synedra

information technologies

DICOM Conformance Statement

synedra product portfolio

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Conformance Statement Overview

The synedra AIM product family is based on a storage facility, a client viewing, and a reporting workstation that enables connectivity to DICOM modalities and other health information systems.

synedra AIM:

- stores images/data and modality performed procedure steps;
- manages the online storage of the images/data;
- commits storage of images/data;
- enables access to images via queries based on standard query models;
- sends requested images/data;
- visualizes images/data;
- sends images/data to a printer upon user request;
- provides access to order information for modality worklist requests;
- notifies other modalities about available images;
- acts as a performed procedure step manager;
- exports data to external media using DICOMDIR;
- reads data from external media using DICOMDIR;

The following table lists the network services synedra AIM uses and provides.

SOP Classes	**User of Service (SCU)**	**Provider of Service (SCP)**
Transfer		
All services of the Storage Service Class	Yes	Yes
Query/Retrieve		
Study Root Query/Retrieve Information Model - FIND	Yes	Yes
Study Root Query/Retrieve Information Model - GET	No	Yes
Study Root Query/Retrieve Information Model - MOVE	Yes	Yes
Patient Root Query/Retrieve Information Model - FIND	Yes	Yes
Patient Root Query/Retrieve Information Model - GET	No	Yes
Patient Root Query/Retrieve Information Model - MOVE	Yes	Yes
Workflow Management		
Instance Availability Notification	Yes	Yes
Modality Performed Procedure Step	Yes	Yes
Modality Worklist Information Model - FIND	Yes	Yes
Storage Commitment Push Model	Yes	Yes

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Print Management		
Basic Grayscale Print Management Meta SOP Class	Yes	No
Basic Color Print Management Meta SOP Class	Yes	No
Web Services (DICOMweb / PS3.18)		
QIDO-RS (Query based on ID for DICOM Objects by RESTful Services)	Yes	Yes
WADO-RS (Web Access to DICOM Objects by RESTful Services)	Yes	Yes

Table 1. Network Services

The following table lists the media services synedra AIM uses and provides.

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk - Recordable		
General Purpose CD-R Interchange	Yes	Yes
CT/MR Studies on CD-R	Yes	Yes
DVD		
General Purpose DVD Interchange with JPEG	Yes	Yes
CT/MR Studies on DVD Media	Yes	Yes

Table 2. Media Services

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1. Introduction

1.1. Revision History

Revision Number	Date	Author	Reason for Change
0.9.1	13/02/2006	KSchu	First draft of the 'new' DICOM Conformance Statement for synedra AIM
0.9.2	10/08/2006	KSchu	Adaption for the new release (Atlas)
Atlas.01	14/09/2006	TPe/KSchu	Final version for the Atlas release
Atlas.02	16/10/2006	KSchu	Adaptations for some small extensions (worklist)
Atlas.03	02/11/2006	KSchu	Fixed some missleading information for the worklist response
Prometheus.01	05/03/2007	ADo	Adaption for the new release (AIM Version 2.3 "Prometheus")
Bellerophon.01	04/01/2008	KSchu	Adaptions for the new release (AIM Version 2.4 "Bellerophon")
Kalypso.01	06/05/2008	KSchu	Adaptions for the new release (AIM Version 2.5 "Kalypso")
Andromeda.01	27/08/2008	RLi	Added information about printing
Andromeda.02	31/10/2008	ADo	Adaptions for the new release (AIM Version 2.6 "Andromeda")
Perseus.01	16/04/2009	KSchu	Adaptions for the new release (AIM Version 2.7 "Perseus")
Kronos.01	29/10/2009	JSi	Adaptions for the new release (AIM Version 2.8 "Kronos")
Athene.01	29/07/2010	JSi	Adaptions for the new release (AIM Version 2.9 "Athene")
Pegasos.01	16/06/2011	JSi	Adaptions for the new release (AIM Version 3.0 "Pegasos")
Artemis.01	23/11/2011	JSi	Adaptions for the new release (AIM Version 3.1 "Artemis")
Helios.01	21/05/2012	RLi	Revision and adaption for the new release (AIM Version 3.2 "Helios")
Eos.01	22/06/2013	JSi	Revision and adaption for the new release (AIM Version 3.3 "Eos")
Triton.01	26/05/2014	JSi	Revision and adaption for the new release (AIM Version 3.4 "Triton")
Odysseus.01	07/05/2015	RLi	Major revision for DICOM 2015a, addition of services
Hermes.01	01/06/2016	JSi	Revision and adaptions for the new release (AIM Version 16 "Hermes")
Poseidon.01	16/05/2017	MDo	Revision and adaption for the new release (AIM Version 17 "Poseidon")
Poseidon.02	02/06/2017	PPe	Revision and adaptation for the new release (AIM Version 17 "Poseidon")
Apollon.01	30/05/2018	JSi	Revision and adaptation for the new release (AIM Version 18 "Apollon")
Zephyr.01	24/04/2019	PPe	Major revision for the new release (AIM Version 19 "Zephyr")

Revision Number	Date	Author	Reason for Change
Kassiopeia.01	04/06/2020	PPe	Revision and adaptation for the new release (AIM Version 20 "Kassiopeia")
Argos.01	24/05/2021	PPe	Revision and adaptation for the new release (AIM Version 21 "Argos")
Niobe.01	24/05/2022	PPe	Revision and adaptation for the new release (AIM Version 22 "Niobe")
Selene.01	02/05/2023	PPe	Revision and adaptation for the new release (AIM Version 23 "Selene")
Herakles.01	22/04/2024	PPe	Revision and adaptation for the new release (HCM Version 24 "Herakles")
Rhea.01	28/04/2025	PPe	Revision and adaptation for the new release (HCM Version 25 "Rhea")
Helena.01	22/04/2026	KWa	Revision and adaptation for the new release (HCM Version 26 "Helena")

Table 1.1. Revision History

1.2. Audience of this Document

This document is addressed to those who need to understand how synedra AIM integrates into their healthcare facility. This includes those responsible for imaging network policy and architecture as well as integrators who need to have a detailed understanding of the DICOM features of the 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 supporting compatible DICOM features.

Readers not familiar with DICOM terminology should first read the relevant parts of the DICOM Standard itself, before reading this Conformance Statement.

1.3. Remarks

The aim of this DICOM Conformance Statement is to help integration between synedra AIM 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 the proper exchange of the intended information. In fact, readers should be aware of the following important issues:

- The comparison of different conformance statements is the first step toward assessing interconnectivity and interoperability between the product and other DICOM-compliant equipment.

- Test procedures should be defined and executed to validate the level of interoperability required with specific compatible DICOM equipment, as established by the healthcare facility.

synedra AIM has participated in an industry-wide testing program sponsored by Integrating the Healthcare Enterprise (IHE). The IHE Integration Statement for synedra AIM, together with the IHE Technical Framework, may facilitate the process of validation testing.

1.4. Terms and Definitions

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

Abstract Syntax	The information agreed to be exchanged between applications, is generally equal to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.
Application Entity	An endpoint of a DICOM information exchange, including the DICOM network or media interface software, i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.
Application Entity Title	The externally known name of an *Application Entity*, used to identify a DICOM application to another DICOM application on the network.
Application Context	The specification of the type of communication used between *Application Entities*. Example: DICOM network protocol.
Association	A network communication channel set up between *Application Entities*.
Attribute	A unit of information in an object definition; a data element identified by a *tag*. The information may be a complex data structure (Sequence), itself composed of lower-level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).
Information Object Definition	The specified set of *Attributes* that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The *Attributes* may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: MR Image IOD, CT Image IOD, Print Job IOD.
Joint Photographic Experts Group	A set of standardized image compression techniques, available for use by DICOM applications.
Media Application Profile	The specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs).
Module	A set of *Attributes* within an *Information Object Definition* that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation	The first phase of *Association* establishment that allows *Application Entities* to agree on the types of data to be exchanged and on how to encode that data.
Presentation Context	The set of DICOM network services used for an *Association* as negotiated between *Application Entities*; includes *Abstract Syntaxes* and *Transfer Syntaxes*.
Protocol Data Unit	A packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size of a packet they can receive.
Security Profile	A set of mechanisms, such as encryption, user authentication, and digital signatures, used by an *Application Entity* to ensure confidentiality, integrity, and/or availability of the exchanged DICOM data.
Service Class Provider	Role of an *Application Entity* that provides a DICOM network service; typically, a server that performs operations requested by another *Application Entity* (*Service Class User*). Examples: Picture Archiving and Communication System (image storage SCP and image query/retrieve SCP), Radiology Information System (modality worklist SCP).
Service Class User	Role of an *Application Entity* that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU and modality worklist SCU), imaging workstation (image query/retrieve SCU).
Service/Object Pair Class	The specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.
Service/Object Pair Instance	An information object; a specific occurrence of information exchanged in an *SOP Class*. Examples: a specific x-ray image.
Tag	A 32-bit identifier for a data element, represented as a pair of four-digit hexadecimal numbers, the "group", and the "element". If the "group" number is odd, the tag specifies a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element].
Transfer Syntax	The encoding used for the exchange of DICOM information objects and messages. Examples: *JPEG* compressed (images), little endian explicit value representation.
Unique Identifier	A globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.
Value Representation	The format type of an individual DICOM data element, such as text, an integer, a person's name, or code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR) or without explicit identification (Implicit VR); when using Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

1.5. Abbreviations

AE	Application Entity
AET	Application Entity Title
CDA	Clinical Document Architecture
CD-R	Compact Disk Recordable
DICOM	Digital Imaging and Communications in Medicine
DNS	Domain Name System
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
HL7	Health Level 7 Standard
IHE	Integrating the Healthcare Enterprise
IOCM	Imaging Object Change Management
IOD	Information Object Definition
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Organization for Standards
JPEG	Joint Photographic Experts Group
LUT	Look-up Table
MPEG	Moving Picture Experts Group
MPPS	Modality Performed Procedure Step
MSPS	Modality Scheduled Procedure Step
MTU	Maximum Transmission Unit (IP)
MWL	Modality Worklist
OS	Operating System
PACS	Picture Archiving and Communication System
PDU	Protocol Data Unit
RIS	Radiology Information System
SCP	Service Class Provider
SCU	Service Class User

SOP	Service/Object Pair
SPS	Scheduled Procedure Step
SR	Structured Reporting
TCP/IP	Transmission Control Protocol/Internet Protocol
TLS	Transport Layer Security
VR	Value Representation
QIDO-RS	Query based on ID for DICOM Objects by RESTful Services
WA-DO-RS	Web Access to DICOM Objects by RESTful Services
WIA	Web-based DICOM Services (DICOMweb)
REST	Representational State Transfer
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
JSON	JavaScript Object Notation
XML	Extensible Markup Language

1.6. References

- NEMA PS3 Digital Imaging and Communications in Medicine (DICOM) Standard, available free at http://medical.nema.org/[1]
- synedra AIM product documentation, available at "synedra Softwaredokumentation".[2]
- TLS RFC, available at https://tools.ietf.org/html/rfc5246
- DICOM PS3.18 Web Services, available at http://dicom.nema.org/medical/dicom/current/output/html/part18.html

[1] http://dicom.nema.org/

[2] https://www.synedra.com/intra/documentation.php

2. Networking

2.1. Implementation Model

2.1.1. Application Data Flow Diagram

The following diagrams show all DICOM-related data flows into and out of synedra AIM.

