eUnity

by /// MACH7

eUnity 7.3

Enterprise Viewing, Integration, and Collaboration Platform

DICOM Conformance Statement

Revision number: 2.4

Revision date: March 22, 2023

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1.0 Introduction

1.1 Revision History

Revision Number	Version Number	Date	Reason for Change
1.0	1.0	January 19, 2011	Initial DICOM Conformance Statement
1.1	2.1	April 17, 2012	Minor updates for JPEG 2000 Support
1.2	2.2	November 22, 2012	Address change
1.3	2.3	June 06, 2014	Added Basic Text SR and Encapsulated PDF Display
1.4	5.1	April 17, 2016	Added 12-lead ECG Waveform Storage and General ECG Waveform Storage Display Support
1.5	5.4	August 31, 2016	Layout / Style / Color changes.
1.6	5.6	December 13, 2016	Added Key Object Selection Display Support
1.7	6.0	March 30, 2017	Added BreastTomosynthesis SCU, SCP

Revision Number	Version Number	Date	Reason for Change
			and Display Support.
1.8	6.2	September 1, 2017	Added Ophthalmic Tomography Image Storage SCU, SCP Support. Added JPEG LS Lossless, JPEG LS Lossy to Accepted Transfer Syntaxes.
1.9	6.8	January 7, 2020	Updated version number.
1.10	6.9	February 6, 2020	Updated version number.
1.11	6.10	July 7, 2020	Added support for Video Endoscopic Image Storage, Video Microscopic Image Storage, Video Photographic Image Storage.
1.12	6.10.1	October 5, 2020	Reorganized and updated styles.
2.0	7.0	February 16, 2021	Updated version number.
2.1	7.1	August 11, 2021	Updated version number.
2.2	7.2	April 26, 2022	Updated version number.

Revision Number	Version Number	Date	Reason for Change
2.3	7.2.1	August 24, 2022	Added display support for Enhanced CT and Enhanced MR.
2.4	7.3	March 17, 2023	Updated version number.

1.2 Audience

This document is written for individuals that need to understand how eUnity will integrate into their healthcare facility. This includes both those responsible for overall imaging network policy and architecture, as well as integrators who need to have a detailed understanding of the DICOM features of this product. This document contains some basic DICOM definitions so that any reader may understand how this product implements DICOM features. However, integrators are expected to fully understand all the DICOM terminology, how the tables in this document relate to the product's functionality, and how that functionality integrates with other devices that support compatible DICOM features.

1.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between eUnity and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. DICOM by itself does not guarantee interoperability. The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of different Conformance Statements is just the first step towards assessing interconnectivity and interoperability between the product and other DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

1.4 Abbreviations

The following abbreviations are used within this DICOM Conformance Statement.

AE   Application Entity

AET   Application Entity Title

CAD   Computer Aided Detection

CR   Computed Radiography

CT   Computed Tomography

DICOM   Digital Imaging and Communications in Medicine

DX   Digital X-ray

GSPS   Grayscale Softcopy Presentation State

HIS   Hospital Information System

HL7   Health Level 7 Standard

IHE   Integrating the Healthcare Enterprise

IOD   Information Object Definition

MG   Mammography (X-ray)

MR   Magnetic Resonance Imaging

NM   Nuclear Medicine

OP   Ophthalmic Photography

PACS   Picture Archiving and Communication System

PET   Positron Emission Tomography

RF   Radiofluoroscopy

RIS   Radiology Information System.

RT   Radiotherapy

SC   Secondary Capture

SCP   Service Class Provider

SCU   Service Class User

ISO   International Organization for Standards

IO   Intra-oral X-ray

JPEG   Joint Photographic Experts Group

LUT   Look-up Table

MPEG   Moving Picture Experts Group

SOP   Service-Object Pair

SR   Structured Reporting

TCP/IP   Transmission Control Protocol/Internet Protocol

US   Ultrasound

VL   Visible Light

VR   Value Representation

XA   X-ray Angiography

1.5 References

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

2.0 Conformance statement overview

The eUnity enterprise system is comprised of a storage device and a diagnostic quality, zero install, web-based image viewer. The eUnity enterprise system is a single PACS application entity (AE).

The eUnity system will:

- store DICOM objects sent to it by service class users;
- request and retrieve images – as needed – from service class providers;
- and display images to a user.

eUnity conforms to the DICOM 3.0 2009 standard and provides Standard Conformance for the SOP classes listed in Table 1 - Network Services Supported.

Table 1 - Network Services Supported

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
Verification			
Verification	Yes	Yes	N/A
Transfer			
Computed Radiography Image Storage	Yes	Yes	Yes

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
Digital X-Ray Image Storage – For Presentation	Yes	Yes	Yes
Digital X-Ray Image Storage – For Processing	Yes	Yes	No
Digital Mammography X-Ray Image Storage – For Presentation	Yes	Yes	Yes
Digital Mammography X-Ray Image Storage – For Processing	Yes	Yes	No
Digital Intra-oral X-Ray Image Storage – For Presentation	Yes	Yes	Yes
Digital Intra-oral X-Ray Image Storage – For Processing	Yes	Yes	No
CT Image Storage	Yes	Yes	Yes
Enhanced CT Image Storage	Yes	Yes	Yes
Ultrasound Multi-frame Image Storage	Yes	Yes	Yes
Ultrasound Multi-frame Image Storage (Retired)	Yes	Yes	Yes
MR Image Storage	Yes	Yes	Yes

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
Enhanced MR Image Storage	Yes	Yes	Yes
MR Spectroscopy Storage	Yes	Yes	No
Enhanced MR Color Image Storage SOP Class	No	No	No
Ultrasound Image Storage	Yes	Yes	Yes
Ultrasound Image Storage (Retired)	Yes	Yes	Yes
Enhanced US Volume Storage	No	No	No
Secondary Capture Image Storage	Yes	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage	Yes	Yes	No
Multi-frame Grayscale Byte Secondary Capture Image Storage	Yes	Yes	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	Yes	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	Yes	Yes	Yes

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
12-lead ECG Waveform Storage	Yes	Yes	Yes
General ECG Waveform Storage	Yes	Yes	Yes[1]
Ambulatory ECG Waveform Storage	Yes	Yes	No
Hemodynamic Waveform Storage	Yes	Yes	No
Cardiac Electrophysiology Waveform Storage	Yes	Yes	No
Basic Voice Audio Waveform Storage	Yes	Yes	No
General Audio Waveform Storage	No	No	No
Arterial Pulse Waveform Storage	No	No	No
Respiratory Waveform Storage	No	No	No
Grayscale Softcopy Presentation State Storage SOP Class	Yes	Yes	Yes

[1] eUnity will display 12-lead ECG traces.

