

synedra



information technologies

DICOM Conformance Statement

synedra AIM

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synedra AIM Version 20 "Kassiopeia"



Conformance Statement Overview

The synedra AIM product family is based on a storage facility, a client viewing and a reporting workstation that enable 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) |
|--|-----------------------|---------------------------|
| <i>Transfer</i> | | |
| All services of the Storage Service Class | Yes | Yes |
| <i>Query/Retrieve</i> | | |
| 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 | No | Yes |
| <i>Workflow Management</i> | | |
| Instance Availability Notification | Yes | Yes |
| Modality Performed Procedure Step | Yes | Yes |
| Modality Worklist Information Model - FIND | Yes | Yes |
| Storage Commitment Push Model | Yes | Yes |
| <i>Print Management</i> | | |

Conformance Statement Overview

| SOP Classes | User of Service (SCU) | Provider of Service (SCP) |
|---|------------------------------|----------------------------------|
| Basic Grayscale Print Management Meta SOP Class | Yes | No |
| Basic Color Print Management Meta SOP Class | Yes | No |

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) |
|---|---------------------------------|-------------------------|
| <i>Compact Disk - Recordable</i> | | |
| General Purpose CD-R Interchange | Yes | Yes |
| CT/MR Studies on CD-R | Yes | Yes |
| <i>DVD</i> | | |
| General Purpose DVD Interchange with JPEG | Yes | Yes |
| CT/MR Studies on DVD Media | Yes | Yes |

Table 2. Media Services

Table of Contents

| | |
|---|----|
| 1. Introduction | 1 |
| 1.1. Revision History | 1 |
| 1.2. Audience of this Document | 2 |
| 1.3. Remarks | 2 |
| 1.4. Terms and Definitions | 2 |
| 1.5. Abbreviations | 4 |
| 1.6. References | 6 |
| 2. Networking | 7 |
| 2.1. Implementation Model | 7 |
| 2.1.1. Application Data Flow Diagram | 7 |
| 2.1.2. Functional Definitions of Applications | 9 |
| 2.1.2.1. Functional Definitions of DicomInterfaceServer | 9 |
| 2.1.2.2. Functional Definitions of SendServer | 9 |
| 2.1.2.3. Functional Definitions of View, View Personal, View Professional, Video Professional | 9 |
| 2.1.2.4. Sequencing of Real World Activities | 10 |
| 2.2. Application Entity Specification | 10 |
| 2.2.1. View AE Specification | 10 |
| 2.2.1.1. SOP Classes | 10 |
| 2.2.1.2. Association Policies | 13 |
| 2.2.1.2.1. General | 13 |
| 2.2.1.2.2. Number of Associations | 14 |
| 2.2.1.2.3. Asynchronous Nature | 14 |
| 2.2.1.2.4. Implementation Identifying Information | 14 |
| 2.2.1.3. Association Initiating Policy | 14 |
| 2.2.1.3.1. Activity - Print | 14 |
| Description and Sequencing of Activities | 14 |
| Proposed presentation contexts | 15 |
| SOP Specific Conformance for Print Management SOP Classes | 16 |
| SOP Specific Conformance for the Printer SOP Class | 16 |
| SOP Specific Conformance for the Basic Film Session SOP Class | 16 |
| SOP Specific Conformance for the Basic Film Box SOP Class | 17 |
| SOP Specific Conformance for the Basic Grayscale Image Box SOP Class..... | 17 |
| SOP Specific Conformance for the Basic Color Image Box SOP Class | 17 |
| SOP Specific Conformance for the Presentation LUT SOP Class | 17 |
| 2.2.1.3.2. Activity - Query/Retrieve | 18 |
| Description and Sequencing of Activities | 18 |
| Proposed presentation contexts | 18 |
| SOP Specific Conformance for Query SOP Classes | 18 |
| 2.2.1.3.3. Activity - Store instances | 19 |
| Description and Sequencing of Activities | 19 |
| Proposed presentation contexts | 19 |