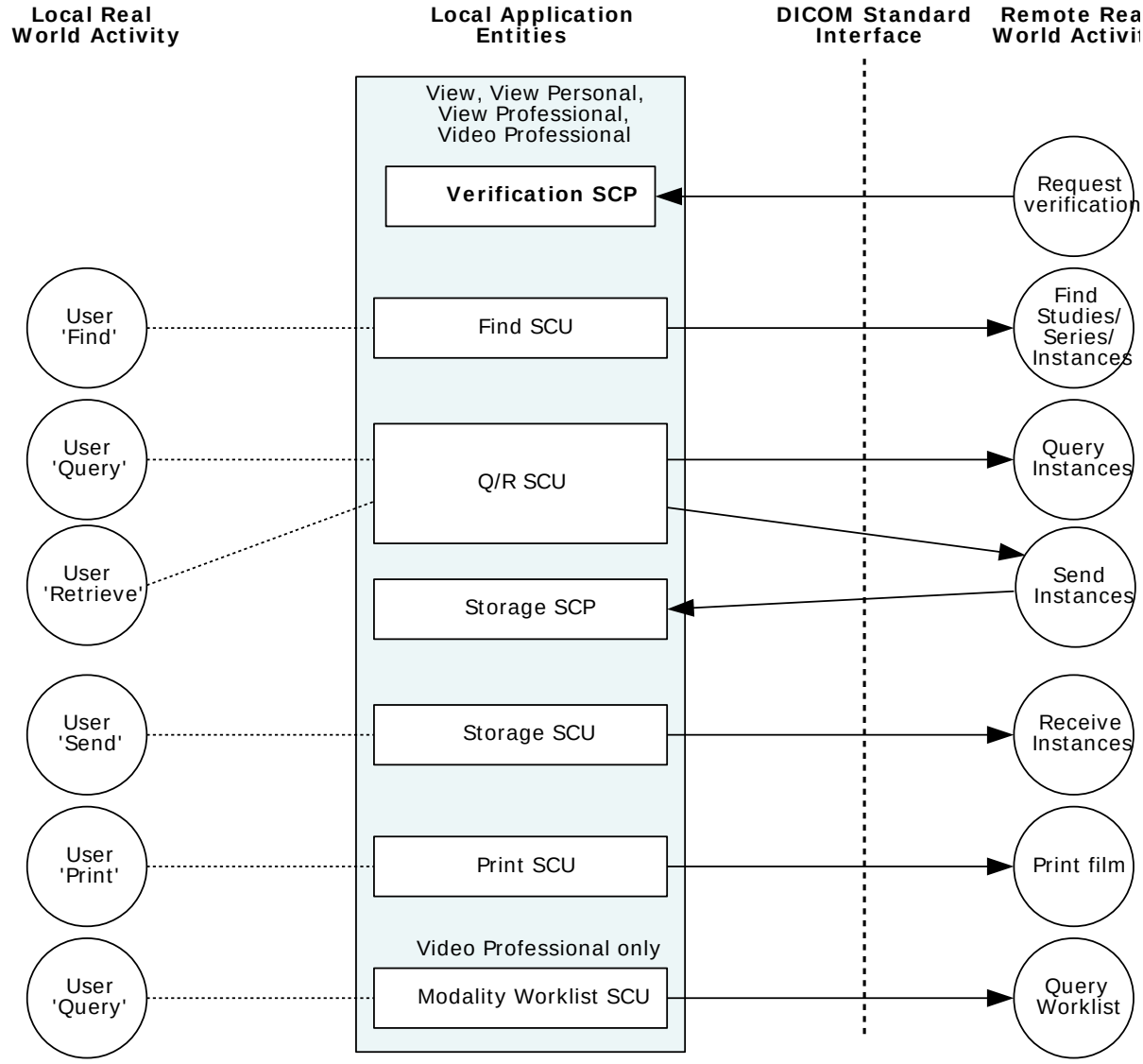
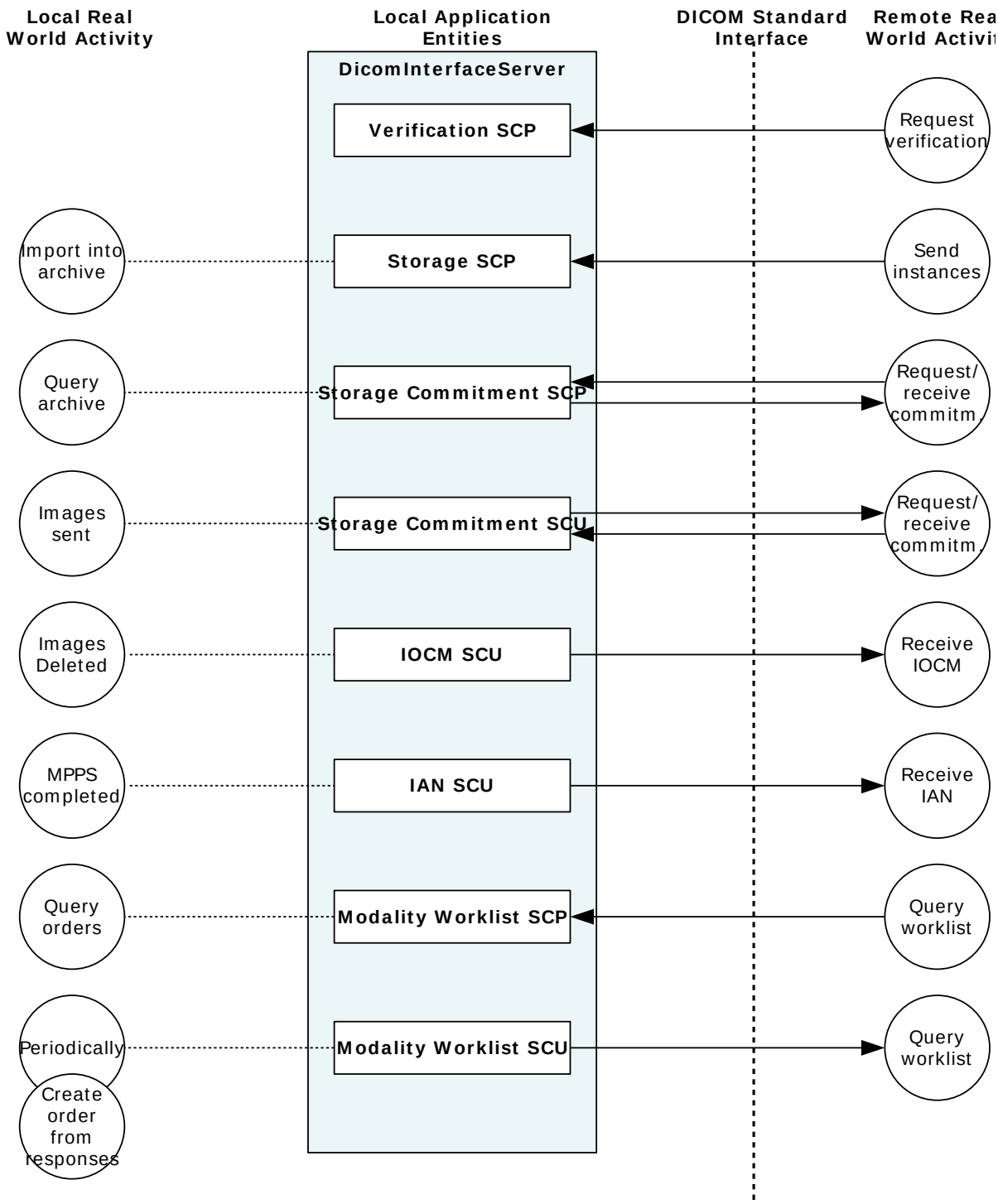


Figure 2.1. synedra View, View Personal, View Professional Application Flow Diagram


Local Real World Activity
Local Application Entities
DICOM Standard Interface
Remote Rea World Activi
DicomInterfaceServer
Verification SCP
Storage SCP
Storage Commitment SCP
Storage Commitment SCU
IOCM SCU
IAN SCU
Modality Worklist SCP
Modality Worklist SCU
Request verification
Send instances
Request/ receive commitm
Request/ receive commitm
Receive IOCM
Receive IAN
Query worklist
Query worklist
Import into archive
Query archive
Images sent
Images Deleted
MPPS completed
Query orders
Periodically
Create order from responses

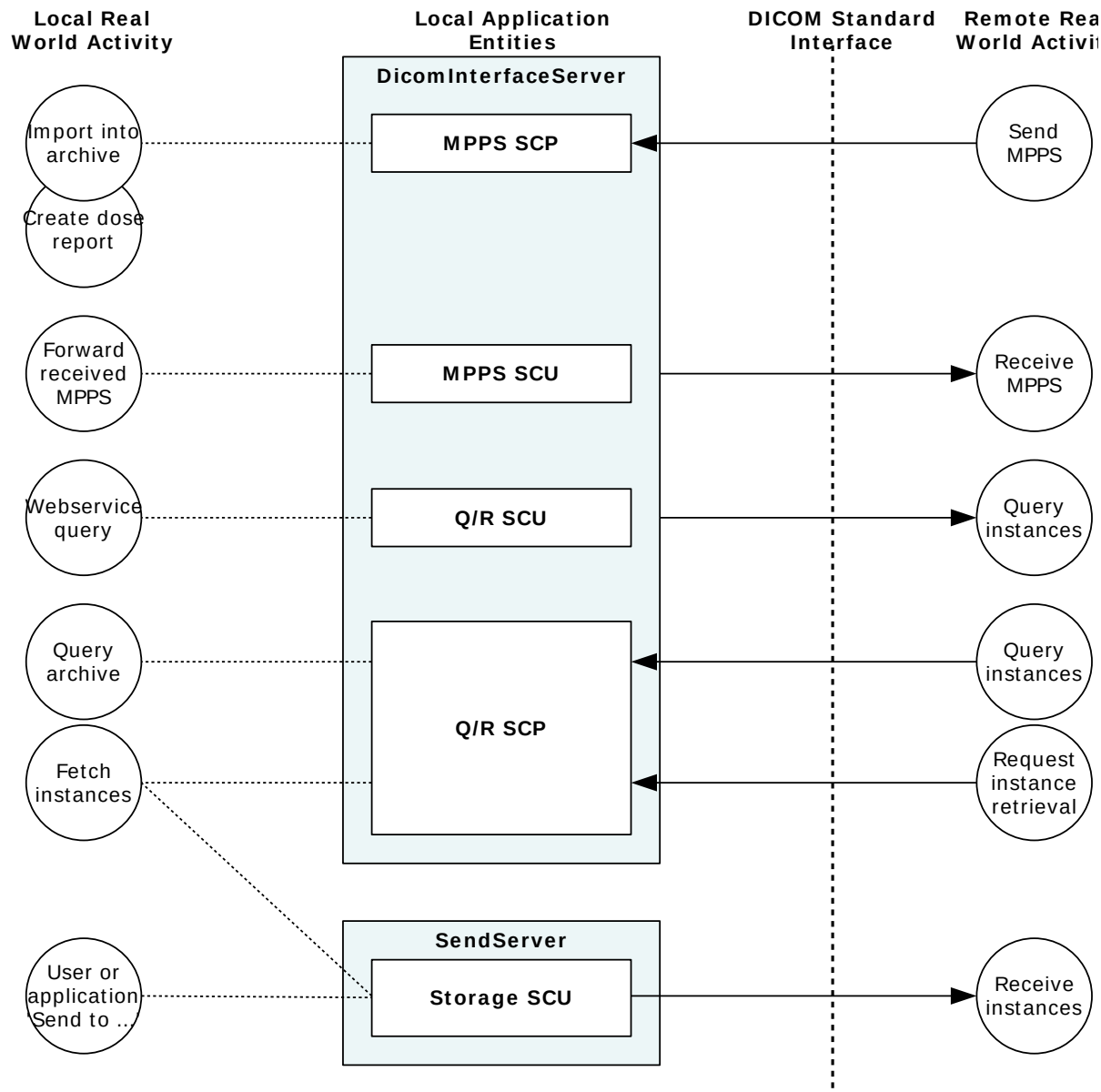


Figure 2.2. Application Flow Diagram

2.1.2. Functional Definitions of Applications

2.1.2.1. Functional Definitions of DicomInterfaceServer

DicomInterfaceServer is the main application for DICOM communication. It can handle

- Verification as an SCP
- Storage as an SCP
- Storage Commitment as an SCP and SCU
- Worklist queries as an SCP and SCU

- Query/Retrieve as an SCP and partially as an SCU (C-Find ant C-Move only)
- Instance Availability Notification as an SCP and an SCU
- Modality Performed Procedure Steps as an SCP and an SCU
- Query by ID for DICOM Objects as Provider of Service

Notes

DicomInterfaceServer handles the managing part of Q/R only, while SendServer handles the sending of data.

2.1.2.2. Functional Definitions of SendServer

SendServer is responsible for the outgoing communication. It can handle

- Storage as an SCU

2.1.2.3. Functional Definitions of View, View Personal, View Professional

View, View Personal, View Professional are capable of finding and retrieving studies, series, images, and importing data from CD/DVD media, as well as storing data. View, View Professional are capable of printing data and exporting data to cd/dvd.

- Verification as an SCP
- Find as an SCU
- Query/Retrieve as an SCU
- Storage as an SCU and SCP
- View, View Professional only: Printing (Grayscale and Color) as an SCU

2.1.2.4. Sequencing of Real World Activities

Composite SOP Instances must be received by the DicomInterfaceServer AE before Storage Commitment Push Model or Query-Retrieve Requests related to this SOP Instance can be handled successfully.

2.2. Application Entity Specification

2.2.1. View AE Specification

See Figure 2.2 (page 8) for the application flow diagram of View, View Personal, View Professional.