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
Color Softcopy Presentation State Storage SOP Class	Yes	Yes	Yes[1]
Pseudo-Color Softcopy Presentation State Storage SOP Class	Yes	Yes	No
Blending Softcopy Presentation State Storage SOP Class	Yes	Yes	No
XA/XRF Grayscale Softcopy Presentation State Storage	No	No	No
X-Ray Angiographic Image Storage	Yes	Yes	Yes
Enhanced XA Image Storage	Yes	Yes	No
X-Ray Radiofluoroscopic Image Storage	Yes	Yes	Yes
X-Ray Angiographic Bi-plane Image Storage (Retired)	Yes	Yes	Yes
Enhanced XRF Image Storage	Yes	Yes	Yes
X-Ray 3D Angiographic Image Storage	No	No	No

[1] eUnity does not support display of ICC Profiles within DICOM CSPS objects.

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
X-Ray 3D Craniofacial Image Storage	No	No	No
Breast Tomosynthesis Image Storage	Yes	Yes	Yes
Nuclear Medicine Image Storage (Retired)	Yes	Yes	Yes
Nuclear Medicine Image Storage	Yes	Yes	Yes
Raw Data Storage	Yes	Yes	No
Spatial Registration Storage	Yes	Yes	No
Spatial Fiducials Storage	Yes	Yes	No
Deformable Spatial Registration SOP Class	Yes	Yes	No
Segmentation SOP Class	Yes	Yes	No
Surface Segmentation Storage	No	No	No
Real World Value Mapping Storage	Yes	Yes	No

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
VL Endoscopic Image Storage	Yes	Yes	Yes
VL Image Storage (Retired)	Yes	Yes	Yes
VL Multiframe Image Storage (Retired)	Yes	Yes	Yes
Video Endoscopic Image Storage	Yes	Yes	Yes[1]
VL Microscopic Image Storage	Yes	Yes	Yes
Video Microscopic Image Storage	Yes	Yes	Yes[2]
VL Slide-Coordinates Microscopic Image Storage	Yes	Yes	No
VL Photographic Image Storage	Yes	Yes	Yes
Video Photographic Image Storage	Yes	Yes	Yes[3]

[1]Videos are displayed only in MPEG-4 transfer syntax.

[2]Videos are displayed only in MPEG-4 transfer syntax.

[3]Videos are displayed only in MPEG-4 transfer syntax.

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
Ophthalmic Photography 8 Bit Image Storage	Yes	Yes	Yes
Ophthalmic Photography 16 Bit Image Storage	Yes	Yes	Yes
Stereometric Relationship Storage	Yes	Yes	No
Ophthalmic Tomography Image Storage	Yes	Yes	No
Lensometry Measurements Storage	No	No	No
Autorefraction Measurements Storage	No	No	No
Keratometry Measurements Storage	No	No	No
Subjective Refraction Measurements Storage	No	No	No
Visual Acuity Measurements Storage	No	No	No
Spectacle Prescription Report Storage	No	No	No
Macular Grid Thickness and Volume Report Storage SOP Class	No	No	No

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
Basic Text SR	Yes	Yes	Yes
Enhanced SR	Yes	Yes	No
Comprehensive SR	Yes	Yes	No
Procedure Log Storage	Yes	Yes	No
Mammography CAD SR	Yes	Yes	Yes
Key Object Selection Document	Yes	Yes	Yes
Chest CAD SR	Yes	Yes	No
X-Ray Radiation Dose SR	Yes	Yes	No
Colon CAD SR	No	No	No
Encapsulated PDF Storage SOP Class	Yes	Yes	Yes
Encapsulated CDA Storage SOP Class	Yes	Yes	No

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
Positron Emission Tomography Image Storage	Yes	Yes	Yes
Enhanced PET Image Storage	No	No	No
Basic Structured Display Storage	No	No	No
RT Image Storage	Yes	Yes	No
RT Dose Storage	Yes	Yes	No
RT Structure Set Storage	Yes	Yes	No
RT Beams Treatment Record Storage	Yes	Yes	No
RT Plan Storage	Yes	Yes	No
RT Brachy Treatment Record Storage	Yes	Yes	No
RT Treatment Summary Record Storage	Yes	Yes	No
Hanging Protocol Storage	No	No	No

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
Color Palette Storage	No	No	No
Standalone Curve Storage (Retired)	Yes	Yes	No
Standalone Modality LUT Storage (Retired)	Yes	Yes	No
Standalone Overlay Storage (Retired)	Yes	Yes	No
Standalone PET Curve Storage (Retired)	Yes	Yes	No
Standalone VOI LUT Storage	Yes	Yes	No
Hardcopy Color Image Storage (Retired)	Yes	Yes	No
Hardcopy Greyscale Image Storage (Retired)	Yes	Yes	No
Query / Retrieve			
Patient Root Query/Retrieve Information Model FIND	Yes	No	N/A
Patient Root Query/Retrieve Information Model – MOVE	Yes	No	N/A

SOP Classes	User of Service (SCU)	Provider of Service (SCP)	Display
Study Root Query/Retrieve Information Model – FIND	Yes	No	N/A
Study Root Query/Retrieve Information Model – MOVE	Yes	No	N/A
Patient-Study Root Query/Retrieve Information Model – FIND	Yes	No	N/A
Patient-Study Root Query/Retrieve Information Model – MOVE	Yes	No	N/A

3.0 Networking

3.1 Implementation model

3.1.1 Application data flow

The Application Data flow diagram depicts associations and real world activities performed by the eUnity Application Entity.
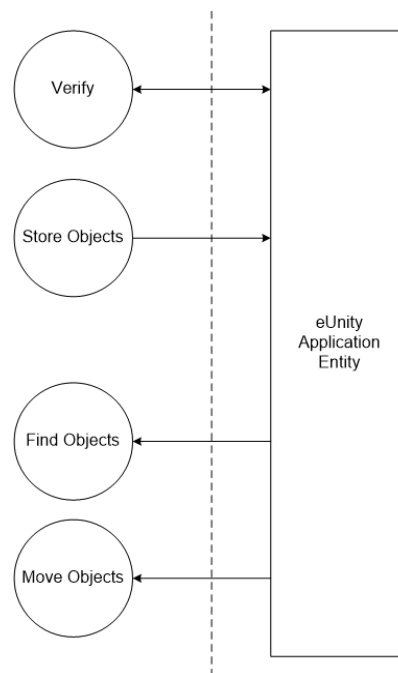
Figure 1: Functional overview - application data flow

- Verify activity will initiate and respond to associations that request verification of communications.
- Store Objects activity will accept associations from a remote AE to store DICOM objects.
- Find Objects activity will initiate an association to query a remote AE.
- Move Objects activity will initiate an association to retrieval DICOM objects from a remote AE.

3.1.2 Functional definition of Application Entities

This section provides functional definitions for all local Application Entity in the eUnity system.

