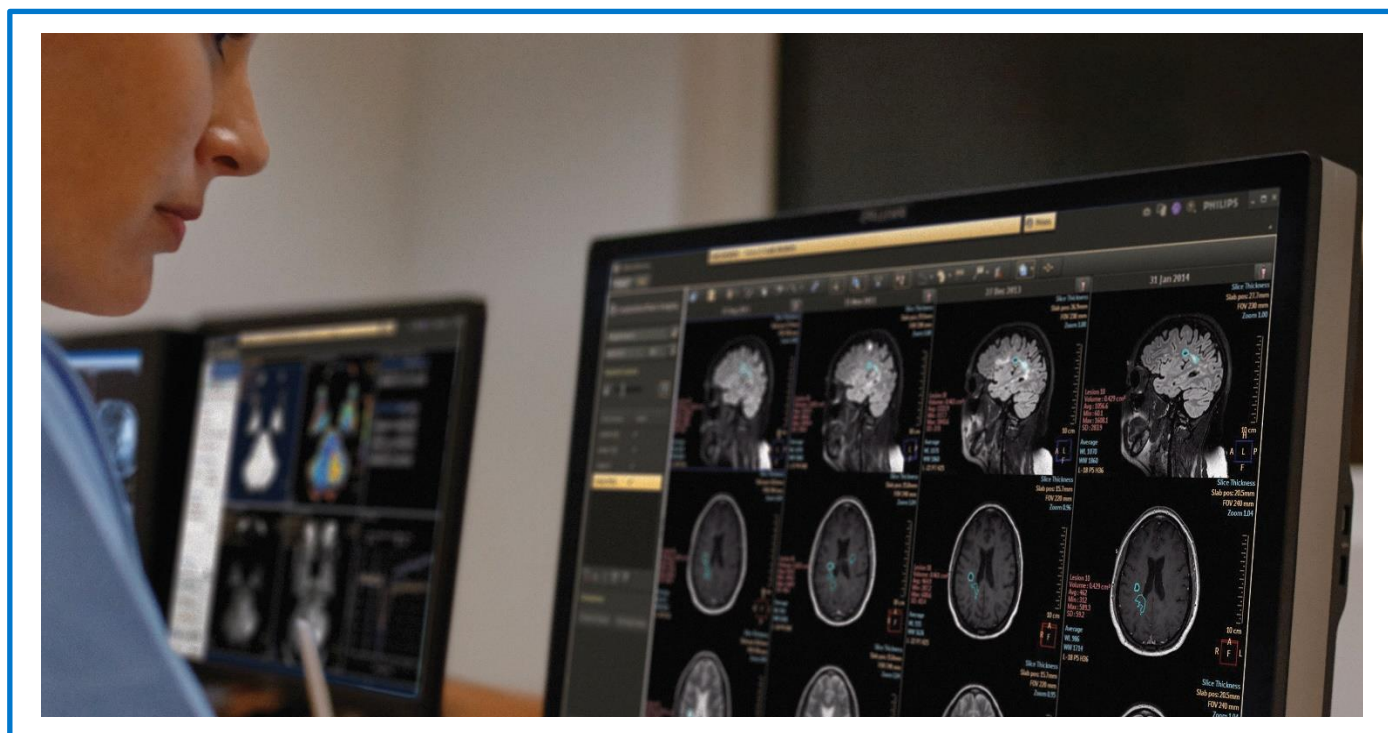


DICOM Conformance Statement

Advanced Visualization Workspace V15.1.3



1. Overview

This DICOM Conformance Statement applies to Advanced Visualization Workspace (AVW) V15.1.3, a Philips software medical device that supports image viewing and post-processing for radiologists and imaging experts across multiple modalities, including Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Nuclear Medicine (NM), Ultrasound (US), and conventional X-Ray, using the DICOM-3 standard.

Advance Visualization Workspace is an advanced visualization and analysis solution designed to support diagnostic, follow-up and communication processes across clinical domains and modalities, through a connected and secure workflow. AVW is a multi-modality and multi-vendor comprehensive suite of advanced visualization solutions for Radiology. It can scale to fit large scale enterprises, helping to maximize resources.

Advance Visualization Workspace offers an integrated portfolio of clinically rich applications for Neurology, Oncology, Cardiology, Pulmonary and other clinical domains.

This version of the DICOM Conformance Statement applies to the following medical devices:

- Advanced Visualization Workspace (AVW) V15.1.3
- CT ASPECTS (Alberta Stroke Program Early CT Score) V15.1.3
- Nuclear Medicine Suite (NM Suite) V15.1.3
- AV Cardio Vascular Suite V1.0
 - o AV Cardiac CT
 - o AV Vascular
 - o AV Cardiac MR
- AV Viewer

The Nuclear Medicine Suite, CT ASPECTS, and Cardio Vascular Suite applications are integrated components that are launched from within the AVW environment and are installed as part of the overall AVW package.

The Advanced Visualization Workspace V15.1.3 provides the following DICOM data exchange features:

- It receives images sent from remote systems (e.g., workstations or imaging modalities) and stores them in a database.
- It allows the operator to copy images from the database to remote databases and vice versa. For this purpose, the operator is able to query remote databases.
- It allows the operator to print images (Grayscale and Color) stored in the database on a DICOM printer.
- It can read and write DICOM media on USB devices, CDs and DVDs (including CD-RW, DVD+/-R, and DVD+/-RW).
- Supports DICOM Webservice WADO-RS as Origin Server.
- Retrieve Transaction as Origin Server receives GET requests to retrieve specific studies, series or instances.
- Store Transaction Origin Server receives POST requests to store or append to an existing resource on the server.
- Search Transaction Origin Server receives GET requests to search for studies, series or instances.

- It also supports the fetching of Priors (MWL query for Priors).

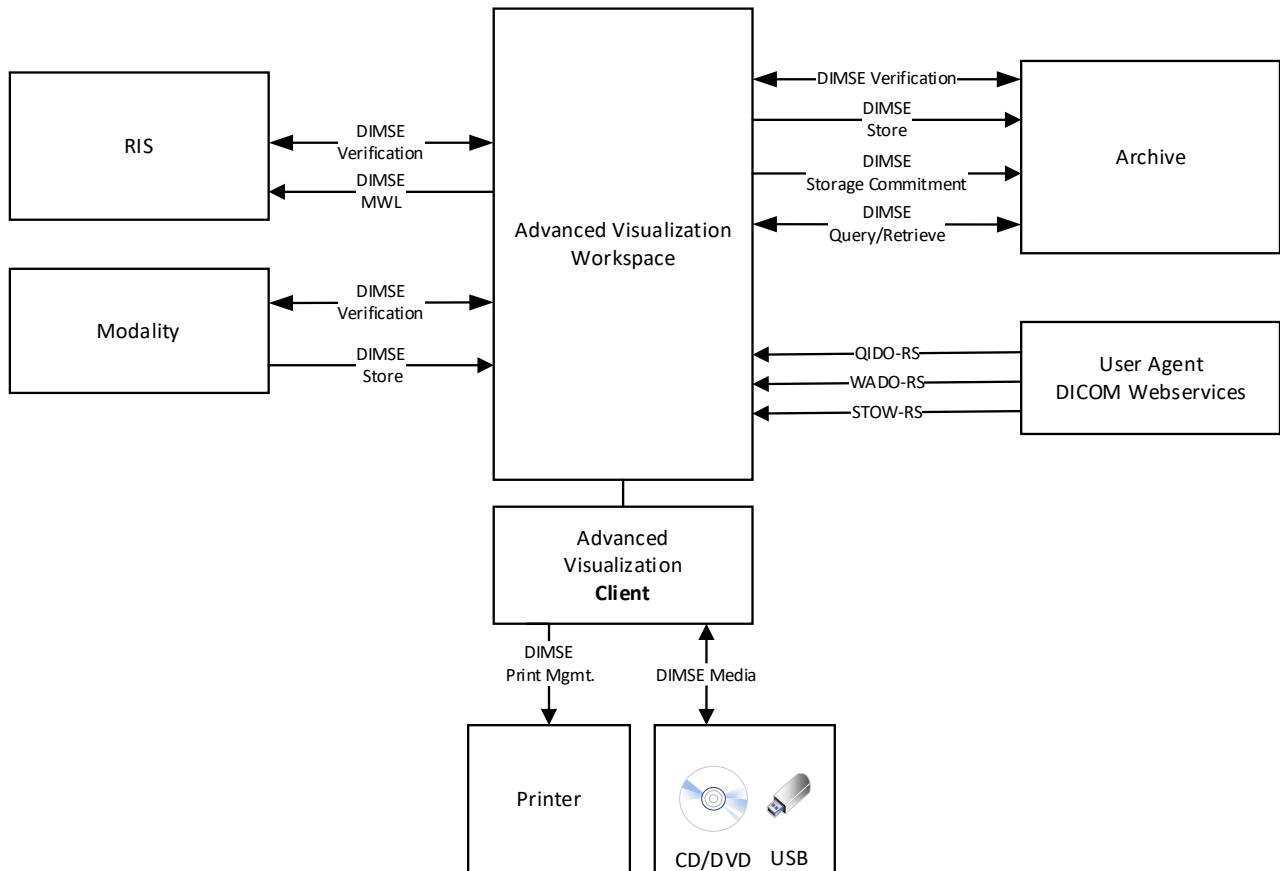


Figure 1-1: Overview of Implemented Services

1.1. Content and Transfer

Table 1-1 lists all Storage SOP Classes and the supported transfer mechanisms as well as the usage scenarios for those instances.

The "Transfer Syntax Set" column lists the sets of Transfer Syntaxes defined in Table 1-2 that are applicable to each SOP Class. The "DIMSE", "DICOM Webservices" and "Media Services" columns indicate the roles supported for each SOP Class.

The "Function" columns indicate how the instances are used by the system:

- Create: The system creates instances of the SOP Class. The type of the created SOP Class is indicated by one of the following abbreviations:
 - S: Standard SOP Class
 - SE: Standard Extended SOP Class
 - SP: Specialized SOP Class
 - P: Private SOP Class

Note: Refer to each application DCS for supported created IODs.

- Display: The system displays the instances of the SOP Class to the user, either by displaying the SOP Instances natively or by applying instances of another suitable SOP Class to the image instances (e.g., a Presentation State or CAD SR).
- Process: The system processes the instances of the SOP Class to derive some further information that is made available to the user (e.g., a CAD processing algorithm, or a 3D Rendering).
- Archive: The system stores the instances of the SOP Class and makes them available again.

Table 1-1: Storage SOP Classes

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
			SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	SE	Yes	Yes	No
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	SE	Yes	Yes	No
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	SE	No	Yes	No
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	No
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	No
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	No
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	NI	Yes	Yes	No	Yes	Yes	Yes	Yes	SE	Yes	No	No
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	NI	Yes	Yes	No	Yes	Yes	Yes	Yes	SE	Yes	Yes	No
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	NI	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	No
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	NI	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	No
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	NI	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	SE	Yes	Yes	No
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	SE	Yes	Yes	No

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
			SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	NI,LL	Yes	Yes	No	Yes	Yes	Yes	Yes	SE	Yes	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	NI,LL	Yes	Yes	No	Yes	Yes	Yes	Yes	SE	Yes	Yes	No
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	NI,LL	No	Yes ¹	No	Yes ¹	Yes	Yes	Yes	No	Yes	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	NI	Yes	Yes	No	Yes	Yes	Yes	Yes	SE	Yes	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	NI,LL	Yes	Yes	No	Yes	Yes	Yes	Yes	SE	Yes	Yes	No
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	NI	No	Yes ¹	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	NI	Yes	Yes	No	Yes	Yes	Yes	Yes	SE	Yes	Yes	No
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	No
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	NI	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	No
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	NI	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	NI	No	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	NI	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	No
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	NI	Yes	Yes	No	No	Yes	Yes	Yes	SE	Yes	No	No
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	NI,LL,L	Yes	Yes	No	No	Yes	Yes	Yes	SE	Yes	Yes	No
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	NI,LL,L	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	NI	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	NI,LL	Yes	Yes	No	Yes	Yes	Yes	Yes	SE	Yes	Yes	No
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	NI	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Multi-frame Grayscale Byte SC Image Storage	1.2.840.10008.5.1.4.1.1.7.2	NI	Yes	Yes	No	No	Yes	Yes	Yes	SE	Yes	Yes	No
Multi-frame Grayscale Word SC Image Storage	1.2.840.10008.5.1.4.1.1.7.3	NI	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	No

SOP Classes		Transfer Syntax Set	DIMSE Services		DICOM Web Services		Media Services			Function			
			SCU	SCP	UA	OS	FSC	FSU	FSR	Create	Display	Process	Archive
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	NI,LL	Yes	Yes	No	Yes	Yes	Yes	Yes	SE	Yes	Yes	No
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	NI	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	No
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	NI	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	No
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	NI	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	NI	Yes	Yes	No	Yes	Yes	Yes	Yes	SE	Yes	Yes	No
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	NI	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	No
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	NI	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No	No
Philips Private ViewForum 3D Volume New Storage	1.3.46.670589.5.0.1.1	NI,LL	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	No
Philips Private ViewForum 3D Volume Object New Storage	1.3.46.670589.5.0.2.1	NI,LL	Yes	No	No	No	Yes	Yes	Yes	No	No	No	No
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	NI,LL	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	NI,LL	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No
Media Storage Directory Storage	1.2.840.10008.1.3.10	NI,LL	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No

Note¹: See Table 5-6: Image Compression by Storage SCP for conversion behaviour of enhanced MR and CT.

Table 1-2: Supported Transfer Syntaxes

Transfer Syntax Set	Transfer Syntax Name	Transfer Syntax UID	DICOM Web Service Bulkdata Media Type
Non-Image Transfer Syntax Set (NI)	Implicit VR Little Endian	1.2.840.10008.1.2	N/A
	Explicit VR Little Endian native	1.2.840.10008.1.2.1	N/A
	CT-private-ELE	1.3.46.670589.33.1.4.1	N/A
Lossless Compressed Transfer Syntax Set (LL)	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)	1.2.840.10008.1.2.4.70	N/A
	RLE Lossless	1.2.840.10008.1.2.5	N/A

Transfer Syntax Set	Transfer Syntax Name	Transfer Syntax UID	DICOM Web Service Bulkdata Media Type
Lossy Compressed Transfer Syntax Set (L)	JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	N/A

1.1.1. Structured Reporting Root Template IDs

Table 1-3 lists all Template IDs (TID) of Root Templates that are supported by the system. The "Function" column indicates how the system uses the content of the DICOM SR:

- **CREATE:** The system creates instances using the specified TID.
- **RENDER:** The system displays the content of the SR, without using the data for any processing.
- **EXTRACT_DATA:** The system can extract structured data from the content and use the data for subsequent processing (e.g. reporting).
- **OVERLAY:** The system uses the information in the SR to display information directly on the images (e.g. Mammography CAD markers).
- **ARCHIVE:** The system stores instances for later retrieval.