| | |
|---|----|
| SOP Specific Conformance for storage SOP Classes | 19 |
| 2.2.1.4. Association Acceptance Policy | 20 |
| 2.2.1.4.1. Activity - Connectivity Verification | 20 |
| Description and Sequencing of Activities | 20 |
| Acceptable Presentation Contexts | 20 |
| SOP specific conformance for Verification SOP Class | 20 |
| 2.2.1.4.2. Activity - Store instances | 20 |
| Description and Sequencing of Activities | 20 |
| Acceptable Presentation Contexts | 21 |
| SOP specific conformance for storage SOP Classes | 21 |
| 2.2.2. DicomInterfaceServer AE Specification | 21 |
| 2.2.2.1. SOP Classes | 21 |
| 2.2.2.2. Association Policies | 25 |
| 2.2.2.2.1. General | 25 |
| 2.2.2.2.2. Number of Associations | 25 |
| 2.2.2.2.3. Asynchronous Nature | 25 |
| 2.2.2.2.4. Implementation Identifying Information | 25 |
| 2.2.2.3. Association Initiating Policy | 26 |
| 2.2.2.3.1. Activity - Receive Storage Commitment Request | 26 |
| Description and Sequencing of Activities | 26 |
| Proposed presentation contexts | 26 |
| 2.2.2.3.2. Activity - Send Storage Commitment Request | 26 |
| Description and Sequencing of Activities | 26 |
| Proposed presentation contexts | 27 |
| 2.2.2.3.3. Activity - Send Instance Availability Notification | 27 |
| Description and Sequencing of Activities | 27 |
| Proposed presentation contexts | 27 |
| SOP Specific Conformance for Instance Availability Notification SOP Class | 27 |
| 2.2.2.3.4. Activity - Forward received MPPS | 28 |
| Description and Sequencing of Activities | 28 |
| Proposed presentation contexts | 28 |
| SOP Specific Conformance for Modality Performed Procedure Step SOP Class | 28 |
| 2.2.2.3.5. Activity - Receive IOCM Notifications | 28 |
| Description and Sequencing of Activities | 28 |
| Proposed presentation contexts | 29 |
| 2.2.2.3.6. Activity - Send IOCM Notifications | 29 |
| Description and Sequencing of Activities | 29 |
| Proposed presentation contexts | 29 |
| 2.2.2.3.7. Activity - Query C-Find SCP | 30 |
| Description and Sequencing of Activities | 30 |
| Proposed presentation contexts | 30 |
| 2.2.2.4. Association Acceptance Policy | 30 |
| 2.2.2.4.1. Activity - Connectivity Verification | 30 |
| Description and Sequencing of Activities | 30 |
| Acceptable Presentation Contexts | 31 |
| SOP specific conformance for Verification SOP Class | 31 |
| 2.2.2.4.2. Activity - Store instances | 31 |

| | |
|--|----|
| Description and Sequencing of Activities | 31 |
| Acceptable Presentation Contexts | 31 |
| SOP specific conformance for storage SOP Classes | 31 |
| 2.2.2.4.3. Activity - Receive Storage Commitment Request | 32 |
| Description and Sequencing of Activities | 32 |
| Acceptable Presentation Contexts | 33 |
| SOP specific conformance for Storage Commitment Push Model SOP Class | 33 |
| 2.2.2.4.4. Activity - Send Storage Commitment request | 34 |
| Description and Sequencing of Activities | 34 |
| Acceptable Presentation Contexts | 34 |
| 2.2.2.4.5. Activity - Worklist Query | 34 |
| Description and Sequencing of Activities | 34 |
| Acceptable Presentation Contexts | 35 |
| SOP specific conformance for Modality Worklist Information Model - FIND | 35 |
| 2.2.2.4.6. Activity - Receive MPPS | 37 |
| Description and Sequencing of Activities | 37 |
| Acceptable Presentation Contexts | 37 |
| SOP specific conformance for Modality Performed Procedure Step SOP Class | 37 |
| 2.2.2.4.7. Activity - Query/Retrieve | 37 |
| Description and Sequencing of Activities | 37 |
| Acceptable Presentation Contexts | 38 |
| SOP specific conformance for Patient and Study Root Query Retrieve Information Model SOP Classes | 39 |
| 2.2.3. SendServer AE Specification | 41 |
| 2.2.3.1. SOP Classes | 41 |
| 2.2.3.2. Association Policies | 44 |
| 2.2.3.2.1. General | 44 |
| 2.2.3.2.2. Number of Associations | 45 |
| 2.2.3.2.3. Asynchronous Nature | 45 |
| 2.2.3.2.4. Implementation Identifying Information | 45 |
| 2.2.3.3. Association Initiating Policy | 45 |
| 2.2.3.3.1. Activity - Store instances | 45 |
| Description and Sequencing of Activities | 45 |
| Proposed presentation contexts | 45 |
| SOP Specific Conformance for Storage SOP Classes | 46 |
| 2.2.3.4. Association Acceptance Policy | 46 |
| 2.3. Network Interfaces | 46 |
| 2.3.1. Physical Network Interface | 46 |
| 2.3.2. Additional Protocols | 46 |
| 2.4. Configuration | 46 |
| 2.4.1. AE Title/Presentation Address Mapping | 46 |
| 2.4.1.1. Local AE Titles | 46 |
| 2.4.1.2. Remote AE Title/Presentation Address Mapping | 47 |
| 2.4.1.2.1. View, View Professional | 47 |
| 2.4.1.2.2. DicomInterfaceServer and SendServer | 47 |
| 2.4.2. Parameters | 47 |