3.1.2.1 Verify

eUnity will respond to a DICOM C-ECHO requests from a remote AE. eUnity can also make outbound C-ECHO requests to a remote AE.

3.1.2.2 Store objects

eUnity will respond to DICOM C-STORE requests from a remote AE. DICOM objects sent from a remote AE will be stored on the file system; some additional DICOM attributes will be stored in the database.

3.2 AE specifications

This section outlines the specifications for the Application Entities in the eUnity system.

3.2.1 SOP classes

This Application Entity provides standard conformance to the following SOP Classes:

Table 2 - SOP classes for eUnity AE

SOP Classes	SOP Class UID	SCU	SCP	Display
Verification				
Verification	1.2.840.10008.1.1	Yes	Yes	N/A
Transfer				
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes	Yes
Fuji Private Computed Radiography Image Storage	1.2.392.200036.9125.1.1.2	Yes	Yes	Yes
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes	Yes
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes	No
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes	Yes
Digital Mammography X-Ray Image Storage – For	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes	No

SOP Classes	SOP Class UID	SCU	SCP	Display
Processing				
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Yes	Yes	Yes
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Yes	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	Yes	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes	Yes
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes	Yes

SOP Classes	SOP Class UID	SCU	SCP	Display
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes	No
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes	Yes
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Yes	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Yes	Yes	No
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes	Yes
Multi-frame True Color Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes	Yes

SOP Classes	SOP Class UID	SCU	SCP	Display
Storage				
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	Yes	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes	Yes[1]
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	Yes	No
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	Yes	No
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Yes	Yes	No
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Yes	Yes	No

[1] eUnity will display 12-lead ECG traces.

SOP Classes	SOP Class UID	SCU	SCP	Display
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes	Yes
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Yes	Yes	Yes[1]
Pseudo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	Yes	Yes	No
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Yes	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes	Yes
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	Yes	No

[1] eUnity does not support display of ICC Profiles within DICOM CSPS objects.

SOP Classes	SOP Class UID	SCU	SCP	Display
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes	Yes
X-Ray Angiographic Bi-plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Yes	Yes	Yes
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Yes	Yes	Yes
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Yes	Yes	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	Yes	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	Yes	No
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes	No
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Yes	Yes	No
Deformable Spatial Registration SOP Class	1.2.840.10008.5.1.4.1.1.66.3	Yes	Yes	No

SOP Classes	SOP Class UID	SCU	SCP	Display
Segmentation SOP Class	1.2.840.10008.5.1.4.1.1.66.4	Yes	Yes	No
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Yes	Yes	No
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	Yes	Yes
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Yes	Yes	Yes
VL Multiframe Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Yes	Yes	Yes
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Yes	Yes	Yes[1]
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	Yes	Yes
Video Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2.1	Yes	Yes	Yes[2]

[1]Videos are displayed only in MPEG-4 transfer syntax.

[2]Videos are displayed only in MPEG-4 transfer syntax.

SOP Classes	SOP Class UID	SCU	SCP	Display
Storage				
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	Yes	No
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	Yes	Yes
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Yes	Yes	Yes[1]
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Yes	Yes	Yes
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Yes	Yes	Yes
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Yes	Yes	No
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes	Yes

[1]Videos are displayed only in MPEG-4 transfer syntax.

SOP Classes	SOP Class UID	SCU	SCP	Display
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes	No
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes	No
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	Yes	Yes	No
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Yes	Yes	Yes
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes	Yes
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Yes	Yes	No
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	Yes	No
Encapsulated PDF Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes	Yes
Encapsulated CDA Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.2	Yes	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	Yes	Yes

SOP Classes	SOP Class UID	SCU	SCP	Display
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes	No
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes	No
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes	No
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Yes	Yes	No
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes	No
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Yes	Yes	No
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Yes	Yes	No
Standalone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.9	Yes	Yes	No
Standalone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	Yes	Yes	No
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Yes	Yes	No

SOP Classes	SOP Class UID	SCU	SCP	Display
(Retired)				
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	Yes	Yes	No
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Yes	Yes	No
Hardcopy Color Image Storage (Retired)	1.2.840.10008.5.1.1.30	Yes	Yes	No
Hardcopy Greyscale Image Storage (Retired)	1.2.840.10008.5.1.1.29	Yes	Yes	No
Query / Retrieve				
Patient Root Query/Retrieve Information Model FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	Yes	N/A
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	Yes	Yes	N/A
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes	N/A

SOP Classes	SOP Class UID	SCU	SCP	Display
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes	N/A
Patient-Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	No	Yes	N/A
Patient-Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	No	Yes	N/A

3.2.2 Association policies

3.2.2.1 General

The eUnity AE will accept requests for verification and for storage. The following application context name will be proposed and accepted by the eUnity AE.

Table 3 - DICOM application context

Application Context Name	1.2.840.10008.3.1.1.1

3.2.2.2 Number of associations

The eUnity AE can support multiple simultaneous associations requested by peer AEs. Default is 10. This value can be configured through the attribute "MaxPoolSize" in the application server configuration file (i.e. jboss-service.xml for JBoss application server).

Table 4 - Max. number of simultaneous associations

Maximum number of simultaneous associations	10 (Configurable)

3.2.2.3 Asynchronous nature

The eUnity AE 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).

Table 5 - Max. Number of Asynchronous Transactions

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

3.2.2.4 Implementation Identifying Information

The implementation information identifying this Application Entity is:

Table 6 - DICOM Implementation Class and Version for eUn AE

Implementation Class UID	1.2.40.2.13.1.1
Implementation Version Name	dcm4che-1.4.28

3.2.3 Association initiation policy

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

- Verify Communication

- Find Objects

- Move Objects

3.2.3.1 Real world activity – Verify communication (SCU)

3.2.3.1.1 Description and sequencing of activities

Send a request to a remote AE to verify the configuration of the DICOM connection.

3.2.3.1.2 Proposed Presentation Contexts

For Verification the eUnity AE proposes the following Presentation Contexts:

Table 7 - Presentation Contexts Proposed by eUnity AE for Verification

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

3.2.3.1.3 SOP-specific conformance for verification

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

3.2.3.2 Real world activity – Find object (SCU)

3.2.3.2.1 Description and sequencing of activities

The eUnity AE will initiate a query to a remote AE to retrieve DICOM information about a single study or a group of studies. This information usually comes before a request to retrieve the DICOM objects for display (see Real World Activity – Move objects (SCU)).

3.2.3.2.2 Proposed Presentation Contexts

The eUnityPACS will query with the following Presentation Contexts:

Table 8 - Presentation Contexts Proposed by eUnity AE for Find

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Relational-queries
Study Root Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Relational-queries
Patient/Study Only Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Relational-queries

3.2.3.2.3 SOP-specific conformance for find

The eUnity PACS AE conforms to the DICOM Query / Retrieve service class as an SCU.