The "SOP Class UID" column indicates which of the SR Storage SOP Classes are used to encode the information or to store it. If multiple SOP Classes are supported the "Condition" column describes the conditions for using the different SOP Classes.

Table 1-3: Supported Root SR Template IDs (TIDs)

Name	Root TID	Function	SOP Classes		Condition
Key Object Selection	2010	CREATE;	Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	-

1.2. DIMSE Services

1.2.1. Verification

Table 1-4 lists support for the Verification SOP Class.

Table 1-4: Verification SOP Class

SOP Classes		Transfer Syntax		SCU	SCP
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	Yes
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

1.2.2. Storage

For details on supported Storage SOP Classes see Section 1.1.

1.2.3. Workflow Management

Table below lists all supported Workflow Management SOP Classes.

Table 1-5: Workflow Management SOP Classes

SOP Classes		Transfer Syntax		SCU	SCP
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

SOP Classes		Transfer Syntax		SCU	SCP
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

1.2.4. Query/Retrieve

Table 1-6 lists all supported Query/Retrieve SOP Classes.

Table 1-6: Query/Retrieve SOP Classes

SOP Classes		Transfer Syntax		SCU	SCP
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	Yes	Yes
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	Yes
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	Yes	Yes
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	Yes

1.2.5. Printing

Table 1-7 lists all supported Printing SOP Classes.

Table 1-7: Printing SOP Classes

SOP Classes		Transfer Syntax		SCU	SCP
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	No
>Basic Film Session	1.2.840.10008.5.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
>Basic Film Box	1.2.840.10008.5.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
>Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
>Printer SOP Class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian	1.2.840.10008.1.2	No	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1	No	No
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
>Basic Film Session	1.2.840.10008.5.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	No
>Basic Film Box	1.2.840.10008.5.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	No

SOP Classes		Transfer Syntax		SCU	SCP
>Basic Color Image Box	1.2.840.10008.5.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	No
>Printer	1.2.840.10008.5.1.1.16	Implicit VR Little Endian	1.2.840.10008.1.2	No	No
		Explicit VR Little Endian	1.2.840.10008.1.2.1	No	No

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

1.3. DICOM Web Services

1.3.1. URI Service (WADO-URI) - N/A

Not implemented.

1.3.2. Studies Service

Table below lists details on the support of the Studies Service.

Table 1-8: Study Service

Service	Transaction	Resource	User Agent	Origin Server
Studies Web Service	Retrieve Capabilities		No	No
	Retrieve (WADO-RS)	Study	No	Yes
		Study Metadata	No	No
		Study Bulkdata	No	No
		Study Pixel Data	No	No
		Rendered Study	No	No
		Study Thumbnail	No	No
		Series	No	Yes
		Series Metadata	No	No
		Series Bulkdata	No	No
		Series Pixel Data	No	No
		Rendered Series	No	No
		Series Thumbnail	No	No
		Instance	No	Yes
		Instance Metadata	No	No
		Instance Bulkdata	No	No
		Instance Pixel Data	No	No
		Rendered Instance	No	No
		Instance Thumbnail	No	No

Service	Transaction	Resource	User Agent	Origin Server
		Frames	No	No
		Rendered Frames	No	No
		Frame Thumbnail	No	No
		Bulkdata	No	No
	Search (QIDO-RS)	All Studies	No	Yes
		Study's Series	No	Yes
		Study's Instances	No	No
		All Series	No	Yes
		Series Instances	No	Yes
		All Instances	No	Yes
	Store (STOW-RS)	All Studies	No	Yes
		Study	No	Yes

1.3.3. Worklist Service – N/A

Not implemented.

1.3.4. Non-Patient Instance Service – N/A

Not implemented.

1.4. Media Services

Table below lists all supported Media Application Profiles.

Table 1-9: Supported Media Application Profiles

Media Storage Application Profile	FSC	FSR	FSU
Compact Disk – Recordable			
CT/MR Studies on CD-R (STD-CTMR-CD)	Yes	Yes	No
General Purpose CD-R Interchange (STD-GEN-CD)	Yes	Yes	No
DVD			
CT/MR Studies on DVD Media (STD-CTMR-DVD)	Yes	Yes	No
General Purpose DVD Interchange with JPEG (STD-GEN-DVD-JPEG)	Yes	Yes	No
USB			
General Purpose USB media (STD-GEN-USB-JPEG)	Yes	Yes	Yes

1.5. Real Time Video Service – N/A

Not implemented.

1.6. De-identification Profiles

Table below lists all supported de-identification profiles and options.

Table 1-10: De-Identification Profiles

Profile	Option
Basic Application-Level Confidentiality Profile	None

This is applicable when de-identification is requested. De-identification of personal data constitutes “processing” under the Philips Privacy Rules (and many country laws). Personal and specifically, sensitive data may only be de-identified by Philips Healthcare under certain conditions. Processing of medical images (sensitive data) may require verifiable, documented authorization or consent. This important aspect of data processing is governed and mandated by Philips Privacy Rules, to which all Philips Employees must adhere.

The privacy rules ensure that the HIPAA de-identification standard is met by following the Safe Harbor Method as defined in section 164.514(b)(2) of the HIPPA Privacy Rule.

The standard for de-identification of DICOM objects is defined by the DICOM Standard PS 3.15 Digital Imaging and Communications in Medicine (DICOM), Part 15: Security and System Management Profiles.

1.7. Specific Character Sets

Table 1-11: Supported Specific Character Sets

Defined Term	IANA	Description
Single-Byte Character Sets without Code Extensions		
ISO_IR 6	ISO 646	Default repertoire
ISO_IR 100	ISO-8859-1	Latin alphabet No. 1
ISO_IR 101	ISO-8859-2	Latin alphabet No. 2
ISO_IR 109	ISO-8859-3	Latin alphabet No. 3
ISO_IR 110	ISO-8859-4	Latin alphabet No. 4
ISO_IR 126	ISO-8859-7	Greek
ISO_IR 144	ISO-8859-5	Cyrillic
ISO_IR 148	ISO-8859-9	Latin alphabet No. 5
ISO_IR 127	ISO-8859-6	Arabic
ISO_IR 138	ISO-8859-8	Hebrew
ISO_IR 166	TIS-620	Thai
ISO_IR 13	ISO-2022-JP	Japanese
Single-Byte Character Sets with Code Extension		

Defined Term	IANA	Description
ISO 2022 IR 100	ISO-8859-1	Latin alphabet No. 1
ISO 2022 IR 101	ISO-8859-2	Latin alphabet No. 2
ISO 2022 IR 109	ISO-8859-3	Latin alphabet No. 3
ISO 2022 IR 110	ISO-8859-4	Latin alphabet No. 4
ISO 2022 IR 148	ISO-8859-9	Latin alphabet No. 5
ISO 2022 IR 13	ISO-2022-JP	Japanese
Multi-Byte Character Sets without Code Extensions		
GB18030	GB18030	Chinese
Multi-Byte Character Sets with Code Extensions		
ISO 2022 IR 87	ISO-2022-JP	Japanese
ISO 2022 IR 149	ISO-2022-KR	Korean
ISO 2022 IR 159	ISO-2022-JP	Japanese

- **Note:** Advanced Visualization Workspace V15.1.3 display the localized Japanese Names encoded in the DICOM data as per the following priority: If Ideographic name is present then it shall be displayed as first priority.
- If Ideographic name is not present then Phonetic name shall be displayed if present.
- If both Ideographic and Phonetic names are not present, then the Alphabetic name shall be displayed.

This format is applicable for Patient Directory, Filming, Reporting and all clinical applications. However, the derived data created will have all the name components as per the original data.

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3. Introduction

3.1. Revision History

Table 3-1: Revision History

Revision	Date	Product Version(s)	Change
01	03-June-2026	15.1.3	Initial release

3.2. Audience

This document is intended for the audience listed below. It is assumed that the reader has a working knowledge of the DICOM Standard.

The document structure was designed for easier access to relevant information for different user groups:

- Clinical Users, who want to get an overview of the implemented interoperability features of the system can see Section 4 Implementation Model.
- Personnel involved in Sales can use the information in Section 1 to assess the compatibility between different systems involved in a sales situation.
- System Integrators can use information in Section 6 during system installation and also information from Section 5 Service and Interoperability Description for details regarding the implemented services.
- Field Service Engineers can use the details from Section 5 Service and Interoperability Description and from Section 7 Network and Media Communication Details for troubleshooting.
- Hospital IT staff focusing on security can use the details provided in Section 8 Security regarding implemented Security features.
- Research Personnel may be interested in using information provided in Appendix A Information Object Definitions (IODs) or Appendix B Structured Report Content Encoding to get detailed imaging and measurement information.

3.3. Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between Advanced Visualization Workspace V15.1.3 and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [1]. 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 should not replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, it is the user's responsibility to perform the following validation activities:
 - The comparison of Conformance Statements from Advanced Visualization Workspace V15.1.3 and other DICOM conformant equipment is the first step towards assessing interconnectivity and interoperability between those systems.
 - Test procedures should be defined and executed to validate the required level of interoperability with specific DICOM conformant equipment, as established by the healthcare facility.

3.4. Terms and Definitions

The following list includes DICOM Terms, that are used throughout this Conformance Statement:

Table 3-2: Terms and Definitions

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 (AE)	A representation of the external behavior of an application process in terms of DICOM Network Services, Web Services and/or media exchange capabilities implemented in one or more roles. A single device may have multiple Application Entities.
Application Entity Title (AET)	The externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.
Application Context	The specification of the type of communication used between Application Entities. Example: DICOM network protocol.
Association	A network communication channel set up between Application Entities.
Attribute	A unit of information in an Information Object Definition; a Data Element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower-level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).
Data Element	A unit of information as defined by a single entry in the data dictionary. An encoded Information Object Definition (IOD) Attribute that is composed of, at a minimum, three fields: a Data Element Tag, a Value Length, and a Value Field. For some specific Transfer Syntaxes, a Data Element also contains a VR Field where the Value Representation of that Data Element is specified explicitly
Information Object Definition (IOD)	The specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. Examples: MR Image IOD, CT Image IOD, Print Job IOD. The Attributes within an IOD 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).
Media Application Profile	The specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs).
Module	A set of Attributes within an Information Object Definition that are logically related to each other. Example: Patient Module includes Patient's Name, Patient ID, Patient's Birth Date, and Patient's Sex.
Negotiation	First phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.
Origin Server	Refers to the program that can originate authoritative responses to HTTP requests for a given Target Resource. The term "server" refers to any implementation that receives a web service request message from a user agent.
Presentation Context	The set of DICOM Network Services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.
Private SOP Class	A SOP Class that is not defined in the DICOM Standard but is published in an implementation's Conformance Statement.

Protocol Data Unit (PDU)	A packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.
Security Profile	A set of mechanisms, such as encryption, user authentication, or digital signatures, used by an Application Entity to ensure confidentiality, integrity, and/or availability of exchanged DICOM data.
Service Class Provider (SCP)	Role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).
Service Class User (SCU)	Role of an Application Entity that uses a DICOM Network Service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU).
Service/Object Pair Class (SOP Class)	The specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of a DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.
Service/Object Pair Instance (SOP Instance)	An information object; a specific occurrence of information exchanged in a SOP Class. E.g., a specific X-ray image.
Specialized SOP Class	A SOP Class that is derived from the Standard that is specialized by additional type 1, 1C, 2, 2C, or 3 Attributes, by enumeration of specific permitted Values for Attributes, or by enumeration of specific permitted Templates. The additional Attributes may either be drawn from the Data Dictionary in PS3.6 or may be Private Attributes.
Standard SOP Class	A SOP Class defined in the Standard, and that is implemented and used without any modifications.
Standard Extended SOP Class	A SOP Class that is defined in the standard, and that is extended by additional type 3 Attributes. The additional Attributes may either be drawn from the DICOM Data Dictionary in PS3.6 or may be Private Attributes.
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 is for 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 exchange of DICOM information objects and messages. Examples: JPEG compressed (images), Little Endian Explicit Value Representation.
TLS-Secured Port	TCP port on which an implementation accepts TLS connections to exchange DICOM information.
Unique Identifier (UID)	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.
User Agent	A client in a network protocol used in communications within a client-server distributed computing system. In particular, the Hypertext Transfer Protocol (HTTP) identifies the client software originating the request, using a user-agent header, even when the client is not operated by a user.

Value Representation (VR)	The format type of an individual DICOM data element, such as text, an integer, a person's name, or a 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) ; with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.
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The following list includes product specific definitions used throughout this Conformance Statement

AVW	Advanced Visualization Workspace
-----	----------------------------------

3.5. Abbreviations

Abbreviations that are used in this DICOM Conformance Statement are listed here.

Table 3-3: Abbreviations

AE	Application Entity
AET	Application Entity Title
CAD	Computer Aided Detection
CDA	Clinical Document Architecture
CID	Context Identifier
DCS	DICOM Conformance Statement
DHCP	Dynamic Host Configuration Protocol
DICOM	Digital Imaging and Communications in Medicine
ELE	Explicit VR Little Endian
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
IANA	Internet Assigned Numbers Authority
IHE	Integrating the Healthcare Enterprise
ILE	Implicit VR Little Endian
IOD	Information Object Definition
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Organization for Standardization
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist

NEMA	National Electrical Manufacturers Association
NTP	Network Time Protocol
OID	Object Identifier
OS	Origin Server
PDU	Protocol Data Unit
PHI	Protected Health Information
PPS	Performed Procedure Step
QIDO-RS	Query based on ID for DICOM Objects by RESTful Services
RTV	Real Time Video
SCP	Service Class Provider
SCU	Service Class User
SDP	Service Description Protocol
SOP	Service-Object Pair
SPS	Scheduled Procedure Step
SR	Structured Reporting
STOW-RS	Store Over the Web by RESTful Services
TCP/IP	Transmission Control Protocol/Internet Protocol
TID	Template Identifier
UA	User Agent
UI	User Interface
UID	Unique Identifier
UL	Upper Layer
UPS	Unified Procedure Step
UPS-RS	Unified Procedure Step by RESTful Services
VR	Value Representation
WADO-RS	Web Access to DICOM Objects by RESTful Services
WADO-URI	Web Access to DICOM Objects by URI

3.6. References

[1] National Electrical Manufacturers Association (NEMA), Rosslyn, VA USA. *PS3 / ISO 12052 Digital Imaging and Communications in Medicine (DICOM) Standard*. <http://www.dicomstandard.org>.

