notification over new Association

3.2.3.2.1.1   Description and Sequencing of Activities

An Association Request is sent to the peer AE that sent the Storage Commitment Push Model request and upon successful negotiation of the required Presentation Context the outstanding N-EVENT-REPORT is sent.

3.2.3.2.1.2   Proposed Presentation Contexts

OnePacs Gateway Storage Server will propose Presentation Contexts as shown in the following table:

Table 3.6: Proposed Presentation Contexts by the OnePacs Gateway Storage Server AE

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None

3.2.3.2.1.3   SOP Specific Conformance

3.2.3.2.1.3.1   Specific Conformance for Verification SOP Class

Standard conformance is provided to the DICOM Verification Service Class as an SCU. The Verification Service as an SCU is actually only supported as a diagnostic service tool for network communication issues. It can be used to test whether Associations can actually be opened with a peer AE that is issuing Storage Commitment Push Model requests (i.e. to test whether the indicated TCP/IP port and AE Title for sending NEVENT-REPORT Requests to the peer AE are truly functional).

3.2.3.2.1.3.2   Specific Conformance for Storage Commitment SOP Classes

The associated Activity with the Storage Commitment Push Model service is the communication by the OnePacs Gateway Storage Server AE to peer AEs that it has committed to permanently store Composite SOP Instances that have been sent to it.

It thus allows peer AEs to determine whether the OnePacs Gateway Storage Server has taken responsibility for the archiving of specific SOP Instances so that they can be flushed from the peer AE system.

3.2.3.3 *Association Acceptance Policy*

3.2.3.3.1 Activity - Receive Images and Storage Commitment Requests

3.2.3.3.1.1 Description and Sequencing of Activities

A remote peer DICOM Application Entity, acting as an Storage SCU, establishes an association with OnePacs Gateway Storage Server that accepts these Associations for the purpose of receiving supported SOP Class Instances and Storage Committment requests.

In the default configuration any Calling and Called AET will be accepted. But the Called AET does not correspond to the actual Storage Server AET, only a Presentation Context for the Verification SOP Class will be accepted and the SCU can only verify the DICOM Association, but cannot invoke any other related DICOM service.

When an association has been established the Sequencing of Real-World Activities is as described in Section 3.1.3, "Sequencing of Real-World Activities".

The Storage Server AE may reject Association attempts as shown in the table below. The Result, Source and Reason / Diag columns represent the values returned in the corresponding fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4).

Table 3.7: Association Rejection Reasons

Result	Source	Reason	Description
2 – rejected transient	Provider	2 – local-limit exceeded	The (configurable) maximum number of simultaneous associations has been reached. An association request with the same parameters may succeed at a later time.
1 – rejected permanent	User	2 – application context name not supported	The Association request contained an unsupported Application Context Name. An association request with the same parameters will NOT succeed at a later time.
1 – rejected permanent	User	3 – calling AE title not recognized	The Association request contained an unrecognized Calling AE Title. An association request with the same parameters will NOT succeed at a later time unless configuration changes are made.

3.2.3.3.1.2 Accepted Presentation Contexts

Table 3.8: Accepted Presentation Contexts for OnePacs Gateway Storage Server AE

Abstract Syntax		Transfert Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Transfer Syntaxes for Non-Image Storage Services		SCP	None

Abstract Syntax		Transfert Syntax		Role	Ext. Neg.
Name	**UID**	**Name List**	**UID List**		
Stored Print Storage	1.2.840.10008.5.1.1.27	Transfer Syntaxes for Non-Image Storage Services		SCP	None
Hardcopy Grayscale Image Storage SOP Class	1.2.840.10008.5.1.1.29	Transfer Syntaxes for Image Storage Services		SCP	None
Hardcopy Color Image Storage SOP Class	1.2.840.10008.5.1.1.30	Transfer Syntaxes for Image Storage Services		SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Transfer Syntaxes for Image Storage Services		SCP	None
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Transfer Syntaxes for Image Storage Services		SCP	None
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1	Transfer Syntaxes for Image Storage Services		SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.2	Transfer Syntaxes for Image Storage Services		SCP	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.2.1	Transfer Syntaxes for Image Storage Services		SCP	None
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.3	Transfer Syntaxes for Image Storage Services		SCP	None
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.3.1	Transfer Syntaxes for Image Storage Services		SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Transfer Syntaxes for Image Storage Services		SCP	None
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Transfer Syntaxes for Image Storage Services		SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Transfer Syntaxes for Image Storage Services		SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Transfer Syntaxes for Image Storage Services		SCP	None

Abstract Syntax		Transfert Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Transfer Syntaxes for Image Storage Services		SCP	None
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Transfer Syntaxes for Image Storage Services		SCP	None
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Transfer Syntaxes for Image Storage Services		SCP	None
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Transfer Syntaxes for Image Storage Services		SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Transfer Syntaxes for Image Storage Services		SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Transfer Syntaxes for Image Storage Services		SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Transfer Syntaxes for Image Storage Services		SCP	None
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Transfer Syntaxes for Image Storage Services		SCP	None
Multi-frame Gray-scale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Transfer Syntaxes for Image Storage Services		SCP	None
Multi-frame Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Transfer Syntaxes for Image Storage Services		SCP	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Transfer Syntaxes for Image Storage Services		SCP	None
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Transfer Syntaxes for Image Storage Services		SCP	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Transfer Syntaxes for Image Storage Services		SCP	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Transfer Syntaxes for Image Storage Services		SCP	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Transfer Syntaxes for Image Storage Services		SCP	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Transfer Syntaxes for Image Storage Services		SCP	None

Abstract Syntax		Transfert Syntax		Role	Ext. Neg.
Name	**UID**	**Name List**	**UID List**	**Role**	**Ext. Neg.**
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Transfer Syntaxes for Image Storage Services		SCP	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Transfer Syntaxes for Image Storage Services		SCP	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Transfer Syntaxes for Image Storage Services		SCP	None
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Transfer Syntaxes for Image Storage Services		SCP	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Transfer Syntaxes for Image Storage Services		SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Transfer Syntaxes for Image Storage Services		SCP	None
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Transfer Syntaxes for Image Storage Services		SCP	None
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Transfer Syntaxes for Image Storage Services		SCP	None
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Transfer Syntaxes for Image Storage Services		SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Transfer Syntaxes for Image Storage Services		SCP	None
Enhanced X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Transfer Syntaxes for Image Storage Services		SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Transfer Syntaxes for Image Storage Services		SCP	None
Enhanced X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Transfer Syntaxes for Image Storage Services		SCP	None
X-Ray Angiograpgic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Transfer Syntaxes for Image Storage Services		SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Transfer Syntaxes for Image Storage Services		SCP	None

Abstract Syntax		Transfert Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Transfer Syntaxes for Image Storage Services		SCP	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Transfer Syntaxes for Image Storage Services		SCP	None
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Transfer Syntaxes for Image Storage Services		SCP	None
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	Transfer Syntaxes for Image Storage Services		SCP	None
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Transfer Syntaxes for Image Storage Services		SCP	None
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Transfer Syntaxes for Image Storage Services		SCP	None
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Transfer Syntaxes for Image Storage Services		SCP	None
VL Multiframe Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Transfer Syntaxes for Image Storage Services		SCP	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Transfer Syntaxes for Image Storage Services		SCP	None
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Transfer Syntaxes for Image Storage Services		SCP	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Transfer Syntaxes for Image Storage Services		SCP	None
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Transfer Syntaxes for Image Storage Services		SCP	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Transfer Syntaxes for Image Storage Services		SCP	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Transfer Syntaxes for Image Storage Services		SCP	None
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Transfer Syntaxes for Image Storage Services		SCP	None
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Transfer Syntaxes for Image Storage Services		SCP	None
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Transfer Syntaxes for Image Storage Services		SCP	None
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Transfer Syntaxes for Image Storage Services		SCP	None

Abstract Syntax		Transfert Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Transfer Syntaxes for Image Storage Services		SCP	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Transfer Syntaxes for Image Storage Services		SCP	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Transfer Syntaxes for Image Storage Services		SCP	None
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	Transfer Syntaxes for Image Storage Services		SCP	None
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Transfer Syntaxes for Image Storage Services		SCP	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Transfer Syntaxes for Image Storage Services		SCP	None
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Transfer Syntaxes for Image Storage Services		SCP	None
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Transfer Syntaxes for Image Storage Services		SCP	None
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Transfer Syntaxes for Image Storage Services		SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Transfer Syntaxes for Image Storage Services		SCP	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Transfer Syntaxes for Image Storage Services		SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Transfer Syntaxes for Image Storage Services		SCP	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Transfer Syntaxes for Image Storage Services		SCP	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Transfer Syntaxes for Image Storage Services		SCP	None
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Transfer Syntaxes for Image Storage Services		SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Transfer Syntaxes for Image Storage Services		SCP	None
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Transfer Syntaxes for Image Storage Services		SCP	None
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	Transfer Syntaxes for Image Storage Services		SCP	None

Storage					
Abstract Syntax		**Transfert Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Transfer Syntaxes for Image Storage Services		SCP	None
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	Transfer Syntaxes for Image Storage Services		SCP	None

Table 3.9: Accepted Transfer Syntaxes for Non-Image Storage Services

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1
Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99
MPEG2	1.2.840.10008.1.2.4.100

Table 3.10: Accepted Transfer Syntaxes for Image Storage Services

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1
JPEG Baseline	1.2.840.10008.1.2.4.50
JPEG Extended	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical	1.2.840.10008.1.2.4.57
JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
JPEG-LS Lossless Image Compression	1.2.840.10008.1.2.4.80
JPEG-LS Lossy (Near-Lossless) Image	1.2.840.10008.1.2.4.81
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91
RLE Lossless	1.2.840.10008.1.2.5

If the Called AET is not corresponding to the actual Storage Server AET, it only will be accepted the Presentation Context for the Verification SOP Class.