The eUnity PACS AE supports relational-queries extended SCU behaviour for the Patient Root Query, Study Root Query and the Patient/Study Only Query/Retrieve.

3.2.3.3 Real World Activity – Move objects (SCU)

3.2.3.3.1 Description and sequencing of activities

The eUnity AE will initiate a retrieve operation to a remote AE to retrieve DICOM information in order to display a study. These requests usually follow after a query request for study metadata. (see Real world activity – Find object (SCU)).

3.2.3.3.2 Proposed Presentation Contexts

The eUnity PACS will move with the following Presentation Contexts:

Table 9 - Presentation Contexts proposed by eUnity AE for move

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query / Retrieve IM Move	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query / Retrieve IM Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Patient / Study Only Query / Retrieve IM Move	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.2.3.3.3 SOP-specific conformance for move

The eUnity PACS AE conforms to the DICOM query / retrieve service class as an SCU.

3.2.4 Association acceptance policy

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

- Verify Communication

- Store Objects

3.2.4.1 Real world activity – Verify communication (SCP)

3.2.4.1.1 Description and sequencing of activities

The eUnity AE will respond to Verification requests to provide an SCU with the ability to determine if the eUnity is receiving DICOM requests.

3.2.4.1.2 Accepted Presentation Contexts

The following Presentation Contexts are accepted for verification:

Table 10 - Presentation Contexts accepted by eUnity AE for verification

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

3.2.4.1.3 SOP-specific conformance for SOP class

The status code for C-ECHO are described in the following table:

Table 11 - Verification response status

Service Status	Further Meaning	Error Code	Reason
Success	Success	0000	The C-Echo request is accepted.

3.2.4.2 Real world activity – Store objects communication (SCP)

3.2.4.2.1 Description and sequencing of activities

The eUnity AE will store image that are sent to it from a remote AE. Images are stored in a local cache file system and are not guaranteed to be stored for any amount of time. Cached images are cleaned up when space is required to store new images.

3.2.4.2.2 Accepted Presentation Contexts

The following Presentation Contexts are accepted for storage:

Table 12 - Presentation Contexts Accepted by eUnity AE for storage

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Transfer syntaxes for Image Storage.		SCP	None
Fuji Private Computed Radiography Image Storage	1.2.392.200036.9125.1.1.2	Transfer syntaxes for Image Storage.		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.		SCP	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.		SCP	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.		SCP	None

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	UID	Name List	UID List		
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.		SCP	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.		SCP	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.		SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Transfer syntaxes for Image Storage.		SCP	None
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Transfer syntaxes for Image Storage.		SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Transfer syntaxes for Image Storage.		SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Transfer syntaxes for Image		SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
		Storage.			
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Transfer syntaxes for Image Storage.		SCP	None
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Transfer syntaxes for Image Storage.		SCP	None
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Transfer syntaxes for Non-Image Storage.		SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Transfer syntaxes for Image Storage.		SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Transfer syntaxes for Image Storage.		SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Transfer syntaxes for Image Storage.		SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Transfer syntaxes for Image Storage.		SCP	None
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Transfer syntaxes for Image Storage.		SCP	None
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Transfer syntaxes for Image Storage.		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.		SCP	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Transfer syntaxes for Non-Image Storage.		SCP	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Transfer syntaxes for Non-Image Storage.		SCP	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Transfer syntaxes for Non-Image		SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
		Storage.			
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Transfer syntaxes for Non-Image Storage.		SCP	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Transfer syntaxes for Non-Image Storage.		SCP	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Transfer syntaxes for Non-Image Storage.		SCP	None
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Transfer syntaxes for Non-Image Storage.		SCP	None
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Transfer syntaxes for Non-Image Storage.		SCP	None
Pseudo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	Transfer syntaxes for Non-Image Storage.		SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Transfer syntaxes for Non-Image Storage.		SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Transfer syntaxes for Image Storage.		SCP	None
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Transfer syntaxes for Image Storage.		SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Transfer syntaxes for Image Storage.		SCP	None
X-Ray Angiographic Bi-plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Transfer syntaxes for Image Storage.		SCP	None
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Transfer syntaxes for Image Storage.		SCP	None
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Transfer syntaxes for Image		SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
		Storage.			
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Transfer syntaxes for Image Storage.		SCP	None
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Transfer syntaxes for Non-Image Storage.		SCP	None
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Transfer syntaxes for Non-Image Storage.		SCP	None
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Transfer syntaxes for Non-Image Storage.		SCP	None
Deformable Spatial Registration SOP Class	1.2.840.10008.5.1.4.1.1.66.3	Transfer syntaxes for Non-Image Storage.		SCP	None
Segmentation SOP Class	1.2.840.10008.5.1.4.1.1.66.4	Transfer syntaxes for Non-Image Storage.		SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Transfer syntaxes for Non-Image Storage.		SCP	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Transfer syntaxes for Image Storage.		SCP	None
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Transfer syntaxes for Image Storage.		SCP	None
VL Multiframe Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Transfer syntaxes for Image Storage.		SCP	None
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Transfer syntaxes for Non-Image Storage.		SCP	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Transfer syntaxes for Non-Image Storage.		SCP	None
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Transfer syntaxes for Non-Image		SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
		Storage.			
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Transfer syntaxes for Image Storage.		SCP	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Transfer syntaxes for Image Storage.		SCP	None
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Transfer syntaxes for Non-Image Storage.		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.		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.		SCP	None
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Transfer syntaxes for Non-Image Storage.		SCP	None

Presentation Context Table					
Abstract Syntax		Transfer 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 Non-Image Storage.		SCP	None
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Transfer syntaxes for Non-Image Storage.		SCP	None
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Transfer syntaxes for Non-Image Storage.		SCP	None
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	Transfer syntaxes for Non-Image Storage.		SCP	None
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Transfer syntaxes for Non-Image Storage.		SCP	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Transfer syntaxes for Non-Image Storage.		SCP	None
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Transfer syntaxes for Non-Image		SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
		Storage.			
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Transfer syntaxes for Non-Image Storage.		SCP	None
Encapsulated PDF Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1	Transfer syntaxes for Non-Image Storage.		SCP	None
Encapsulated CDA Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.2	Transfer syntaxes for Non-Image Storage.		SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Transfer syntaxes for Image Storage.		SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Transfer syntaxes for Image Storage.		SCP	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Transfer syntaxes for Non-Image Storage.		SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Transfer syntaxes for Non-Image Storage.		SCP	None
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Transfer syntaxes for Non-Image Storage.		SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Transfer syntaxes for Non-Image Storage.		SCP	None
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Transfer syntaxes for Non-Image Storage.		SCP	None
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Transfer syntaxes for Non-Image Storage.		SCP	None
Standalone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.9	Transfer syntaxes for Non-Image Storage.		SCP	None
Standalone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	Transfer syntaxes for Non-Image		SCP	None