| | |
|---|----|
| 3. Media Interchange | 49 |
| 3.1. Implementation Model | 49 |
| 3.1.1. Application Data Flow Diagram | 49 |
| 3.1.2. Functional Definitions of Applications | 49 |
| 3.1.2.1. Functional Definitions of View, View Personal, View Professional, Video Professional | 49 |
| 3.1.2.2. Sequencing of Real World Activities | 49 |
| 3.1.3. File Meta Information for Implementation Class and Version | 50 |
| 3.2. Application Entity Specification | 50 |
| 3.2.1. View, View Personal, View Professional, Video Professional AE Specification | 50 |
| 3.2.1.1. File Meta Information for View | 50 |
| 3.2.1.2. Real World Activities | 50 |
| 3.2.1.2.1. Activity - Load Directory or File | 50 |
| 3.2.1.2.2. Activity - Export to Media | 50 |
| 3.3. Augmented and Private Profiles | 51 |
| 3.4. Media Configuration | 51 |
| 4. Transformation of DICOM to CDA | 52 |
| 5. Support of Character Sets | 53 |
| 6. Security | 54 |
| 6.1. Security Profiles | 54 |
| 6.2. Association Level Security | 54 |
| 6.3. Application Level Security | 54 |
| 7. Annexes | 55 |
| 7.1. IOD Contents | 55 |
| 7.1.1. Created SOP Instances | 55 |
| 7.1.2. Usage of Attributes From Received IODs | 55 |
| 7.1.3. Attribute Mapping | 55 |
| 7.1.4. Coerced/Modified Fields | 55 |
| 7.2. Data Dictionary of Private Attributes | 55 |
| 7.3. Coded Terminology and Templates | 55 |
| 7.4. Grayscale Image Consistency | 55 |
| 7.5. Standard Extended/Specialized/Private SOP Classes | 55 |
| 7.6. Private Transfer Syntaxes | 56 |

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 syndra 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 misleading 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") |

Table 1.1. Revision History

1.2. Audience of this Document

This document is addressed to those who need to understand how synedra AIM will integrate into their healthcare facility. This includes those responsible for overall imaging network policy and architecture as well as integrators who need to have a detailed understanding of the DICOM features of 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, prior to reading this Conformance Statement.

1.3. Remarks

The aim of this DICOM Conformance Statement is to facilitate 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 in order 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 just the first step towards assessing interconnectivity and interoperability between the product and other DICOM-compliant equipment.
- Test procedures should be defined and executed in order 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, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class. |
| Application Entity | An end point of a DICOM information exchange, including the DICOM network or media interface software, i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities. |
| Application Entity Title | The externally known name of an <i>Application Entity</i> , used to identify a DICOM application to another DICOM application on the network. |
| Application Context | The specification of the type of communication used between <i>Application Entities</i> . Example: DICOM network protocol. |
| Association | A network communication channel set up between <i>Application Entities</i> . |
| Attribute | A unit of information in an object definition; a data element identified by a <i>tag</i> . 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 <i>Attributes</i> 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 <i>Attributes</i> 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 <i>Attributes</i> within an <i>Information Object Definition</i> that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex. |
| Negotiation | First phase of <i>Association</i> establishment that allows <i>Application Entities</i> 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 <i>Association</i> as negotiated between <i>Application Entities</i> ; includes <i>Abstract Syntaxes</i> and <i>Transfer Syntaxes</i> . |
| 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 <i>Application Entity</i> to ensure confidentiality, integrity, and/or availability of the exchanged DICOM data. |

| | |
|------------------------------|--|
| Service Class Provider | Role of an <i>Application Entity</i> that provides a DICOM network service; typically, a server that performs operations requested by another <i>Application Entity (Service Class User)</i> . 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 <i>Application Entity</i> 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 <i>SOP Class</i> . 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: <i>JPEG</i> 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 |

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 <http://www.synedra.com/intra/documents/product-Docu/documentation.php>
- TLS RFC, available at <https://tools.ietf.org/html/rfc5246>

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.