2.2.1.1. SOP Classes

View provides standard conformance to the following DICOM SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	No	Yes
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No
Study Root Query Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	No	Yes
Study Root Query Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	No	Yes
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	Yes
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	Yes
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1	Yes	Yes
Autorefraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.2	Yes	Yes
Basic Structured Display Storage	1.2.840.10008.5.1.4.1.1.131	Yes	Yes
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Yes	Yes
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Yes	Yes
Breast Projection X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.13.1.4	Yes	Yes
Breast Projection X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.13.1.5	Yes	Yes
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	Yes	Yes
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Yes	Yes
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Yes	Yes
Colon CAD SR	1.2.840.10008.5.1.4.1.1.88.69	Yes	Yes
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Yes	Yes
Comprehensive 3D SR	1.2.840.10008.5.1.4.1.1.88.34	Yes	Yes
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
Corneal Topography Map Storage	1.2.840.10008.5.1.4.1.1.82.1	Yes	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	Yes	Yes
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	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
Digital Mammography Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes
Digital Mammography Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	Yes	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	Yes
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3	Yes	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes
Enhanced PET Image Storage	1.2.840.10008.5.1.4.1.1.130	Yes	Yes
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2	Yes	Yes
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	Yes
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Yes	Yes
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2	Yes	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes
Generic Implant Template Storage	1.2.840.10008.5.1.4.43.1	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	Yes
Implant Assembly Template Storage	1.2.840.10008.5.1.4.44.1	Yes	Yes
Implantation Plan SR Document Storage	1.2.840.10008.5.1.4.1.1.88.70	Yes	Yes
Implant Template Group Storage	1.2.840.10008.5.1.4.45.1	Yes	Yes
Intraocular Lens Calculations Storage	1.2.840.10008.5.1.4.1.1.78.8	Yes	Yes
Intravascular Optical Coherence Tomography Image Storage -€# For Presentation	1.2.840.10008.5.1.4.1.1.14.1	Yes	Yes
Intravascular Optical Coherence Tomography Image Storage -€# For Processing	1.2.840.10008.5.1.4.1.1.14.2	Yes	Yes
Keratometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.3	Yes	Yes
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
Legacy Converted Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.2	Yes	Yes
Legacy Converted Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.4	Yes	Yes
Legacy Converted Enhanced PET Image Storage	1.2.840.10008.5.1.4.1.1.128.1	Yes	Yes
Lensometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.1	Yes	Yes
Macular Grid Thickness and Volume Report	1.2.840.10008.5.1.4.1.1.79.1	Yes	Yes
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Yes	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	Yes	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Ophthalmic Axial Measurements Storage	1.2.840.10008.5.1.4.1.1.78.7	Yes	Yes
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Yes	Yes
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Yes	Yes
Ophthalmic Thickness Map Storage	1.2.840.10008.5.1.4.1.1.81.1	Yes	Yes
Ophthalmic Tomography Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.4	Yes	Yes
Ophthalmic Visual Field Static Perimetry Measurements Storage	1.2.840.10008.5.1.4.1.1.80.1	Yes	Yes
Parametric Map Storage	1.2.840.10008.5.1.4.1.1.30	Yes	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	Yes
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40	Yes	Yes
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Yes	Yes
Radiopharmaceutical Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.68	Yes	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	Yes
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Yes	Yes
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1	Yes	Yes
RT Beams Delivery Instruction Storage	1.2.840.10008.5.1.4.34.7	Yes	Yes
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Yes	Yes
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Yes	Yes
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	Yes	Yes
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Yes	Yes
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	Yes
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes
Spectacle Prescription Report Storage	1.2.840.10008.5.1.4.1.1.78.6	Yes	Yes
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Yes	Yes
Subjective Refraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.4	Yes	Yes
Surface Scan Mesh Storage	1.2.840.10008.5.1.4.1.1.68.1	Yes	Yes
Surface Scan Point Cloud Storage	1.2.840.10008.5.1.4.1.1.68.2	Yes	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	Yes	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Yes	Yes
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Yes	Yes
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Yes	Yes
Visual Acuity Measurements Storage	1.2.840.10008.5.1.4.1.1.78.5	Yes	Yes
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	Yes
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	Yes
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	Yes
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	Yes
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6	Yes	Yes
XA/XRF Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.5	Yes	Yes
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	Yes
X-Ray 3D Craniofacial Image Storage	1.2.840.10008.5.1.4.1.1.13.1.2	Yes	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes

Table 2.1. SOP Classes for View, View Personal, View Professional

2.2.1.2. Association Policies

2.2.1.2.1. General

The DICOM standard application context name is always accepted.

Application Context Name	1.2.840.10008.3.1.1.1

Table 2.2. DICOM Application Context for View, View Personal, View Professional

2.2.1.2.2. Number of Associations

There is no limit to the number of associations View, View Personal, View Professional can handle - except hardware and OS restrictions.

2.2.1.2.3. Asynchronous Nature

View, View Personal, View Professional do not support asynchronous communication.

2.2.1.2.4. Implementation Identifying Information

Implementation Class UID	1.3.6.1.4.1.24930.6.1005
Implementation Version Name	synedra AIM

Table 2.3. Implementation Identifying Information

2.2.1.3. Association Initiating Policy

2.2.1.3.1. Activity - Print

Description and Sequencing of Activities

The user has selected and laid out one or more DICOM instances to print. View creates a new association for each print job. It then sends each page of the layout to be printed as one image to the printer.

The Flow Chart in Figure 2.3 shows the possible flow of control when printing.

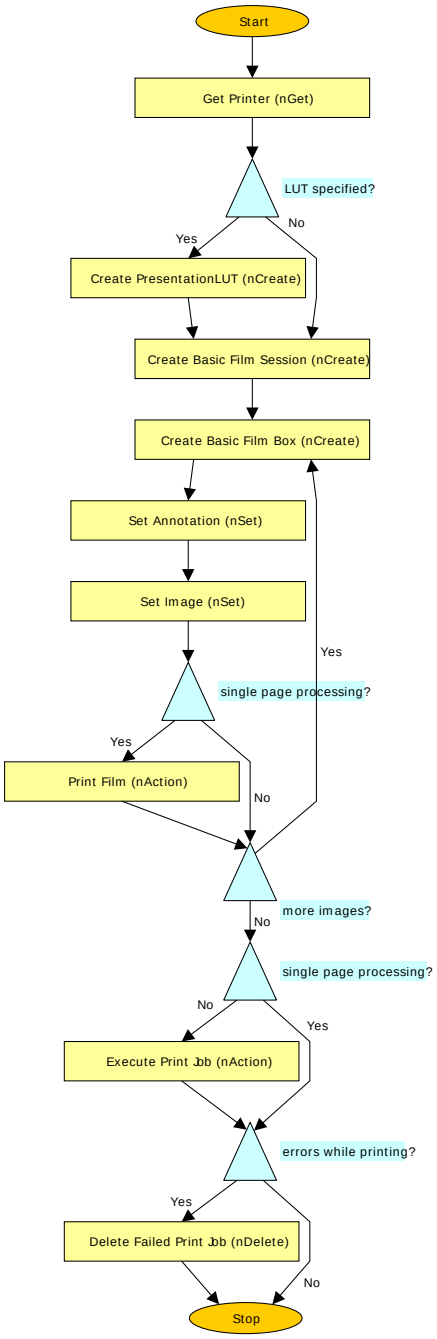


Figure 2.3. Print Flow Diagram

When using Print SCPs that do not support N-EXECUTE for Basic Film Sessions, single page processing needs to be activated in the configuration. This leads to each film box being printed separately.

Proposed presentation contexts

View, View Professional are capable of proposing the Presentation Contexts specified in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	none
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	none
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	none

[a]Extended Negotiation

Table 2.4. Proposed Presentation Contexts for Activity Store Instances

The configuration of the printer in View, View Professional determines the proposed print management meta class.

SOP Specific Conformance for Print Management SOP Classes

View provides standard conformance to the DICOM Print Management Service Class as an SCU.

The general behavior of Print Management AE:

- is to abort the current print job and display an error message during a communication failure.
- is to abort the current print job and display an error message when receiving a non-success response.
- is to fill all required tags as specified by the DICOM V3.0 Standard, 2008. Optional tags are not filled, except when explicitly specified.

SOP Specific Conformance for the Printer SOP Class

Print Management AE supports the following DIMSE operations and notifications for the Printer SOP Class:

- N-GET. The status code reported in the N-GET response is required to indicate success (0000). Otherwise, printing is aborted. The Printer Status (2110,0010) and Printer Status Info (2110,0020) attributes in the response are ignored.
- N-EVENT-REPORT. N-EVENT-REPORT requests can be received at any time during an association. They will always be responded to successfully, but are otherwise ignored.

SOP Specific Conformance for the Basic Film Session SOP Class

Print Management AE supports the following DIMSE operations and notifications for the Basic Film Session SOP Class:

- N-CREATE. The N-CREATE request contains the Number of Copies (2000,0010) and the Print Priority (2000,0020) attributes.
- N-ACTION. The N-ACTION request is used to print the complete film session if single-page processing is not used. It contains the "Print" Action Type and no optional attributes.
- N-DELETE. The N-DELETE request is used to delete a film session in the case that an error occurs while printing.

SOP Specific Conformance for the Basic Film Box SOP Class

Print Management AE supports the following DIMSE operations and notifications for the Basic Film Box SOP Class:

- N-CREATE. The N-CREATE request always contains the Film Orientation (2010,0040) and the Film Size ID (2010,0050) attributes. It contains the Referenced Presentation LUT Sequence (2050,0500) attribute if a LUT was selected by the user.
- N-ACTION. The N-ACTION request will be used to print a single page if single-page processing is used. It contains the "Print" Action Type and no optional attributes.

SOP Specific Conformance for the Basic Grayscale Image Box SOP Class

Print Management AE supports the following DIMSE operations and notifications for the Basic Grayscale Image Box SOP Class:

- N-SET. The N-SET request contains the Requested Image Size (2020,0030) attribute if the original size print option was selected by the user.

SOP Specific Conformance for the Basic Color Image Box SOP Class

Print Management AE supports the following DIMSE operations and notifications for the Basic Color Image Box SOP Class:

- N-SET. The N-SET request contains the Requested Image Size (2020,0030) attribute if the original size print option was selected by the user.

SOP Specific Conformance for the Presentation LUT SOP Class

Print Management AE supports the following DIMSE operations and notifications for the Presentation LUT SOP Class:

- N-CREATE. The N-CREATE request always contains the Presentation LUT Sequence (2050,0010) attribute.

2.2.1.3.2. Activity - Query/Retrieve

Description and Sequencing of Activities

View, View Personal, View Professional send a query request (C-FIND) (containing user-supplied criteria) for instances and display the received C-FIND responses in a GUI. If the user decides to transfer some or all instances, View, View Personal, View Professional send a transfer request (C-MOVE) to the remote AE containing the name of its own Storage SCP as the target of the transfer.

Proposed presentation contexts

View, View Personal, View Professional are capable of proposing the Presentation Contexts specified in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Study Root Query Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Yes[b]
Study Root Query Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	none

[a]Extended Negotiation

[b]Relational queries are supported

Table 2.5. Proposed Presentation Contexts for Activity Store Instances

SOP Specific Conformance for Query SOP Classes

View, View Personal, View Professional support the following optional keys for Study Root Query Retrieve Information Model - FIND

Attribute Name	**Tag**
Study Level	
Patient's Birth Date	(0010,0030)
Patient's Sex	(0010,0040)
Study Description	(0008,1030)
Modalities in Study	(0008,0061)
Referring Physician's Name	(0008,0090)
Series Level	

Attribute Name	Tag
Series Description	(0008,103E)

Table 2.6. Supported optional keys for Study Root Query Retrieve Information Model - FIND

View, View Personal, View Professional support relational queries (configurable).

View, View Personal, View Professional do not support combined date-time matching or fuzzy semantic matching.

View, View Personal, View Professional honor the supplied Specific Character Set (0008,0005) when interpreting C-FIND results. For C-FIND Requests, the Specific Character Set "ISO_IR 100" (Latin 1/ISO 8859-1) or "ISO_IR 192" (UTF-8) is used, depending on how the query can be represented.

2.2.1.3.3. Activity - Store instances

Description and Sequencing of Activities

The user requests DICOM instances to be sent to a remote AE. View, View Personal, View Professional initiate an association with the remote AE, proposing the presentation contexts required to transfer the requested instances. It then stores the instances using C-STORE requests.

Proposed presentation contexts

SendServer can propose the following Presentation Contexts:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
All storage SOP Classes		Any transfer syntax		SCP	none

[a]Extended Negotiation

Table 2.7. Proposed Presentation Contexts for Activity Store Instances

If an instance is to be transferred for which no presentation context containing the stored transfer syntax of the instance exists, the instance is not sent and an error message is displayed.

SOP Specific Conformance for Storage SOP Classes

View, View Personal, View Professional provide standard conformance to the DICOM Storage Service Class as an SCU.

A successful C-STORE operation will result in the send job being marked as completed in the GUI.

A C-STORE operation whose status is either an error or a warning results in the send job marked as failed in the GUI. Error (warning) information will be displayed.

Any optional element of any storage SOP Class may be included in Storage SOP instances.

View, View Personal, View Professional do not support referenced pixel data transfer syntaxes.

2.2.1.4. Association Acceptance Policy

View, View Personal, View Professional accept associations on the TCP ports specified in its configuration.