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Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
		Storage.			
Standalone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	Transfer syntaxes for Non-Image Storage.		SCP	None
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	Transfer syntaxes for Non-Image Storage.		SCP	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Transfer syntaxes for Non-Image Storage.		SCP	None
Hardcopy Color Image Storage (Retired)	1.2.840.10008.5.1.1.30	Transfer syntaxes for Image Storage.		SCP	None
Hardcopy Greyscale Image Storage (Retired)	1.2.840.10008.5.1.1.29	Transfer syntaxes for Image Storage.		SCP	None

Table 13 - Accepted transfer syntaxes for image storage

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
RLE Lossless	1.2.840.10008.1.2.5
JPEG 2000 (Lossless Only)	1.2.840.10008.1.2.4.90
JPEG 2000	1.2.840.10008.1.2.4.91
JPEG LS Lossless	1.2.840.10008.1.2.4.80
JPEG LS Lossy	1.2.840.10008.1.2.4.81

Table 14 - Accepted transfer syntaxes for non-image storage

Name	UID	Display
Implicit VR Little Endian	1.2.840.10008.1.2	No
Explicit VR Little Endian	1.2.840.10008.1.2.1	No
MPEG2 Main Profile Main Level	1.2.840.10008.1.2.4.100	No
MPEG-4 AVC/H.264 High Profile / Level 4.1	1.2.840.10008.1.2.4.102	Yes
MPEG-4 AVC/H.264 BD-compatible High Profile / Level 4.1	1.2.840.10008.1.2.4.103	Yes

3.2.4.2.3 SOP-specific conformance for SOP class

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

The eUnity 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 eUnity AE is configured to retain the original DICOM data in DICOM Part 10 compliant file format. The eUnity 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 eUnity 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.

Table 15 - Storage response status

Service Status	Further Meaning	Error Code	Reason
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 file system operation. The appropriate status will be sent in the C-STORE Response. Error indication message is output to the service log.
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

Service Status	Further Meaning	Error Code	Reason
			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.

3.3 Network interfaces

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

3.3.1 Physical network interface

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

3.4 Configuration

3.4.1 AE Title / presentation address mapping

3.4.1.1 Local AE Titles

The local AE title mapping and network ports are configured through administration web interface. By default the AE activities are configured as follows:

Table 16 - Default AE Service Configuration

Application Entity	Default AE Title	Default TCP / IP Port
Verification	EUNITY	11112
Store	EUNITY	11112

3.4.1.2 Remote AE Title / presentation address mapping

Configuration of remote host names and port numbers can be done through the administration web interface.

In the default configuration, Association Requests with any Calling AET will be accepted.

Find and move requests will only be made to known and properly configured AE systems.

3.4.2 Parameters

The following table shows the eUnity configuration parameters relevant to DICOM communication.

Table 17 - Configuration parameters

Parameter	Configurable (Yes / No)	Default Value
General Parameters		
Listening Port	Yes	11112
Maximum number of simultaneous Associations	Yes	10
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	Yes	5 seconds
General DIMSE level time-out values	Yes	60 seconds
Maximum PDU size the AE can receive	Yes	16532
Maximum PDU size the AE can send	Yes	65535
Pack Command and Data PDV's in one PDU	Yes	false

Parameter	Configurable (Yes / No)	Default Value
Storage AE		
Accepted Called AETs	Yes	EUNITY
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	NONE
Accept Missing Patient ID	Yes	False
Accept Missing Patient Name	Yes	False

4.0 Media interchange

eUnity does not support media storage.

5.0 Support of character sets

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

Parsing of all other valid DICOM extended character sets is supported, but not all features may work correctly with them.

6.0 Security

6.1 Security profiles

eUnity does not implement any DICOM security profiles from PS 3.15.

6.2 Association-level security

eUnity can be configured to accept association requests from 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

The eUnity system requires user authentication in order for a user to access the administration console and viewing functionality.

7.0 Annexes

7.1 IOD Contents

7.1.1 Created SOP instance(s)

eUnity creates Presentation State SOP Instances (grayscale or color) when the user saves markup changes. These will get propagated to the VNA or PACS, according to the provider configuration.

7.1.1.1 Grayscale Softcopy Presentation State IOD

Table 18 – IOD of Created Grayscale Softcopy Presentation State SOP instances

IE	Module	Usage	Reference
Patient	Patient	Always	Table 20 – Patient Module of Created SOP Instances
Study	General Study	Always	Table 21 – General study module of created SOP instances
	Patient Study	N/A	Table 22 – Patient study module of created SOP instances
Series	General Series	Always	Table 23 – General series module of created SOP instances

IE	Module	Usage	Reference
Equipment	General Equipment	Always	Table 24 – General equipment module of created SOP instances
Presentation State	Presentation State Identification	Always	Table 25 – Presentation State identification module of created SOP instances
	Presentation State Relationship	Always	Table 26 – Presentation State relationship module of created SOP instances
	Presentation State Shutter	Sometimes	Table 27– Presentation State shutter module of created SOP instances
	Presentation State Mask	Sometimes	Table 38 – Presentation State mask (and mask) modules of created grayscale softcopy SOP instances
	Mask	Sometimes	Table 38 – Presentation State mask (and mask) modules of created grayscale softcopy SOP instances
	Display Shutter	Always	Table 28 – Display shutter module of created SOP instances

IE	Module	Usage	Reference
	Bitmap Display Shutter	Never	Table 29 — Bitmap display shutter module of created SOP instances
	Overlay Plane	Sometimes	Table 30 — Overlay plane module of created SOP instances
	Overlay Activation	Sometimes	Table 31 — Overlay activation module of created SOP instances
	Displayed Area	Always	Table 32 — Displayed area module of created SOP instances
	Graphic Annotation	Sometimes	Table 33 — Graphic annotation module of created SOP instances
	Spatial Transformation	Always	Table 34 — Spatial transformation module of created SOP instances
	Graphic Layer	Sometimes (Yes if overlays or graphic annotations exist)	Table 35 — Graphic layer module of created SOP instances
	Graphic Group	Sometimes (Yes if eUnity markups exist)	Table 36 — Graphic group module of created SOP instances

IE	Module	Usage	Reference
	CLO Graphic Annotations Module (Private)	Sometimes (Yes if eUnity markups exist)	Table 37 – CLO graphic annotations module (private)
	Modality LUT	Sometimes (Yes for new image references)	Table 39 – Modality LUT module of created grayscale softcopy SOP instances
	Softcopy VOI LUT	Sometimes (Yes for new image references)	Table 40 – Softcopy VOI LUT module of created grayscale softcopy SOP instances
	Softcopy Presentation LUT	Always	Table 41 – Softcopy presentation LUT module of created grayscale softcopy SOP instances
	SOP Common	Always	Table 42 – SOP common module of created grayscale softcopy SOP instances