4. Implementation Model

The implementation model consists of three sections:

- The application data flow diagram, specifying the relationship between the Application Entities and the "external world" or Real-World Activities,
- A functional description of each Application Entity, and
- The sequencing constraints among them.

4.1. Application Entities and Data Flow

The Advanced Visualization Workspace V15.1.3 system consists of the following three Application Entities. The Advanced Visualization Workspace V15.1.3 system implements and provides DICOM services using these Application Entities.

- DICOM Manager AE
- Print Manager AE
- WebDICOM AE
- Media AE

The following figure shows the Networking application data flow as a functional overview of the Advanced Visualization Workspace V15.1.3.

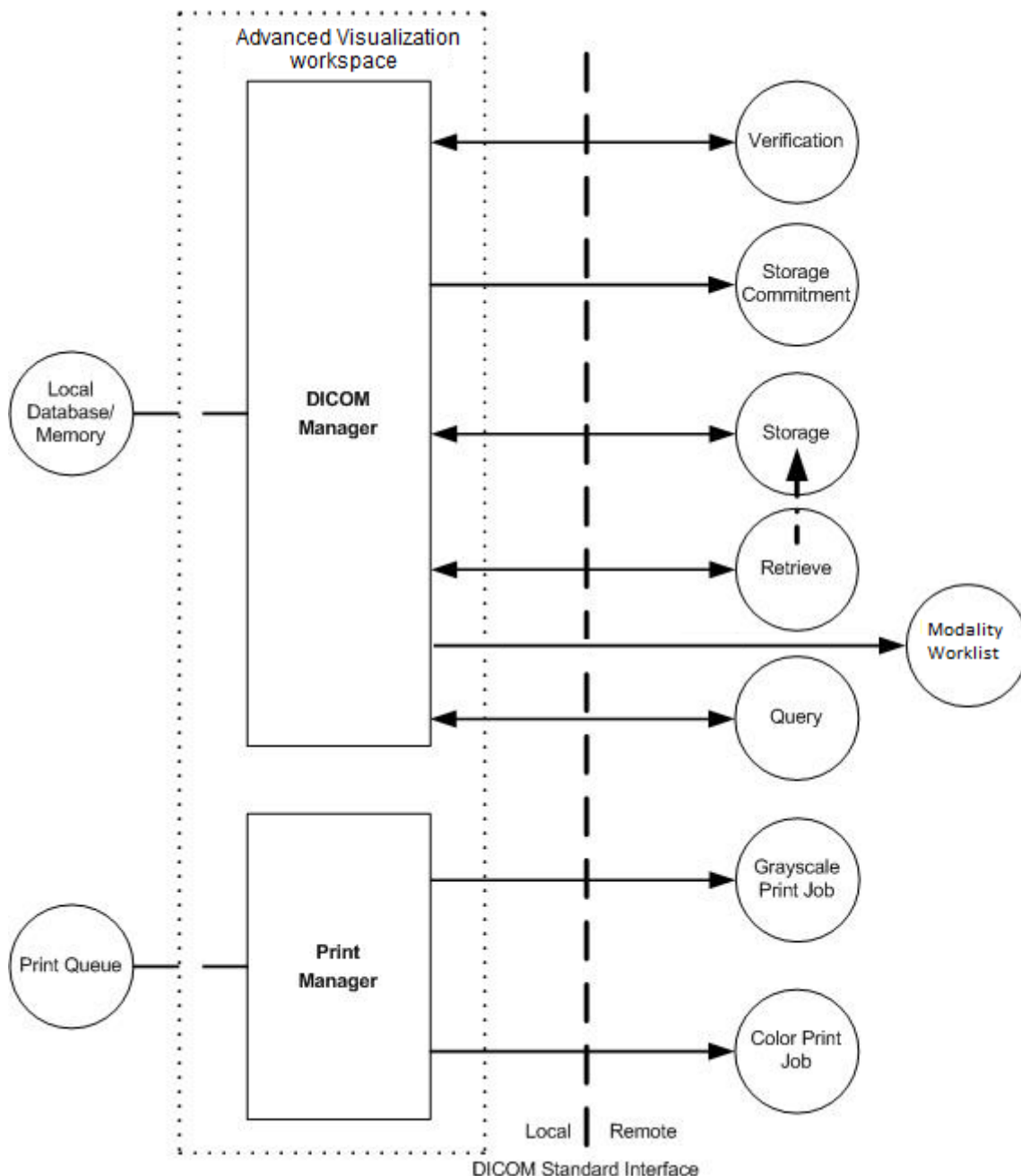


Figure 4-1: Network Application Data Flow Diagram

As depicted in the above figure, the Advanced Visualization Workspace V15.1.3 incorporates the following functionality.

- The Advanced Visualization Workspace V15.1.3 as SCU uses standard Verification Service Class functionality to the SCP.
- After RWA Request Verification, the Advanced Visualization Workspace V15.1.3 as SCP provides standard Verification Service Class functionality to the requesting SCU.
- After RWA Import Images, the Advanced Visualization Workspace V15.1.3 as SCP provides standard Storage Service Class functionality to the requesting SCU.
- After RWA Query Local Images/Retrieve Local Images, the Advanced Visualization Workspace V15.1.3 as SCP provides standard Query/Retrieve Service Class functionality to the requesting SCU.

- After RWA Export Images (triggered by either the operator or RWA Retrieve Local Images), the Advanced Visualization Workspace V15.1.3 as SCU uses the Remote SCP Storage Service Class functionality to store Local Images on a Remote Database.
- After operator RWA Find Remote Images, the Advanced Visualization Workspace V15.1.3 as SCU uses the remote SCP Query/Retrieve Service Class functionality to query remote images.
- After operator RWA Move Remote Images, the Advanced Visualization Workspace V15.1.3 as SCU uses the remote SCP Query/Retrieve Service Class functionality to retrieve remote images.
- After operator RWA Request Storage Commitment, the Advanced Visualization Workspace V15.1.3 as SCU uses the remote SCP Storage Commitment Service Class functionality to commit remote images.
- After operator RWA Print Images, the Advanced Visualization Workspace V15.1.3 as SCU uses the remote Print Management Service Class to print local images.

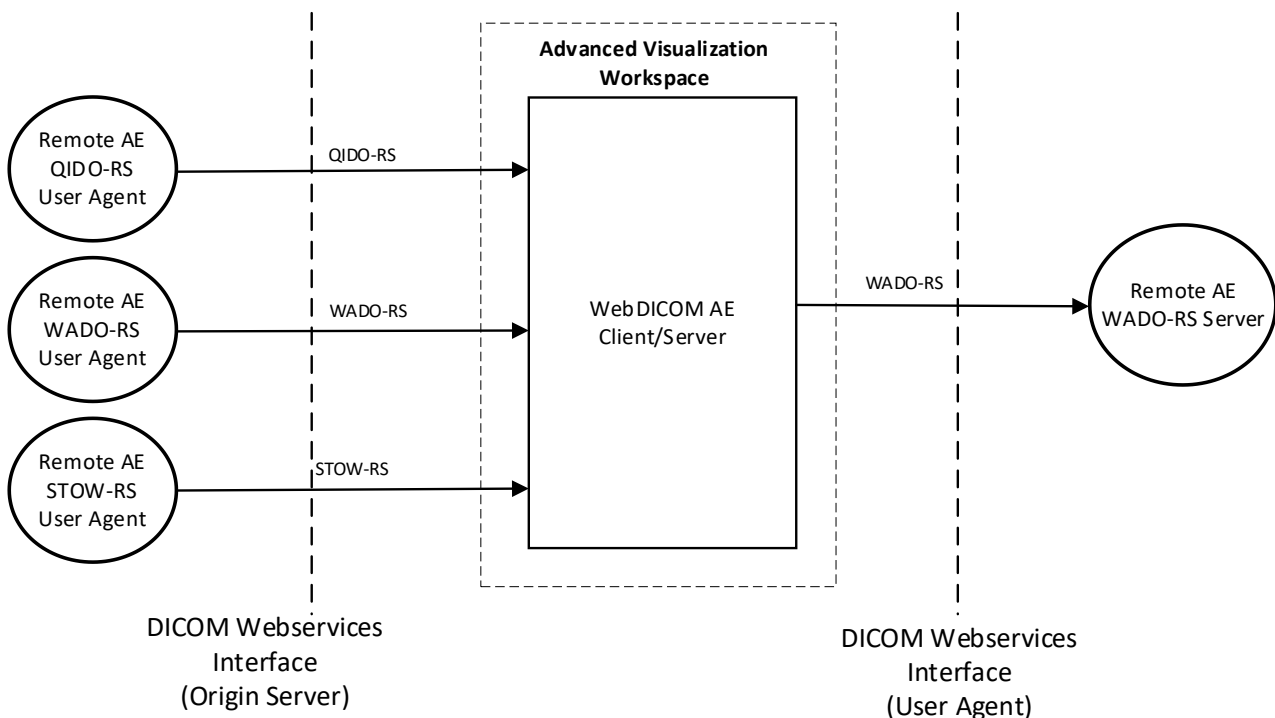


Figure 4-2: Application WebDICOM AE Data Flow Diagram

4.1.1. Functional Definition of DICOM Manager AE

The DICOM Manager AE as SCU and SCP includes the following service classes:

Storage Service:

When performing a Storage Service as SCP, the DICOM Manager will receive images and store them into the system's local database. The same AE may be used (with a configurable different AE title) to access the additional local devices.

Imported data object received from an external system will be inserted into the local data base with all the original attributes (including private), except those that jeopardize database integrity or further processing by applications.

When performing a Storage Service as SCU, the DICOM Manager will export images and related object data to a remote system using the relevant image storage or Grayscale Softcopy Presentation State SOP class.

Storage Commitment Service:

The DICOM Manager is responsible to issue and support the storage commitment service as SCU.

The DICOM Manager establishes association with the specified AE title and sends storage commitment (N-ACTION) request using the push model. After that, it may accept storage commitment (N-EVENT-REPORT) requests on the same association or by establishing another association.

Query-Retrieve Service:

The DICOM Manager AE as Query/Retrieve SCU implements the RWA Query Images to find Examinations on a remote system (e.g. PACS).

The DICOM Manager waits for another application to connect at the presentation address configured for its AE title. The DICOM

Manager will accept associations with Presentation Contexts for Service Object Pair (SOP) classes for

- Storage Service Classes (C-STORE)
- Query-Retrieve Service Class (C-MOVE and C-FIND only)
- Verification Service Classes.

When performing Query-Retrieve Service Class (C-FIND-RSP) as SCP, the DICOM Manager will query its local database according to the request's parameters, and will send the results to the issuer.

When performing Query-Retrieve Service Class (C-MOVE-RSP) as SCP, the DICOM Manager will issue a C-STORE-RQ as SCU to the target AE for every image found according to the request.

The following figure provides an illustration of DICOM Manager Activities:

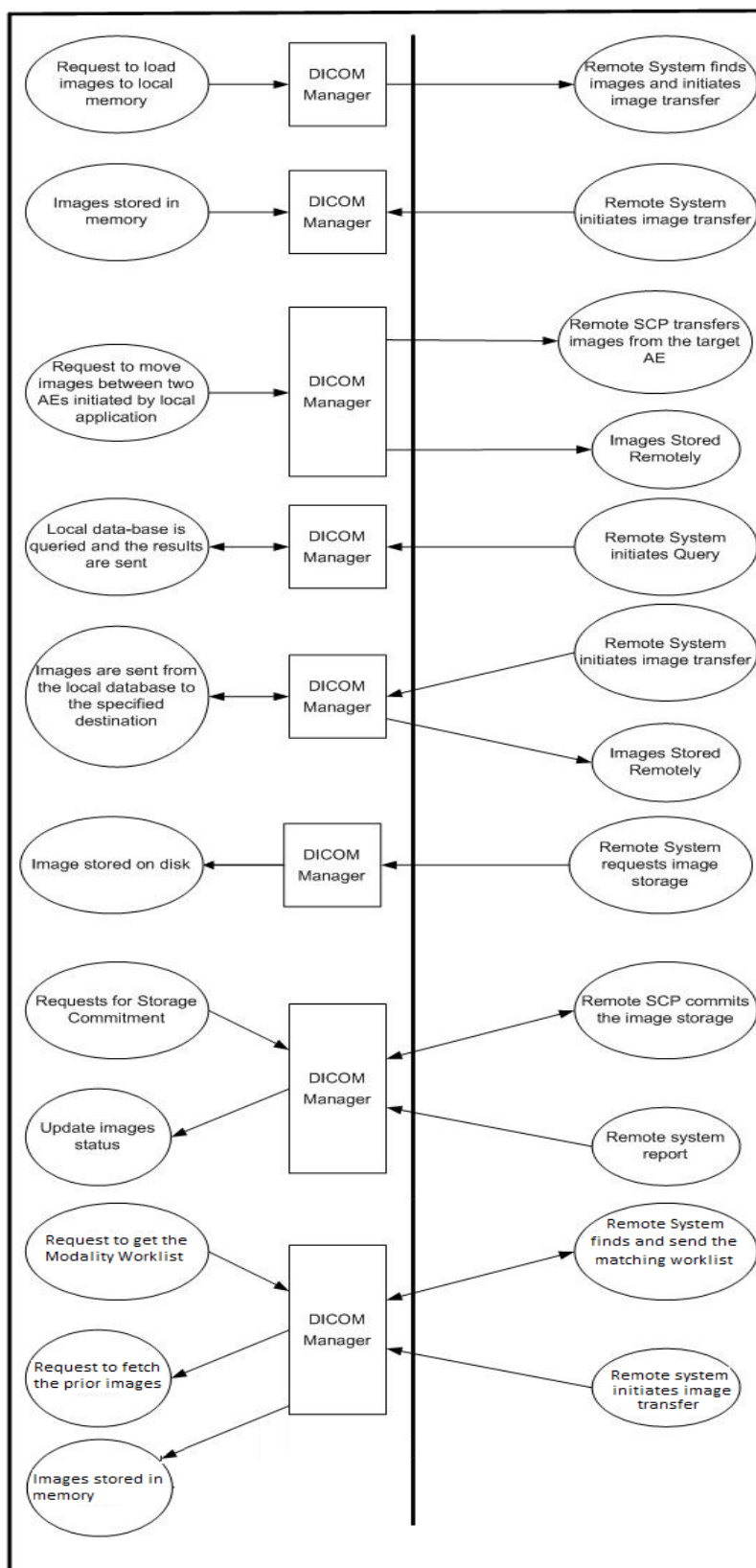


Figure 4-3: Illustration of DICOM Manager

4.1.2. Functional Definition of Print Manager

The Print-Manager is a Graphical User Interface (GUI) based application. It enables the user to print selected images using the DICOM protocol. The user can specify as a printing destination one of several configured printers. The user can also modify some of the printing parameters such as the film size and format.