2.2.1.4.1. Activity - Connectivity Verification

Description and Sequencing of Activities

View, View Personal, View Professional wait for incoming DICOM associations and respond to a Verification Request (C-ECHO).

Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Verification SOP Class	1.2.840.10008.1.1	Any transfer syntax (configurable)		SCP	none

[a]Extended Negotiation

Table 2.8. Acceptable Presentation Contexts for Connectivity Verification

SOP specific conformance for Verification SOP Class

View, View Personal, View Professional provide standard conformance to the DICOM Verification Service Class as an SCP.

2.2.1.4.2. Activity - Store instances

Description and Sequencing of Activities

View, View Personal, View Professional receive a request (C-STORE) to store an instance. It loads the instance into a part of the GUI and replies with a status of Success.

Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
All storage SOP Classes		Any transfer syntax (configurable)		SCP	none

[a]Extended Negotiation

Table 2.9. Acceptable Presentation Contexts for Store instances

SOP specific conformance for storage SOP Classes

View, View Personal, View Professional provide Level 2 (Full), Signature Level 1 standard conformance to the DICOM Storage Service Class as an SCP.

No optional elements are discarded.

A successful C-STORE operation implies that the instance is loaded in the GUI of View, View Personal, View Professional.

Instances are stored in volatile memory only. The user may discard them any time at his discretion.

View, View Personal, View Professional always return successful C-STORE responses. Any error during the operation results in an error message.

2.2.2. DicomInterfaceServer AE Specification

See Figure 2.2 (page 8) for the application flow diagram for DicomInterfaceServer.

2.2.2.1. SOP Classes

DicomInterfaceServer provides standard conformance to the following DICOM SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	No	Yes
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	Yes
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	Yes
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1	Yes	Yes
Autorefraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.2	Yes	Yes
Basic Structured Display Storage	1.2.840.10008.5.1.4.1.1.131	Yes	Yes
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Yes	Yes
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Yes	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Breast Projection X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.13.1.4	Yes	Yes
Breast Projection X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.13.1.5	Yes	Yes
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	Yes	Yes
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Yes	Yes
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Yes	Yes
Colon CAD SR	1.2.840.10008.5.1.4.1.1.88.69	Yes	Yes
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Yes	Yes
Comprehensive 3D SR	1.2.840.10008.5.1.4.1.1.88.34	Yes	Yes
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
Corneal Topography Map Storage	1.2.840.10008.5.1.4.1.1.82.1	Yes	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	Yes	Yes
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	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
Digital Mammography Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes
Digital Mammography Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	Yes	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	Yes
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3	Yes	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes
Enhanced PET Image Storage	1.2.840.10008.5.1.4.1.1.130	Yes	Yes
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2	Yes	Yes
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	Yes
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Yes	Yes
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2	Yes	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes
Generic Implant Template Storage	1.2.840.10008.5.1.4.43.1	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	Yes
Implant Assembly Template Storage	1.2.840.10008.5.1.4.44.1	Yes	Yes
Implantation Plan SR Document Storage	1.2.840.10008.5.1.4.1.1.88.70	Yes	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Implant Template Group Storage	1.2.840.10008.5.1.4.45.1	Yes	Yes
Intraocular Lens Calculations Storage	1.2.840.10008.5.1.4.1.1.78.8	Yes	Yes
Intravascular Optical Coherence Tomography Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.14.1	Yes	Yes
Intravascular Optical Coherence Tomography Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.14.2	Yes	Yes
Keratometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.3	Yes	Yes
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
Legacy Converted Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.2	Yes	Yes
Legacy Converted Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.4	Yes	Yes
Legacy Converted Enhanced PET Image Storage	1.2.840.10008.5.1.4.1.1.128.1	Yes	Yes
Lensometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.1	Yes	Yes
Macular Grid Thickness and Volume Report	1.2.840.10008.5.1.4.1.1.79.1	Yes	Yes
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Yes	Yes
Ophthalmic Axial Measurements Storage	1.2.840.10008.5.1.4.1.1.78.7	Yes	Yes
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Yes	Yes
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Yes	Yes
Ophthalmic Thickness Map Storage	1.2.840.10008.5.1.4.1.1.81.1	Yes	Yes
Ophthalmic Tomography Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.4	Yes	Yes
Ophthalmic Visual Field Static Perimetry Measurements Storage	1.2.840.10008.5.1.4.1.1.80.1	Yes	Yes
Parametric Map Storage	1.2.840.10008.5.1.4.1.1.30	Yes	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	Yes
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40	Yes	Yes
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Yes	Yes
Radiopharmaceutical Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.68	Yes	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Yes	Yes
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1	Yes	Yes
RT Beams Delivery Instruction Storage	1.2.840.10008.5.1.4.34.7	Yes	Yes
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Yes	Yes
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Yes	Yes
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	Yes	Yes
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Yes	Yes
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	Yes
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes
Spectacle Prescription Report Storage	1.2.840.10008.5.1.4.1.1.78.6	Yes	Yes
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Yes	Yes
Subjective Refraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.4	Yes	Yes
Surface Scan Mesh Storage	1.2.840.10008.5.1.4.1.1.68.1	Yes	Yes
Surface Scan Point Cloud Storage	1.2.840.10008.5.1.4.1.1.68.2	Yes	Yes
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	Yes	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Yes	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	Yes
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Yes	Yes
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Yes	Yes
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Yes	Yes
Visual Acuity Measurements Storage	1.2.840.10008.5.1.4.1.1.78.5	Yes	Yes
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	Yes
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	Yes
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	Yes
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	Yes
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6	Yes	Yes
XA/XRF Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.5	Yes	Yes

SOP Class Name	SOP Class UID	SCU	SCP
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	Yes
X-Ray 3D Craniofacial Image Storage	1.2.840.10008.5.1.4.1.1.13.1.2	Yes	Yes
X-Ray Angiographic Bi-plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Yes	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	Yes
Instance Availability Notification SOP Class	1.2.840.10008.5.1.4.33	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	Yes
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	Yes
Study Root Query Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Patient Root Query Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	Yes
Study Root Query Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Patient Root Query Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Yes	Yes
Study Root Query Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.2.3	No	Yes
Patient Root Query Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.1.3	No	Yes

Table 2.10. SOP Classes for DicomInterfaceServer

2.2.2.2. Association Policies

2.2.2.2.1. General

The DICOM standard application context name is always accepted.

Application Context Name	1.2.840.10008.3.1.1.1

Table 2.11. DICOM Application Context for DicomInterfaceServer

2.2.2.2.2. Number of Associations

DicomInterfaceServer can handle at most 50 incoming associations at the same time.

2.2.2.2.3. Asynchronous Nature

DicomInterfaceServer does not support asynchronous communication.

2.2.2.2.4. Implementation Identifying Information

Implementation Class UID	1.3.6.1.4.1.24930.6.1005
Implementation Version Name	synedra AIM

Table 2.12. Implementation Identifying Information

2.2.2.3. Association Initiating Policy

2.2.2.3.1. Activity - Receive Storage Commitment Request

Description and Sequencing of Activities

A remote AE has requested a storage commitment from DicomInterfaceServer by sending an N-ACTION message. If the locale configuration for the remote AE is set to asynchronous Storage Commitment, the response to this request is not given on the same association. Instead, DicomInterfaceServer initiates a new association to perform an N-EVENT-REPORT operation. No storage commits are granted for soft-deleted images.

Proposed presentation contexts

DicomInterfaceServer can propose the following Presentation Contexts:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	none

[a]Extended Negotiation

Table 2.13. Proposed Presentation Contexts for Activity Receive Storage Commitment Request

2.2.2.3.2. Activity - Send Storage Commitment Request

Description and Sequencing of Activities

When SendServer is configured to trigger Storage Commitment requests, it notifies DicomInterfaceServer, whenever a set of SOP instances has been sent. DicomInterfaceServer in turn requests a Storage Commitment, by sending an N-Action. DicomInterfaceServer also requests storage commitments for IOCM requests. If the locale

configuration for the remote AE is set to asynchronous Storage Commitment, the response to this request is not on the same association. Instead, DicomInterfaceServer expects a new association to be opened by the remote AE, and the N-EVENT-REPORT to be sent on this new association.

Proposed presentation contexts

For the response (N-Event report), DicomInterfaceServer supports the Presentation Contexts specified in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	none

[a]Extended Negotiation

Table 2.14. Proposed Presentation Contexts for Activity Send Storage Commitment Request

2.2.2.3.3. Activity - Send Instance Availability Notification

Description and Sequencing of Activities

DicomInterfaceServer has received a Modality Performed Procedure Step message that marks the step as COMPLETED. DicomInterfaceServer then sends an Instance Availability Notification to all configured remote AEs.

Proposed presentation contexts

DicomInterfaceServer can propose the following Presentation Contexts:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Instance Availability Notification SOP Class	1.2.840.10008.5.1.4.33	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	none

[a]Extended Negotiation

Table 2.15. Proposed Presentation Contexts for Send Instance Availability Notification

SOP Specific Conformance for Instance Availability Notification SOP Class

DicomInterfaceServer provides standard conformance to the DICOM Instance Availability Notification Service Class as an SCU.

DicomInterfaceServer creates and sends an IAN SOP Class Instance if it has received an MPPS with the status COMPLETED.

IAN SOP Class Instances created always contain "ONLINE" as Instance Availability (0008,0056), which means that every instance is always available in synedra AIM.

2.2.2.3.4. Activity - Forward received MPPS

Description and Sequencing of Activities

DicomInterfaceServer has received a Modality Performed Procedure Step message. DicomInterfaceServer forwards this message to all configured remote AEs.

Proposed presentation contexts

DicomInterfaceServer can propose the following Presentation Contexts:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	none

[a]Extended Negotiation

Table 2.16. Proposed Presentation Contexts for Forward received MPPS

SOP Specific Conformance for Modality Performed Procedure Step SOP Class

DicomInterfaceServer provides standard conformance to the DICOM Instance Availability Notification Service Class as an SCU.

Since DicomInterfaceServer forwards incoming MPPS, please refer to the DICOM Conformance Statement of the creating system for details about provided attribute values, conditions required to create an MPSS, etc.

2.2.2.3.5. Activity - Receive IOCM Notifications

Description and Sequencing of Activities

A KOS Object with an IOCM rejection reason is sent to DicomInterfacesServer via C-Store. DicomInterfaceServer (soft-)deletes the referenced images and/or marks them to be rejected for further attempts at storing them.

The KOS Objects themselves are archived and immediately soft-deleted. Storage Commit Request will be answered positively, but the Objects won't be accessible via Query/Retrieve requests by default. It is, however, possible to configure DicomInterfaceServer to deliver soft-deleted Objects on specific ports.

Proposed presentation contexts

DicomInterfaceServer can propose the following Presentation Contexts:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Key Object Selection Document SOP Class	1.2.840.10008.5.1.4.1.1.88.59	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	none

[a]Extended Negotiation

Table 2.17. Proposed Presentation Contexts for Forward received MPPS

2.2.2.3.6. Activity - Send IOCM Notifications

Description and Sequencing of Activities

Images were deleted in AIM. DicomInterfaceServer sends IOCM notifications to configured application entities and request Storage Commitments for the sent KOS objects. In this context, DicomInterfaceServer only supports synchronous (i.e. on same association) Storage Commit responses.

Proposed presentation contexts

DicomInterfaceServer can propose the following Presentation Contexts:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Key Object Selection Document SOP Class	1.2.840.10008.5.1.4.1.1.88.59	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	none

[a]Extended Negotiation

Table 2.18. Proposed Presentation Contexts for Forward Received MPPS

2.2.2.3.7. Activity - Query C-Find SCU

Description and Sequencing of Activities

DicomInterfaceServer receives a webservice call with search parameters for a Dicom C-Find query. DicomInterfaceServer sends a C-Find request and return the results to the caller of the webservice.

Proposed presentation contexts

DicomInterfaceServer can propose the following Presentation Contexts:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Patient Root Query/ Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	none

[a]Extended Negotiation

Table 2.19. Proposed Presentation Contexts for C-Find requests

2.2.2.3.8. Activity - Retrieve C-Move SCU

Description and Sequencing of Activities

DicomInterfaceServer receives a webservice call with parameters for a Dicom C-Move request. DicomInterfaceServer subsequently sends a C-Move request.

Proposed presentation contexts

DicomInterfaceServer can propose the following Presentation Contexts:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Patient Root Query/ Retrieve Information Model - Move	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	none

[a]Extended Negotiation

Table 2.20. Proposed Presentation Contexts for C-Move requests

2.2.2.4. Association Acceptance Policy

DicomInterfaceServer accepts associations on the TCP ports specified in its configuration. If a TCP port is configured to use TLS, the remote AE must establish the TCP connection with TLS. If the TCP port is configured to require client authentication, the remote AE must establish the TCP connection with TLS and present a client certificate that has been signed by a Certificate Authority and whose public key is known (i.e. configured) to DicomInterfaceServer.