3.2.3.3.1.3   SOP Specific Conformance

3.2.3.3.1.3.1   Specific Conformance for Verification SOP Class

OnePacs Gateway Storage Server provides standard conformance to the DICOM Verification Service Class as a SCP. The status code for the C-ECHO is described in the next table:

Table 3.11: C-Echo Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The C-ECHO request is accepted

3.2.3.3.1.3.2   Specific Conformance for Storage SOP Classes

The associated Activity with the Storage service is the storage of medical DICOM data received over the network on a designated storage repository. The OnePacs Gateway AE will return a failure status if it is unable to store the received instance(s).

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

The OnePacs Gateway Storage Server AE is configured to retain the original DICOM data in DICOM Part 10 compliant file format. The OnePacs Gateway Storage Server AE is Level 2 (Full) conformant as a Storage SCP. In addition, all Private and SOP Class Extended Elements are maintained in the DICOM format files. In addition to saving all Elements in files, a subset of the Elements are stored in the OnePacs Gateway Query/Retrieve Server database to support query and retrieval requests and also allow updating of Patient, Study, and Series information by user input, or demographic and Study related messages.

If the received instance is a duplicate of a previously received instance, the old file and database information will not be overwritten with the new one.

3.2.3.3.1.3.3   Storage Server AE C-STORE Response

Table 3.12: OnePacs Gateway C-STORE Response Status

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The Composite SOP Instance was successfully received, verified, and stored in the system repository.
Error	Processing Failure	0110	This status is returned due to internal errors such as a processing failure response from the internal database or a filesystem operation. The appropriate Status will be sent in the C-STORE Response. Error indication message is output to the Service Log.

Service Status	Further Meaning	Error Code	Behavior
Warning	Coercion of Data Elements	B000	This status is returned if one or more Attribute values were coerced/ modified on reception. Image transmission is considered successful. The appropriate SUCCESS Status will be sent in the C-STORE Response. Warning indication message is output to the Service Log.
Warning	Data set does not match SOP Class	B007	This status is returned if the C-STORE Request specifies Attributes that are not specific as part of the Storage SOP class. Image transmission is considered successful. The appropriate SUCCESS Status will be sent in the C-STORE Response. Warning indication message is output to the Service Log.

3.2.3.3.1.3.4   Storage Server AE Storage Service Communication Failure Reasons

Table 3.13: OnePacs Gateway Service Communication Failure Reasons

Exception	Reason
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout). I.e. The STORAGESCP AE is waiting for the next C-STORE Request on an open Association but the timer expires.	The Association is aborted by issuing a DICOM AABORT. Error message is output to the Service Log. If some Composite SOP Instances have already been successfully received then they are maintained in the database. They are not automatically discarded because of a later failure.
Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout). I.e. The STORAGE-SCP AE is waiting for the next C-STORE Data Set PDU but the timer expires.	The Association is aborted by issuing a DICOM AABORT. Error message is output to the Service Log. If a C-STORE Data Set has not been fully received then the data already received is discarded. If some Composite SOP Instances have already been successfully received over the Association then they are maintained in the database.
Association aborted by the SCU or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	Error message is output to the Service Log. If some Composite SOP Instances have already been successfully received then they are maintained in the database. They are not automatically discarded because of a later failure.

3.2.3.3.1.3.5   Specific Conformance for Storage Commitment SOP Class

The associated Activity with the Storage Commitment Push Model service is the

communication by the OnePacs Gateway AE to peer AEs that it has committed to permanently store Composite SOP Instances that have been sent to it. It thus allows peer AEs to determine whether the OnePacs Gateway Query/Retrieve Server has taken responsibility for the archiving of specific SOP Instances so that they can be flushed from the peer AE
system.

The OnePacs Gateway AE takes the list of Composite SOP Instance UIDs specified in a Storage Commitment Push Model N-ACTION Request and checks if they are present in the OnePacs Gateway query/retrieve Server repository. As long as the Composite SOP Instance UIDs are present in the database, the OnePacs Gateway AE will consider those Composite SOP Instance UIDs to be successfully archived. The OnePacs Gateway Storage Server AE does not require the Composite SOP Instances to actually be successfully written to archive media in order to commit to responsibility for maintaining these SOP Instances.

Once the OnePacs Gateway AE has checked for the existence of the specified Composite SOP Instances, it will then attempt to send the Notification request (N-EVENT-REPORT-RQ). The OnePacs Gateway AE will request a new Association with the peer AE that made the original N-ACTION Request.

The OnePacs Gateway AE will not cache Storage Commitment Push Model N-ACTION Requests that specify Composite SOP Instances that have not yet been transferred to the OnePacs Gateway Query/Retrieve Server. If a peer AE sends a Storage Commitment Push Model N-ACTION Request before the specified Composite SOP Instances are later sent over the same Association, the OnePacs Gateway AE will not commit to responsibility for such SOP Instances.

The OnePacs Gateway AE does not support the optional Storage Media File-Set ID & UID attributes in the N-ACTION.
The OnePacs Gateway AE will support Storage Commitment Push Model requests for SOP Instances of any of the Storage SOP Classes that are also supported by the OnePacs Gateway AE:

Table 3.14: Supported Referenced SOP Classes In Storage Commitment Push Model N-ACTION Requests

Supported Referenced SOP Classes
Stored Print Storage
Hardcopy Grayscale Image Storage SOP Class
Hardcopy Color Image Storage SOP Class
Computed Radiography Image Storage
Digital X-Ray Image Storage - For Presentation
Digital X-Ray Image Storage - For Processing
Digital Mammography X-Ray Image Storage - For Presentation
Digital Mammography X-Ray Image Storage - For Processing
Digital Intra-oral X-Ray Image Storage - For Presentation

Supported Referenced SOP Classes
Digital Intra-oral X-Ray Image Storage - For Processing
CT Image Storage
Enhanced CT Image Storage
Ultrasound Multi-frame Image Storage (Retired)
Ultrasound Multi-frame Image Storage
MR Image Storage
Enhanced MR Image Storage
MR Spectroscopy Storage
Nuclear Medicine Image Storage (Retired)
Ultrasound Image Storage (Retired)
Ultrasound Image Storage
Secondary Capture Image Storage
Multi-frame Grayscale Byte Secondary Capture Image Storage
Multi-frame Grayscale World Secondary Capture Image Storage
Multi-frame Color Secondary Capture Image Storage
Standalone Overlay Storage
Standalone Curve Storage
12-lead ECG Waveform Storage
General ECG Waveform Storage
Ambulatory ECG Waveform Storage
Hemodynamic Waveform Storage
Cardiac Electrophysiology Waveform Storage
Basic Voice Audio Waveform Storage
Standalone Modality LUT Storage
Standalone VOI LUT Storage
Grayscale Softcopy Presentation State Storage SOP Class
Color Softcopy Presentation State Storage
Pseudo-Color Softcopy Presentation State Storage
Blending Softcopy Presentation State Storage
X-Ray Angiographic Image Storage
Enhanced X-Ray Angiographic Image Storage
X-Ray Radiofluoroscopic Image Storage
Enhanced X-Ray Radiofluoroscopic Image Storage
X-Ray Angiographic Bi-Plane Image Storage (Retired)
Nuclear Medicine Image Storage

