



Perennity AccessBox
DICOM Conformance Statement
Version: 3.00

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Revision history

Rev. 1.0.6	March 2013	Laurent Janssens
Rev. 2.0 b1218	March 2014	Laurent Janssens
Rev. 3.0 b1222	June 2015	Laurent Janssens

2. Preface

Perennity AccessBox offers a turnkey solution for the medical industry to store, transfer & share DICOM images from any modality or PACS system.

The AccessBox will securely send DICOM studies, originating from any digital modality, directly to any other AccessBox anywhere around the world, making them immediately available for diagnosis in any clinic or even at home. No need to incur the high initial investment costs of VPNs or dedicated lines. AccessBox, by nature, has been designed to work over standard Internet connections. Additionally, hundreds of thousands of images can be stored on the AccessBox's built-in storage and can also be replicated to a local or remote storage device for increased protection. Besides, a copy of these studies can be securely stored in the Cloud or forwarded to a PACS.

The AccessBox has a built-in "DICOM Router" and "DICOM Server". It will automatically, reliably and securely transfer DICOM studies among different locations (e.g. several Acquisition Clinics sharing a central Diagnostic Center). It is designed to use regular Internet connections. If there happens to be an interruption in the connection, the AccessBox will perform an automatic restore from the point of interruption, not from the beginning of the transfer. Checksums make sure the data that is sent is also the data that arrives.

The AccessBox, with its built-in high-capacity HDD storage, has been designed to apply all best practices to preserve your valuable DICOM studies, making sure they will still be available after decades. The content of the AccessBox can automatically be replicated to a local or network-attached disk-based storage device (e.g. an external USB drive, NAS system, Silent Cube). Furthermore the AccessBox offers protection against viruses, malware, spyware or other intrusive programs. It can also be replicated to a remote location (even at your home), or be securely stored in the Cloud (STP/FTPS server or Amazon). Optionally (multiple) copies of your DICOM studies can be recorded to CD, DVD or BluRayBlu-ray (requires Perennity DICOM edition).

The AccessBox uses a central database (MySQL/MariaDB) to log all operations and keep track of which media contain which data. For archiving purposes you may optionally decide to keep available on the Perennity server all processed data - with the possibility to resubmit it to CD/DVD/BD later on.

Each AccessBox includes a dedicated web server that offers HTTP based DICOM viewer access to the studies stored on the AccessBox. In this way e.g. clinicians can easily review the images from within the hospital LAN, without the need to install extra viewer software. When exposed to the internet, it can even allow referring physicians or patients to check out their own studies. Consult the iMAGE Portal Administration Guide for more information on this feature.

This is a conformance statement for the "Perennity AccessBox" which supports DICOM.

The "Perennity DICOM Server" is a component of the Perennity AccessBox solution. Its goal is to receive images sent by modalities or PACS system, and store them as file. It also extracts DICOM metadata in the Perennity database (MySQL/MariaDB).



This document contains: SOP classes supported, "Perennity DICOM Server" roles and a view of interaction components in Perennity DICOM solution.

Supported roles:

- Storage SCP
- Storage SCU Query-Retrieve
- Storage SCP Query-Retrieve

3. Perennity DICOM server (AE) specifications

3.1. Transfer syntax

3.1.1. Native

Name	UID
Explicit VR Little Endian	1.2.840.10008.1.2.1
Explicit VR Big Endian	1.2.840.10008.1.2.2
Implicit VR Little Endian	1.2.840.10008.1.2

3.1.2. Compression

Name	UID
JPEGBaseline	1.2.840.10008.1.2.4.50
JPEGExtended	1.2.840.10008.1.2.4.51
JPEGLSLossyNearLossless	1.2.840.10008.1.2.4.81
JPEG2000Lossy	1.2.840.10008.1.2.4.91
JPEGLossless14	1.2.840.10008.1.2.4.57
JPEGLossless	1.2.840.10008.1.2.4.70
JPEGLSLossless	1.2.840.10008.1.2.4.80
JPEG2000Lossless	1.2.840.10008.1.2.4.90
MPEG2	1.2.840.10008.1.2.4.100
RLELossless	1.2.840.10008.1.2.5