DicomInterfaceServer can be configured to check the calling AET and called AET of the incoming association request against a list of allowed values. Both values must satisfy the configured criteria.

If the connection requirements described above are fulfilled and if any of the presentation contexts shown below are met, an association will be accepted.

2.2.2.4.1. Activity - Connectivity Verification

Description and Sequencing of Activities

DicomInterfaceServer waits for incoming DICOM associations and respond to a Verification Request (C-ECHO).

Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
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

[a]Extended Negotiation

Table 2.21. Acceptable Presentation Contexts for Connectivity Verification

SOP specific conformance for Verification SOP Class

DicomInterfaceServer provides standard conformance to the DICOM Verification Service Class as an SCP.

2.2.2.4.2. Activity - Store instances

Description and Sequencing of Activities

DicomInterfaceServer receives a request (C-STORE) to store an instance. It stores the instance in the archive and replies with a status of Success.

Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
All storage SOP Classes		Any transfer syntax		SCP	none

[a]Extended Negotiation

Table 2.22. Acceptable Presentation Contexts for Store instances

The acceptable presentation contexts are configurable. Please refer to the DicomInterfaceServer documentation provided in "synedra Softwaredokumentation".[1]

SOP specific conformance for storage SOP Classes

DicomInterfaceServer provides Level 2 (Full), Signature Level 1 standard conformance to the DICOM Storage Service Class as an SCP.

No optional elements are discarded.

A successful C-STORE operation implies that the instance is queued for archiving. Once archiving has been completed, DicomInterfaceServer provides storage commitment for the instance and to provide the instances with the Query/Retrieve Service Class.

Instances are stored forever (in the absence of catastrophic events).

In the event of consistency errors, Study UIDs/Series UIDs/Instance SOP UIDs of incoming data may be changed (depending on the configuration, please refer to the documentation of ArchiveServer provided in "synedra Softwaredokumentation".[2]). Since consistency checks occur during archiving and archiving is performed asynchronously, DicomInterfaceServer will not generate a warning in this case.

[1] https://www.synedra.com/intra/documentation.php

[2] https://www.synedra.com/intra/documentation.php

DicomInterfaceServer stores instances as-is, even in the presence of Lossy Image Compression (0028,2110).

Service Status	Further Meaning	Error Code	Reason
Success	Success	0000	The Composite SOP Instance was successfully received and queued for archiving.
Warning	Elements Discarded	B006	The Composite SOP Instance was not accepted for archiving due to IOCM restrictions.
Error	Error	C000	The Composite SOP Instance could not be archived. Reasons include • Wrong configuration of DicomInterfaceServer • Network problems • An invalid configuration of the modality (e.g. host and AE title) • A problem during the import to synedra AIM (e.g. insufficient disk space) • Invalid IOCM Rejection Note • Internal errors

Table 2.23. DicomInterfaceServer C-STORE Response Status Return Reasons

2.2.2.4.3. Activity - Receive Storage Commitment Request

Description and Sequencing of Activities

DicomInterfaceServer receives a storage commitment request (N-ACTION) and replies by sending an N-EVENT-REPORT message. Depending on the configuration of the remote AE in synedra AIM, it will either do so on the same association or initiate a new association to send the N-EVENT-REPORT message.

Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	none

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
		Explicit VR Big Endian			

[a]Extended Negotiation

Table 2.24. Acceptable Presentation Contexts for Storage Commitment

SOP specific conformance for Storage Commitment Push Model SOP Class

DicomInterfaceServer provides standard conformance to the DICOM Storage Commitment Service Class as an SCP.

The Activity associated with the Storage Commitment Push Model Service is the communication by the DicomInterfaceServer 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 DicomInterfaceServer has taken responsibility for the archiving of specific SOP Instances, so that they can be flushed from the peer AE system.

DicomInterfaceServer uses the list of Composite SOP Instance UIDs specified in a Storage Commitment Push Model N-ACTION Request to check if they are present in the synedra AIM database. If some instances are not found, a configurable amount of time is spent waiting for asynchronous archiving processes to finish, before the check is performed again.

Once DicomInterfaceServer has checked for the existence of the specified Composite SOP Instances, it attempts to send the Notification Request (N-EVENT-REPORT-RQ). Depending on the configuration, the notification is either sent over the same Association or on a separate Association.

DicomInterfaceServer does not cache Storage Commitment Push Model N-ACTION Requests specifying Composite SOP Instances that have not been archived yet. If a peer AE sends a Storage Commitment Push Model N-ACTION Request before the specified Composite SOP Instances are archived, DicomInterfaceServer does not accept responsibility for such Storage Commitment of such SOP Instances.

synedra AIM allows to delete Composite SOP Instances from the archive (e.g. to meet data retention policy requirements). The absolute persistence of SOP Instances and the maximum archiving capacity for such SOP Instances is dependent on the actual hardware synedra AIM runs on.

DicomInterfaceServer always uses the values specified in the following table for Storage Media File-Set ID & UID attributes in the N-ACTION operation.

Attribute Name	Tag	Value
Storage Media File-Set ID	(0088,0130)	synedra AIM
Storage Media File-Set UID	(0088,0140)	1.3.6.1.4.1.24930

Table 2.25. Storage Media File Set values

DicomInterfaceServer supports the optional Retrieve AE Title (0008,0054) Attribute in the N-EVENT-REPORT. It is determined by the configuration of DicomInterfaceServer and the port of the incoming association.

2.2.2.4.4. Activity - Send Storage Commitment request

Description and Sequencing of Activities

DicomInterfaceServer receives a request via webservice call to request a Storage Commitment (N-ACTION). It expexts the response (N-EVENT-REPORT) to be sent asynchronously, i.e. on a new association, initiated by the peer.

Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	none

[a]Extended Negotiation

Table 2.26. Acceptable Presentation Contexts for Storage Commitment

2.2.2.4.5. Activity - Worklist Query

Description and Sequencing of Activities

DicomInterfaceServer receives a worklist query request (C-FIND) and replies by sending C-FIND response messages for each worklist match found. After all matches have been sent, a final C-FIND response with a status of Success is sent.

Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	none

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
		Explicit VR Big Endian			

[a]Extended Negotiation

Table 2.27. Acceptable Presentation Contexts for Worklist Query

SOP specific conformance for Modality Worklist Information Model - FIND

DicomInterfaceServer provides standard conformance to the DICOM Basic Worklist Management Service Class as an SCP.

DicomInterfaceServer supports the following optional keys for Modality Worklist Information Model - FIND.

Attribute Name	**Tag**	**Matching supported?**	**Return supported?**
Admitting Diagnosis Description	(0008,1080)	yes	yes
InstitutionalDepartmentName	(0008,1040)	yes	yes
Scheduled Procedure Step Sequence	(0040,0100)		
>Scheduled Station AE Title	(0040,0001)	yes	yes
>Scheduled Procedure Step Start Date	(0040,0002)	yes	yes
>Scheduled Procedure Step Start Time	(0040,0003)	yes	yes
>Modality	(0008,0060)	yes	yes
>Scheduled Performing Physician's Name	(0040,0006)	yes	yes
>Scheduled Procedure Step Description	(0040,0007)	yes	yes
>Scheduled Protocol Code Sequence	(0040,0008)	yes	yes
>>Code Value	(0008,0100)	yes	yes
>>Coding Scheme Version	(0008,0103)	yes	yes
>>Coding Scheme Designator	(0008,0102)	yes	yes
>Scheduled Procedure Step ID	(0040,0009)	yes	yes
Requested Procedure ID	(0040,1001)	yes	yes
Reason for the Requested Procedure	(0040,1002)	yes	yes
Requested Procedure Description	(0032,1060)	yes	yes
Requested Procedure Comments	(0040,1400)	yes	yes
Study Instance UID	(0020,000D)	yes	yes
Referenced Study Sequence	(0008,1110)	no	yes
Accession Number	(0008,0050)	yes	yes
Issuer Of Accession Number Sequence	(0008,0051)	yes	yes
>Local Namespace Entity ID	(0040,0031)	yes	yes

Attribute Name	Tag	Matching supported?	Return supported?
Requesting Physician	(0032,1032)	yes	yes
Referring Physician's Name	(0008,0090)	yes	yes
Admission ID	(0038,0010)	yes	yes
Current Patient Location	(0038,0300)	yes	yes
Referenced Patient Sequence	(0008,1120)	no	yes
Patient's Name	(0010,0010)	yes	yes
Patient ID	(0010,0020)	yes	yes
Patient's Birth Date	(0010,0030)	yes	yes
Patient's Sex	(0010,0040)	yes	yes
Patient's Weight	(0010,1030)	yes	yes
Patient's Size	(0010,1020)	yes	yes
Confidentiality Constraint On Patient Data	(0040,3001)	yes	yes
Patient State	(0038,0500)	yes	yes
Pregnancy Status	(0010,21C0)	yes	yes
Medical Alerts	(0010,2000)	yes	yes
Allergies	(0010,2110)	yes	yes
Special Needs	(0038,0050)	yes	yes

Table 2.28. Supported optional keys for Modality Worklist Information Model

DicomInterfaceServer does not support fuzzy semantic matching of person names.

The following table shows the attributes for which DicomInterfaceServer supports case-insensitive matching in Worklist Queries.

Attribute Name	Tag
Patient's Name	(0010,0010)
Patient's Sex	(0010,0040)
Modality	(0028,3000)

Table 2.29. Case insensitive matching keys

DicomInterfaceServer respects the supplied Specific Character Set (0008,0005) when interpreting queries. Matching is always based on UTF-8 and query parameters are translated accordingly. Responses are sent in the configured character set, defaulting to "ISO_IR 100". The Timezone Offset From UTC (0008,0201) is not supported.

2.2.2.4.6. Activity - Receive MPPS

Description and Sequencing of Activities

A remote AE creates a Modality Performed Procedure Step by sending an N-CREATE request to DicomInterfaceServer. At a later time, it sends one or more N-SET requests to update (e.g. mark as completed) the MPPS.

Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	none

[a]Extended Negotiation

Table 2.30. Acceptable Presentation Contexts for Receive MPPS

SOP specific conformance for Modality Performed Procedure Step SOP Class

DicomInterfaceServer provides standard conformance to the DICOM Modality Performed Procedure Step SOP Class as an SCP.

DicomInterfaceServer accepts any DICOM-compliant attribute value within N-CREATE or N-SET operations.

If DicomInterfaceServer receives an MPPS with a "Performed Procedure Step Status" Attribute of "COMPLETED" or "DISCONTINUED", it no longer returns the associated worklist items. MPPS will persist forever.

2.2.2.4.7. Activity - Query/Retrieve

Description and Sequencing of Activities

DicomInterfaceServer receives a query request (C-FIND) for instances and replies by sending C-FIND response messages for each instance match found. After all matches have been sent, a final C-FIND response with a status of Success is sent.

After the remote AE has processed the query results, it may decide to transfer some (or all) of the instances found. It does so by sending a C-MOVE request to DicomInterfaceServer, which in turn instructs the SendServer AE to transfer the requested instances to the requested target (using C-STORE).

Alternatively, the remote AE may also download some (or all) of the instances found by sending a C-GET request to DicomInterfaceServer, which replies by transferring the requested instances within the same transaction.

Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Study Root Query Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	yes[b]
Patient Root Query Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	yes[b]
Study Root Query Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	none
Patient Root Query Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	none
Study Root Query Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.2.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	none

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
Patient Root Query Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.1.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	none
All storage SOP Classes		JPEG Lossless JPEG Baseline Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	none

[a]Extended Negotiation

[b]Relational queries and combined date-time matching are supported, but no fuzzy matching.

Table 2.31. Acceptable Presentation Contexts for Query/Retrieve

SOP specific conformance for Patient and Study Root Query Retrieve Information Model SOP Classes

DicomInterfaceServer provides standard conformance to the DICOM Patient and Study Root Query Retrieve Information Model SOP Classes as an SCP.

The following table shows the optional keys supported by DicomInterfaceServer:

Attribute Name	**Tag**	**Matching supported?**	**Return supported?**
Patient Level			
Patient's Birth Date	(0010,0030)	yes	yes
Patient's Sex	(0010,0040)	yes	yes
Number of Patient Related Studies	(0020,1200)	no	yes
Number of Patient Related Series	(0020,1202)	no	yes
Number of Patient Related Instances	(0020,1204)	no	yes
Study Level			
Modalities in Study	(0008,0061)	yes	yes
Study Description	(0008,1030)	yes	yes

Attribute Name	Tag	Matching supported?	Return supported?
Referring Physician's Name	(0008,0090)	yes	yes
Number of Study Related Series	(0020,1206)	no	yes
Number of Study Related Instances	(0020,1208)	no	yes
Series Level			
Series Description	(0008,103E)	yes	yes
RequestAttributesSequence	(0040,0275)	yes	yes
>Requested Procedure ID	(0040,1001)	yes	yes
>Scheduled Procedure Step ID	(0040,0009)	yes	yes
Performed Procedure Step Start Date	(0040,0244)	yes	yes
Institution Name	(0008,0080)	yes	yes
Number of Series Related Instances	(0020,1209)	no	yes
Composite Object Instance Level			
SOP Class UID	(0008,0016)	yes	yes
Rows	(0028,0010)	yes	yes
Columns	(0028,0011)	yes	yes
BitsAllocated	(0028,0100)	yes	yes
NumberOfFrames	(0028,0008)	yes	yes

Table 2.32. Supported optional keys for Patient and Study Root Query Retrieve Information Model SOP Classes

DicomInterfaceServer supports relational queries and combined date-time matching.