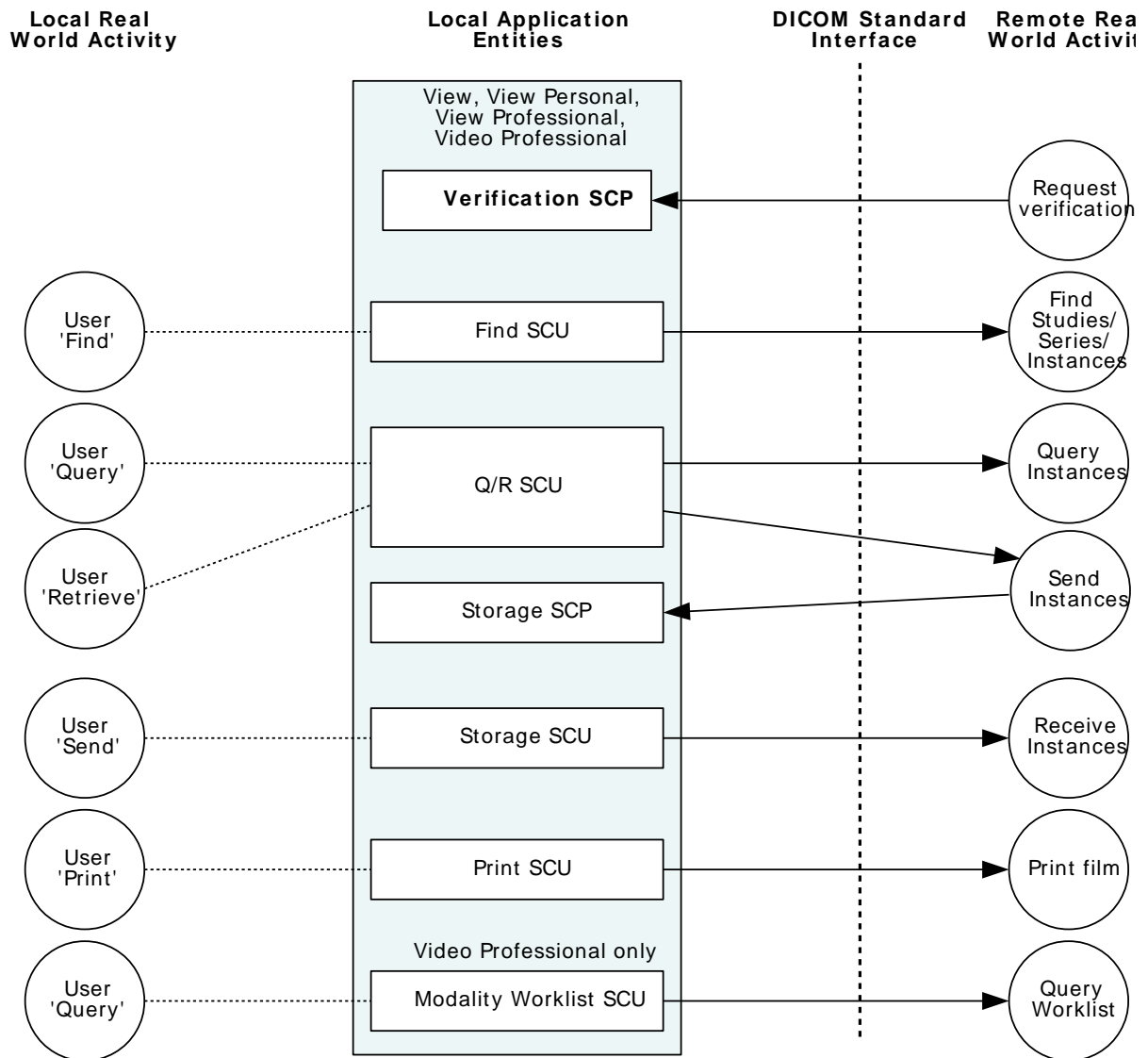


Figure 2.1. synedra View, View Personal, View Professional, Video Professional Application Flow Diagram