3.1.3. SR

Name	UID
Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99

3.2. Supported SOP Classes

The Perennity DICOM server SCP entity provides standard conformance to the following SOP classes:

SOP Class Name	SOP Class UID	Transfer Syntax	Role
Basic Study Content Notification SOP Class (Retired)	1.2.840.10008.1.9	All	SCP
Stored Print Storage SOP Class (Retired)	1.2.840.10008.5.1.1.27	All	SCP
Hardcopy Grayscale Image Storage SOP Class (Retired)	1.2.840.10008.5.1.1.29	All	SCP
Hardcopy Color Image Storage SOP Class (Retired)	1.2.840.10008.5.1.1.30	All	SCP
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	All	SCP
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	All	SCP
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	All	SCP
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	All	SCP
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	All	SCP
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	All	SCP
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	All	SCP
Standalone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	All	SCP
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	All	SCP
Standalone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	All	SCP
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	All	SCP
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	All	SCP
Pseudo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	All	SCP

SOP Class Name	SOP Class UID	Transfer Syntax	Role
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	All	SCP
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	All	SCP
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	All	SCP
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	All	SCP
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	All	SCP
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	All	SCP
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	All	SCP
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	All	SCP
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	All	SCP
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	All	SCP
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	All	SCP
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	All	SCP
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	All	SCP
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	All	SCP
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	All	SCP
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	All	SCP
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	All	SCP
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	All	SCP
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	All	SCP
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	All	SCP
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	All	SCP
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	All	SCP
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	All	SCP

SOP Class Name	SOP Class UID	Transfer Syntax	Role
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	All	SCP
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	All	SCP
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	All	SCP
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	All	SCP
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	All	SCP
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	All	SCP
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	All	SCP
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	All	SCP
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	All	SCP
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	All	SCP
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	All	SCP
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	All	SCP
VL Image Storage - Trial (Retired)	1.2.840.10008.5.1.4.1.1.77.1	All	SCP
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	All	SCP
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	All	SCP
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	All	SCP
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	All	SCP
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	All	SCP
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	All	SCP
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	All	SCP

SOP Class Name	SOP Class UID	Transfer Syntax	Role
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	All	SCP
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	All	SCP
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	All	SCP
VL Multi-frame Image Storage - Trial (Retired)	1.2.840.10008.5.1.4.1.1.77.2	All	SCP
Standalone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	All	SCP
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	All	SCP
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	All	SCP
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	All	SCP
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	All	SCP
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	All	SCP
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	All	SCP
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65	All	SCP
Standalone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.9	All	SCP
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	All	SCP
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	All	SCP
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	All	SCP
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	All	SCP
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	All	SCP
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	All	SCP
Hanging Protocol Storage	1.2.840.10008.5.1.4.38.1	All	SCP
Siemens CSA Non-Image Storage	1.3.12.2.1107.5.9.1	All	SCP

3.3. Implementation Class and Version

Implementation Class UID	1.2.40.0.13.1.1
Implementation Version Name	Dcm4che-2.0

4. Verification

SOP Class Name	SOP Class UID	Role
Verification	1.2.840.10008.1.1	SCP

5. C-STORE

SOP Class Name	SOP Class UID	Role
Storage	1.2.840.10008.4.2	SCP

“Perennity DICOM Server” implements C-STORE service like defined in standard DICOM (ASSOCIATION-RQ, A-ASSOCIATE-AC, etc). The SOP Class, which can be accepted for the transfer, are included in the “Supported SOP classes” table of this document.

Service status	Return code
Success	0000
Error	0001

6. C-FIND

SOP Class Name	SOP Class UID	Role
Patient Root Query/Retrieve information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	SCP
Study Root Query/Retrieve information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	SCP
Patient/Study Only Query/Retrieve information Model – FIND	1.2.840.10008.5.1.4.1.2.3.1	SCP

Function C-FIND allows querying the “Perennity DICOM Server” to obtain information related to the images already stored. Four retrieve levels are available: PATIENT, STUDY, SERIES or IMAGES.