DicomInterfaceServer uses default values for not specified segments of data elements with VR DA (00000101), TM (000000.000000), and DT (00000101000000.000000) and matches them exactly. For example, a value of '201205' for AcquisitionDateTime will be interpreted as '20120501000000.00000000' and only matches entries for 2012-05-01 00:00:00.000000 exactly. To search for all entries from May 2012, range matching needs to be used. For the specific example '201205-201206'.

DicomInterfaceServer does not support fuzzy matching.

DicomInterfaceServer supports case-insensitive matching for the following attributes:

Attribute Name	Tag
Query Retrieve Level	(0008,0052)
Patient's Sex	(0010,0040)
Patient's Name	(0010,0010)
Accession Number	(0008,0050)
Modalities in Study	(0008,0061)
Institution Name	(0008,0080)
Study Description	(0008,1030)
Referring Physician's Name	(0008,0090)

Attribute Name	Tag
Modality	(0008,0060)
Series Description	(0008,103E)

Table 2.33. Attributes matched case-insensitive

DicomInterfaceServer respects the supplied Specific Character Set (0008,0005) when interpreting queries. Matching is always done in UTF-8 and query parameters are translated accordingly. Responses are sent in the configured character set, defaulting to "ISO_IR 100". The Timezone Offset From UTC (0008,0201) is not supported.

2.2.2.4.8. Activity - Query by ID for DICOM Objects

Description and Sequencing of Activities

DicomInterfaceServer receives a query request (QIDO-RS) for instances and replies by sending JSON or XML responses for each instance match found.

The maximum number of matches is not limited. DicomInterfaceServer provides a native implementation (as opposed to a proxy implementatino) of QIDO-RS. Fuzzy Matching, Empty Value Matching and Empty Value Matching are not supported.

Supported Optional Attributes

DicomInterfaceServer supports the following optional matching attributes:

Attribute Name	Tag	Matching supported?	Return supported?
Patient Level			
Patient's Birth Date	(0010,0030)	yes	yes
Patient's Sex	(0010,0040)	yes	yes
Number of Patient Related Studies	(0020,1200)	no	yes
Number of Patient Related Series	(0020,1202)	no	yes
Number of Patient Related Instances	(0020,1204)	no	yes
Study Level			
Modalities in Study	(0008,0061)	yes	yes
Study Description	(0008,1030)	yes	yes
Referring Physician's Name	(0008,0090)	yes	yes
Number of Study Related Series	(0020,1206)	no	yes
Number of Study Related Instances	(0020,1208)	no	yes
Series Level			
Series Description	(0008,103E)	yes	yes

Attribute Name	Tag	Matching supported?	Return supported?
RequestAttributesSequence	(0040,0275)	yes	yes
>Requested Procedure ID	(0040,1001)	yes	yes
>Scheduled Procedure Step ID	(0040,0009)	yes	yes
Performed Procedure Step Start Date	(0040,0244)	yes	yes
Institution Name	(0008,0080)	yes	yes
Number of Series Related Instances	(0020,1209)	no	yes
Composite Object Instance Level			
SOP Class UID	(0008,0016)	yes	yes
Rows	(0028,0010)	yes	yes
Columns	(0028,0011)	yes	yes
BitsAllocated	(0028,0100)	yes	yes
NumberOfFrames	(0028,0008)	yes	yes

Table 2.34. Supported optional keys for Patient and Study Root Query Retrieve Information Model SOP Classes

2.2.3. SendServer AE Specification

See Figure 2.2 (page 8) for the application flow diagram for SendServer.

2.2.3.1. SOP Classes

SendServer provides standard conformance to the following DICOM SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	No
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	No
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1	Yes	No
Autorefraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.2	Yes	No
Basic Structured Display Storage	1.2.840.10008.5.1.4.1.1.131	Yes	No
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Yes	No
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Yes	No
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Yes	No
Breast Projection X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.13.1.4	Yes	No
Breast Projection X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.13.1.5	Yes	No
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	Yes	No
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Yes	No
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Yes	No

SOP Class Name	SOP Class UID	SCU	SCP
Colon CAD SR	1.2.840.10008.5.1.4.1.1.88.69	Yes	No
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Yes	No
Comprehensive 3D SR	1.2.840.10008.5.1.4.1.1.88.34	Yes	No
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Yes	No
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	No
Corneal Topography Map Storage	1.2.840.10008.5.1.4.1.1.82.1	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	No
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	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
Digital Mammography Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	No
Digital Mammography Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	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
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	No
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	No
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3	Yes	No
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	No
Enhanced PET Image Storage	1.2.840.10008.5.1.4.1.1.130	Yes	No
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Yes	No
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2	Yes	No
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	No
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Yes	No
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2	Yes	No
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	No
Generic Implant Template Storage	1.2.840.10008.5.1.4.43.1	Yes	No
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	No
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	No
Implant Assembly Template Storage	1.2.840.10008.5.1.4.44.1	Yes	No
Implantation Plan SR Document Storage	1.2.840.10008.5.1.4.1.1.88.70	Yes	No
Implant Template Group Storage	1.2.840.10008.5.1.4.45.1	Yes	No
Intraocular Lens Calculations Storage	1.2.840.10008.5.1.4.1.1.78.8	Yes	No
Intravascular Optical Coherence Tomography Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.14.1	Yes	No
Intravascular Optical Coherence Tomography Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.14.2	Yes	No

SOP Class Name	SOP Class UID	SCU	SCP
Keratometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.3	Yes	No
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	Yes	No
Legacy Converted Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.2	Yes	No
Legacy Converted Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.4	Yes	No
Legacy Converted Enhanced PET Image Storage	1.2.840.10008.5.1.4.1.1.128.1	Yes	No
Lensometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.1	Yes	No
Macular Grid Thickness and Volume Report	1.2.840.10008.5.1.4.1.1.79.1	Yes	No
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	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 Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Yes	No
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	No
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Yes	No
Ophthalmic Axial Measurements Storage	1.2.840.10008.5.1.4.1.1.78.7	Yes	No
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Yes	No
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Yes	No
Ophthalmic Thickness Map Storage	1.2.840.10008.5.1.4.1.1.81.1	Yes	No
Ophthalmic Tomography Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.4	Yes	No
Ophthalmic Visual Field Static Perimetry Measurements Storage	1.2.840.10008.5.1.4.1.1.80.1	Yes	No
Parametric Map Storage	1.2.840.10008.5.1.4.1.1.30	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	No
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40	Yes	No
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Yes	No
Radiopharmaceutical Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.68	Yes	No
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	No
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Yes	No
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1	Yes	No
RT Beams Delivery Instruction Storage	1.2.840.10008.5.1.4.34.7	Yes	No
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Yes	No
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Yes	No
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Yes	No

SOP Class Name	SOP Class UID	SCU	SCP
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	No
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	Yes	No
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Yes	No
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	No
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	No
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	No
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Yes	No
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	No
Spectacle Prescription Report Storage	1.2.840.10008.5.1.4.1.1.78.6	Yes	No
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Yes	No
Subjective Refraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.4	Yes	No
Surface Scan Mesh Storage	1.2.840.10008.5.1.4.1.1.68.1	Yes	No
Surface Scan Point Cloud Storage	1.2.840.10008.5.1.4.1.1.68.2	Yes	No
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	Yes	No
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Yes	No
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	No
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Yes	No
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Yes	No
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Yes	No
Visual Acuity Measurements Storage	1.2.840.10008.5.1.4.1.1.78.5	Yes	No
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	No
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	No
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	No
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	No
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6	Yes	No
XA/XRF Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.5	Yes	No
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	No
X-Ray 3D Craniofacial Image Storage	1.2.840.10008.5.1.4.1.1.13.1.2	Yes	No
X-Ray Angiographic Bi-plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	No

SOP Class Name	SOP Class UID	SCU	SCP
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	No

Table 2.35. SOP Classes for SendServer

2.2.3.2. Association Policies

2.2.3.2.1. General

The DICOM standard application context name is always accepted.

Application Context Name	1.2.840.10008.3.1.1.1

Table 2.36. DICOM Application Context for SendServer

2.2.3.2.2. Number of Associations

SendServer has no hard limit on outgoing associations, but an upper limit for outgoing associations can be configured.

2.2.3.2.3. Asynchronous Nature

SendServer does not support asynchronous communication.

2.2.3.2.4. Implementation Identifying Information

Implementation Class UID	1.3.6.1.4.1.24930.6.1005
Implementation Version Name	synedra AIM

Table 2.37. Implementation Identifying Information

2.2.3.3. Association Initiating Policy

2.2.3.3.1. Activity - Store instances

Description and Sequencing of Activities

DicomInterfaceServer, RoutingServer, or another product of synedra AIM has requested instances to be transferred to a remote AE. SendServer initiates an association with the remote AE, proposing the presentation con-

texts required to transfer the requested instances (according to the configuration stored for the remote AE). It then stores the instances using C-STORE requests.

Proposed presentation contexts

SendServer can propose the following Presentation Contexts:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**[a]
Name	**UID**	**Name List**	**UID List**		
All storage SOP Classes		Any transfer syntax		SCP	none

[a]Extended Negotiation

Table 2.38. Proposed Presentation Contexts for Activity Store Instances

The proposed presentation contexts can be configured on a per-AE basis.

If an instance is to be transferred for which no presentation context with the stored transfer syntax of the instance exists, the instance is transcoded impromptu, i.e. the instance is sent in one of the transfer syntaxes available. This is not recommended for reasons of performance and image quality though. Also, note that some transcoding combinations are not possible.

SOP Specific Conformance for Storage SOP Classes

SendServer provides standard conformance to the DICOM Storage Service class as an SCU.

A successful C-STORE operation results in the send job being marked as completed.

A C-STORE operation whose status is either an error or a warning will result in the send job being marked as failed. Status details will be recorded. SendServer will also write entries into the logfile.

Any optional element of any storage SOP Class may be included in Storage SOP Instances.

SendServer does not support referenced pixel data transfer syntaxes.

2.2.3.4. Association Acceptance Policy

SendServer does not accept associations.

2.3. Network Interfaces

2.3.1. Physical Network Interface

Not applicable, synedra AIM supports any network interface supported by the underlying OS.

2.3.2. Additional Protocols

IPv4 is used by all Application Entities.

IPv6 is not supported.

DNS resolution is required for proper operation of all Application Entities.

2.4. Configuration

2.4.1. AE Title/Presentation Address Mapping

2.4.1.1. Local AE Titles

When printing films, View, View Professional use a configurable value as Calling AET of the outgoing association.

When querying for instances, View, View Personal, and View Professional use a configurable value as Calling AET of the outgoing association.

When sending instances, View, View Personal, View Professional use a configurable value as Calling AET of the outgoing association.

When sending asynchronous storage commitment responses, DicomInterfaceServer uses the Called AET of the request as Calling AET of the outgoing association.

When sending Instance Availability Notifications, DicomInterfaceServer uses a configurable value as Calling AET of the outgoing association.

When forwarding received MPPS, DicomInterfaceServer uses the Calling AET of the incoming association as Calling AET of the outgoing association.

When sending instances to remote AEs, SendServer uses a configurable value as Calling AET of the outgoing association.

Application Entity	**Default AE Title**	**Default TCP/IP Port**
View, View Personal, View Professional	SYNEDRA_VIEW	104
DicomInterfaceServer	SYNEDRA_AIM	11600
SendServer	SYNEDRA_AIM	-

Table 2.39. AE Title Configuration Table

2.4.1.2. Remote AE Title/Presentation Address Mapping

2.4.1.2.1. View, View Professional

Remote AEs for printing and query/retrieve can be configured in the configuration dialog of View, View Professional. Each activity allows multiple AEs.

2.4.1.2.2. DicomInterfaceServer and SendServer

Remote AEs are configured in the AET management of synedra Control Center. Associations are only accepted from known hosts that are associated with the calling AET.