Supported Referenced SOP Classes
Raw Data Storage
Spatial Registrationn Storage
Spatial Fiducials Storage
Deformable Spatial Registration Storage
Segmentation Storage
Real World Value Mapping Storage
VL Image Storage (Retired)
VL Multiframe Image Storage (Retired)
VL Endoscopic Image Storage
Video Endoscopic Image Storage
VL Microscopic Image Storage
Video Microscopic Image Storage
VL Slide-Coordinates Microscopic Image Storage
VL Photographic Image Storage
Video Photographic Image Storage
Ophthalmic Photography 8 Bit Image Storage
Ophthalmic Photography 16 Bit Image Storage
Stereometric Relationship Storage
Basic Text SR
Enhanced SR
Comprehensive SR
Procedure Log Storage
Mammography CAD SR
Key Object Selection Document
Chest CAD SR
X-Ray Radiation Dose SR
Encapsulated PDF Storage
Positron Emission Tomography Image Storage
Standalone PET Curve Storage
RT Image Storage
RT Dose Storage
RT Structure Set Storage
RT Beams Treatment Record Storage
RT Plan Storage
RT Branchy Treatment Record Storage

Supported Referenced SOP Classes
RT Treatment Summary Record Storage
RT Ion Plan Storage
RT Ion Beams Treatment Redord Storage

The OnePacs Gateway Storage Server AE will return the following Status Code values in N-ACTION Responses:

Table 3.15: OnePacs Gateway Storage Server N-ACTION Response Status

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has successfully received the Storage Commitment Push Model N-ACTION Request and can process the commitment request for the indicated SOP Instances.
Error	Processing Failure	0110	Indicates that the Storage Commitment Push Model N-ACTION Request cannot be parsed or fully processed due to a database or system failure.
Error	Missing Attribute	0120	Indicates that the Storage Commitment Push Model N-ACTION Request cannot be processed because a required attribute is missing from the N-ACTION Request Data Set.
Error	Missing Attribute Value	0121	Indicates that the Storage Commitment Push Model N-ACTION Request cannot be processed because a Type 1 attribute in the N-ACTION Request Data Set does not specify a value.

The OnePacs Gateway AE will exhibit the following Behavior according to the Status Code value returned in an N-EVENT-REPORT Response from a destination Storage Commitment Push Model SCU:

Table 3.16. OnePacs Gateway Storage Server N-EVENT Report Response Status Handling Behaviour

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCU has successfully received the Storage Commitment Push Model N-EVENT-REPORT Request. Success indication message is output to the Service Logs.
Warning	Attribute List Error	0107	Transmission of Storage Commitment Push Model N-EVENTREPORT Request is considered successful.

			Warning indication message is output to the Service Logs.
*	*	Any Other Code	This is treated as a permanent Failure. Error indication message is output to the Service Logs.

The next table report the OnePacs Gateway behaviour in case of communication failure:

Table 3.17: OnePacs Gateway Storage Server AE Storage Commitment Push Model Communication Failure Behaviour

Exception	Behavior
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout). I.e. The STORAGESCP AE is waiting for the next N-ACTION Request on an open Association but the timer expires.	The Association is aborted by issuing a DICOM AABORT. If some Composite SOP Instances have been successfully received over the same Association via the Storage Service then they are maintained in the database. They are not automatically discarded because of a later Storage Commitment messaging failure. Any previously received Storage Commitment Push Model N-ACTION Requests will still be fully processed. Error indication message is output to the Service Logs. No message is posted to the User Interface.
Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout).	The Association is aborted by issuing a DICOM AABORT. If some Composite SOP Instances have been successfully received over the same Association via the Storage Service then they are maintained in the database. They are not automatically discarded because of a later Storage Commitment messaging failure. Any previously received Storage Commitment Push Model N-ACTION Requests will still be fully processed. Error indication message is output to the Service Logs. No message is posted to the User Interface.
Association A-ABORTed by the SCU or the network layers indicate communication loss (i.e. Low-level TCP/IP socket closure).	The TCP/IP socket is closed. If some Composite SOP Instances have been successfully received over the same Association via the Storage Service then they are maintained in the database. They are not automatically discarded because of a later Storage Commitment messaging failure. Any previously received Storage Commitment Push Model N- ACTION Requests will still be fully processed. Error indication message is output to the Service Logs. No message is

	posted to the User Interface.

3.2.4 OnePacs Gateway Query/Retrieve Server Application Entity Specification

3.2.4.1 SOP Classes

OnePacs Gateway Query/Retrieve Server Application Entity provides Standard Conformance to the following SOP Classes:

Table 3.18: SOP Classes for OnePacs Gateway Query/Retrieve Server AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
Patient Root Q/R Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	No	Yes
Patient Root Q/R Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	No	Yes
Study Root Q/R Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	No	Yes
Study Root Q/R Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	No	Yes
Patient/Study Only Q/R Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	No	Yes
Patient/Study Only Q/R Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	No	Yes
Hardcopy Grayscale Image Storage SOP Class	1.2.840.10008.5.1.1.29	Yes	No
Hardcopy Color Image Storage SOP Class	1.2.840.10008.5.1.1.30	Yes	No
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	No
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	No
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	No
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	No
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	No
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Yes	No
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	No
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	No
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	No

SOP Class Name	SOP Class UID	SCU	SCP
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	No
MR Spettroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.5	Yes	No
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Yes	No
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Yes	No
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Yes	No
Multi-frame Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	No
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Yes	No
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Yes	No
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	No
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	No
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	No
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	No
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Yes	No
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Yes	No
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Yes	No
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Yes	No
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	No
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Yes	No
Pseudo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	Yes	No
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
Enhanced X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	No
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	No

SOP Class Name	SOP Class UID	SCU	SCP
Enhanced X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Yes	No
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.2.3	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	No
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	No
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	No
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Yes	No
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	Yes	No
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	No
Real World Value Mapping	1.2.840.10008.5.1.4.1.1.67	Yes	No
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Yes	No
VL Multiframe Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Yes	No
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	No
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Yes	No
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	No
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Yes	No
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	No
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	No
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Yes	No
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Yes	No
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Yes	No
Stereomatric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Yes	No
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Yes	No
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Yes	No
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Yes	No
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	Yes	No
Mammography CAD	1.2.840.10008.5.1.4.1.1.88.50	Yes	No

SOP Class Name	SOP Class UID	SCU	SCP
Key Object Selection Object	1.2.840.10008.5.1.4.1.1.88.59	Yes	No
Chest Cad SR	1.2.840.10008.5.1.4.1.1.88.65	Yes	No
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	No
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Yes	No
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	No
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Yes	No
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	No
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Yes	No
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	No
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Yes	No
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Yes	No
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Yes	No
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	Yes	No

3.2.4.2   *Association Establishment Policy*

3.2.4.2.1   General

The OnePacs Gateway Query/Retrieve Server AE can both accept and propose Association Requests. The Query/Retrieve Server AE will accept Association Requests for the Verification and Query/Retrieve Services. It will propose Associations for Verification and Storage Services.

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

Table 3.19: DICOM application context name for OnePacs Gateway Query/Retrieve Server AE

Application Context Name	1.2.840.10008.3.1.1.1

3.2.4.2.2   Number of Associations

OnePacs Gateway Query/Retrieve Server can support multiple simultaneous Associations requested by peer AEs. Default is 10. This value can be configured through the attribute "MaxClients" in the Application Server configuration file (i.e. jboss-service.xml for JBoss application seerver).

Table 1.21. Number of Associations accepted for OnePacs Gateway Query/Retrieve Server AE

Maximum number of simultaneous Associations	128 (Configurable)

3.2.4.2.3   Asynchronous Nature

OnePacs Gateway Query/Retrieve Server does not support asynchronous communication. Multiple outstanding transactions are not supported. It allows up to one invoked and one performed operation on an Association (it is synchronous). Asynchronous mode of operation is not supported.

Table 3.20: Asynchronous Nature as SCP for OnePacs Gateway Query/Retrieve Server AE

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

3.2.4.2.4   Implementation Identifying Information

The implementation information for this Application Entity is:

Table 3.21: DICOM Implementation Class and Version for OnePacs Gateway Query/Retrieve Server AE

Implementation Class UID	1.3.6.1.4.1.50304
Implementation Version Name	dcm4che-1.4.34

3.2.4.3   Association Initiation Policy

3.2.4.3.1   Activity - Send Images Requested by an External Peer AE

3.2.4.3.1.1   Description and Sequencing of Activities

The OnePacs Gateway Query/Retrieve Server AE will initiate a new Association when a valid C-MOVE Request has been performed by an external Peer. The Query/Retrieve Server AE will send the Association Request to the specific C-MOVE destination, and upon successful negotiation of the required Presentation Context the image transfer is started. In all cases an attempt will be made to transmit all the indicated images in a single Association but this may not always be possible. The Association will be released when all the images have been sent.

If an error occurs during transmission over an open Association then the image transfer is halted. The Query/Retrieve Server AE will not attempt to independently retry the image export.