Information returned for each item:

PATIENT

Attribute Name	Tag	VR	Request	Return
<i>SOP Common</i>				
Specific Character Set	0008,0005	CS	x	x
<i>Patient Level</i>				
Patient's Name	0010,0010	PN	x	x
Patient ID	0010,0020	LO	x	x
Patient's Birth Date	0010,0030	DA	x	x
Patient's Sex	0010,0040	CS	x	x
Number Of Patient Related Studies	0020,1200	IS		x
Number Of Patient Related Series	0020,1202	IS		x
Number Of Patient Related Instances	0020,1204	IS		x

STUDY

Attribute Name	Tag	VR	Request	Return
<i>SOP Common</i>				
Specific Character Set	0008,0005	CS	x	x
<i>Patient Level</i>				
Patient's Name	0010,0010	PN	x	x
Patient ID	0010,0020	LO	x	x
Patient's Birth Date	0010,0030	DA	x	x
Patient's Sex	0010,0040	CS	x	x
<i>Study Level</i>				
Study Instance UID	0020,000D	UI	x	x
Study ID	0020,0010	SH	x	x
Study Date	0008,0020	DA	x	x
Study Description	0008,1030	LO	x	x
Accession Number	0008,0050	SH	x	x
Referring Physician's Name	0008,0090	PN	x	x
Modalities In Study	0008,0061	CS	x	x
Institution Name	0008,0080	LO		x
Number Of Study Related Series	0020,1206	IS		x
Number Of Study Related Instances	0020,1208	IS		x

SERIES

Attribute Name	Tag	VR	Request	Return
<i>SOP Common</i>				
Specific Character Set	0008,0005	CS	x	x
<i>Patient Level</i>				
Patient's Name	0010,0010	PN	x	
Patient ID	0010,0020	LO	x	
Patient's Birth Date	0010,0030	DA	x	
Patient's Sex	0010,0040	CS	x	
<i>Study Level</i>				
Study Instance UID	0020,000D	UI	x	
Study ID	0020,0010	SH	x	
Study Date	0008,0020	DA	x	
Study Description	0008,1030	LO	x	
Accession Number	0008,0050	SH	x	
Referring Physician's Name	0008,0090	PN	x	
Modalities In Study	0008,0061	CS	x	
Modality	0008,0060	CS	x	x
Series Number	0020,0011	IS	x	x
Series Instance UID	0020,000E	UI	x	x
Series Description	0008,103E	LO		x
Series Date	0008,0021	DA		x
Number Of Series Related Instances	0020,1209	IS		x

SERIES

Attribute Name	Tag	VR	Request	Return
<i>SOP Common</i>				
Specific Character Set	0008,0005	CS	x	x
<i>Patient Level</i>				
Patient's Name	0010,0010	PN	x	
Patient ID	0010,0020	LO	x	
Patient's Birth Date	0010,0030	DA	x	
Patient's Sex	0010,0040	CS	x	
<i>Study Level</i>				
Study Instance UID	0020,000D	UI	x	
Study ID	0020,0010	SH	x	
Study Date	0008,0020	DA	x	
Study Description	0008,1030	LO	x	
Accession Number	0008,0050	SH	x	
Referring Physician's Name	0008,0090	PN	x	
Modalities In Study	0008,0061	CS	x	
Modality	0008,0060	CS	x	
Series Number	0020,0011	IS	x	
Series Instance UID	0020,000E	UI	x	
Instance Number	0020,0013	IS	x	x
SOP Class UID	0008,0016	UI	x	x
SOP Instance UID	0008,0018	UI	x	x

The complete set of data is returned during the C-FIND query. If the SCU specifies a date (or a range of two dates – from ... to ...) in the "StudyDate" tag, the result set will be refined and returns only the data within this date range.

7. C-MOVE

SOP Class Name	SOP Class UID	Role
Patient Root Query/Retrieve information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	SCP
Study Root Query/Retrieve information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	SCP
Patient/Study Only Query/Retrieve information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2	SCP

8. C-ECHO

Service Status	Return Code	Behavior
Success	0000	The C-ECHO request is accepted