2.4.2. Parameters

Parameter	Configurable	Default Value
View, View Personal, View Professional parameters		
Timeout waiting for acceptance or rejection Response to an Association Open Request (Application Level timeout)	no	indefinite
General DIMSE level timeout	no	120 s
Timeout waiting for response to TCP/IP connect request (Low-level timeout)	no	20 s
Timeout waiting for acceptance of a TCP/IP message over the network (Low-level timeout)	no	20 s
Timeout for waiting for data between TCP/IP packets (Low-level timeout)	no	indefinite
Maximum PDU Size the AE can send/receive	yes	131072
DicomInterfaceServer and SendServer parameters		
Timeout waiting for acceptance or rejection Response to an Association Open Request (Application Level timeout)	no	5 s
General DIMSE level time-out	no	10 s
Timeout waiting for response to TCP/IP connect request (Low-level timeout)	no	5 s
Timeout waiting for acceptance of a TCP/IP message over the network (Low-level timeout)	no	5 s
Timeout waiting for data between TCP/IP packets (Low-level timeout)	no	60 s
Maximum PDU Size the AE can send/receive	no	16384
TCP Nagle Algorithm	no	disabled

Table 2.40. Parameters

3. Web-based DICOM Services (WIA / DICOMweb)

This chapter describes the conformance of synedra AIM to the DICOM Web Services defined in DICOM PS3.18. These services use RESTful HTTP/HTTPS interfaces and are independent of the DIMSE-based services described in the Networking chapter.

3.1. Implementation Model

3.1.1. Application Data Flow

synedra AIM exposes and consumes DICOMweb endpoints over HTTP/HTTPS. The *DicomInterfaceServer* serves as origin server for QIDO-RS and WADO-RS transactions. The *XDSServer* serves as user agent for QIDO-RS and WADO-RS transactions.

3.1.2. Functional Definitions

3.1.2.1. Functional Definition of the WIA Server (DicomInterfaceServer)

The WIA Server component of synedra AIM provides RESTful HTTP endpoints conforming to DICOM PS3.18. External systems can query and retrieve DICOM objects using standard HTTP GET requests. The Server supports:

- QIDO-RS: Search for Studies, Series, and Instances
- WADO-RS: Retrieve Studies, Series, Instances, Frames, Bulk Data, and Metadata

3.1.2.2. Functional Definition of the WIA Client (XDSServer)

The WIA Client component of synedra AIM can connect to external DICOMweb-compliant servers using HTTP/HTTPS. It supports:

- QIDO-RS: Querying remote servers for Studies, Series, and Instances
- WADO-RS: Retrieving DICOM objects from remote servers

3.1.2.3. Sequencing of Real World Activities

QIDO-RS queries may be issued at any time. WADO-RS retrieve requests should be preceded by a QIDO-RS query to identify valid Study/Series/Instance UIDs. The server only returns resources for instances that have been successfully stored in the archive.

3.2. Web Application Entity Specification

3.2.1. WIA Server AE Specification (Service Provider)

The WIA Server AE provides QIDO-RS and WADO-RS services over HTTP/HTTPS. External clients connect to this AE to query and retrieve DICOM content from the synedra AIM archive.

3.2.1.1. QIDO-RS — Search (Provider)

synedra AIM supports the QIDO-RS service as defined in DICOM PS3.18 Section 10.6 Search Transaction. Queries are performed using HTTP GET requests against the following resource URLs.

Role: synedra AIM (DicomInterfaceServer) plays the role of *origin server* for QIDO-RS transactions.

Implementation type: Native implementation. synedra AIM directly serves query results from its own archive database; it does not act as a proxy to another DICOMweb server.

Maximum number of matches: The maximum number of matches returned for a single QIDO-RS query is unbound.

3.2.1.1.1. Supported Resources

Resource	URL Template	Supported
Search for Studies	{baseURL}/studies	Yes
Search for Series	{baseURL}/series	Yes
Search for Series in a Study	{baseURL}/studies/{StudyInstanceUID}/series	Yes
Search for Instances	{baseURL}/instances	Yes
Search for Instances in a Study	{baseURL}/studies/{StudyInstanceUID}/instances	Yes
Search for Instances in a Series	{baseURL}/studies/{StudyInstanceUID}/series/{SeriesInstanceUID}/instances	Yes

Table 3.1. QIDO-RS Supported Resources (Server)

3.2.1.1.2. Supported Query Parameters

Parameter	Supported	Remarks
All Dicom attributes	Yes	DicomInterfaceServer indexes a subset of Dicom attributes. Additional attributes can be configured via the `[AdditionalMetadata] # AdditionalAttributes` system configuration.
limit	Yes	Pagination support: Maximum number of results returned
offset	Yes	Pagination support: Index of first result to be returned
includefield	Yes	"all" and specific tags supported
fuzzymatching	No	Warning 299 returned if sent
emptyvaluematching	No	Warning 299 returned if sent
multiplevaluematching	No	Warning 299 returned if sent

Table 3.2. QIDO-RS Query Parameters (Server)

3.2.1.1.3. Response Media Types

Media Type	Supported
application/dicom+json	Yes
multipart/related; type="application/dicom+xml"	Yes

Table 3.3. QIDO-RS Response Media Types (Server)

3.2.1.1.4. Response Status Codes

Code	Meaning
200 OK	The query was successful and matching resources are returned.
204 No Content	The query was successful but no matching resources were found.
400 Bad Request	The request was malformed or contained invalid parameters.

Code	Meaning
401 Unauthorized	Authentication is required.
403 Forbidden	The requester is not authorized to access this resource.
406 Not Acceptable	Not all values can be encoded in UTF-8.
500 Internal Server Error	An unexpected error occurred on the server.

Table 3.4. QIDO-RS HTTP Response Status Codes (Server)

3.2.1.2. WADO-RS — Retrieve (Provider)

synedra AIM supports the WADO-RS service as defined in DICOM PS3.18 Section 10.4 Retrieve Transaction. DICOM objects are retrieved using HTTP GET requests against the following resource URLs.

Role: synedra AIM (DicomInterfaceServer) plays the role of *origin server* for WADO-RS transactions.

3.2.1.2.1. Supported Header Fields

Header Field	Supported	Remarks
Accept	Yes	
Accept-Charset	Yes	Only UTF-8 is supported.

Table 3.5. WADO-RS Supported Header Fields (Server)

3.2.1.2.2. Supported Query Parameters

Parameter	Supported	Remarks
accept	Yes	Allows media type selection via query parameter in addition to the Accept header field.
charset	Yes	Supported for Metadata resources; UTF-8 is the only supported character set.
annotation	Yes	Supported for Rendered resources (image annotation overlay).
quality	Yes	Supported for Rendered resources (JPEG compression quality, 1–100).

Parameter	Supported	Remarks
viewport	Yes	Supported for Rendered resources (target width and height in pixels; cropping is not supported).
window	No	
offset	Yes	Supported for Bulkdata resources.
length	Yes	Supported for Bulkdata resources.

Table 3.6. WADO-RS Optional Query Parameters (Server)

3.2.1.2.3. Supported Composite SOP Classes

All Composite SOP classes stored in the synedra AIM archive are retrievable via WADO-RS.

3.2.1.2.4. Supported Retrieve Resources

Resource	URL Template	Supported
Retrieve Study	{baseURL}/studies/{StudyInstanceUID}	Yes
Retrieve Series	{baseURL}/studies/{StudyInstanceUID}/series/{SeriesInstanceUID}	Yes
Retrieve Instance	{baseURL}/studies/{StudyInstanceUID}/series/{SeriesInstanceUID}/instances/{SOPInstanceUID}	Yes
Retrieve Frames	{baseURL}/studies/{StudyInstanceUID}/series/{SeriesInstanceUID}/instances/{SOPInstanceUID}/frames/{FrameList}	Yes
Retrieve Study - Metadata	{baseURL}/studies/{StudyInstanceUID}/metadata	Yes
Retrieve Series - Metadata	{baseURL}/studies/{StudyInstanceUID}/series/{SeriesInstanceUID}/metadata	Yes
Retrieve Instance - Metadata	{baseURL}/studies/{StudyInstanceUID}/series/{SeriesInstanceUID}/instances/{SOPInstanceUID}/metadata	Yes

Resource	URL Template	Supported
Retrieve Study - Rendered	{baseURL}/ studies/{StudyInstanceUID}/rendered	Yes
Retrieve Series - Rendered	{baseURL}/ studies/{StudyInstanceUID}/se- ries/{SeriesInstanceUID}/rendered	Yes
Retrieve Instance - Rendered	{baseURL}/ studies/{StudyInstanceUID}/se- ries/{SeriesInstanceUID}/in- stances/{SOPInstanceUID}/rendered	Yes
Retrieve Frames - Rendered	{baseURL}/ studies/{StudyInstanceUID}/se- ries/{SeriesInstanceUID}/in- stances/{SOPInstanceUID}/frames/ {FrameList}/rederenderedred	Yes
Retrieve Bulk Data	{baseURL}/bulkdata/{imageId}	Yes

Table 3.7. WADO-RS Supported Resources (Server)

3.2.1.2.5. Supported Response Media Types

Media Type	Applicable Re- sources	Supported
multipart/related; type="application/dicom"	Instance, Series, Study	Yes
multipart/related; type="application/octet-stream"	Instance, Series, Study, Bulkdata	Yes
application/dicom+json	Metadata	Yes
multipart/related; type="application/dicom+xml"	Metadata	Yes
multipart/related; type="image/jpeg"	Rendered	Yes
multipart/related; type="image/png"	Rendered	Yes
multipart/related; type="image/gif"	Rendered	Yes
multipart/related; type="text/html"	Rendered	Yes
multipart/related; type="text/plain"	Rendered	Yes
multipart/related; type="text/xml"	Rendered	No

Table 3.8. WADO-RS Response Media Types (Server)

3.2.1.2.6. Response status codes

Code	Meaning
200 OK	All requested instances were found and are returned.

Code	Meaning
206 Partial Content	Some instances were found; a warning header lists missing items.
400 Bad Request	The request was malformed.
401 Unauthorized	Authentication is required.
403 Forbidden	The requester is not authorized.
404 Not Found	The requested Study/Series/Instance does not exist.
406 Not Acceptable	None of the requested media types or transfer syntaxes are supported.
503 Service Unavailable	The service is temporarily unavailable.

Table 3.9. WADO-RS HTTP Response Status Codes (Server)

3.2.2. WIA Client AE Specification (Service User)

The WIA Client AE allows to connect to external DICOMweb servers as a consuming application. Connections are made using HTTP/HTTPS GET requests as defined in DICOM PS3.18.

3.2.2.1. QIDO-RS — Search (User)

synedra AIM issues QIDO-RS search requests to external DICOMweb servers to discover Studies, Series, and Instances prior to retrieval.

Role: synedra AIM (XDSServer) plays the role of *user agent* for QIDO-RS transactions.

3.2.2.1.1. Supported Resources

Resource	URL Template	Supported
Search for Studies	{baseURL}/studies	Yes
Search for Series in a Study	{baseURL}/studies/{StudyInstanceUID}/series	Yes
Search for Instances in a Series	{baseURL}/studies/{StudyInstanceUID}/series/{SeriesInstanceUID}/instances	Yes

Table 3.10. QIDO-RS Supported Resources (Client)

3.2.2.1.2. Supported Query Parameters (Client)

Parameter	Matching key supported	Return key (includefield) supported
StudyDate (0008,0020)	Yes	Yes
StudyTime (0008,0030)	Yes	Yes
AccessionNumber (0008,0050)	Yes	Yes
IssuerOfAccessionNumberSequence > LocalNamespaceEntityID (0008,0051 > 0040,0031)	Yes	Yes
IssuerOfAccessionNumberSequence > UniversalEntityID (0008,0051 > 0040,0032)	Yes	Yes
IssuerOfAccessionNumberSequence > UniversalEntityIDType (0008,0051 > 0040,0033)	Yes	Yes
ModalitiesInStudy (0008,0061)	Yes	Yes
ReferringPhysicianName (0008,0090)	Yes	Yes
RetrieveURL (0008,1190)	No	Yes
PatientName (0010,0010)	Yes	Yes
PatientID (0010,0020)	Yes	Yes
IssuerOfPatientID (0010,0021)	Yes	Yes
IssuerOfPatientIDQualifiersSequence > UniversalEntityID (0010,0024 > 0040,0032)	Yes	Yes
IssuerOfPatientIDQualifiersSequence > UniversalEntityIDType (0010,0024 > 0040,0033)	Yes	Yes
PatientBirthDate (0010,0030)	Yes	Yes
PatientSex (0010,0040)	Yes	Yes
StudyInstanceUID (0020,000D)	Yes	Yes
StudyID (0020,0010)	Yes	Yes
Modality (0008,0060)	Yes	Yes
SeriesDescription (0008,103E)	Yes	Yes
SeriesInstanceUID (0020,000E)	Yes	Yes
SeriesNumber (0020,0011)	Yes	Yes
PerformedProcedureStepStartDate (0040,0244)	Yes	Yes
PerformedProcedureStepStartTime (0040,0245)	Yes	Yes
RequestAttributesSequence > ScheduledProcedureStepID (0040,0275 > 0040,0009)	Yes	Yes
RequestAttributesSequence > RequestedProcedureID (0040,0275 > 0040,1001)	Yes	Yes
SOPClassUID (0008,0016)	Yes	Yes
SOPInstanceUID (0008,0018)	Yes	Yes

Parameter	Matching key supported	Return key (includefield) supported
InstanceNumber (0020,0013)	Yes	Yes
limit	Yes	No
offset	Yes	No
fuzzymatching	No	No
emptyvaluematching	No	No
multiplevaluematching	No	No

Table 3.11. QIDO-RS Query Parameters Sent (Client)

3.2.2.1.3. Accepted Response Media Types (Client)

Media Type	Accepted
application/dicom+json	Yes
multipart/related; type="application/dicom+xml"	No

Table 3.12. QIDO-RS Accepted Response Media Types (Client)

3.2.2.2. WADO-RS — Retrieve (User)

synedra AIM issues WADO-RS retrieve requests to external DICOMweb servers to download DICOM instances for display and processing.