The following figure provides an illustration of Print-Manager activities:

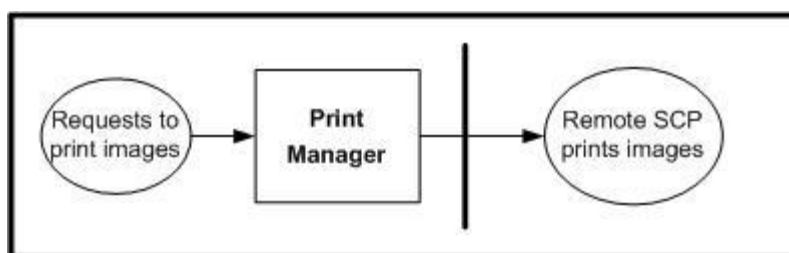


Figure 4-4: Illustration of Print Manager

4.1.3. Functional Definition of WebDICOM AE

The WebDicom application entity includes the following service classes:

- Store Transaction (STOW-RS) as Origin Server
- Search Transaction (QIDO-RS) as Origin Server
- Retrieve Transaction (WADO-RS) as Origin Server

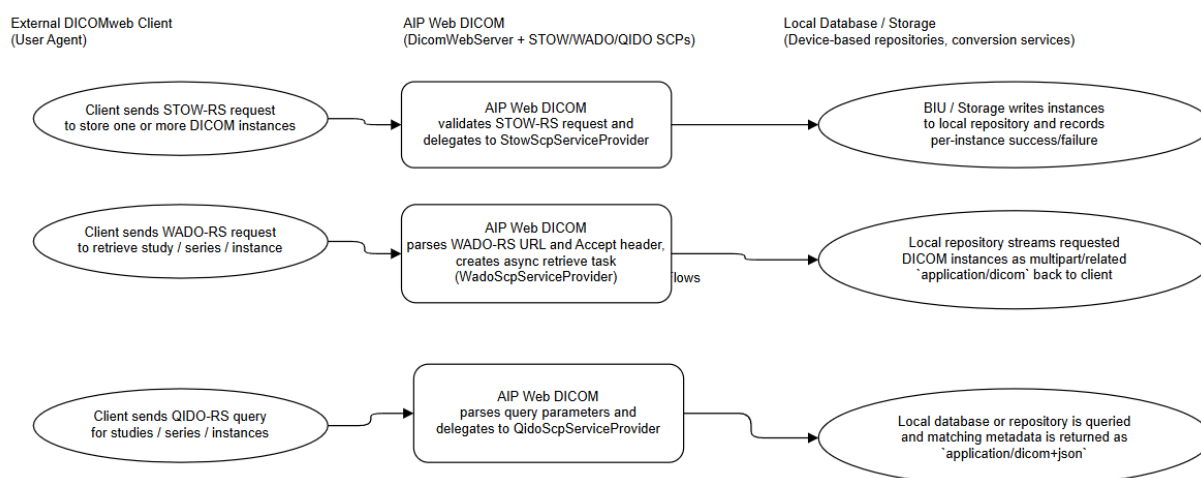


Figure 4-5: Illustration of WebDICOM AE

- **Retrieve Transaction (WADO-RS)**

The Advanced Visualization Workspace is an Origin Server for the WADO-RS service.

The Advanced Visualization Workspace receives WADO-RS requests from a remote WADO User Agent. The Remote system performs a DICOM query to a AVW System and send a requested images to the Remote system. The action can be performed on Study, Series and Image levels.

The following figure provides an illustration of WADO-RS as Origin Server:

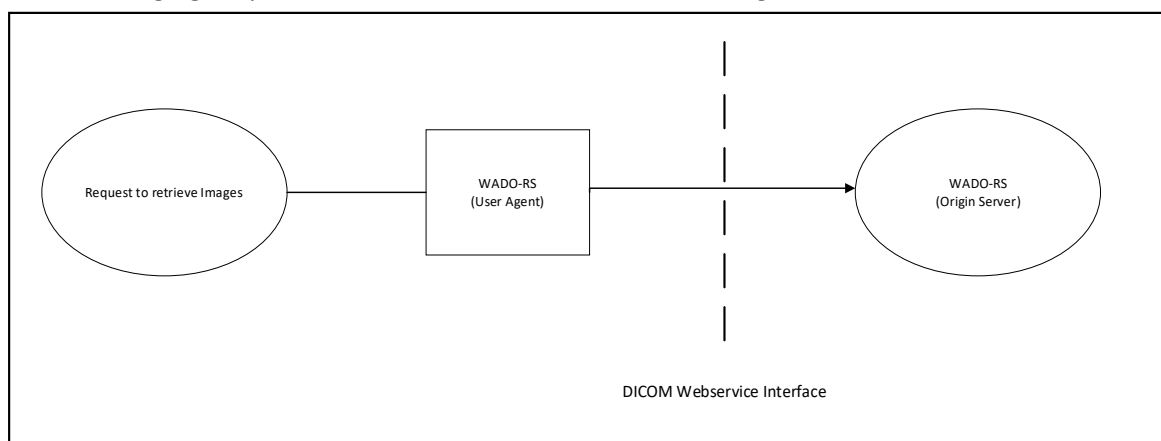


Figure 4-6: Illustration of WADO-RS as Origin Server

Search Transaction (QIDO-RS)

The Advanced Visualization Workspace acts as an Origin Server for the DICOM QIDO-RS service, supporting RESTful HTTP GET search at Study, Series, and Instance levels. It accepts standard QIDO-RS query parameters (such as patient and study identifiers, modality, date/time filters, and pagination) and returns the matching results as DICOM JSON (or XML, if configured), containing only supported attributes. Invalid or unsupported parameters are handled in accordance with the QIDO-RS specification, with the system returning appropriate HTTP status codes and error messages. The following figure provides an illustration of QIDO-RS as Origin Server:

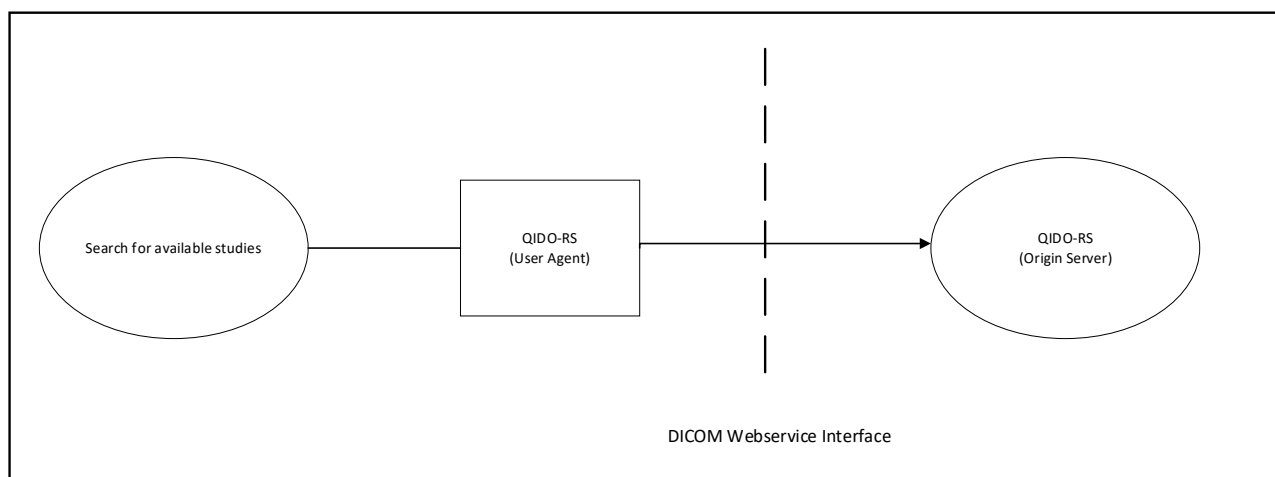


Figure 4-7: Illustration of QIDO-RS as Origin Server

Store Transaction (STOW-RS)

The Advanced Visualization Workspace acts as an Origin Server for the DICOM STOW-RS service, supporting RESTful HTTP POST for storage of DICOM Instances at All Study, Study levels. It accepts STOW-RS requests containing one or more DICOM objects (and, where applicable, associated bulk data) encoded as multipart/related and stores the received Instances into its managed archive. Upon completion, the Advanced Visualization Workspace returns a STOW-RS response that indicates success, partial success, or failure on a per-instance basis in accordance with the standard, using appropriate HTTP status codes and error messages.

The following figure provides an illustration of STOW-RS as Origin Server:

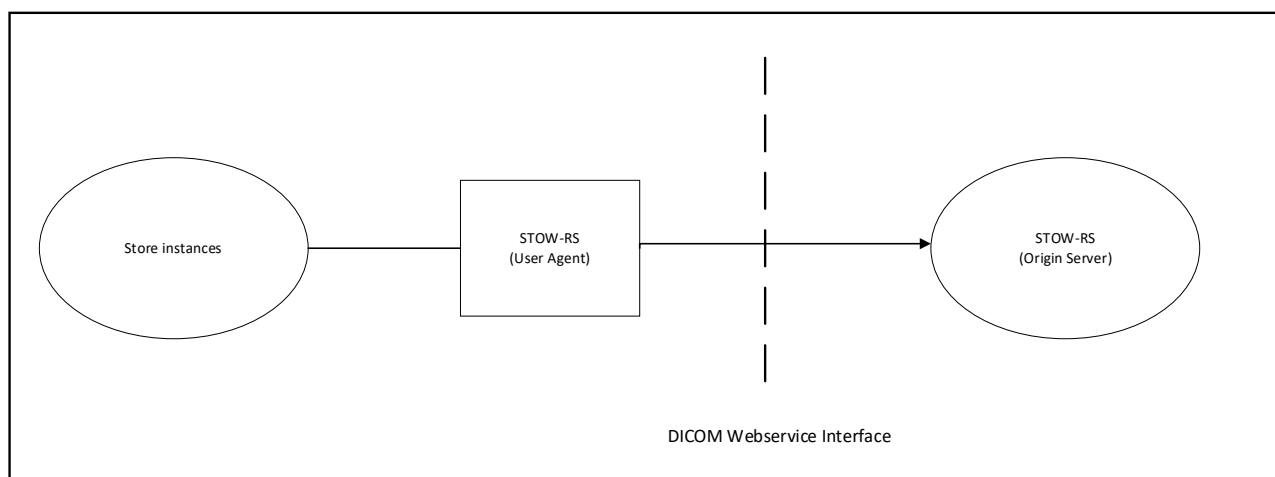


Figure 4-8: Illustration of STOW-RS as Origin Server

4.1.4. Functional Definition of Media AE

The supported Application Profiles, their Roles and the Service Class options, all defined in DICOM terminology, are listed in the following table.

For reading and writing the media AE provides standard conformance to:

- DICOM media Storage Service and File Format ([DICOM] PS 3.10);
- Media Storage Application Profiles ([DICOM] PS 3.11); and
- Media Formats and Physical Media for Media Interchange ([DICOM] PS 3.12) for Reading (FSR), Writing (FSC) and Updating (FSU).

Advanced Visualization Workspace V15.1.3 does not support multi-session writes to CD/DVD's.

Supported media:

- CD: CD-R and CD-RW with the profile STD-GEN-CD.
- DVD: DVD-R, DVD+R, DVD-RW, DVD+RW and DVD-RAM with the profile: STD-GEN-DVD-JPEG as FSR.
- USB: STD-GEN-USB-JPEG as FSC, FSR and FSU.

5. Service and Interoperability Description

5.1. Mapping of Services to Application Entities

Table 5-1 provides an overview of the Application Entities and the Services supported by each AE.

Table 5-1: Service to AE Mapping

Application Entity	Supported Services	Role								
		DIMSE		DICOM Web		DICOM Media			Real-Time Video	
		SCU	SCP	Origin Server	User Agent	FSC	FSU	FSR	SCU	SCP
DICOM Manager	Basic Worklist Management	Yes	No	No	No	N/A	N/A	N/A	N/A	N/A
	Storage Service	Yes	Yes	No	No	Yes	Yes	Yes	N/A	N/A
	Storage Commitment	Yes	No	No	No	N/A	N/A	N/A	N/A	N/A
	Query/Retrieve	Yes	Yes	No	No	N/A	N/A	N/A	N/A	N/A
	Veriifcation	Yes	Yes	No	No	N/A	N/A	N/A	N/A	N/A
Print Manager	Print	Yes	No	No	No	N/A	N/A	N/A	N/A	N/A
WebDicom	Retrieve (WADO-RS)	No	No	Yes	No	N/A	N/A	N/A	N/A	N/A
	Search (QIDO-RS)	No	No	Yes	No	N/A	N/A	N/A	N/A	N/A
	Store (STOW-RS)	No	No	Yes	No	N/A	N/A	N/A	N/A	N/A

5.2. Supported DIMSE Services

5.2.1. Basic Worklist Management Service

5.2.1.1. SCU of the Modality Worklist Information Model - FIND SOP Class

The figure below shows sequencing of RWA for MWL as SCU.

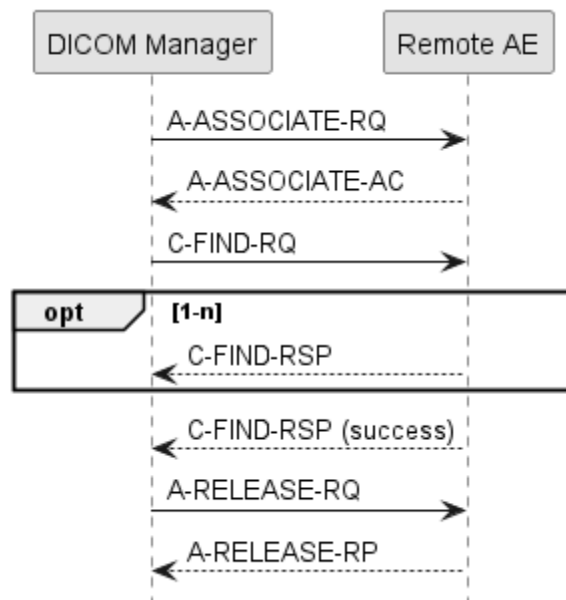


Figure 5-1: Real World Activity – Modality Worklist as SCU

As a Service Class User of the Modality Worklist Information Model - FIND SOP Class, the Advanced Visualization Workspace V15.1.3 uses the C-FIND-RQ message to query the SCP. It supports the Query Keys listed in Table 5-2.