3.2.4.3.1.2   Proposed Presentation Contexts

OnePacs Gateway Query/Retrieve Server will propose Presentation Contexts as shown in the following table:

Table 3.22: Proposed Presentation Contexts by the OnePacs Gateway Query/Retrieve Server AE

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Hardcopy Grayscale Image Storage SOP	1.2.840.10008.5.1.1.29	Transfer Syntaxes for Image Storage Services		SCU	None

Class					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Hardcopy Color Image Storage SOP Class	1.2.840.10008.5.1.1.30	Transfer Syntaxes for Image Storage Services		SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Transfer Syntaxes for Image Storage Services		SCU	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Transfer Syntaxes for Image Storage Services		SCU	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Transfer Syntaxes for Image Storage Services		SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Transfer Syntaxes for Image Storage Services		SCU	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Transfer Syntaxes for Image Storage Services		SCU	None
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Transfer Syntaxes for Image Storage Services		SCU	None
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Transfer Syntaxes for Image Storage Services		SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Transfer Syntaxes for Image Storage Services		SCU	None
Enahnced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Transfer Syntaxes for Image Storage Services		SCU	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Transfer Syntaxes for Image Storage Services		SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Transfer Syntaxes for Image Storage Services		SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Transfer Syntaxes for Image Storage Services		SCU	None
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Transfer Syntaxes for Image Storage Services		SCU	None
MR Spectroscopy	1.2.840.10008.5.1.4.	Transfer Syntaxes for Image		SCU	None

Image Storage	1.1.4.2	Storage Services			
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Nuclear Mredicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Transfer Syntaxes for Image Storage Services		SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Transfer Syntaxes for Image Storage Services		SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Transfer Syntaxes for Image Storage Services		SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Transfer Syntaxes for Image Storage Services		SCU	None
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Transfer Syntaxes for Image Storage Services		SCU	None
Multi-frame Gray-scale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Transfer Syntaxes for Image Storage Services		SCU	None
Multi-frame Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Transfer Syntaxes for Image Storage Services		SCU	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Transfer Syntaxes for Image Storage Services		SCU	None
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Transfer Syntaxes for Image Storage Services		SCU	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Transfer Syntaxes for Image Storage Services		SCU	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Transfer Syntaxes for Image Storage Services		SCU	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Transfer Syntaxes for Image Storage Services		SCU	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Transfer Syntaxes for Image Storage Services		SCU	None
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Transfer Syntaxes for Image Storage Services		SCU	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Transfer Syntaxes for Image Storage Services		SCU	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Transfer Syntaxes for Image Storage Services		SCU	None

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	**UID**	**Name List**	**UID List**		
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Transfer Syntaxes for Image Storage Services		SCU	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Transfer Syntaxes for Image Storage Services		SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Transfer Syntaxes for Image Storage Services		SCU	None
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Transfer Syntaxes for Image Storage Services		SCU	None
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Transfer Syntaxes for Image Storage Services		SCU	None
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Transfer Syntaxes for Image Storage Services		SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Transfer Syntaxes for Image Storage Services		SCU	None
Enhanced X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Transfer Syntaxes for Image Storage Services		SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Transfer Syntaxes for Image Storage Services		SCU	None
Enhanced X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Transfer Syntaxes for Image Storage Services		SCU	None
X-Ray Angiograpgic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Transfer Syntaxes for Image Storage Services		SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Transfer Syntaxes for Image Storage Services		SCU	None
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Transfer Syntaxes for Image Storage Services		SCU	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Transfer Syntaxes for Image Storage Services		SCU	None
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Transfer Syntaxes for Image Storage Services		SCU	None
Deformable Spatial	1.2.840.10008.5.1.4.	Transfer Syntaxes for Image		SCU	None

Registration Storage	1.1.66.3	Storage Services			

Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Transfer Syntaxes for Image Storage Services		SCU	None
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Transfer Syntaxes for Image Storage Services		SCU	None
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Transfer Syntaxes for Image Storage Services		SCU	None
VL Multiframe Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Transfer Syntaxes for Image Storage Services		SCU	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Transfer Syntaxes for Image Storage Services		SCU	None
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Transfer Syntaxes for Image Storage Services		SCU	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Transfer Syntaxes for Image Storage Services		SCU	None
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Transfer Syntaxes for Image Storage Services		SCU	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Transfer Syntaxes for Image Storage Services		SCU	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Transfer Syntaxes for Image Storage Services		SCU	None
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Transfer Syntaxes for Image Storage Services		SCU	None
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Transfer Syntaxes for Image Storage Services		SCU	None
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Transfer Syntaxes for Image Storage Services		SCU	None
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Transfer Syntaxes for Image Storage Services		SCU	None
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Transfer Syntaxes for Image Storage Services		SCU	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Transfer Syntaxes for Image Storage Services		SCU	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Transfer Syntaxes for Image Storage Services		SCU	None
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	Transfer Syntaxes for Image Storage Services		SCU	None

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Transfer Syntaxes for Image Storage Services		SCU	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Transfer Syntaxes for Image Storage Services		SCU	None
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Transfer Syntaxes for Image Storage Services		SCU	None
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Transfer Syntaxes for Image Storage Services		SCU	None
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Transfer Syntaxes for Image Storage Services		SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Transfer Syntaxes for Image Storage Services		SCU	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Transfer Syntaxes for Image Storage Services		SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Transfer Syntaxes for Image Storage Services		SCU	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Transfer Syntaxes for Image Storage Services		SCU	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Transfer Syntaxes for Image Storage Services		SCU	None
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Transfer Syntaxes for Image Storage Services		SCU	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Transfer Syntaxes for Image Storage Services		SCU	None
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Transfer Syntaxes for Image Storage Services		SCU	None
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Transfer Syntaxes for Image Storage Services		SCU	None
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Transfer Syntaxes for Image Storage Services		SCU	None
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	Transfer Syntaxes for Image Storage Services		SCU	None

Table 3.24: Proposed Transfer Syntaxes for Non-Image Storage Services

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1

Table 3.25: Proposed Transfer Syntaxes for Image Storage Services

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1
JPEG Baseline	1.2.840.10008.1.2.4.50
JPEG Extended	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical	1.2.840.10008.1.2.4.57
JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
JPEG-LS Lossless Image Compression	1.2.840.10008.1.2.4.80
JPEG-LS Lossy (Near-Lossless) Image	1.2.840.10008.1.2.4.81
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91
RLE Lossless	1.2.840.10008.1.2.5

3.2.4.3.1.3   SOP Specific Conformance

3.2.4.3.1.3.1   Specific Conformance for Image, SR, KIN and SPS SOP Classes

When a SOP Instance is selected for export from OnePacs Gateway Query/Retrieve Server, its contents will be exported as it was originally received unless some of the Patient demographic and Study information Elements were altered.

The Patient demographic and Study information can be entered or altered by several means: manually (through the web interface), or from HL7 messaging. The replacement behavior depends on which specific DICOM and HL7 services are supported. Also, this behavior is configurable. Values can be altered without changing the SOP Instance UID unless otherwise noted.

The Query/Retrieve Server AE will exhibit the following behavior according to the Status Code value returned in a C-STORE Response from a destination C-STORE SCP:

Table 3.26: OnePacs Gateway Query/Retrieve Server AE C-STORE Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The remote Storage SCP has successfully stored the exported SOPInstance. The appropriate PENDING or SUCCESS Status will be sent in the C-MOVE Response. Success

			indication message is output to the Service Log.

Service Status	Further Meaning	Error Code	Behavior
Refused	Out of Resources	A700 – A7FF	This is treated as a permanent Failure. The appropriate Status will be sent in the C-MOVE Response. Error indication message is output to the Service Log.
Error	Cannot Understand	CFFF	This is treated as a permanent Failure. The appropriate Status will be sent in the C-MOVE Response. Error indication message is output to the Service Log.
Warning	Coercion of Data Element	B000	Image transmission is considered successful. The appropriate PENDING or SUCCESS Status will be sent in the C-MOVE Response. Success indication message is output to the Service Log.
Warning	Data Set does not match SOP class	B007	Image transmission is considered successful. The appropriate PENDING or SUCCESS Status will be sent in the C-MOVE Response. Success indication message is output to the Service Log.
Warning	Elements Discarded	B006	Image transmission is considered successful. The appropriate PENDING or SUCCESS Status will be sent in the C-MOVE Response. Success indication message is output to the Service Log.
Warning	Attribute List Error	0107	Image transmission is considered successful. The appropriate PENDING or SUCCESS Status will be sent in the C-MOVE Response. Success indication message is output to the Service Log.
Warning	Attribute Value Out of Range	0116	Image transmission is considered successful. The appropriate PENDING or SUCCESS Status will be sent in the C-MOVE Response. Success indication message is output to the Service Log.
*	*	Any other status code	This is treated as a permanent Failure. The appropriate Status will be sent in the C-MOVE Response. Error indication message is output to the Service Log.