Role: synedra AIM (XDSServer) plays the role of *user agent* for WADO-RS transactions.

Optional Header Fields used: The `Accept` header field is set on all outgoing WADO-RS requests. The `Authorization` header field (Bearer Token / IUA) is set when IUA parameters are available.

Composite SOP classes: synedra AIM retrieves any Composite SOP class returned by the remote origin server.

Thumbnail support: Thumbnails are not explicitly requested by the WIA Client. Rendered representations may be requested via the Rendered resource if supported by the remote server.

3.2.2.2.1. Supported Retrieve Resources (Client)

Resource	URL Template	Supported
Retrieve Study	{baseURL}/studies/{StudyInstanceUID}	Yes
Retrieve Series	{baseURL}/studies/{StudyInstanceUID}/series/{SeriesInstanceUID}	Yes
Retrieve Instance	{baseURL}/studies/{StudyInstanceUID}/se-	Yes

Resource	URL Template	Supported
	ries/{SeriesInstanceUID}/in-stances/{SOPInstanceUID}	
Retrieve Frames	{baseURL}/ studies/{StudyInstanceUID}/se-ries/{SeriesInstanceUID}/in-stances/{SOPInstanceUID}/frames/ {FrameList}	Yes
Retrieve Instance Metadata	{baseURL}/ studies/{StudyInstanceUID}/se-ries/{SeriesInstanceUID}/in-stances/{SOPInstanceUID}/metadata	Yes
Retrieve Bulk Data (URI-referenced)	{bulkDataURI}	Yes

Table 3.13. WADO-RS Supported Resources (Client)

3.2.2.2.2. Accepted Transfer Syntaxes (Client)

Transfer Syntax Name	Transfer Syntax UID	Accepted
Any (wildcard negotiation)	transfer-syntax="*"	Yes
Implicit VR Little Endian	1.2.840.10008.1.2	Yes
Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	Yes
JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91	Yes

Table 3.14. WADO-RS Accepted Transfer Syntaxes (Client)

3.2.2.2.3. Accepted Response Media Types (Client)

Media Type	Accepted
multipart/related; type="application/dicom"	Yes
multipart/related; type="application/dicom+xml"	Yes
multipart/related; type="application/octet-stream"	Yes
multipart/related; type="image/jpeg"	Yes
multipart/related; type="image/png"	Yes
multipart/related; type="image/gif"	Yes
application/dicom+json	Yes

Table 3.15. WADO-RS Accepted Response Media Types (Client)

4. Media Interchange

4.1. Implementation Model

4.1.1. Application Data Flow Diagram

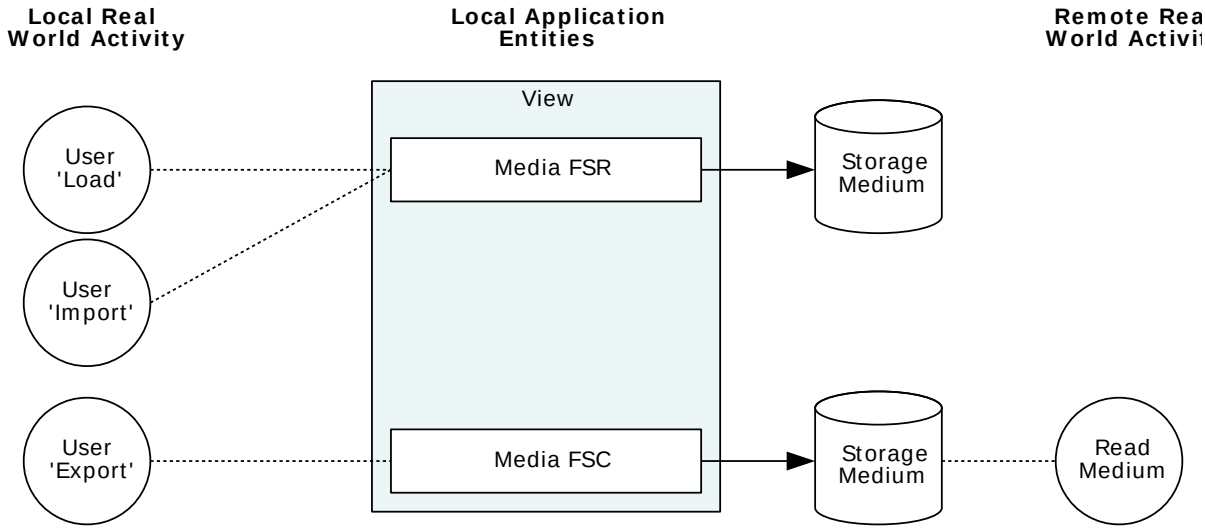


Figure 4.1. View, View Personal, View Professional Application Flow Diagram

4.1.2. Functional Definitions of Applications

4.1.2.1. Functional Definitions of View, View Personal, and View Professional

View, View Personal, and View Professional load a user-selected PS3.10-compliant file, which may be a DICOMDIR or another DICOM object (image, SR), either from the local file system or from PS3.12-compliant media according to one of the General Purpose Media Application Profiles of PS3.11.

View and View Professional can also export user-selected DICOM objects to the local file system or create PS3.12-compliant media.

4.1.2.2. Sequencing of Real World Activities

All activities are initiated by the user interface and can be initiated/executed in parallel.

4.1.3. File Meta Information for Implementation Class and Version

Attribute	Tag	Value
File Meta Information Version	(0002,0001)	00\01
Implementation Class UID	(0002,0012)	1.3.6.1.4.1.24930.1
Implementation Version Name	(0002,0013)	DCMTK360_synedra

Table 4.1. File Meta Information attributes

4.2. Application Entity Specification

4.2.1. View, View Personal, View Professional AE Specification

View, View Personal, and View Professional provide standard conformance to the Media Storage Service Class.

Application Profiles Supported	Real World Activity	Role
All STD-GEN profiles (if hardware available)	Load directory or file	FSR
STD-GEN-CD, STD-CTMR-CD, STD-CTMR-DVD, STD-GEN-DVD-JPEG	Export to media	FSC

Table 4.2. Application Profiles, Activities, and Roles for View, View Personal, and View Professional

4.2.1.1. File Meta Information for View

View does neither use Source Application Entity Title nor Private Information.

4.2.1.2. Real World Activities

4.2.1.2.1. Activity - Load Directory or File

View, View Personal, and View Professional are activated through the user interface when a user selects the File load operation. If the loaded file is a DICOMDIR, a browser is displayed, from which instances may be selected and in turn loaded. Otherwise, the file is loaded and displayable.

4.2.1.2.2. Activity - Export to Media

View, View Professional are activated through the user interface when a user selects the Export operation. The currently loaded files are exported to a file system in a format suitable for creating media. Depending on the configuration, the operation system or disc producer handles the actual creation of the media.

4.3. Augmented and Private Profiles

None.

4.4. Media Configuration

View and View Professional provide the configuration for various means to produce media (locally installed burning device, disc producers). At least one such configuration must be created before Export to Media is available.

5. Transformation of DICOM to CDA

Not applicable.

6. Support of Character Sets

All application entities support the ISO_IR 100 (ISO 8859-1:1987 Latin Alphabet No. 1 supplementary set)

The use of ISO_IR 192 (Unicode in UTF-8) is partially supported.

For incoming requests without an explicit Specific Characterset, the DicomInterfaceServer uses a configurable default characterset, to interpret string values.

Dicom images are archived "as is", and parts of the metadata are stored redundantly in the database. This metadata can be changed by users. When the SendServer sends images with changed metadata, it incorporates these changes into the outgoing data stream. Should any of the changed values not fit the original Specific Characterset, the SendServer will find an appropriate one (ISO_IR 100 or ISO_IR 192) and use it instead of the original one.

7. Support of Issuers/Assigning Authorities

With synedra AIM, it is possible to store Dicom images for multiple Assigning Authorities. Specifically, the elements PatientID, AdmissionID, and AccessionNumber with their respective Issuer elements IssuerOfPatientID, IssuerOfAdmissionIDSequence, IssuerOfAccessionNumberSequence are relevant. DicomInterfaceServer can tolerate missing issuer elements by resolving a suitable value, based on the configuration of the calling AET, and amending it to the request, using the following heuristic.

Element (Dicom request)	**Issuer Element (Dicom request)**	**Issuer (AIM Authority configuration)**	**Calling AET**	**Action**
Present	Present	Present	-	Value from request is used
Present	Present	Not present	-	No match/empty result is returned for queries
Present	Not present	-	AET matches "#(.*)\$" (=Session-AET)	Default-Issuer (Authority with ID 0) is used
Present	Not present	-	normal AET	Fallback Authority, set in AET-Configuration matching the calling AET
Not present	-	-	-	No issuer is required

Table 7.1. Heuristic to resolve suitable values for issuer elements

Worklist queries (incoming)	Issuers are resolved by the heuristic above, for PatientID, AdmissionID and AccessionNumber in the incoming request.
Worklist queries (outgoing)	Issuers are resolved by the heuristic above, for PatientID, AdmissionID and AccessionNumber in the incoming response.
MPPS (incoming)	Issuers are resolved by the heuristic above, for AccessionNumber in the incoming request.
C-Store (incoming)	Issuers are resolved exclusively by the calling AET, for PatientID and AdmissionID for the incoming images.
Query/Retrieve C-Find, C-Move, C-Get (incoming)	Issuers are resolved by the heuristic above, for PatientID in the incoming request.

Table 7.2. Relevant Dicom operations

8. Security

The View, View Personal, View Professional AEs support transport level security with (optional) SSL Client Certificates for incoming and outgoing connections.

The DicomInterfaceServer AE optionally supports transport level security for incoming connections with SL Client Certificates, i.e. DicomInterfaceServer refuses a connection over TLS from a source that does not provide a certificate that has been signed by a known CA.

The DicomInterfaceServer AE optionally supports transport level security for outgoing connections using installable SSL Client Certificates. Whether or not an association is established over TLS is configurable on a per-AE basis.

The SendServer AE supports transport level security using installable SSL Client Certificates. Whether or not an association is established over TLS is configurable on a per-AE basis.

8.1. Security Profiles

DicomInterfaceServer and SendServer support the AES TLS Secure Transport Connection Profile (configurable).

8.2. Association Level Security

DicomInterfaceServer can be configured to check the following DICOM values when determining whether to accept Association Open Requests:

- Calling AE Title
- Called AE Title

If configured, it accepts Association Requests from only a limited list of Calling AE Titles. If configured, it accepts Association Requests only if the Association requestor specifies the correct Called AE Title. In addition, the IP address of the requestor is checked. Only if the Calling AET is connected to the calling host will the Association Request be accepted.

8.3. Application Level Security

None supported.

9. Annexes

9.1. IOD Contents

9.1.1. Created SOP Instances

None.

9.1.2. Usage of Attributes From Received IODs

synedra AIM uses the conventional identification attributes to distinguish patients, studies, series, and instances. Patients whose name, date of birth, sex, and patient ID are identical are treated as identical in synedra AIM.

9.1.3. Attribute Mapping

Not applicable.

9.1.4. Coerced/Modified Fields

No coercion is performed.

9.2. Data Dictionary of Private Attributes

No private attributes are defined.

9.3. Coded Terminology and Templates

synedra AIM is not using any Codes (SNOMED) or Controlled Terminology, such as DICOM Content Mapping Resource (DCMR).

9.4. Grayscale Image Consistency

The high-resolution display monitor attached to the product can be calibrated according to the Grayscale Standard Display Function (GSDF). The Service/Installation Tool is used together with a luminance meter to measure the Characteristic Curve of the display system and the current ambient light. The result of the calibration pro-

cedure is a Monitor Correction LUT that will be active within the display subsystem after the application has been restarted.

9.5. Standard Extended/Specialized/Private SOP Classes

None.

9.6. Private Transfer Syntaxes

None.