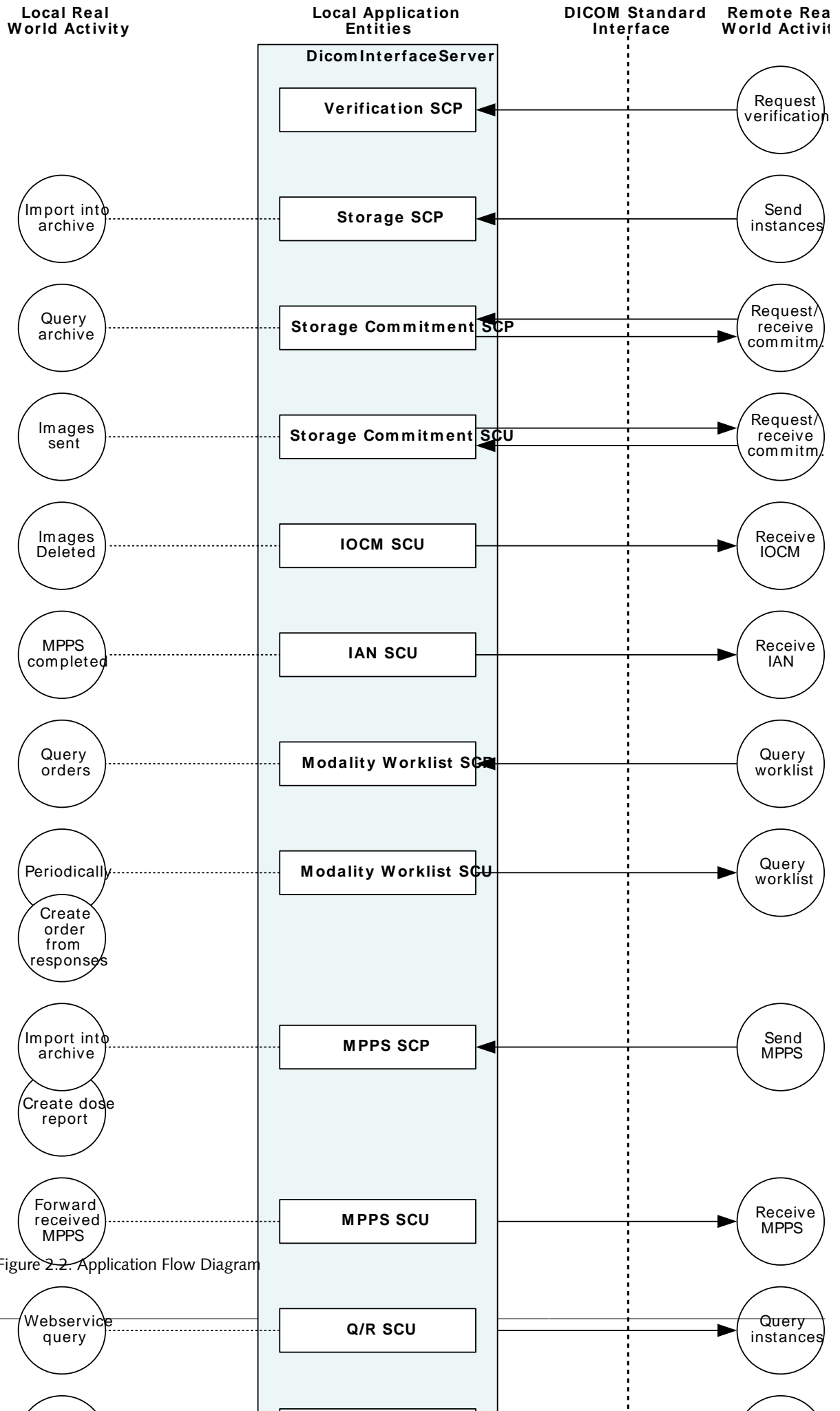


Figure 2.2. Application Flow Diagram

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 only)
- Instance Availability Notification as an SCP and an SCU
- Modality Performed Procedure Steps as an SCP and an SCU

Notes

DicomInterfaceServer is responsible for the managing part of Q/R only. The sending of data is handled by SendServer.

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, Video Professional

View, View Personal, View Professional, Video Professional are capable of finding studies, series, images, retrieving studies, series, images and importing data from CD/DVD media, 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
- Video Professional only: Modality Worklist Query 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, Video 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 |
| Autorefractometry 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 |

| SOP Class Name | SOP Class UID | SCU | SCP |
|--|--------------------------------|-----|-----|
| 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 |
| 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 |

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|----------------------------------|-----|-----|
| 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 |
| 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 |

| SOP Class Name | SOP Class UID | SCU | SCP |
|--|----------------------------------|-----|-----|
| 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 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, Video 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, Video Professional

2.2.1.2.2. Number of Associations

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

2.2.1.2.3. Asynchronous Nature

View, View Personal, View Professional, Video Professional does 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 be printed. View will create a new association for each print job. It will then send 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.