Table 3.27: OnePacs Gateway Query/Retrieve Server AE Communication Failure Behavior

Exception	Behavior
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout).	The Association is aborted by issuing a DICOM AABORT. The appropriate Status will be sent in the CMOVE Response. Error indication message is output to the Service Logs.
Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout).	The Association is aborted by issuing a DICOM AABORT. The appropriate Status will be sent in the CMOVE Response. Error indication message is output to the Service Logs.
Association A-ABORTed by the SCU or the network layers indicate communication loss (i.e. Low-level TCP/IP socket closure).	The TCP/IP Socket is closed. Error indication message is output to the Service Logs.

3.2.4.4   *Association Acceptance Policy*

3.2.4.4.1   Activity - Handling Query and Retrieval Requests

3.2.4.4.1.1   Description and Sequencing of Activities

The Query/Retrieve Server AE accepts Associations only if they have valid Presentation Contexts. If none of the requested Presentation Contexts are accepted then the Association Request itself is rejected. It can be configured to only accept Associations from certain Application Entities.

If Query/Retrieve Server AE receives a query (C-FIND) request then the response(s) will be sent over the same Association used to send the C-FIND-Request.

If Query/Retrieve Server AE receives a retrieval (C-MOVE) request then the responses will be sent over the same Association used to send the C-MOVE-Request.

The Query/Retrieve Server AE will send the requested SOP Instances to the C-MOVE Destination over a newly created Association and report in the C-MOVE-Response any success or failure status of each attempt to send a CompositeSOP Instance.

When an association has been established the Sequencing of Real-World Activities is as described in Section 3.1.3, "Sequencing of Real-World Activities".

The Query/Retrieve Server AE may reject Association attempts as shown in the table below. The Result, Source and Reason / Diag columns represent the values returned in the corresponding fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4).

Table 3.28: Association Rejection Reasons

Result	Source	Reason	Description
2 – rejected transient	Provider	2 – local-limit exceeded	The (configurable) maximum number of simultaneous associations has been reached. An association request with the same parameters may succeed at a later time.
1 – rejected permanent	User	2 – application context name not supported	The Association request contained an unsupported Application Context Name. An association request with the same parameters will NOT succeed at a later time.
1 – rejected permanent	User	3 – calling AE Title not recognized	The Association request contained an unrecognized Calling AE Title. An association request with the same parameters will NOT succeed at a later time unless configuration changes are made.

3.2.4.4.1.2   Accepted Presentation Contexts

Table 3.29 Accepted Presentation Contexts for OnePacs Gateway Query/Retrieve Server AE

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Patient Root Q/R Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational – queries
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Patient Root Q/R Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational – retrieves
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Study Root Q/R 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	Relational – queries
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Study Root Q/R	1.2.840.10008.5.1.4.1.	Implicit VR	1.2.840.10008.1.2	SCP	Relati

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Information Model – MOVE	2.2.2	Little Endian			onal – retrieves
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Patient/Study Only Q/R Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational – queries
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Patient/Study Only Q/R Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational – retrieves
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

If the Called AET is not corresponding to the actual Storage Server AET, it only will be accepted the Presentation Context for the Verification SOP Class.

3.2.4.4.1.3 SOP Specific Conformance

3.2.4.4.1.3.1 Specific Conformance for Verification SOP Class

OnePacs Gateway Storage Server provides standard conformance to the DICOM Verification Service Class as a SCP. The status code for the C-ECHO is described in the following table:

Table 3.30: C-Echo Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The C-ECHO request is accepted

3.2.4.4.1.3.2 Specific Conformance for Query SOP Classes

The Query/Retrieve Server AE supports hierarchical and relational queries. There are no attributes always returned by default. Only those attributes requested in the query identifier are returned.
Query responses always return values from the Query/Retrieve Server database. Exported SOP Instances are always updated with the latest values kept in the database prior to export. Thus, a change in Patient demographic information will be contained in both the C-FIND Responses and any Composite SOP Instances exported to a C-MOVE Destination AE.

Patient Root Information Model: All required search keys on each of the four levels (Patient, Study, Series, and Image) are supported. However, the Patient ID (0010,0020) key must have at least a partial value if the Patient's Name (0010,0010) is not present in a Patient Level query.

Study Root Information Model: All the required search keys on each of the three levels

(Study, Series, and Image) are supported. If no partial values are specified for Study attributes then either the Patient ID (0010,0020) key or the Patient's Name (0010,0010) must have at least a partial value specified.

Patient/Study Only Information Model: All the required search keys on the Patient and Study levels are supported. The Patient ID (0010,0020) key must be at least partially stated if the Patient's Name (0010,0010) is not present in a Patient Level query.

Table 3.31: Patient Root C-FIND SCP Supported Elements

Attribute Name	Tag	VR	Types of Matching
SOP Common			
Specific Character Set	0008.0005	CS	NONE
Patient Level			
Patient's Name	0010.0010	PN	S,*,U
Patient ID	0010.0020	LO	S,*,U
Issuer of Patient ID	0010.0021	LO	NONE
Patient's Birth Date	0010.0030	DA	S,U,R
Patient's Sex	0010.0040	CS	S,*,U
Study Level			
Study Instance UID	0020,000D	UI	S,L
Study ID	0020.0010	SH	S,*,U
Study Date	0008.0020	DA	S,U,R
Study Time	0008.0030	TM	S,U,R
Accession Number	0008.0050	SH	S,*,U
Referring Physician's Name	0008.0090	PN	S,*,U
Modalities in Study	0008.0061	CS	S,*,U
Series Level			
Series Instance UID	0020,000E	UI	S,L
Series Number	0020.0011	IS	S,*,U
Modality	0008.0060	CS	S,*,U
Performed Procedure Step Start Date	0040.0244	DA	S,U,R
Performed Procedure Step Start Time	0040.0245	TM	S,U,R
Image Level			
SOP Instance UID	0008.0018	UI	S,L
SOP Class UID	0008.0016	UI	S,L
Instance Number	0020.0013	IS	S,*,U
Completion Flag	0040,0A91	CS	S,*,U

Attribute Name	Tag	VR	Types of Matching
Verification Flag	0040,0A93	CS	S,*,U

Table 3.32: Study Root C-FIND SCP Supported Elements

Attribute Name	Tag	VR	Types of Matching
SOP Common			
Specific Character Set	0008.0005	CS	NONE
Patient Level			
Patient's Name	0010.0010	PN	S,*,U
Patient ID	0010.0020	LO	S,*,U
Issuer of Patient ID	0010.0021	LO	NONE
Patient's Birth Date	0010.0030	DA	S,U,R
Patient's Sex	0010.0040	CS	S,U
Study Level			
Study Instance UID	0020,000D	UI	S,L
Study ID	0020.0010	SH	S,*,U
Study Date	0008.0020	DA	S,U,R
Study Time	0008.0030	TM	S,U,R
Accession Number	0008.0050	SH	S,*,U
Referring Physician's Name	0008.0090	PN	S,*,U
Modalities in Study	0008.0061	CS	S,*,U
Series Level			
Series Instance UID	0020,000E	UI	S,L
Series Number	0020.0011	IS	S,*,U
Modality	0008.0060	CS	S,*,U
Performed Procedure Step Start Date	0040.0244	DA	S,U,R
Performed Procedure Step Start Time	0040.0245	TM	S,U,R
Image Level			
SOP Instance UID	0008.0018	UI	S,L
SOP Class UID	0008.0016	UI	S,L
Instance Number	0020.0013	IS	S,*,U
Completion Flag	0040,0A91	CS	S,*,U
Verification Flag	0040,0A93	CS	S,*,U

Types of Matching:

The types of Matching supported by the C-FIND SCP. An "S" indicates the identifier attribute uses Single Value Matching, an "R" indicates Range Matching, an "*" indicates wildcard matching, a 'U' indicates Universal Matching, and an 'L' indicates that UID lists are supported for matching. "NONE" indicates that no matching is supported, but that values for this Element are requested to be returned (i.e. universal matching).

Table 3.33. OnePacs Gateway Query/Retrieve Server C-FIND Response Status

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	Matching is complete. No final identifier is supplied
Error	Processing Failure	0110	This status is returned due to internal errors such as a processing failure response on an query of the internal database. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
Cancel	Matching terminated due to Cancel Request	FE00	The C-FIND SCU sent a Cancel Request. This has been acknowledged and the search for matches has been halted. Cancel indication message is output to the Service Log.
Pending	Matches are continuing and current match in supplied	FF00	Indicates that the search for further matches is continuing. This is returned when each successful match is returned and when further matches are forthcoming. Pending indication message is output to the Service Log.