In the "Matching Type" column, the following Values can be used:

- SINGLE_VALUE: SCU can request single Value matching on this Attribute.
- UID: SCU can request List of UID matching on this Attribute.
- WILDCARD: SCU can request Wildcard matching on this Attribute.
- RANGE: SCU can request Range matching on this Attribute.
- SEQUENCE: SCU can request sequence matching on this Attribute.
- UNIVERSAL: SCU can request that the Attribute be a return Value (universal matching).

In the "Query Value Source" column, the following Values can be used:

- FIXED: The query Value cannot be modified by the user or by configuration.
- GENERATED: The query Value is generated by the system (e.g. current date as the study date).
- CONFIGURATION: The query Value is dependent on system configuration.
- USER: The query Value is entered by the user.
- SCANNED: The query Value is read from a barcode scanner or similar device.
- EMPTY: The query Value is sent with a zero-length Value to indicate it is a return key only.

In the "Display on UI" column the following Values can be used:

- D: the return Value is displayed on the main UI by default.
- C: the return Value is displayed on the main UI if configured.
- N: the return Value is never displayed.

Table 5-2: Supported C-FIND Query Parameters for Modality Worklist - SCU

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Scheduled Procedure Step						
Scheduled Procedure Step Sequence	(0040,0100)	SEQUENCE				
>Scheduled Procedure StepStart date	(0040,0002)	SINGLE_VALUE ,RANGE	CONFIGURATION	Today, Tomorrow, or "Today and Tomorrow".	N	Value used for modality matching is configurable in the Preferences in Advanced Visualization Workspace
>Modality	(0008,0060)	SINGLE_VALUE	CONFIGURATION	CT, ECG, MR, US, PET, CR, RT, NM, DX, RF or XA	N	Value used for modality matching is configurable in the Preferences in Advanced Visualization Workspace
Patient Identification						
Patient's Name	(0010,0010)	WILDCARD	FIXED	*	N	
Patient ID	(0010,0020)	UNIVERSAL	EMPTY		N	

Note: Advanced Visualization Workspace gets the scheduled worklist for the day and fetch priors for some of these orders before execution, so when new exams arrive on Portal, priors are already available (no need for manual Query/Retrieve from PACS).

5.2.1.2. SCP of the Modality Worklist Information Model - FIND SOP Class – N/A

Not implemented.

5.2.2. Modality Performed Procedure Step Service - N/A

Not implemented.

5.2.3. Unified Worklist and Procedure Step Service – N/A

Not implemented.

5.2.4. Instance Availability Notification Service - N/A

Not implemented.

5.2.5. Storage Service

5.2.5.1. SCU of the Storage SOP Classes

The figure below shows sequencing of RWA for Storage as SCU.

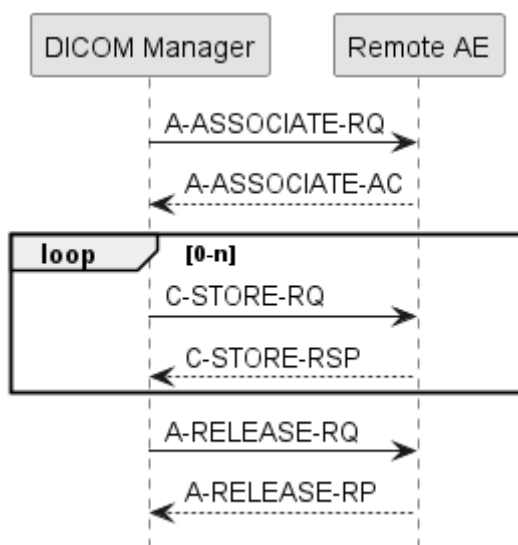


Figure 5-2: Real World Activity – Storage as SCU

As a Service Class User of the Storage Service Class, the Advanced Visualization Workspace uses the C-STORE-RQ message to request storage of DICOM objects by a remote SCP. See Section 1.1 Content and Transfer in the Overview for the list of supported SOP Classes.

For details regarding the content of SOP Instances that are created by the system, see Appendix A, which describes the underlying IOD of the supported SOP Classes.

The associated Real-World Activity is a request for retrieval of images from the disk or save operation from Advanced Visualization Workspace applications and storage of the images to a remote system using a C-STORE command.

5.2.5.1.1. Transcoding of Transfer Syntaxes – N/A

Not implemented.

5.2.5.2. SCP of the Storage SOP Classes

The real world activity associated with the C-STORE operation is the storage of the image in the memory of the system upon which DICOM Manager is running in order to make it available for immediate processing by applications. DICOM Manager will issue a failure status if it is unable to store the image in the memory.

The figure below shows sequencing of RWA for Storage as SCP.

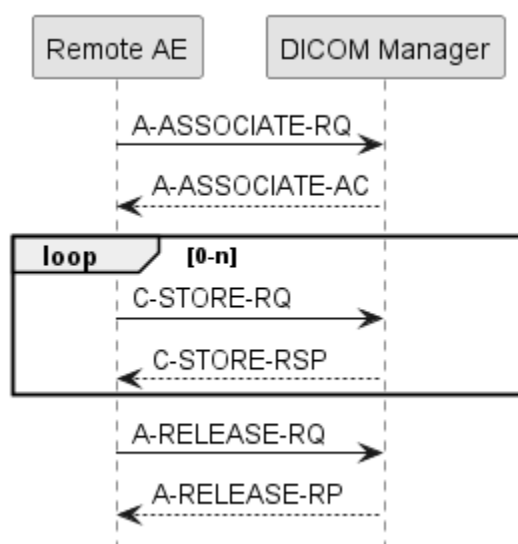


Figure 5-3: Real World Activity – Storage as SCP

As a Service Class Provider of the Storage Service Class, the Advanced Visualization Workspace V15.1.3 receives the C-STORE-RQ message from remote SCUs. See Section 1.1 Content and Transferring the Overview for the list of supported SOP Classes.

Advanced Visualization Workspace V15.1.3 displays the Patient Name and Patient ID as “UNKNOWN” on receiving a Store Request for patient data which contains empty values for Patient Name and Patient ID attributes.

Advanced Visualization Workspace V15.1.3 records in the Log Viewer logs if there is a network reply timeout during import.

On receiving an A-ABORT message while performing import, Advanced Visualization Workspace V15.1.3 logs the occurrence of the abort in the log viewer.

Advanced Visualization Workspace V15.1.3 is able to import objects that contain non-Philips private attributes.

Advanced Visualization Workspace V15.1.3 is able to import objects with retired date and time format.

It is possible for AVW to import object after the demographics information has undergone modification for that patient.

If an object containing a value for Modality, which is not supported by the Value Representation rules for CS, is imported into Advanced Visualization Workspace V15.1.3, Advanced Visualization Workspace V15.1.3 corrects the value while displaying the object on the Patient Directory.

If an object containing a value for Modality, which is not any of the defined terms, is imported into AVW, Advanced Visualization Workspace V15.1.3 displays the value as is on the Patient Directory, for that object but records it in the Log Viewer.

Advanced Visualization Workspace V15.1.3 displays a message to the user if import operation is interrupted during data transfer.

Table below defines the conformance levels of Advanced Visualization Workspace V15.1.3

Table 5-3: Levels of Conformance

Levels of Conformance	2
Level of Digital Signature Support	1

The Advanced Visualization Workspace does not coerce attributes upon receiving them from other systems.

Table below lists any limitations on displaying or processing instances, e.g., display or processing of the respective SOP Instances is prevented by an unsupported Value for an Attribute or the absence of that Attribute.

The "Effect" column describes what happens if the limitation is encountered. The following Values are used:

- ND: Display is not possible
- LD: Display is limited
- NP: Processing is not possible
- LP: Processing is limited
- OT: Other effects described in the "Comments" column

Table 5-4: Display and Processing Limitations for Storage SCP

Limitation Case			Effect	Comments
Attribute Name	Tag	Value		
CT Image Storage (1.2.840.10008.5.1.4.1.1.2)				
Pixel spacing	(0028,0030)		ND	Only supported if Row Spacing \ Column Spacing are equal
Ultrasound Image Storage (1.2.840.10008.5.1.4.1.1.6.1)				
Transfer Syntax UID	(0002,0010)	1.2.840.10008.1.2.1 or 1.2.840.10008.1.2	OT	Not possible to export JPEG/RLE format if the image is stored in ELE/ILE format.
All SOP Classes				
Transfer Syntax UID	(0002,0010)	1.2.840.10008.1.2.4.70	OT	JPEG Lossless, Non-Hierarchical, FOP (Process 14) Transfer syntax is not supported for SOP classes that do not have pixel data.
Transfer Syntax UID	(0002,0010)	1.2.840.10008.1.2	OT	All SOP Classes support the ILE transfer syntax by default.

Table below lists the actions performed upon receiving instances from a remote AE and the system behavior when certain conditions are encountered.

Table 5-5: Behavior when storing Instances

Action upon Receiving	Condition	System Behavior
Perform Attribute Validation	Minor DICOM inconsistencies	Fix error and log warning message:

Action upon Receiving	Condition	System Behavior
		- Incorrect characters are replaced with " _ " - Attributes exceeding length of VR are truncated.
	Duplicate Instance	Ignore Instances
	DICOM Validation error	Send failure code on Association
	Success	Instances are stored in database
Add to an existing study	Mismatch in patient identifying information detected	Instances are stored as new instance
	Success	Instances are stored in a local database
Localize Patient Information	Success	New instances is stored in database and it is upto user whether to retain the old instance or not.
<i>Evaluate Key Object Selection Document Title</i>	All other document titles	Display key images according to the specified title

Table below describes how the SCP handles compression for stored instances.

The following Values are used in the "Behavior" column:

- AS_IS: Images are stored as received.
- CONFIGURATION: Images are compressed based on internal configuration settings.
- OTHER: All other conditions, which are further described in the "Comments" column.

The Transfer Syntax is used to describe the compression mechanism applied.

Table 5-6: Image Compression by Storage SCP

SOP Class		Behavior	Transfer Syntax		Comments
Enhanced CT Images	1.2.840.10008.5.1.4.1.1.2.1	CONFIGURATION	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70	Converted to Classic CT images upon arrival in Portal. Filters need to be set to enable exporting converted CT images of Enhanced CT to DICOM Nodes/CD/DVD/USB. All the generated Presentation States and Book Marks will not be exported and will be retained in Portal itself.
Enhanced MR images	1.2.840.10008.5.1.4.1.1.4.1	CONFIGURATION	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70	Converted to Classic MR Image upon arrival in Portal for internal diagnostic/viewing purposes. While exporting the same studies to DICOM Nodes/CD/DVD/USB, only the original Enhanced MR data as it arrived into Portal will be exported along with the Portal generated Secondary Captures, derived images (as Classic MR objects) and Book Marks. This enhanced MR to classic conversion

SOP Class		Behavior	Transfer Syntax		Comments
					will be done only for Philips models. For other vendor models this conversion will not happen and this data cannot be used inside AVW.
All other SOP Classes	All other SOP Classes	AS_IS			No Comments

5.2.6. Storage Commitment Service

DICOM Manager will attempt to initiate a new association when requested to commit the images that were stored on a remote device, which supports the storage Commitment Service.

The associated real world activity for the N-ACTION-RQ is a storage commitment request to the remote storage device.

The associated real world activity for the N-EVENT-REPORT operation is the completion of the storage commitment by the remote device.

This can be as Synchronous storage commitment as the N-EVENT-REPORT-RQ is received inside the configure timeout or as Asynchronous storage commitment after the A-RELEASE-RQ by the timeout is already send to the remote system.

DICOM-Manager will issue a failure status if it is unable to properly handle the storage commitment report event.

5.2.6.1. SCU of the Storage Commitment SOP Class

The figure below shows sequencing of RWA for Storage Commitment as SCU.

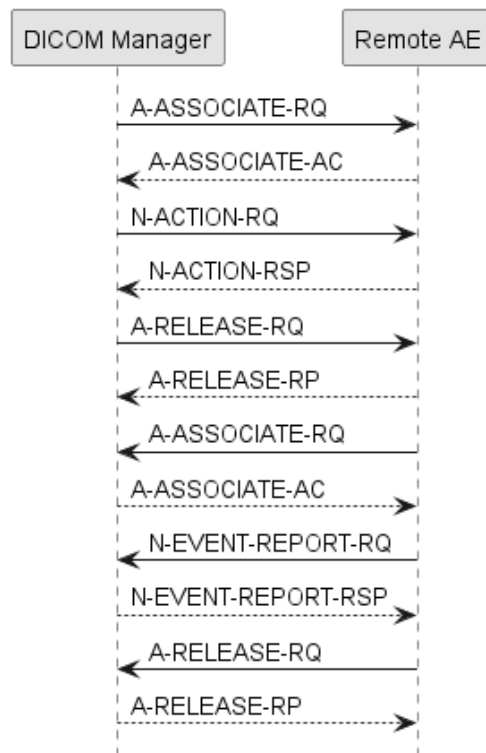


Figure 5-4: Real World Activity – Storage Commitment as SCU (Synchronous)

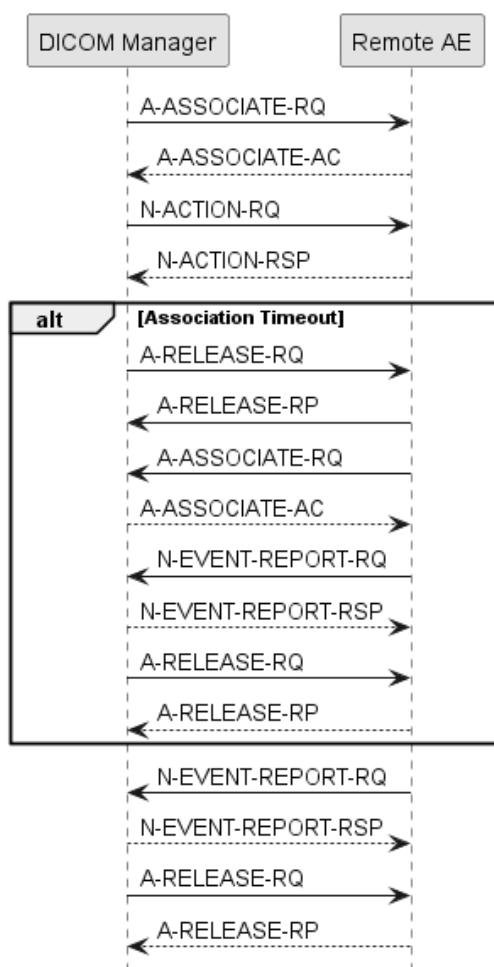


Figure 5-5: Real World Activity – Storage Commitment as SCU (Asynchronous)

As a Service Class User of the Storage Commitment SOP Class, the Advanced Visualization Workspace V15.1.3 uses the N-ACTION-RQ message to request storage commitment from a remote SCP. In turn, it receives N-EVENT-REPORT-RQ messages from the SCP indicating success or failure of the request.