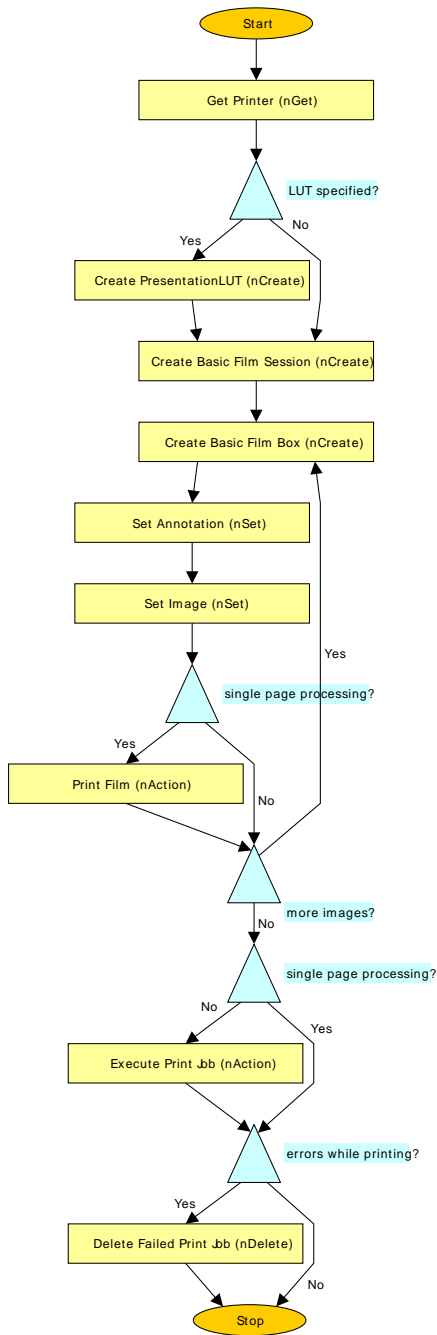


Figure 2.3. Print Flow Diagram

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

Proposed presentation contexts

View, View Professional is 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 |

^aExtended Negotiation

Table 2.4. Proposed Presentation Contexts for Activity Store instances

The print management meta class proposed is determined by the configuration of the printer in View, View Professional.

SOP Specific Conformance for Print Management SOP Classes

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

The general behavior of Print Management AE during a communication failure is to abort the current print job and display an error message.

The general behavior of Print Management AE when receiving a non-success response is to abort the current print job and display an error message.

The general behavior of Print Management AE is to fill all required tags as specified by the DICOM V3.0 Standard, 2008. Optional tags will not be 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 will be 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 will contain the Number of Copies (2000,0010) and the Print Priority (2000,0020) attributes.
- N-ACTION. The N-ACTION request will be used to print the complete film session if single page processing is not used. It will contain the "Print" Action Type and no optional attributes.
- N-DELETE. The N-DELETE request will be 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 will contain 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 will contain 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 will contain 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 will contain 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, Video Professional send a query request (C-FIND) (containing user-supplied criteria) for instances and displays the received C-FIND responses in a GUI. If the user decides to transfer some or all of the instances, View, View Personal, View Professional, Video Professional will send a transfer request (C-MOVE) to the remote AE containing the name of its own Storage SCP as target of the transfer.

Proposed presentation contexts

View, View Personal, View Professional, Video Professional is 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 |

^aExtended Negotiation

^bRelational 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, Video 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 | |
| Series Description | (0008,103E) |

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

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

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

View, View Personal, View Professional, Video 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, Video Professional will initiate an association to the remote AE, proposing the presentation contexts required to transfer the requested instances. It will then store the instances using C-STORE requests.

Proposed presentation contexts

SendServer is 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 | | |
| All storage SOP Classes | | Any transfer syntax | | SCP | none |

^aExtended 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 will not be sent and an error message will be displayed.

SOP Specific Conformance for storage SOP Classes

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

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

A C-STORE operation whose status is either an error or a warning will result in the send job to be 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, Video Professional do not support referenced pixel data transfer syntaxes.

2.2.1.4. Association Acceptance Policy

View, View Personal, View Professional, Video 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, Video Professional will 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 |

^aExtended Negotiation

Table 2.8. Acceptable Presentation Contexts for Connectivity Verification

SOP specific conformance for Verification SOP Class

View, View Personal, View Professional, Video 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, Video 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 |

^aExtended Negotiation

Table 2.9. Acceptable Presentation Contexts for Store instances

SOP specific conformance for storage SOP Classes

View, View Personal, View Professional, Video 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, Video Professional.

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

View, View Personal, View Professional, Video Professional will always return successful C-STORE responses. Any error during the operation will result 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 |
| Breast Projection X-Ray Image Storage - For Presentation | 1.2.840.10008.5.1.4.1.1.13.1.4 | Yes | Yes |

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|--------------------------------|-----|-----|
| 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 |
| Implant Template Group Storage | 1.2.840.10008.5.1.4.45.1 | Yes | Yes |

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|----------------------------------|-----|-----|
| 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 |
| Real World Value Mapping Storage | 1.2.840.10008.5.1.4.1.1.67 | Yes | Yes |

| SOP Class Name | SOP Class UID | SCU | SCP |
|--|----------------------------------|-----|-----|
| 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 |
| X-Ray 3D Angiographic Image Storage | 1.2.840.10008.5.1.4.1.1.13.1.1 | Yes | Yes |

| SOP Class Name | SOP Class UID | SCU | SCP |
|--|--------------------------------|-----|-----|
| 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 | No | 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 | No | Yes |
| Patient Root Query Retrieve Information Model - MOVE | 1.2.840.10008.5.1.4.1.2.1.2 | No | 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 will not be given on the same association. Instead, DicomInterfaceServer will initiate a new association to perform an N-EVENT-REPORT operation. No storage commits will be granted for soft-deleted images.