3.2.4.4.1.3.3   Specific Conformance for Query SOP Classes

Exported SOP Instances are always updated with the latest values kept in the database prior to export.

Table 3.34: OnePacs Gateway Query/Retrieve Server C-MOVE Response Status

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	Matching is complete. No final identifier is supplied
Error	Processing Failore	0110	This status is returned due to internal errors such as a processing failure response on an query of the internal database. The appropriate Status

			will be sent in the C-MOVE Response. Error indication message is output to the Service Log.

Service Status	Further Meaning	Error Code	Behavior
Error	Unable to perform sub-operation	A702	C-STORE sub-operations cannot be performed due to failure of an Association Request or a C-STORE Request. Error indication message is output to the Service Log.
Error	Move Destination unknown	A801	The Destination Application Entity named in the C-MOVE Request is unknown to Query/Retrieve SCP AE. Error indication message is output to the Service Log.
Error	Identifier does not match SOP Class	A900	The C-MOVE identifier contains invalid Elements or values, or is missing mandatory Elements or values for the specified SOP Class or retrieval level. Error indication message is output to the Service Log.
Error	Unable to process	Cxxx	The Move Destination AET is missing in the C-MOVE Request. Error indication message is output to the Service Log.
Pending	Matches are continuing ad current match is supplied	FF00	Indicates that the search for further matches is continuing. This is returned when each successful match is returned and when further matches are forthcoming. Pending indication message is output to the Service Log.

Table 3.35: OnePacs Gateway Query/Retrieve Server Service Communication Failure Behavior

Exception	Behavior
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout). I.e. the Query/Retrieve Server SCP AE is waiting for the next C-FIND or CMOVE Request on an open Association but the timer expires.	The Association is aborted by issuing a DICOM AABORT. Error message is output to the Service Log.

Timeout expiry for an expected DICOM PDU or TCP/ IP packet (Low-level timeout). I.e. The Query/Retrieve Server AE is waiting for the next message PDU but the timer expires.	The Association is aborted by issuing a DICOM AABORT. Error message is output to the Service Log.

Exception	Behavior
Association aborted by the SCU or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	Error message is output to the Service Log.

3.2.5 OnePacs Gateway Modality Worklist Server Application Entity Specification

3.2.5.1 SOP Classes

OnePacs Gateway Modality Worklist Server Application Entity provides Standard Conformance to the following SOP Classes:

Table 3.36: SOP Classes for OnePacs Gateway Modality Worklist Server AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	No	Yes
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	No	Yes

3.2.5.2 Association Establishment Policy

3.2.5.2.1 General

OnePacs Gateway Modality Worklist Server AE can both accept and propose Association Requests. The Query/Retrieve Server AE will accept Association Requests for the Verification and Query/Retrieve Services. It will propose Associations for Verification and Storage Services.

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

Table 3.37: DICOM application context name for OnePacs Gateway Modality Worklist Server AE

Application Context Name	1.2.840.10008.3.1.1.1

3.2.5.2.2 Number of Associations

OnePacs Gateway Modality Worklist Server can support multiple simultaneous Associations requested by peer AEs. Default is 128. This value can be configured through the attribute "MaxClients" in the Application Server configuration file (i.e. jboss-service.xml for JBoss application seerver).

Table 3.38: Number of Associations accepted for OnePacs Gateway Modality

Worklist Server AE

Maximum number of simultaneous Associations	128 (Configurable)

3.2.5.2.3 Asynchronous Nature

OnePacs Gateway Modality Worklist Server does not support asynchronous communication. Multiple outstanding transactions are not supported. It allows up to one invoked and one performed operation on an Association (it is synchronous). Asynchronous mode of operation is not supported.

Table 3.39: Asynchronous Nature as SCP for OnePacs Gateway Modality Worklist Server AE

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

3.2.5.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 3.40: DICOM Implementation Class and Version for OnePacs Gateway Modality Worklist Server AE

Implementation Class UID	1.3.6.1.4.1.50304
Implementation Version Name	dcm4che-1.4.34

3.2.5.3 Association Initiation Policy

The Modality Worklist Server AE does not initiate Associations.

3.2.5.4 Association Acceptance Policy

3.2.5.4.1 Activity - External Peer AE requests MWL query

3.2.5.4.1.1 Description and Sequencing of Activities

The Modality Worklist Server AE accepts Associations only if they have valid Presentation Contexts. If none of the requested Presentation Contexts are accepted then the Association Request itself is rejected. It can be configured to only accept Associations from certain Application Entities.

When Modality Worklist SCUs query the Modality Worklist Server AE the queries run against the MWL items in the local database.

When an association has been established the Sequencing of Real-World Activities is as described in Section 3.1.3, "Sequencing of Real-World Activities".

The Modality Worklist Server AE may reject Association attempts as shown in the table below. The Result, Source and Reason / Diag columns represent the values returned in the corresponding fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4).

Table 3.41: Association Rejection Reasons

Result	Source	Reason	Description

Result	Source	Reason	Description
2 – rejected transient	Provider	2 – local limit exceeded	The (configurable) maximum number of simultaneous associations has been reached. An association request with the same parameters may succeed at a later time.

Result	Source	Reason	Description
1 – rejected permanent	User	2 – application context name not supported	The Association request contained an unsupported Application Context Name. An association request with the same parameters will NOT succeed at a later time.
1 – rejected permanent	User	3 – calling AE title not recognized	The Association request contained an unrecognized Calling AE Title. An association request with the same parameters will NOT succeed at a later time unless configuration changes are made.

3.2.5.4.1.2 Accepted Presentation Contexts

Table 3.42: Accepted Presentation Contexts for OnePacs Gateway Query/Retrieve Server AE

Abstract Syntax		UID		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

If the Called AET is not corresponding to the actual Modality Worklist Server AET, only the Presentation Context for the Verification SOP Class will be accepted.

3.2.5.4.1.3 SOP Specific Conformance

3.2.5.4.1.3.1 Specific Conformance for Verification SOP Class

OnePacs Gateway Storage Server provides standard conformance to the DICOM Verification Service Class as a SCP. The status code for the C-ECHO is described in the following table:

Table 3.43: C-Echo Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The C-ECHO request is accepted

3.2.5.4.1.3.2 Specific Conformance for Modality Worklist SOP Class

Return attributes depend on the information provided by the connected HIS/RIS. There are no attributes always returned by default. Only those attributes requested in the query identifier are returned. Query responses always return values from the Modality Worklist Server database.

Table 3.44: Modality Worklist C-FIND SCP Supported Elements

Attribute Name	Tag	VR	Types of Matching
Specific Character Set	0008.0005	CS	NONE
Scheduled station AE tite	0040.0001	AE	S
Scheduled Procedure Step Start Date	0040.0002	DA	S,R
Scheduled Procedure Step Start Time	0040.0003	TM	S,R
Scheduled Performing Physician's Name	0040.0006	PN	S,*
Modality	0008.0060	CS	S
Accession Number	0008.0050	SH	S
Patient's Name	0010.0010	PN	S,*
Patient's ID	0010.0020	LO	S
All others			NONE

Types of Matching:

The types of Matching supported by the C-FIND SCP. An "S" indicates the identifier attribute uses Single Value Matching, an "R" indicates Range Matching, an "*" indicates wildcard matching, a "U" indicates Universal Matching. "NONE" indicates that no matching is supported, but that values for this Element are requested to be returned.

3.2.5.4.1.3.3 Modality Worklist Server AE C-STORE Response

Table 3.45: OnePacs Gateway Modality Worklist Server C-STORE Response Status

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	Success indication message is output to the Service Log.
Error	Processing Failure	0110	This is treated as a permanent Failure. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
Canceled	Matching	FE00	This status is returned if a Cancel

Error	Processing Failure	0110	This is treated as a permanent Failure. The appropriate Status will be sent in the C-FIND Response. Error indication message is output to the Service Log.
	terminated due to cancel request		Request is received from the SCU during the processing of a Modality Worklist request. A cancel indication message is output to the Service Log.
Pending	Matching in continuing	FF00	This status is returned with each matching response. A pending indication message is output to the Service Log.

3.2.5.4.1.3.4 Modality Server AE Storage Service Communication Failure Reasons

Table 3.45: OnePacs Gateway Modality Server Service Communication Failure Behavior

Exception	Behavior
Association aborted by the SCU or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	Error message is output to the Service Log.

3.2.6 OnePacs Gateway MPPS Manager Application Entity Specification SCU

3.2.6.1 SOP Classes

The MPPS SCU provides standard conformance to the following DICOM MPPS SOP Class as SCU.