7.1.1.2 Color Softcopy Presentation State IOD

Table 19 – IOD of Created Color Softcopy Presentation State SOP Instances

IE	Module	Usage	Reference
Patient	Patient	Always	Table 20 – Patient Module of Created SOP Instances
Study	General Study	Always	Table 21 – General study module of created SOP instances
	Patient Study	N/A	Table 22 – Patient study module of created SOP instances
Series	General Series	Always	Table 23 – General series module of created SOP instances
Equipment	General Equipment	Always	Table 24 – General equipment module of created SOP instances
Presentation State	Presentation State Identification	Always	Table 25 – Presentation State identification module of created SOP instances
	Presentation State Relationship	Always	Table 26 – Presentation State relationship module of created SOP instances
	Presentation State Shutter	Sometimes	Table 27– Presentation State shutter

IE	Module	Usage	Reference
			module of created SOP instances

IE	Module	Usage	Reference
	Display Shutter	Always	Table 28 – Display shutter module of created SOP instances
	Bitmap Display Shutter	Never	Table 29 – Bitmap display shutter module of created SOP instances
	Overlay Plane	Sometimes	Table 30 – Overlay plane module of created SOP instances
	Overlay Activation	Sometimes	Table 31 – Overlay activation module of created SOP instances
	Displayed Area	Always	Table 32 – Displayed area module of created SOP instances
	Graphic Annotation	Sometimes	Table 33 – Graphic annotation module of created SOP instances
	Spatial Transformation	Always	Table 34 – Spatial transformation module of created SOP instances
	Graphic Layer	Sometimes (Yes if overlays or graphic annotations exist)	Table 35 – Graphic layer module of created SOP instances

IE	Module	Usage	Reference
	Graphic Group	Sometimes (Yes if eUnity markups exist)	Table 36 – Graphic group module of created SOP instances
	CLO Graphic Annotations Module (Private)	Sometimes (Yes if eUnity markups exist)	Table 37 – CLO graphic annotations module (private)
	ICC Profile	Always	Table 43 – ICC profile module of created color softcopy SOP instances
	SOP Common	Always	Table 44 – SOP common module of created color softcopy SOP instances

7.1.1.3 Common modules

eUnity creates CSPS objects.

Table 20 – Patient Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Existence
Patient Name	(0010,0010)	PN	(From Referenced Image(s) or Presentation State)	
Patient ID	(0010,0020)	LO	(From Referenced Image(s) or	

Attribute Name	Tag	VR	Value	Existence
			Presentation State)	
Issuer of Patient ID	(0010,0021)	LO	(From Referenced Image(s) or Presentation State)	
Patient Birth Date	(0010,0030)	DA	(From Referenced Image(s) or Presentation State)	
Patient Sex	(0010,0040)	CS	(From Referenced Image(s) or Presentation State)	
Other Patient IDs Sequence	(0010,1002)	SQ	(From Referenced Image(s) or Presentation State)	
> Patient ID	(0010,0020)	LO	(From Referenced Image(s) or Presentation State)	
> Issuer of Patient ID	(0010,0021)	LO	(From Referenced Image(s) or Presentation State)	
> Type of Patient ID	(0010,0022)	CS	(From Referenced Image(s) or Presentation State)	

Table 21 – General study module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Study Date	(0008,0020)	DA	(From Referenced Image(s) or Presentation State)	
Study Time	(0008,0030)	TM	(From Referenced Image(s) or Presentation State)	
Accession Number	(0008,0050)	SH	(From Referenced Image(s) or Presentation State)	
Study Description	(0008,1030)	LO	(From Referenced Image(s) or Presentation State)	
Study Instance UID	(0020,000D)	UI	(From Referenced Image(s) or Presentation State)	
Study ID	(0020,0010)	SH	(From Referenced Image(s) or Presentation State)	
Study ID Issuer	(0032,0012)	LO	(From Referenced Image(s) or Presentation State)	

Table 22 – Patient study module of created SOP instances

Attribute Name	Tag	VR	Value	Existence

Table 23 – General series module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Modality	(0008,0060)	CS	PR	
Series Instance UID	(0020,000E)	UI	(Automatically Generated)	
Series Number	(0020,0011)	IS	1	
Series Date	(0008,0021)	DA	(Automatically Generated)	
Series Time	(0008,0031)	TM	(Automatically Generated)	
Series Description	(0008,103E)	LO	eUnity Presentation	

Table 24 – General equipment module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Manufacturer	(0008,0070)	LO	Mach7 Technologies Canada Inc.	

Table 25 – Presentation State identification module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Instance Number	(0020,0013)	IS	(Generated Ordered Integer)	
Presentation Creation Date	(0070,0082)	DA	(Automatically Generated. Is the same for each object in the series)	
Presentation Creation Time	(0070,0083)	TM	(Automatically Generated. Is the same for each object in the series)	
Content Label	(0070,0080)	CS	EUNITY__XXXXXXXX (where X's are the same random alpha-numeric for each object in series)	
Content Description	(0070,0081)	LO	(Empty)	
Content Creator's Name			eUnity Presentation 1.0	

Table 26 – Presentation State relationship module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Referenced Series Sequence	(0008,1115)	SQ	(One or more items identifying the referenced images)	

> Include 'Image SOP Instance Reference Macro'

Table 27— Presentation State shutter module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Shutter Presentation Value	(0018,1622)	US	See 'Display Shutter Module' or Bitmap Display Shutter Module' table in the DICOM standard.	
Shutter Presentation Color CIELab Value	(0018,1624)	US	See 'Display Shutter Module' or Bitmap Display Shutter Module' table in the DICOM standard.	

Table 28 – Display shutter module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Shutter Shape	(0018,1600)	CS	(One or more of RECTANGULAR, CIRCULAR, or POLYGONAL)	
Shutter Left Vertical Edge	(0018,1602)	IS	(From Referenced Image(s) or Presentation State)	
Shutter Right Vertical Edge	(0018,1604)	IS	(From Referenced Image(s) or Presentation State)	
Shutter Upper Horizontal Edge	(0018,1606)	IS	(From Referenced Image(s) or Presentation State)	
Shutter Lower Horizontal Edge	(0018,1608)	IS	(From Referenced Image(s) or Presentation State)	
Center of Circular Shutter	(0018,1610)	IS	(From Referenced Image(s) or Presentation State)	
Radius of Circular Shutter	(0018,1612)	IS	(From Referenced Image(s) or Presentation State)	

Attribute Name	Tag	VR	Value	Existence
Vertices of the Polygonal Shutter	(0018,1620)	IS	(From Referenced Image(s) or Presentation State)	
Shutter Presentation Value	(0018,1622)	US	(From Referenced Image(s) or Presentation State)	
Shutter Presentation Color CIELab Value	(0018,1624)	US	(From Referenced Image(s) or Presentation State)	

Table 29 – Bitmap display shutter module of created SOP instances

Attribute Name	Tag	VR	Value	Existence

The Bitmap Display Shutter Module is not supported for generation, though it is supported for read.