As a Service Class User of the Storage Commitment Push Model SOP Classes the product supports committing all Storage SOP Classes listed in Section 1.1 Content and Transfer are supported.

Table below lists the behavior of Advanced Visualization Workspace V15.1.3 for each possible Failure Reason (0008,1197) in the Failed SOP Sequence (0008,1198) upon receiving an N-EVENT-REPORT request from the SCP with an Event Type ID of 2 (Storage Commitment Request Complete - Failures Exist).

Table 5-7: Failure Behavior for Storage Commitment SCU

Status Code	Description	Behavior
Any other status code	ARTIM Time-out	The reason is logged
Any other status code.	Reply Time-out	The association is released. Continues with waiting for storage commitment
Any other status code.	Association Time-out	The association is released. Continues with waiting for storage commitment

Status Code	Description	Behavior
Any other status code.	Association aborted	Continues with waiting for storage commitment

5.2.6.2. SCP of the Storage Commitment SOP Class – N/A

Not implemented.

5.2.7. Query/Retrieve Service Class

5.2.7.1. SCU of the Study Root Q/R Information Model - FIND SOP Class

The figure below shows sequencing of RWA for Find as SCU at Study Root.

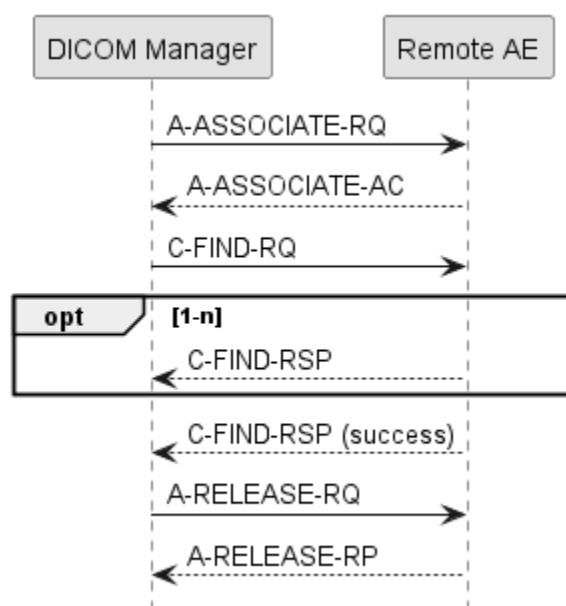


Figure 5-6: Real World Activity – Find as SCU (Study Root)

As a Service Class User of the Study Root Q/R - Information Model - FIND SOP Class, the Advanced Visualization Workspace V15.1.3 uses the C-FIND-RQ message and supports the Query Keys listed below for hierarchical queries.

In the "Matching Type" column the following Values can be used:

- SINGLE_VALUE: SCU can request Single Value matching on this Attribute.
- UID: SCU can request List of UID matching on this Attribute.
- WILDCARD: SCU can request Wildcard matching on this Attribute.
- RANGE: SCU can request Range matching on this Attribute.
- SEQUENCE: SCU can request Sequence matching on this Attribute.
- UNIVERSAL: SCU can request that the Attribute be a return Value (universal matching).

In the "Query Value Source" column the following Values can be used:

- FIXED: The query Value cannot be modified by the user or by configuration.
- GENERATED: The query Value is generated by the system (e.g., current date as the study date).
- CONFIGURATION: The query Value is dependent on system configuration.
- USER: The query Value is entered by the user.
- SCANNED: The query Value is read from a barcode scanner or similar device.
- EMPTY: The query Value is sent with a zero-length value to indicate it is a return key only.

In the "Display on UI" column the following Values can be used:

- D: the return Value is displayed on the main UI by default.
- C: the return Value is displayed on the main UI if configured.
- N: the return Value is never displayed.

Table 5-8: Supported C-FIND Attribute Matching for Study Root Q/R Model -SCU

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Specific Character Set	(0008,0005)	UNIVERSAL				
Query/Retrieve Level	(0008,0052)	SINGLE_VALUE	CONFIGURATION	STUDY, SERIES, IMAGE		
Study Level						
Study Date	(0008,0020)	RANGE, SINGLE_VALUE, UNIVERSAL	USER		D	
Study Time	(0008,0030)	RANGE, SINGLE_VALUE, UNIVERSAL	USER		D	
Accession Number	(0008,0050)	WILDCARD, UNIVERSAL	USER		D	
Modalities in Study	(0008,0061)	UNIVERSAL	USER	All, CT, ECG, MR, US, PET or CT, CR, PET, SPECT, RT, Nuclear Medicine, CT or ECG, DX, RF, XA	D	
Referring Physician's Name	(0008,0090)	UNIVERSAL, WILDCARD	USER		D	
Study Description	(0008,1030)	WILDCARD, UNIVERSAL	USER, GENERATED		D	
Patient ID	(0010,0020)	UNIVERSAL, WILDCARD	USER		D	
Patient's Birth Date	(0010,0030)	UNIVERSAL	GENERATED			
Patient's Birth Time	(0010,0032)	UNIVERSAL	GENERATED			
Patient's Name	(0010,0010)	WILDCARD	USER		D	
Patient's Sex	(0010,0040)	UNIVERSAL, WILDCARD	USER	Any, Male, Female, Other	D	
Study ID	(0020,0010)	WILDCARD, UNIVERSAL	USER		D	
Study Instance UID	(0020,000D)	UNIVERSAL	GENERATED			

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Number of study related series	(0020,1206)	UNIVERSAL	GENERATED			
Number of study related instances	(0020,1208)	UNIVERSAL	GENERATED			
Series Level						
Series Time	(0008,0031)	UNIVERSAL	GENERATED			
Modality	(0008,0060)	UNIVERSAL	GENERATED			
Manufacturer	(0008,0070)	UNIVERSAL	GENERATED			
Series Date	(0008,0021)	UNIVERSAL	GENERATED			
Series Description	(0008,103E)	UNIVERSAL	GENERATED			
Body Part Examined	(0018,0015)	UNIVERSAL	GENERATED			
Spacing Between Slices	(0018,0088)	UNIVERSAL	GENERATED			
Protocol Name	(0018,1030)	UNIVERSAL	GENERATED			
Series Number	(0020,0011)	UNIVERSAL	GENERATED			
Frame of Reference UID	(0020,0052)	UNIVERSAL	GENERATED			
Study Instance UID	(0020,000D)	UNIVERSAL	GENERATED			
Series Instance UID	(0020,000E)	UNIVERSAL	GENERATED			
Number of Series Related Instances	(0020,1209)	UNIVERSAL	GENERATED			
Performed Procedure Step Start Date	(0040,0244)	UNIVERSAL	GENERATED			
Performed Procedure Step Start Time	(0040,0245)	UNIVERSAL	GENERATED			
Performed Procedure Step Description	(0040,0254)	UNIVERSAL	GENERATED			
Request Attributes	(0040,0275)	UNIVERSAL	GENERATED			
Image Level						
Image Type	(0008,0008)	UNIVERSAL	GENERATED			
Instance Creation Date	(0008,0012)	UNIVERSAL	GENERATED			

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Instance Creation Time	(0008,0013)	UNIVERSAL	GENERATED			
SOP Class UID	(0008,0016)	UNIVERSAL	GENERATED			
SOP Instance UID	(0008,0018)	UNIVERSAL	GENERATED			
Contrast/Bolus Agent	(0018,0010)	UNIVERSAL	GENERATED			
KVP	(0018,0060)	UNIVERSAL	GENERATED			
Instance Number	(0020,0013)	UNIVERSAL	GENERATED			
Patient Orientation	(0020,0020)	UNIVERSAL	GENERATED			
Image Orientation	(0020,0035)	UNIVERSAL	GENERATED			
Study Instance UID	(0020,000D)	SINGLE_VALUE	GENERATED			
Series Instance UID	(0020,000E)	SINGLE_VALUE	GENERATED			
Slice Location	(0020,1041)	UNIVERSAL	GENERATED			
Samples per Pixel	(0028,0002)	UNIVERSAL	GENERATED			
Rows	(0028,0010)	UNIVERSAL	GENERATED			
Columns	(0028,0011)	UNIVERSAL	GENERATED			
Photometric Interpretation	(0028,0004)	UNIVERSAL	GENERATED			
Pixel Spacing	(0028,0030)	UNIVERSAL	GENERATED			
Concept Name Code Sequence	(0040,A043)	UNIVERSAL	GENERATED			

5.2.7.2. SCU of the Study Root Q/R Information Model - MOVE SOP Class

The figure below shows sequencing of RWA for Move as SCU at Study Root.

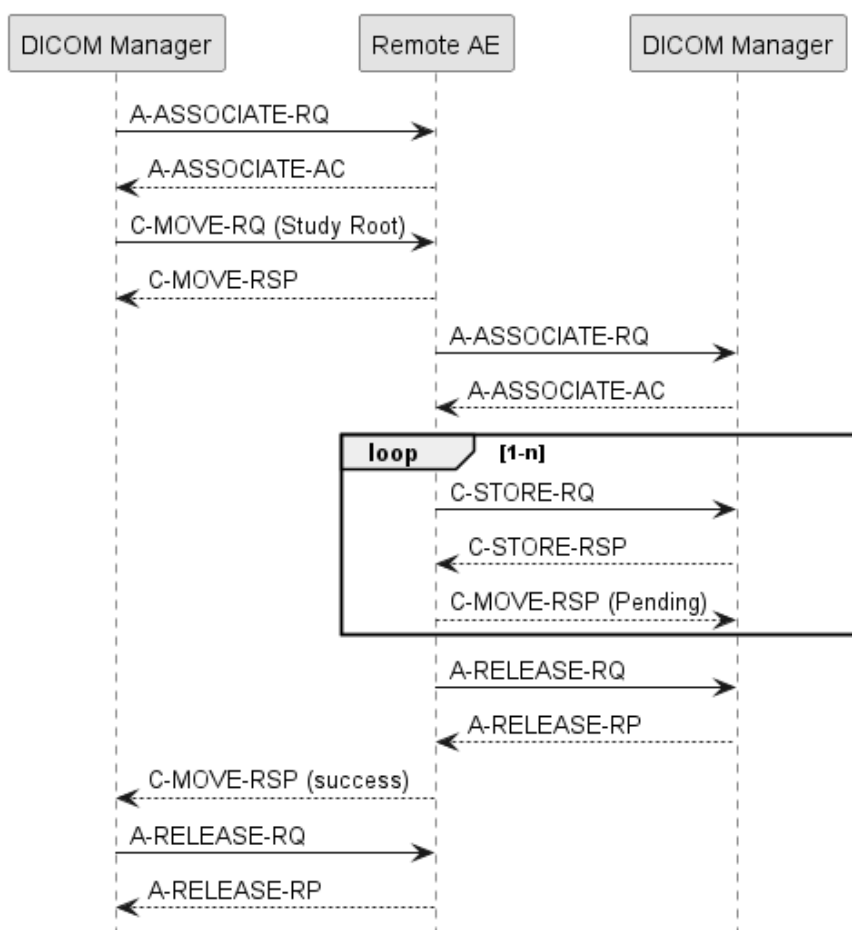


Figure 5-7: Real World Activity – Move as SCU (Study Root)

Table 5-9: Supported C-Move Attribute Matching for Study Root Q/R Model -SCU

Attribute Name	Tag	Matching Type	Comments
Query/Retrieve Level	(0008,0052)	SINGLE_VALUE	STUDY, SERIES, IMAGE
Study Level			
Study Instance UID	(0020,000D)	SINGLE_VALUE	
Series Level			
Series Instance UID	0020,000E	SINGLE_VALUE	
Study Instance UID	0020,000D	SINGLE_VALUE	
Image Level			
Series Instance UID	0020,000E	SINGLE_VALUE	
SOP Instance UID	0008,0018	SINGLE_VALUE	
Study Instance UID	0020,000D	SINGLE_VALUE	

5.2.7.3. SCP of the Study Root Q/R Information Model - FIND SOP Class

Advanced Visualization Workspace V15.1.3 does not support Relational Search, a query that may contain any combination of keys at any level in the hierarchy. Starting at the top level in the Query/Retrieve

Information Model, continuing until the Query/Retrieve level specified in the C-FIND request is reached. All Required (R) and Unique (U) Study, Series and Image level keys for the Study Root Query/Retrieve Information Model are supported.

Unsupported fields will not be returned in the C-FIND response.

The figure below shows sequencing of RWA for C-FIND as SCP at Study Root.

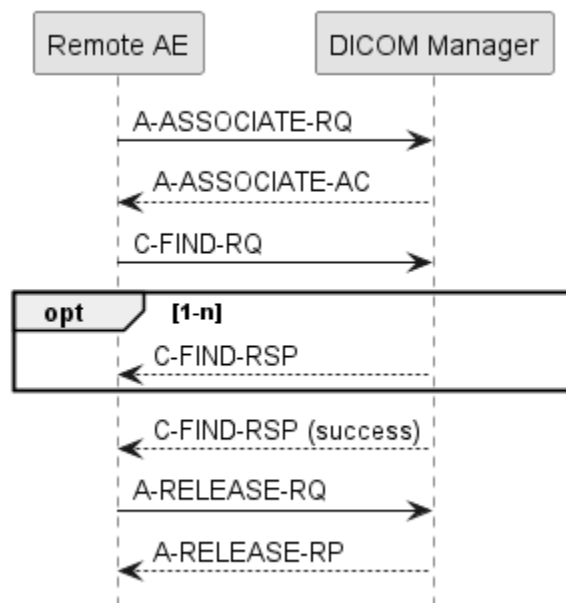


Figure 5-8: Real World Activity – FIND as SCP (Study Root)

As a Service Class Provider of the Study Root Q/R - Information Model - FIND SOP Class, the *Advanced Visualization Workspace* uses the C-FIND-RSP to communicate matches back to the SCU. It supports the Matching Keys listed in Table below for hierarchical queries.

In the "Matching Type" column, the following Values can be used:

- SINGLE_VALUE: SCP can perform single Value matching on this Attribute.
- UID: SCP can perform List of UID matching on this Attribute.
- WILDCARD: SCP can perform Wildcard matching on this Attribute.
- RANGE: SCP can perform Range matching on this Attribute.
- SEQUENCE: SCP can perform sequence matching on this Attribute.
- UNIVERSAL: SCP can provide the Attribute in the C-FIND response (universal matching).