Table 3.46: Supported SOP Class of MPPS SCU

SOP Class Name	SOP Class UID	SCU	SCP
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Yes	No

3.2.6.2 Association Initiation Policy

The MPPS SCU does not initiate Associations.

3.2.6.3 Association Acceptance Policy

3.2.6.3.1 Activity – MPPS N-CREATE / N-SET Request from External Peer AE

3.2.6.3.1.1 Description and Sequencing of Activities

The remote AE acting as SCP of the MPPS Service Class sends an N-CREATE / N-SET request to the DICOM Server working as SCU of the MPPS Service Class. The MPPS SCP of the DICOM Server can forward this request to remote MPPS SCU.

3.2.6.3.1.2   Accepted Presentation Context

The follow table shows the presentation context that are accepted by the DICOM Server for Modality Performed Procedure Step Class Operations.

Table 3.47: Accepted Presentation Context for MPPS Service Class

Abstract Syntax Name	Absract Syntax UID	Transfert Syntax Name	Transfert Syntax UID	Role	Extended Negotiation
Modality Performed Procedure Step	1.2.840.10008. 3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1. 2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1. 2.1		

3.2.7 OnePacs Gateway MPPS Manager Application Entity Specification SCP

3.2.7.1   SOP Classes

Table 3.48: Supported SOP Class of MPPS SCU

SOP Class Name	SOP Class UID	SCU	SCP
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	No	Yes

3.2.7.2   Association Initiation Policy

The MPPS SCU does not initiate Associations.

3.2.7.2.1   Activity – MPPS N-CREATE / N-SET Request from External Peer AE

3.2.7.2.1.1   Description and Sequencing of Activities

If the MPPS SCU receives an N-CREATE / N-SET, the MPPS SCP can forward it to a remote MPPS SCU.

3.2.7.2.1.2   Accepted Presentation Context

The follow table shows the presentation context that are accepted by the DICOM Server for Modality Performed Procedure Step Class Operations.

Table 3.49: Proposed Presentation Context

Abstract Syntax Name	Absract Syntax UID	Transfert Syntax Name	Transfert Syntax UID	Role	Extended Negotiation
Modality Performed Procedure Step	1.2.840.10008. 3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1. 2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1. 2.1		
		Explicit VR Big Endian	1.2.840.10008.1. 2.1.2		

3.2.8 Physical Network Interfaces

3.2.8.1   Supported Communication Stacks

The DICOM Server provides DICOM TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

3.2.8.2   TCP/IP Stack

OnePacs Gateway inherits their TCP/IP stack from the installed Java Runtime Environment.

3.2.8.3   Physical Network Interface

OnePacs Gateway is indifferent to the physical medium over which TCP/IP executes; it inherits this from the Java Runtime Environment.

3.2.9 Configuration

3.2.9.1   AE Title/Presentation Address Mapping

3.2.9.1.1   Local AE Titles

The local AE Titles and TCP ports are configurable through administrator web interface.

Table 3.50: AE Title Configuration Table

Application Entity	Default AE Title	Default TCP/IP Port
OnePacs Gateway Storage Server	GATEWAY	4104
OnePacs Gateway Query/Retrieve Server	GATEWAY	4104
OnePacs Gateway Modality Worklist Server	GATEWAY	4104
OnePacs Gateway MPPS Manager	GATEWAY	4104

3.2.9.1.2   Remote AE Title

Remote AE Titles, TCP/IP Addresses and ports can be configured through web interface. In the default configuration, Association Requests with any Calling AET will be accepted.

3.2.9.2   Parameters

The following table shows the OnePacs Gateway configuration parameters relevant to DICOM communication. Refer to the OnePacs Gateway Service Manual for details on general configuration capabilities.

Table 3.51: Configuration Parameter Table

Parameter	Configurable (Yes/No)	Default Value
General Parameters		
Listening Port	Yes	4104
Maximum number of simultaneous Associations	Yes	10
Time-out waiting for A-ASSOCIATE RQ on open TCP/IP connection (ARTIM timeout)	Yes	-
Time-out waiting on an open association for the next message (DIMSE timeout)	Yes	600 s
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	Yes	5 s
Time-out waiting on an open association for the next message after sending A-RELEASE RSP or A-ABORT RQ (Closing timeout)	Yes	500 ms
Maximum PDU size the AE can receive	Yes	16352
Maximum PDU size the AE can send	Yes	65535
Pack Command and Data PDVs in one PDU	Yes	False
Support for the Basic TLS Secure Transport Connection Profile	Yes	Off
Accepted TLS Ciphers	Yes	-
Storage Server AE		
Accepted Called AETs	Yes	ONEPACS GATEWAY
Accepted Calling AETs	Yes	Any
List of DICOM AETs that identify the location from which composite object instance(s) received by this Storage Server may be retrieved on the network	Yes	ONEPACS GATEWAY
Storage Directory Path Prefix	Yes	/archive
Time-out waiting for the A-ASSOCIATE-AC PDU after transmission of the A-ASSOCIATE-RQ to open an association to the Storage Commitment SCU	Yes	10 s
Query/Retrieve Server AE		
Accepted Called AETs	Yes	ONEPACS GATEWAY
Accepted Calling AETs	Yes	Any
Send optional C-MOVE RSPs with Pending Status to the C-MOVE SCU during the retrieve process	Yes	True
Time-out waiting for the A-ASSOCIATE-AC PDU after transmission of the A-ASSOCIATE-RQ to open an association to the Move Destination AE	Yes	5 s

Query/Retrieve Server AE		
Modality Worklist Server AE		
Accepted Called AETs	Yes	ONEPACS GATEWAY
Accepted Calling AETs	Yes	Any
MPPS Manager AE		
Accepted Called AETs	Yes	ONEPACS GATEWAY
Accepted Calling AETs	Yes	Any
MPPS Forward AET	Yes	-
Time-out waiting for the A-ASSOCIATE-AC PDU after transmission of the A-ASSOCIATE-RQ to open an association to the MPPS Forward SCP AE	Yes	5 s

4 Media Interchange

4.1 *Implementation Model*

4.1.1 Application Data Flow Diagram

cdw behaves as a single application entity and is integrated in the OnePacs Gatewa Web User Interface.

The Export to CD-R and Export to DVD-R real-world activities initiate the creation of a File-Set on a medium (FSC) for the purpose of interchange of DICOM objects of a patient.

4.1.2 Functional Definitions of AE's

4.1.2.1 *Functional Definition of cdw Application Entity*

cdw can be used within the OnePacs Gateway Web UI. The web user is able to search for a patient within a query mask and to select the series which shall be exported to disc. The SOP Instances associated with the selection will be collected into an export job. The contents of the job will be written to a single CD-R or DVD-R media.

4.1.3 Sequencing of Real-World Activities

At least one series must exist within OnePacs Gateway and be selected within OnePacs Gateway Web UI before the cdw application entity can be invoked.

4.1.4 File Meta Information Options

The implementation information written to the File Meta Header in each file is:

Table 4.1: Implementation Class UID and Version Name for cdw

Implementation Class UID	1.3.6.1.4.1.50304
Implementation version name	dcm4che-1.4.34

Note that the cdw application entity uses the same implementation class UID and same implementation version name as the OnePacs Gateway PACS AE's.

4.2   AE Specifications

4.2.1 cdw Application Entity Specification

The cdw application entity provides standard conformance to the Media Storage Service Class. The Application Profiles and roles are listed on table below:

Table 4.2: Application Profiles, Activities and Roles for cdw

Application Profiles Supported	Real World Activity	Role
STD-GEN-CD	Export to CD-R	FSC
STC-GEN-DVD	Export to DVD	FSC

4.2.1.1   Real-World Activities

4.2.1.1.1   Activity – Export to CD-R

The cdw application entity acts as an FSC when requested to export SOP Instances from the database to a CD-R medium.
If the contents of the current selection do not fit on a single media, the user has to adapt the selection.
The user will be prompted to insert an empty CD-R for the patient. The contents of the export job will be written together with a corresponding DICOMDIR to a single-session CD-R. Writing multi-session mode is not supported. The user can cancel an export job.

4.2.1.1.1.1   Media Storage Application Profiles

The cdw application entity supports the STD-GEN-CD Application Profile.