Table 30 – Overlay plane module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Overlay Rows	(60xx,0010)	US	(From Presentation State)	
Overlay Columns	(60xx,0011)	US	(From Presentation State)	
Overlay Type	(60xx,0040)	US	(From Presentation State)	
Overlay Origin	(60xx,0050)	SS	(From Presentation State)	
Overlay Bits Allocated	(60xx,0100)	US	(From Presentation State)	
Overlay Bit Position	(60xx,0102)	US	(From Presentation State)	
Overlay Data	(60xx,3000)	OB	(From Presentation State)	
Overlay Description	(60xx,0022)	LO	(From Presentation State)	
Overlay Subtype	(60xx,0045)	LO	(From Presentation State)	
Overlay Label	(60xx,1500)	LO	(From Presentation State)	
ROI Area	(60xx,1301)	IS	(From Presentation State)	
ROI Mean	(60xx,1302)	DS	(From Presentation State)	

Attribute Name	Tag	VR	Value	Existence
ROI Standard Deviation	(60xx,1303)	DS	(From Presentation State)	

Table 31 — Overlay activation module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Overlay Activation Layer	(60xx,1001)	CS	(From Presentation State or Inferred from Referenced Image)	

Table 32 — Displayed area module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Displayed Area Selection Sequence	(0070,005A)	SQ	(Sequence containing one item for each image frame)	YES
> Referenced Image Sequence	(0008,1140)	SQ	(References one image frame)	YES

Attribute Name	Tag	VR	Value	Existence
>> Include 'Image SOP Instance Reference Macro'				
> Displayed Area Top Left Hand Corner	(0070,0052)	SL	(From Presentation State or Created New)	YES
> Displayed Area Bottom Right Hand Corner	(0070,0053)	SL	(From Presentation State or created new)	YES
> Presentation Size Mode	(0070,0100)	CS	SCALE TO FIT, TRUE SIZE or MAGNIFY	YES
> Presentation Pixel Spacing	(0070,0101)	DS	(From Presentation State, or created from image header if header's Pixel Spacing or Imager Pixel Spacing is present)	
> Presentation Pixel Aspect Ratio	(0070,0102)	IS	(From Presentation State, or created from image header if Presentation Pixel Spacing is not present in this PS)	

Attribute Name	Tag	VR	Value	Existence
>Presentation Pixel Magnification Ratio	(0070,0103)	FL	(From Presentation State if Presentation Size Mode is 'MAGNIFY')	

Table 33 – Graphic annotation module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Displayed Area Selection Sequence	(0070,005A)	SQ	(Sequence containing one item for each image frame)	YES
> Referenced Image Sequence	(0008,1140)	SQ	(References one image frame)	YES
>> Include 'Image SOP Instance Reference Macro'				
> Graphic Layer	(0070,0002)	CS	(From Presentation State or created new)	
> Text Object Sequence	(0070,0008)	SQ	(One or more items if present)	
>> Bounding Box	(0070,0003)	CS	PIXEL (or value from previous	

Attribute Name	Tag	VR	Value	Existence
Annotation Units			Presentation State)	
>> Anchor Point Annotation Units	(0070,0004)	CS	PIXEL (included if Anchor is part of graphic, or if a value exists from previous Presentation State)	
>> Unformatted Text Value	(0070,0006)	ST	(From Presentation State or created new)	
>>Include "Text Style Sequence Macro Attributes"				
>> Bounding Box Top Left Hand Corner	(0070,0010)	FL	(From Presentation State or created new)	
>> Bounding Box Bottom Right Hand Corner	(0070,0011)	FL	(From Presentation State or created new)	
>> Bounding Box Text Horizontal Justification	(0070,0012)	CS	CENTER (or value from previous Presentation State)	

Attribute Name	Tag	VR	Value	Existence
>> Anchor Point	(0070,0014)	FL	(included if Anchor is part of graphic, or if a value exists from previous Presentation State)	
>> Anchor Point Visibility	(0070,0015)	CS	N (if Anchor Point is present, or may have the value from a previous Presentation State)	
>>Compound Graphic Instance ID	(0070,0226)	UL	(From Presentation State)	
>>Graphic Group ID	(0070,0295)	UL	(Points to a separate group for each eUnity markup, else may be from a previous Presentation State)	
>Graphic Object Sequence	(0070,0009)	SQ	(One or more items if present)	
>>Graphic Annotation Units	(0070,0005)	CS	PIXEL (or value from previous Presentation State)	
>> Graphic Dimensions	(0070,0020)	US	2	

Attribute Name	Tag	VR	Value	Existence
>>Number of Graphic Points	(0070,0021)	US	(From Presentation State or created new)	
>> Graphic Data	(0070,0022)	FL	(From Presentation State or created new)	
>> Graphic Type	(0070,0023)	CS	POINT, POLYLINE, INTERPOLATED, CIRCLE or ELLIPSE	
>>Include "Line Style Sequence Macro Attributes"				
>>Graphic Filled	(0070,0024)	CS	Y or N	
>>Include "Fill Style Sequence Macro Attributes"				
>>Compound Graphic Instance ID	(0070,0226)	UL	(From Presentation State)	
>>Graphic Group ID	(0070,0295)	UL	(Points to a separate group for each eUnity markup, else may be from a previous Presentation State)	

Attribute Name	Tag	VR	Value	Existence
>Compound Graphic Sequence	(0070,0209)	SQ	(From Presentation State)	

>> Include compound graphic items as they existed in previous Presentation State.