Proposed presentation contexts

DicomInterfaceServer is 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 | | |
| Storage Commitment Push Model | 1.2.840.10008.1.20.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCP | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended 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 will also request storage commitments for IOCM requests. If the locale configuration for the remote AE is set to asynchronous Storage Commitment, the response to this request will not be expected on the same association. Instead, DicomInterfaceServer will expect 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 | 1.2.840.10008.1.2 | SCU | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended 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 will send an Instance Availability Notification to all configured remote AEs.

Proposed presentation contexts

DicomInterfaceServer is 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 | | |
| Instance Availability Notification SOP Class | 1.2.840.10008.5.1.4.33 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended 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 will create and send an IAN SOP Class Instance if it has received an MPPS with status COMPLETED.

IAN SOP Class Instances created will 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 will forward this message to all configured remote AEs.

Proposed presentation contexts

DicomInterfaceServer is 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 | | |
| Modality Performed Procedure Step SOP Class | 1.2.840.10008.3.1.2.3.3 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended 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.

Proposed presentation contexts

DicomInterfaceServer is 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 | | |
| Key Object Selection Document SOP Class | 1.2.840.10008.5.1.4.1.1.88.50 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended 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 will send 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 is 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 | | |
| Key Object Selection Document SOP Class | 1.2.840.10008.5.1.4.1.1.88.50 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended Negotiation

Table 2.18. Proposed Presentation Contexts for Forward received MPPS

2.2.2.3.7. Activity - Query C-Find SCP

Description and Sequencing of Activities

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

Proposed presentation contexts

DicomInterfaceServer is 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 | | |
| 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 |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended Negotiation

Table 2.19. Proposed Presentation Contexts for Forward received MPPS

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 will 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 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCP | none |

^aExtended Negotiation

Table 2.20. 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 |

^aExtended Negotiation

Table 2.21. Acceptable Presentation Contexts for Store instances

The acceptable presentation contexts are configurable. Please refer to the DicomInterfaceServer documentation provided in "synedra AIM Backend-Dokumentation".

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 will be able to provide 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 AIM Backend-Dokumentation"). Since consistency checks occur during archiving and archiving is performed asynchronously, DicomInterfaceServer will not generate a warning in this case.

DicomInterfaceServer will store 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 <ul style="list-style-type: none"> • 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 2.22. 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 | 1.2.840.10008.1.2 | SCP | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended Negotiation

Table 2.23. 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 will be spent waiting for asynchronous archiving processes to be finished, before the check is performed again.

Once DicomInterfaceServer has checked for the existence of the specified Composite SOP Instances, it will attempt 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 will 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 will 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 |

| Attribute Name | Tag | Value |
|----------------------------|-------------|-------------------|
| Storage Media File-Set UID | (0088,0140) | 1.3.6.1.4.1.24930 |

Table 2.24. 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 expects 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 | 1.2.840.10008.1.2 | SCU | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended Negotiation

Table 2.25. 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 | 1.2.840.10008.1.2 | SCP | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended Negotiation

Table 2.26. 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 |

| Attribute Name | Tag | Matching supported? | Return supported? |
|--|-------------|---------------------|-------------------|
| 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 |
| 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 2.27. 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 will support case-insensitive matching in Worklist Queries.

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

Table 2.28. Case insensitive matching keys

DicomInterfaceServer honors the supplied Specific Character Set (0008,0005) when interpreting queries. Matching is always based on UTF-8 and query parameters are translated accordingly. Responses will be 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 will send 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 | 1.2.840.10008.1.2 | SCP | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended Negotiation

Table 2.29. 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 will no longer return 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 will in turn instruct 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 will reply 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 | 1.2.840.10008.1.2 | SCP | yes ^b |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| 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 | SCP | yes ^b |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| Study Root Query Retrieve Information Model - MOVE | 1.2.840.10008.5.1.4.1.2.2.2 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCP | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| 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 | SCP | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| Study Root Query Retrieve Information Model - GET | 1.2.840.10008.5.1.4.1.2.2.3 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCP | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

| 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 | 1.2.840.10008.1.2 | SCP | none |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| All storage SOP Classes | | JPEG Lossless | 1.2.840.10008.1.2.4.70 | SCU | none |
| | | JPEG Baseline | 1.2.840.10008.1.2.4.50 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |

^aExtended Negotiation

^bRelational queries and combined date time matching are supported, but no fuzzy matching.

Table 2.30. 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 2.31. 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 will only match 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 2.32. Attributes matched case-insensitive

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

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 |
| Autorefration 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 |
| 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 |

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|--------------------------------|-----|-----|
| 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 |
| 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 |

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|----------------------------------|-----|-----|
| 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 |
| 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 |

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

Table 2.33. 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 2.34. 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 2.35. 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 will initiate an association to the remote AE, proposing the presentation contexts required to transfer the requested instances (according to the configuration stored for the remote AE). It will then store the instances using C-STORE requests.