In the "Query Value Source" column the following Values can be used:

- FIXED: The query Value cannot be modified by the user or by configuration.
- GENERATED: The query Value is generated by the system (e.g., current date as the study date).
- CONFIGURATION: The query Value is dependent on system configuration.
- USER: The query Value is entered by the user.
- SCANNED: The query Value is read from a barcode scanner or similar device.
- EMPTY: The query Value is sent with a zero-length value to indicate it is a return key only.

In the "Display on UI" column the following Values can be used:

- D: the return Value is displayed on the main UI by default.
- C: the return Value is displayed on the main UI if configured.
- N: the return Value is never displayed.

Table 5-10: Supported C-FIND Attribute Matching for Study Root Q/R Model – SCP

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Query/Retrieve Level	(0008,0052)	SINGLE_VALUE		STUDY, SERIES, IMAGE		
Study Level						
Study Date	(0008,0020)	RANGE, SINGLE_VALUE, UNIVERSAL	GENERATED		D	
Study Time	(0008,0030)	RANGE, SINGLE_VALUE, UNIVERSAL	GENERATED		D	
Referring Physician's Name	(0008,0090)	UNIVERSAL, WILDCARD	GENERATED		D	
Study Description	(0008,1030)	SINGLE_VALUE, WILDCARD, UNIVERSAL	GENERATED		D	
Accession Number	(0008,0050)	SINGLE_VALUE, WILDCARD, UNIVERSAL	GENERATED		D	
Modalities in Study	(0008,0061)	UNIVERSAL	GENERATED		D	
Patient ID	(0010,0020)	UNIVERSAL, WILDCARD	GENERATED		D	
Patient's Name	(0010,0010)	WILDCARD	GENERATED		D	
Patient's Birth Date	(0010,0030)	RANGE, SINGLE_VALUE, UNIVERSAL	GENERATED		D	
Patient's Birth Time	(0010,0032)	RANGE, SINGLE_VALUE, UNIVERSAL	GENERATED		D	
Patient's Sex	(0010,0040)	SINGLE_VALUE, UNIVERSAL	GENERATED		D	
Study ID	(0020,0010)	SINGLE_VALUE, WILDCARD, UNIVERSAL	GENERATED		D	
Study Instance UID	(0020,000D)	SINGLE_VALUE, WILDCARD, UNIVERSAL	GENERATED		D	

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Number of study related series	(0020,1206)	UNIVERSAL	GENERATED		D	
Number of study related instances	(0020,1208)	UNIVERSAL	GENERATED		D	
Series Level						
Body Part Examined	(0018,0015)	SINGLE_VALUE, WILDCARD, UNIVERSAL	GENERATED		D	
Series Date	(0008,0021)	SINGLE_VALUE, UNIVERSAL	GENERATED		D	
Series Time	(0008,0031)	UNIVERSAL	GENERATED		D	
Manufacturer	(0008,0070)	UNIVERSAL	GENERATED		D	
Modality	(0008,0060)	SINGLE_VALUE, WILDCARD, UNIVERSAL	GENERATED		D	
Protocol Name	(0018,1030)	UNIVERSAL	GENERATED		D	
Series Description	(0008,103E)	UNIVERSAL	GENERATED		D	
Series Number	(0020,0011)	SINGLE_VALUE, UNIVERSAL	GENERATED		D	
Study Instance UID	(0020,000D)	UNIVERSAL	GENERATED		D	
Series Instance UID	(0020,000E)	SINGLE_VALUE, UNIVERSAL	GENERATED		D	
Number of Series Related Instances	(0020,1209)	UNIVERSAL	GENERATED		D	
Performed Procedure Step Start Date	(0040,0244)	UNIVERSAL	GENERATED		D	
Performed Procedure Step Start Time	(0040,0245)	SINGLE_VALUE	GENERATED		D	
Performed Procedure Step Description	(0040,0254)	SINGLE_VALUE, UNIVERSAL	GENERATED		D	
Request Attributes	(0040,0275)	UNIVERSAL	GENERATED		D	
Image Level						
Image Type	(0008,0008)	SINGLE_VALUE	GENERATED		D	
Instance Creation Date	(0008,0012)	SINGLE_VALUE	GENERATED		D	

Attribute Name	Tag	Matching Type	Query Value Source	Value	Display on UI	Comments
Instance Creation Time	(0008,0013)	SINGLE_VALUE	GENERATED		D	
SOP Class UID	(0008,0016)	SINGLE_VALUE, UNIVERSAL, UID	GENERATED		D	
SOP Instance UID	(0008,0018)	SINGLE_VALUE, UNIVERSAL, UID	GENERATED		D	
Contrast/Bolus Agent	(0018,0010)	UNIVERSAL	GENERATED		D	
KVP	(0018,0060)	UNIVERSAL	GENERATED		D	
Study Instance UID	(0020,000D)	SINGLE_VALUE	GENERATED		D	
Series Instance UID	(0020,000E)	UNIVERSAL	GENERATED		D	
Instance Number	(0020,0013)	SINGLE_VALUE, UNIVERSAL	GENERATED		D	
Patient Orientation	(0020,0020)	UNIVERSAL	GENERATED		D	
Image Orientation	(0020,0035)	UNIVERSAL	GENERATED		D	
Frame of Reference UID	(0020,0052)	SINGLE_VALUE	GENERATED		D	
Slice Location	(0020,1041)	UNIVERSAL	GENERATED		D	
Samples per Pixel	(0028,0002)	SINGLE_VALUE	GENERATED		D	
Photometric Interpretation	(0028,0004)	SINGLE_VALUE	GENERATED		D	
Rows	(0028,0010)	UNIVERSAL	GENERATED		D	
Columns	(0028,0011)	UNIVERSAL	GENERATED		D	
Pixel Spacing	(0028,0030)	UNIVERSAL	GENERATED		D	

5.2.7.4. SCP of the Study Root Q/R Information Model - MOVE SOP Class

The figure below shows sequencing of RWA for Find as SCP at Study Root.

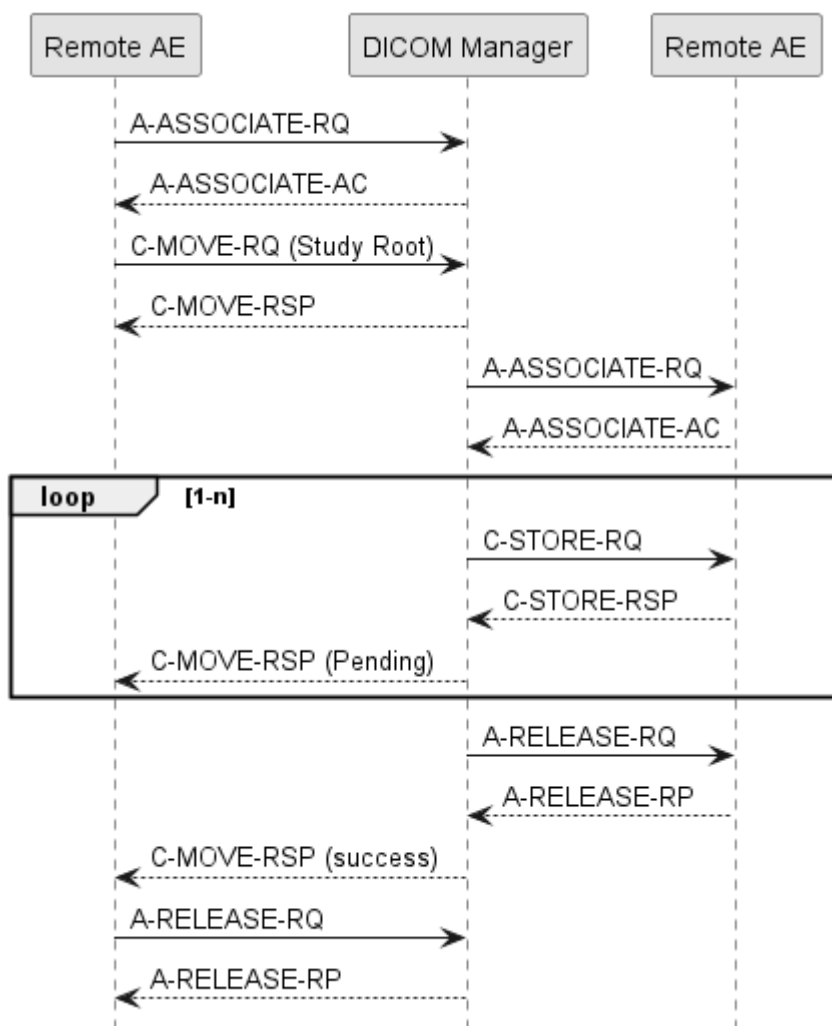


Figure 5-9: Real World Activity – Move as SCP (Study Root)

As the SCP of the Study Root Q/R - Information Model - MOVE, the Advanced Visualization Workspace V15.1.3 receives the C-MOVE-RQ and in turn uses the C-STORE-RQ sub operation to send matching SOP Instances to the Move Destination AE included in the C-MOVE-RQ.

As the SCP of the Storage Service Class, all Storage SOP Classes listed in Section 1.1 are supported.

5.2.8. Print Management Service

The figure below shows sequencing of RWA for Print Management as SCU.

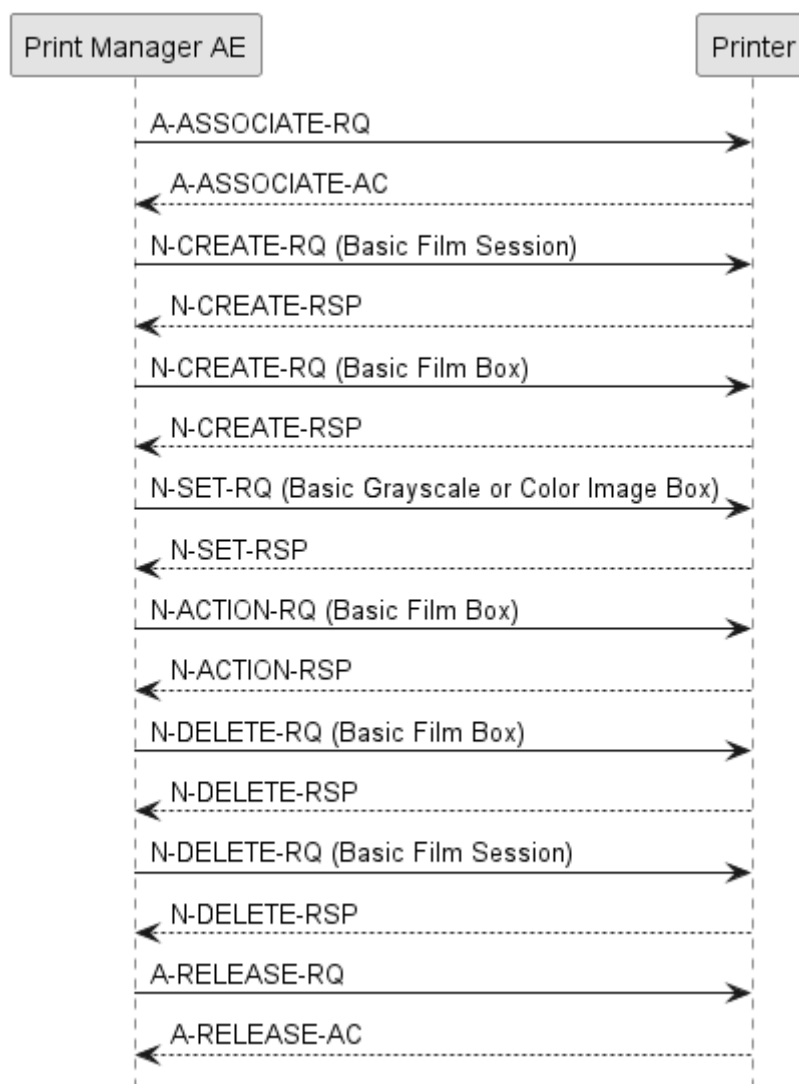


Figure 5-10: Real World Activity – Print Management as SCU

5.2.8.1. SCU of the Basic Grayscale Print Management Meta SOP Class

The Basic Grayscale Print Management Meta SOP Class is composed of the mandatory SOP Classes listed in Table below.

Table 5-11: Basic Grayscale Print Management Meta SOP Classes - SCU

SOP Class Name	SOP Class UID
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4
Printer	1.2.840.10008.5.1.1.16

5.2.8.1.1. Basic Film Session SOP Class

Table below lists the supported DIMSE Services for the Basic Film Session SOP Class:

The Printer process conforms to the Basic Film Session SOP Class. The following DIMSE service element is supported: N-CREATE, N-DELETE.

Table 5-12: Services for the Basic Film Session SOP Class - SCU

DIMSE Service Element	Purpose
N-CREATE	Create the Film Session
N-DELETE	Delete the Film Session

Table below lists the supported N-CREATE and N-SET Attributes for Basic Film Session:

Table 5-13: Supported N-CREATE and N-SET Attributes for the Basic Film Session SOP Class - SCU

Attribute Name	Tag	Values	Default
Number of Copies	(2000,0010)	Values between 1-100	
Print Priority	(2000,0020)	AUTO, HIGH, LOW, MED	
Medium Type	(2000,0030)	BLUE FILM, CLEAR FILM, PAPER	
Film Destination	(2000,0040)	MAGAZINE, PROCESSOR	

5.2.8.1.2. Basic Film Box SOP Class

Table below lists the supported DIMSE Services for the Basic Film Box SOP Class:

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

The Printer process conforms to the Basic Film Box Sop Class. The following DIMSE service elements are supported: N-CREATE, N-ACTION, N-DELETE.

Table 5-14: Supported Services for the Basic Film Box SOP Classes

DIMSE Service Element	Purpose
N-CREATE	Create the Film Box in a previously created Film Session
N-ACTION	Print the Film Box
N-DELETE	Delete the Film Box

Table below lists the supported N-CREATE and N-SET Attributes for Basic Film Box:

Table 5-15: Supported N-CREATE and N-SET Attributes for the Basic Film Box SOP Class - SCU

Attribute Name	Tag	Values	Default
Image Display Format	(2010,0010)	STANDARD\1,1	
Film Orientation	(2010,0040)	LANDSCAPE, PORTRAIT	
Film Size ID	(2010,0050)	As in Printer Configuration file	
Trim	(2010,0140)	NO, YES	
Configuration Information	(2010,0150)	As in Printer Configuration file	

Attribute Name	Tag	Values	Default
Referenced Film Session Sequence	(2010,0500)		
>Referenced SOP Class UID	(0008,1150)	UID of Parent Film Session	
>Referenced SOP Instance UID	(0008,1155)		

5.2.8.1.3. Basic Grayscale Image Box SOP Class

The Printer process conforms to the Basic Grayscale Image Box Sop Class. The following DIMSE service element is supported: N-SET.