4.2.1.1.1.2   Options

The cdw application entity supports the SOP Classes and Transfer Syntaxes listed in the Table below:

Table 4.3: Supported SOP Classes and Transfert Syntaxes for cdw

SOP Class Name	SOP Cass UID	Transfert syntax	Transfert syntax UID
Media Storage Directory Storage	1.2.840.10008.1.3.10	Implicit VR Little Endian	1.2.840.10008.1.2
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	Implicit VR Little Endian	1.2.840.10008.1.2
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	Implicit VR Little Endian	1.2.840.10008.1.2
Computer Radiography Image Storage	1.2.840.10008.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2
Digital X-Ray Image	1.2.840.10008.1.1.1.1	Implicit VR	1.2.840.10008.1.2

SOP Class Name	SOP Cass UID	Transfert syntax	Transfert syntax UID
Storage – For Presentation		Little Endian	
Digital X-Ray Image Storage – For Processing	1.2.840.10008.1.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2
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
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
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2
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
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
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Implicit VR Little Endian	1.2.840.10008.1.2
Nuclear Medicine Image Storage (retired)	1.2.840.10008.5.1.4.1.1.5	Implicit VR Little Endian	1.2.840.10008.1.2
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Implicit VR Little Endian	1.2.840.10008.1.2

SOP Class Name	SOP Cass UID	Transfert syntax	Transfert syntax UID
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Implicit VR Little Endian	1.2.840.10008.1.2
Multi-frame Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Implicit VR Little Endian	1.2.840.10008.1.2
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Implicit VR Little Endian	1.2.840.10008.1.2
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Implicit VR Little Endian	1.2.840.10008.1.2
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Implicit VR Little Endian	1.2.840.10008.1.2
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Implicit VR Little Endian	1.2.840.10008.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Implicit VR Little Endian	1.2.840.10008.1.2
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Implicit VR Little Endian	1.2.840.10008.1.2
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Implicit VR Little Endian	1.2.840.10008.1.2
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Implicit VR Little Endian	1.2.840.10008.1.2
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Implicit VR Little Endian	1.2.840.10008.1.2
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Implicit VR Little Endian	1.2.840.10008.1.2
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
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Implicit VR Little Endian	1.2.840.10008.1.2
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Implicit VR Little Endian	1.2.840.10008.1.2
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Implicit VR Little Endian	1.2.840.10008.1.2
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
Enhanced X-Ray	1.2.840.10008.5.1.4.1.1.12	Implicit VR	1.2.840.10008.1.2

SOP Class Name	SOP Cass UID	Transfert syntax	Transfert syntax UID
Angiographic Image Storage	.1.1	Little Endian	
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
Enhanced X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Implicit VR Little Endian	1.2.840.10008.1.2
X-Ray Angiographic Bi-Plane Image Storage (retired)	1.2.840.10008.5.1.4.1.1.12.3	Implicit VR Little Endian	1.2.840.10008.1.2
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Implicit VR Little Endian	1.2.840.10008.1.2

SOP Class Name	SOP Cass UID	Transfer syntax	Transfer syntax UID
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Implicit VR Little Endian	1.2.840.10008.1.2
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Implicit VR Little Endian	1.2.840.10008.1.2
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	Implicit VR Little Endian	1.2.840.10008.1.2
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Implicit VR Little Endian	1.2.840.10008.1.2
Real World Value Mapping	1.2.840.10008.5.1.4.1.1.67	Implicit VR Little Endian	1.2.840.10008.1.2
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Implicit VR Little Endian	1.2.840.10008.1.2
VL Multiframe Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Implicit VR Little Endian	1.2.840.10008.1.2
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Implicit VR Little Endian	1.2.840.10008.1.2
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Implicit VR Little Endian	1.2.840.10008.1.2
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2
VL Slide-Coordinates	1.2.840.10008.5.1.4.1.1.77	Implicit VR	1.2.840.10008.1.2

SOP Class Name	SOP Cass UID	Transfer syntax	Transfer syntax UID
Microscopic Image Storage	.1.3	Little Endian	
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77 .1.4	Implicit VR Little Endian	1.2.840.10008.1.2
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77 .1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77 .1.5.1	Implicit VR Little Endian	1.2.840.10008.1.2
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77 .1.5.2	Implicit VR Little Endian	1.2.840.10008.1.2
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77 .1.5.3	Implicit VR Little Endian	1.2.840.10008.1.2
Basic Text SR	1.2.840.10008.5.1.4.1.1.88 .11	Implicit VR Little Endian	1.2.840.10008.1.2
Enhanced SR	1.2.840.10008.5.1.4.1.1.88 .22	Implicit VR Little Endian	1.2.840.10008.1.2
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88 .33	Implicit VR Little Endian	1.2.840.10008.1.2
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88 .40	Implicit VR Little Endian	1.2.840.10008.1.2
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88 .50	Implicit VR Little Endian	1.2.840.10008.1.2
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88 .59	Implicit VR Little Endian	1.2.840.10008.1.2
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88 .65	Implicit VR Little Endian	1.2.840.10008.1.2
X-Ray Radiation Dose	1.2.840.10008.5.1.4.1.1.88 .67	Implicit VR Little Endian	1.2.840.10008.1.2
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1. 104.1	Implicit VR Little Endian	1.2.840.10008.1.2
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
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1. 129	Implicit VR Little Endian	1.2.840.10008.1.2
RT Image Storage	1.2.840.10008.5.1.4.1.1. 481.1	Implicit VR Little Endian	1.2.840.10008.1.2
RT Dose Storage	1.2.840.10008.5.1.4.1.1. 481.2	Implicit VR Little Endian	1.2.840.10008.1.2
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1. 481.3	Implicit VR Little Endian	1.2.840.10008.1.2

SOP Class Name	SOP Cass UID	Transfer syntax	Transfer syntax UID
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Implicit VR Little Endian	1.2.840.10008.1.2
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Implicit VR Little Endian	1.2.840.10008.1.2
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Implicit VR Little Endian	1.2.840.10008.1.2
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Implicit VR Little Endian	1.2.840.10008.1.2
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Implicit VR Little Endian	1.2.840.10008.1.2
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	Implicit VR Little Endian	1.2.840.10008.1.2

4.2.1.1.2 Activity – Export to DVD-R

See section 4.2.1.1.1.

4.2.1.1.2.1 Media Storage Application Profiles

The cdw application entity supports the STD-GEN-DVD Application Profile.

4.2.1.1.2.2 Options

See section 4.2.1.1.1.2.

4.2.1.2 SOP Specific Conformance

In the case that an attribute is not present or empty in a DICOM object, but is specified as mandatory in the DICOMDIR definition of DICOM media, a generated value will be filled in (dependant on the RECORD type).

Table 4.4 Generated Values for DICOMDIR

Key	Tag	Value
STUDY Record Type		
Study Date	0008.0020	19000101
Study Time	0008.0030	000000
Study ID	0020.0010	NOT AVAILABLE
SERIES Record Type		
Modality	0008.0060	OT
Series Number	0020.0011	0
IMAGE Record Type		
Instance Number	0020.0013	0

5 Support of Extended Character Sets

dm4che supports ISO_IR 100 (ISO 8859-1 Latin 1) as an extended character set.

6 Security

6.1 Security Profiles

OnePacs Gateway supports secure DICOM communication in conformance with the Basic TLS Secure Transport Connection Profile. At default configuration, the TLS option is deactivated.

Table 6.1 Configuration Table

Parameter	Configurable (Yes/No)	Default Value
protocol	Yes	TLSv1,TLSv1.1,TLSv1.2
tls-key	Yes	n/a
tls-key-password	Yes	n/a
tls-cacerts	Yes	n/a
tls-cacerts-passwd	Yes	n/a

6.2 Association Level Security

OnePacs Gateway can be configured to accept Association Requests from only a limited list of Calling AE Titles.
In the default configuration, Association requests with any Calling AET and any Called AET will be accepted. However, if the Called AET is not correspondent to any of the actual Storage Server AETs, only acceptance of the Presentation Context for Verification SOP Class will be returned in the Association Acceptance Response (A-ASSOCIATE AC).

6.3 Application Level Security

OnePacs Gateway web module can be configured to require user authentication in order to access to the user interface functionalities.

7 Annexes

7.1 Created SOP Instances

The cdw AE generates the Media Storage Directory IOD (DICOMDIR) corresponding to the DICOM objects selected to be exported to media (cp. Section 4).

The values in the DICOMDIR are taken from the first DICOM object instance announced to the database. In the case that an attribute is not present or empty in an object, but is specified as mandatory in the DICOMDIR definition of DICOM media, a generated value will be filled in dependant on the RECORD type (see Table 4.4).

7.2 Coerced/Modified Fields

Attribute coercion is configurable for IOD's received by the Storage Server. Attributes can either be mapped or may be filled with "fixed values" depending on the existence or the content(s) of one or more other Attributes.
Patient Information, Patient Demographics and Study Information could either be modified manually using the web based system management tool or updated automatically by information received from HIS/RIS.

The coerced/modified Attribute values are provided when a remote Query/Retrieve SCU queries information or when SOP Instances are sent to a remote Storage SCP. Attribute Coercion will be indicated in the appropriate Service Response Status.