Table 34 – Spatial transformation module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Image Rotation	(0070,0042)	US	0, 90, 180 or 270	
Image Horizontal Flip	(0070,0041)	CS	Y or N	

Table 35 – Graphic layer module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Graphic Layer Sequence	(0070,0060)	SQ	(One or more items)	

Attribute Name	Tag	VR	Value	Existence
>Graphic Layer	(0070,0002)	CS	(Identifies the layer. eUnity adds the layers CLO_EXISTING and EUNITY_MARKUP)	
> Graphic Layer Order	(0070,0062)	IS	(EUNITY_MARKUP will have the highest layer number, with CLO_EXISTING just below)	
> Graphic Layer Recommended Display Grayscale Value	(0070,0066)	US	0xAAAA (or value from existing Presentation State)	
> Graphic Layer Recommended Display CIELab Value	(0070,0401)	US	(values from existing Presentation State, or White for CLO_EXISTING, or Orange-Gold for EUNITY_MARKUP)	
> Graphic Layer Description	(0070,0068)	LO	(values from existing Presentation State, or "Original Image Overlays", or "Eunity Markup")	

Table 36 – Graphic group module of created SOP instances

Attribute Name	Tag	VR	Value	Existence
Graphic Group Sequence	(0070,0234)	SQ	(One or more items)	
>Graphic Group ID	(0070,0295)	UL	(Identifies the group. Each eUnity markup will have its own Graphic Group ID)	
>Graphic Group Label	(0070,0207)	LO	(For eUnity markup, this will be a unique String identifying the markup, else from existing Presentation State)	
>Graphic Group Description	(0070,0208)	ST	(exists only if copied from an existing Presentation State)	

Table 37 – CLO graphic annotations module (private)

Attribute Name	Tag	VR	Value	Existence
Private Creator Code	(0053,00xx)	LO	EUNITY_PRESENTATION_ ATTRIBUTES_1.0	

Attribute Name	Tag	VR	Value	Existence
CLO Graphic Annotations Sequence	(0053,xx17)	SQ	(One item for each referenced image frame)	
> Referenced Image Sequence	(0008,1140)	SQ	(References one image frame)	YES
>> Include 'Image SOP Instance Reference Macro'				
> Private Creator Code	(0053,00xx)	LO	EUNITY_PRESENTATION_ ATTRIBUTES_1.0	
> CLO Graphic Annotation Items Sequence	(0053,xx18)	SQ	(One item for each eUnity markup for the referenced image frame)	
>> Private Creator Code	(0053,00xx)	LO	EUNITY_PRESENTATION_ ATTRIBUTES_1.0	
>> CLO Graphic Annotation Data	(0053,xx19)	UT	XML text of the eUnity markup item.	

7.1.1.4 Grayscale Softcopy Presentation State modules

Table 38 – Presentation State mask (and mask) modules of created grayscale softcopy SOP instances

Attribute Name	Tag	VR	Value	Existence
Mask Subtraction Sequence	(0028,6100)	SQ	(Present only if copied from an existing Presentation State. One item if present)	

Any appropriate Presentation State Mask or Mask Module fields may be copied from a Presentation State

Table 39 – Modality LUT module of created grayscale softcopy SOP instances

Attribute Name	Tag	VR	Value	Existence
Modality LUT Sequence	(0028,3000)	SQ	(Present only if copied from an existing Presentation State, or the referenced image header. One item if present)	
> LUT Descriptor	(0028,3002)	US	(From Referenced Image(s) or Presentation State)	YES
> LUT Explanation	(0028,3003)	LO	(From Referenced Image(s) or Presentation State)	
> Modality LUT Type	(0028,3004)	CS	(From Referenced Image(s) or Presentation State)	

Attribute Name	Tag	VR	Value	Existence
> LUT Data	(0028,3006)	US		
Rescale Intercept	(0028,1052)	DS	(Present if there is no Modality LUT Sequence)	
Rescale Slope	(0028,1053)	DS	(Present if there is no Modality LUT Sequence)	
Rescale Type	(0028,1054)	CS	(From Referenced Image(s) or Presentation State)	

Table 40 – Softcopy VOI LUT module of created grayscale softcopy SOP instances

Attribute Name	Tag	VR	Value	Existence
Softcopy VOI LUT Sequence	(0028,3110)	SQ	(Sequence containing one item for each image frame)	YES
> Referenced Image Sequence	(0008,1140)	SQ	(References one image frame)	YES

Attribute Name	Tag	VR	Value	Existence
> VOI LUT Sequence	(0028,3010)	SQ	(Included if Window Width and Window Center are not present)	
>> LUT Descriptor	(0028,3002)	US		YES
>> LUT Explanation	(0028,3003)	LO	(From Presentation State)	
>> LUT Data	(0028,3006)	US		
> Window Center	(0028,1050)	DS	(Included if VOI LUT Sequence is not present)	
> Window Width	(0028,1055)	DS	(Included if VOI LUT Sequence is not present)	
> Window Center & Width Explanation	(0028,1055)	LO	(From Presentation State or referenced image header)	
> VOI LUT Function	(0028,1056)	CS	(From Presentation State or referenced image header)	

Table 41 – Softcopy presentation LUT module of created grayscale softcopy SOP instances

Attribute Name	Tag	VR	Value	Existence
Presentation LUT Sequence	(2050,0010)	SQ	(Present only if copied from an existing Presentation State. One item if present)	YES
> LUT Descriptor	(0028,3002)	US		YES
> LUT Explanation	(0028,3003)	LO	(From Presentation State)	
> LUT Data	(0028,3006)	US		
Presentation LUT Shape	(2050,0020)	CS	IDENTITY or INVERSE (Included if VOI LUT Sequence is not present)	

Table 42 – SOP common module of created grayscale softcopy SOP instances

Attribute Name	Tag	VR	Value	Existence
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.11.1 (Grayscale Softcopy Presentation State Storage)	YES

Attribute Name	Tag	VR	Value	Existence
SOP Instance UID	(0008,0018)	UI	(Automatically Generated)	YES
Specific Character Set	(0008,0005)	CS	ISO_IR 192 (mutibyte UTF-8 character set)	YES

7.1.1.5 Color softcopy Presentation State modules

Table 43 – ICC profile module of created color softcopy SOP instances

Attribute Name	Tag	VR	Value	Existence
ICC Profile	(0028,2000)	OB	(From Presentation State, or created for new referenced images as an sRGB profile. This may not be consistent with the way the image is currently being displayed)	YES

Table 44 – SOP common module of created color softcopy SOP instances

Attribute Name	Tag	VR	Value	Existence
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.11.2 (Color Softcopy Presentation State Storage)	YES
SOP Instance UID	(0008,0018)	UI	(Automatically Generated)	YES
Specific Character Set	(0008,0005)	CS	ISO_IR 192 (mutibyte UTF-8 character set)	YES

7.1.2   Usage of attributes from received IODs

eUnity does not require an DICOM attributes other than those specified as mandatory by the DICOM standard.

7.2 Data dictionary of private attributes

eUnity may use the following private attributes in Presentation State objects.

Tag	Name	VR	VM	Description
(0053,00xx)	Private Creator Code	LO	1	Value: EUNITY_ PRESENTATION_ ATTRIBUTES_1.0

Tag	Name	VR	VM	Description
(0053,xx17)	CLO Graphic Annotations Sequence	SQ	1	Sequence of eUnity Annotation Items Sequences
(0053,xx18)	CLO Graphic Annotation Items Sequence	SQ	1	Sequence of eUnity Markup items
(0053,xx19)	CLO Graphic Annotation Data	UT	1	XML document of an eUnity Markup