Proposed presentation contexts

SendServer is 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 | | |
| All storage SOP Classes | | Any transfer syntax | | SCP | none |

^aExtended Negotiation

Table 2.36. 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 will be transcoded on the fly, i.e. the instance will be 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 will result in the send job to be marked as completed.

A C-STORE operation whose status is either an error or a warning will result in the send job to be 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 will use a configurable value as Calling AET of the outgoing association.

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

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

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

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

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

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

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

Table 2.37. 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 will only be accepted from known hosts that are associated with the calling AET.

2.4.2. Parameters

| Parameter | Configurable | Default Value |
|---|--------------|---------------|
| View, View Personal, View Professional, Video 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 |

| Parameter | Configurable | Default Value |
|---|--------------|---------------|
| 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 2.38. Parameters

3. Media Interchange

3.1. Implementation Model

3.1.1. Application Data Flow Diagram

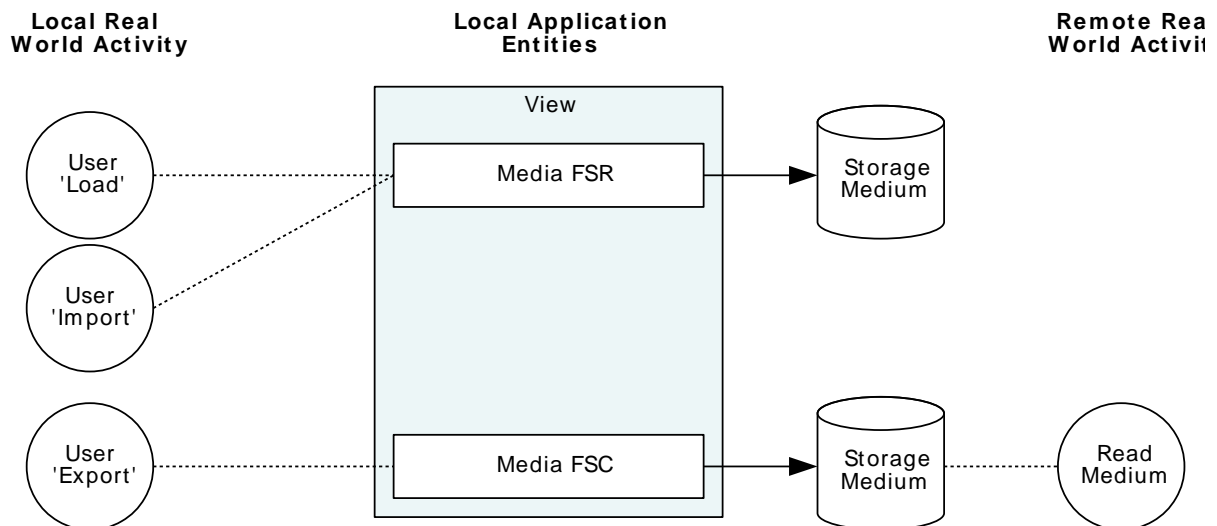


Figure 3.1. View, View Personal, View Professional, Video Professional Application Flow Diagram

3.1.2. Functional Definitions of Applications

3.1.2.1. Functional Definitions of View, View Personal, View Professional, Video Professional

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

3.1.2.2. Sequencing of Real World Activities

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

3.1.3. 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 3.1. File Meta Information attributes

3.2. Application Entity Specification

3.2.1. View, View Personal, View Professional, Video Professional AE Specification

View, View Personal, View Professional, Video 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 3.2. Application Profiles, Activities, and Roles for View, View Personal, View Professional, Video Professional

3.2.1.1. File Meta Information for View

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

3.2.1.2. Real World Activities

3.2.1.2.1. Activity - Load Directory or File

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

3.2.1.2.2. 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 actual creation of the media will be handled by the operating system or by a disc producer.

3.3. Augmented and Private Profiles

None.

3.4. Media Configuration

View, 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.

4. Transformation of DICOM to CDA

Not applicable.

5. 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 on the fly. 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.

6. Security

The View, View Personal, View Professional, Video 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 will refuse a connection over TLS from a source that does not provide a certificate which has been signed by a known CA.

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

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

6.1. Security Profiles

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

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

6.3. Application Level Security

None supported.

7. Annexes

7.1. IOD Contents

7.1.1. Created SOP Instances

None.

7.1.2. 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 will be treated as identical in synedra AIM.

7.1.3. Attribute Mapping

Not applicable.

7.1.4. Coerced/Modified Fields

No coercion is performed.

7.2. Data Dictionary of Private Attributes

No private attributes are defined.

7.3. Coded Terminology and Templates

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

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

7.5. Standard Extended/Specialized/Private SOP Classes

None.

7.6. Private Transfer Syntaxes

None.