Table below lists the supported DIMSE Service for the Basic Grayscale Image Box SOP Class:

Table 5-16: Services for the Basic Grayscale Image Box SOP Class

DIMSE Service Element	Purpose
N-SET	Set Image Attributes for a previously created Film Box

Table below lists the supported N-SET Attributes for Basic Grayscale Image Box:

Table 5-17: Supported N-SET Attributes for the Basic Grayscale Image Box SOP Class - SCU

Attribute Name	Tag	Values	Default
Image Box Position	(2020,0010)		1
Basic Grayscale Image Sequence	(2020,0110)		
>Samples per Pixel	(0028,0002)		1
>Photometric Interpretation	(0028,0004)		MONOCHROME2
>Rows	(0028,0010)	As in Printer Configuration file	
>Columns	(0028,0011)	As in Printer Configuration file	
>Pixel Aspect Ratio	(0028,0034)	Must be present if not 1/1	
>Bits Allocated	(0028,0100)		8
>Bits Stored	(0028,0101)		8
>High Bit	(0028,0102)		7
>Pixel Representation	(0028,0103)		0
>Pixel Data	(7FE0,0010)		

5.2.8.1.4. Printer SOP Class – N/A

Not implemented.

5.2.8.2. SCU of the Basic Color Print Management Meta SOP Class

The Basic Color Print Management Meta SOP Class is composed of the mandatory SOP Classes listed in Table below:

Table 5-18: Basic Color Print Management Meta SOP Classes

SOP Class Name	SOP Class UID
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Color Image Box	1.2.840.10008.5.1.1.4.1
Printer	1.2.840.10008.5.1.1.16

5.2.8.2.1. Basic Film Session SOP Class

Table 5-19: Services for the Basic Film Session SOP Class - SCU

DIMSE Service Element	Purpose
N-CREATE	Create the Film Session
N-DELETE	Delete the Film Session

Table below lists the supported N-CREATE and N-SET Attributes for Basic Film Session:

Table 5-20: Supported N-CREATE and N-SET Attributes for the Basic Film Session SOP Class - SCU

Attribute Name	Tag	Values	Default
Number of Copies	(2000,0010)	Value between 1-100	
Print Priority	(2000,0020)	AUTO, HIGH, LOW, MED	
Medium Type	(2000,0030)	BLUE FILM, CLEAR FILM, PAPER	
Film Destination	(2000,0040)	MAGAZINE, PROCESSOR	

5.2.8.2.2. Basic Film Box SOP Class

Table 5-21: Supported Services for the Basic Film Box SOP Classes

DIMSE Service Element	Purpose
N-CREATE	Create the Film Box in a previously created Film Session
N-ACTION	Print the Film Box
N-DELETE	Delete the Film Box

Table 5-22: Supported N-CREATE and N-SET Attributes for the Basic Film Box SOP Class - SCU

Attribute Name	Tag	Values	Default
Image Display Format	(2010,0010)	STANDARD\1,1	
Film Orientation	(2010,0040)	LANDSCAPE, PORTRAIT	
Film Size ID	(2010,0050)	As in Printer Configuration file	
Trim	(2010,0140)	NO, YES	
Configuration Information	(2010,0150)	As in Printer Configuration file	

Attribute Name	Tag	Values	Default
Referenced Film Session Sequence	(2010,0500)		
>Referenced SOP Class UID	(0008,1150)	UID of Parent Film Session	
>Referenced SOP Instance UID	(0008,1155)		

5.2.8.2.3. Basic Color Image Box SOP Class

Table below lists the supported DIMSE Service for the Basic Color Image Box SOP Class:

Table 5-23: Services for the Basic Color Image Box SOP Class - SCU

DIMSE Service Element	Purpose
N-SET	Set each Image Attributes for a previously created Film Box

Table below lists the supported N-SET Attributes for Basic Color Image Box:

Table 5-24: Supported N-SET Attributes for the Basic Color Image Box SOP Class - SCU

Attribute Name	Tag	Values	Default
Image Box Position	(2020,0010)		1
Basic Color Image Sequence	(2020,0111)		
>Samples per Pixel	(0028,0002)		
>Photometric Interpretation	(0028,0004)		RGB
>Planar Configuration	(0028,0006)		
>Rows	(0028,0010)	As in Printer Configuration file	
>Columns	(0028,0011)	As in Printer Configuration file	
>Pixel Aspect Ratio	(0028,0034)	Must be present if not 1/1	
>Bits Allocated	(0028,0100)		8
>Bits Stored	(0028,0101)		8
>High Bit	(0028,0102)		7
>Pixel Representation	(0028,0103)		
>Pixel Data	(7FE0,0010)		

5.2.8.2.4. Printer SOP Class – N/A

Not implemented.

5.2.8.3. SCU of the Basic Annotation Box SOP Class – N/A

Not implemented.

5.2.8.4. SCU of the Print Job SOP Class – N/A

Not implemented.

5.2.8.5. SCU of the Presentation LUT SOP Class – N/A

Not implemented.

5.2.8.6. SCU of the Printer Configuration Retrieval SOP Class – N/A

Not implemented.

5.2.9. Verification Service

5.2.9.1. SCU of the Verification SOP Class

DICOM Manager initiates an association when the user points to one of the icons in the devices tool-bar in Advanced Visualization Workspace UI, clicks the right mouse button and selects "Verify Connection" operation.

The figure below shows sequencing of Association as SCU.

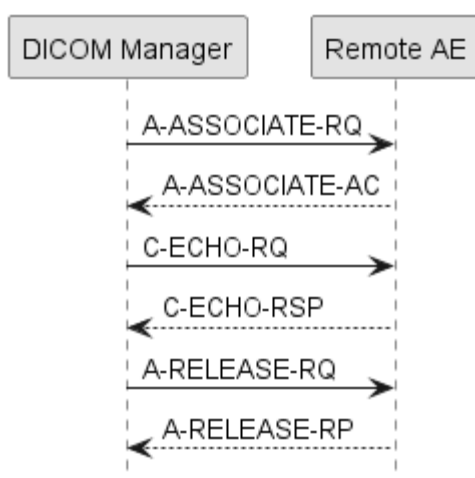


Figure 5-11: Real-World Activities for Verification as SCU

5.2.9.2. SCP of the Verification SOP Class

A remote system requests verification from DICOM Manager using the C-ECHO command.

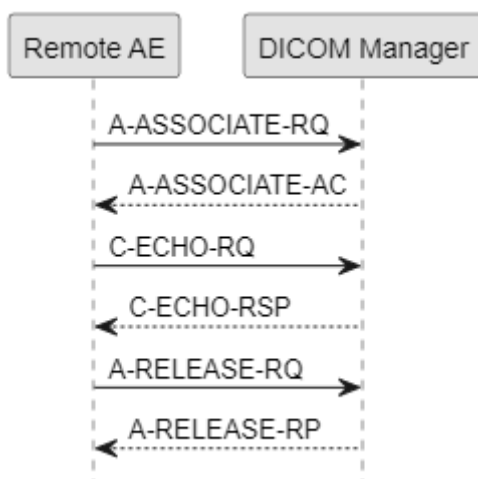


Figure 5-12: Real-World Activities for Verification as SCP

5.3. Supported DICOM Web Services

5.3.1. URI Web Service (WADO URI) - N/A

Not applicable, not implemented by product.

5.3.2. Studies Web Service

This section provides details regarding the Studies Web Service. For an overview of supported transactions and resources see Table 1-9: Study Service.

The Studies Service allows users to store, retrieve, and search for DICOM Studies, Series, and Instances.

5.3.2.1. Supported Web Media Types

5.3.2.1.1. DICOM Media Types

The supported DICOM Storage SOP Classes / Transfer Syntaxes are listed in Section 1.1 of this document.

5.3.2.1.2. DICOM Bulkdata Media Type – N/A

Not applicable, not implemented by product.

5.3.2.1.3. Supported Rendered Media Types -N/A

Not applicable, not implemented by product.

5.3.2.2. Retrieve supported transaction (WADO-RS)

The Studies Web Service Retrieve Transaction is also known as WADO-RS.

5.3.2.2.1. User Agent – N/A

Not applicable, not implemented by product.

5.3.2.2.2. Origin Server

The Retrieve Transaction origin server receives GET requests to retrieve specific studies, series or instances.

The user agent specifies the Target Resource as part of the URI and the acceptable response Content-Type in the HTTP Header (i.e., dicom, dicom+xml, dicom+json).

The URI is composed by a Base URI: See Section 6.3.2.1 for the Base URI of the origin server

The Retrieve Transaction origin server supports resources listed in Table below.

Table 5-25: Resources Retrieve Transaction - Origin Server

Resource	Comments
<i>DICOM Instance Resources - See Resources path in Table 10.4.1-1 in PS3.18</i>	
Study Instances	
Series Instances	
Individual Instance	

Table below lists Query parameters supported for the Retrieve Transaction as an origin server.

Table 5-26: Query Parameters for Retrieve Transaction - Origin Server

Query Parameter	Supported Values	Comments
Accept	multipart/related; type="application/dicom"; transfer-syntax={uid}	

The Retrieve Transaction origin server supports Header Fields listed in Table below.

Table 5-27: Header Fields for Retrieve Transaction - Origin Server

Header Field	Supported Values	Comments
Instance Resource		
Accept	multipart/related; type="application/dicom"; transfer-syntax={uid}	See in the Overview section Table 1-1 the supported DICOM SOP Classes / Transfer Syntaxes. Look for "Y" in the "OS" column.
All Resources		
Content-Type	Content-Type returned by the origin server in the response. It contains the media type of the Payload. See Accept for supported Values	
	Accept-charset	UTF-8

5.3.2.3. Store Transaction (STOW-RS)

5.3.2.3.1. User Agent – N/A

Not applicable, not implemented by product.

5.3.2.3.2. Origin Server

The Store Transaction origin server receives POST requests to store or append to an existing resource on the server.

The user agent specifies the Target Resource as part of the URI and encapsulates the data in a multipart request body with a proper Content-Type (i.e., JSON).

The URI is composed by a Base URI: See Base URI for the origin server in Section 6.3.2.2.

The Store Transaction origin server can request resources listed in Table below.

Table 5-28: Resources Store Transaction - Origin Server

Resource	Comments
See resource path in Table 10.5.1-1 in PS3.18	
All Studies	
Study	

The Store Transaction origin server supports Header Fields listed in Table below.

Table 5-29: Header Fields for Store Transaction - Origin Server

Header Field	Supported Values	Comments
Content-Type	multipart/related; type="application/dicom";	See in the Overview section Table 1-1 the supported DICOM SOP Classes / Transfer syntaxes (look for "Y" in the "OS" column)

5.3.2.4. Search Transaction (QIDO-RS)

5.3.2.4.1. User Agent – N/A

Not applicable, not implemented by product

5.3.2.4.2. Origin Server

The Search Transaction origin server receives GET requests to search for studies, series or instances.

The Origin Server is a proxy implementation; DICOM objects and associated metadata are stored and managed by the system

The origin server does not ignore unsupported query parameters as expected. Instead, it processes the request by returning a 400 Bad Request response.

The user agent specifies the Target Resource as part of the URI and the acceptable response Content-Type in the HTTP Header (i.e., dicom+xml or dicom+json).

The URI is composed by a Base URI: See Base URI for the origin server in Section 6.3.2.3.

The Search Transaction origin server supports resources listed in Table below.

Table 5-30: Resources Search Transaction - Origin Server

Transaction	Resource	Comments
See Resource Path in Table 10.6.1-1 in PS3.18		
Search	All studies	Mandatory
	All series	Optional
	All instances	Optional
	Study's Series	Mandatory
	Study Series's Instances	Mandatory

The Search Transaction origin server supports query parameters listed in Table below.

Table 5-31: Query Parameters for Search Transaction - Origin Server

Query Parameter	Supported Values	Comments
Match	Attribute Values to address the search (matching key).	Empty Value matching and Multivalue matching are not supported
Includefield	Attributes to be included in the response (return key).	

Query Parameter	Supported Values	Comments
Limit		Optional attribute, supported when including offset
Offset	Number of results the server skips before the first returned result	Optional attribute, must be equal to zero.

The Search Transaction origin server supports Header Fields listed in Table below.

Table 5-32: Header Fields for Search Transaction - Origin Server

Header Field	Supported Values	Comments
Accept	Received in the user agent request: multipart/related; type="application/dicom+xml" application/dicom+json	
Content-Type	Application/dicom+json (Default) Multipart/related; type="application/dicom+xml"	
Content-Length		If Content-Encoding is not present. Content-Length is present in the Response.

Table below lists the DICOM query / returned Attributes supported by the Search Transaction origin server.

Table 5-33: Query / Return Key Search Transaction - Origin Server

Attribute Name	Tag	Matching Key	Return Key	Comments on the Response
Study Level (May be used for All studies, All series, All instance resource query)				
StudyDate	(0008,0020)	Yes	Yes	Supported
StudyTime	(0008,0030)	Yes	Yes	Supported
AccessionNumber	(0008,0050)	Yes	Yes	Supported
ModalitiesInStudy	(0008,0061)	Yes	Yes	Supported
ReferringPhysicianName	(0008,0090)	Yes	Yes	Supported
Retrieve URL	(0008,1190)	Yes	Yes	Will be present if the Instance is retrievable by the Retrieve Transaction
PatientName	(0010,0010)	Yes	Yes	Supported
PatientID	(0010,0020)	Yes	Yes	Supported
PatientBirthDate	(0010,0030)	Yes	Yes	Supported
PatientSex	(0010,0040)	Yes	Yes	Supported
StudyInstanceUID	(0020,000D)	Yes	Yes	Supported
StudyID	(0020,0010)	Yes	Yes	Supported
NumberOfStudyRelatedSeries	(0020,1206)	Yes	Yes	Supported

Attribute Name	Tag	Matching Key	Return Key	Comments on the Response
NumberOfStudyRelatedInstances	(0020,1208)	Yes	Yes	Supported
Series Level (May be used for All Series, Study's Series, Study's Instances, All Instances resource query)				
Modality	(0008,0060)	Yes	Yes	
SeriesDescription	(0008,103E)	Yes	Yes	Will be present if known
Retrieve URL	(0008,1190)	Yes	Yes	Will be present if the Instance is retrievable by the Retrieve Transaction
SeriesInstanceUID	(0020,000E)	Yes	Yes	
SeriesNumber	(0020,0011)	Yes	Yes	
NumberOfSeriesRelatedInstances	(0020,1209)	Yes	Yes	
PerformedProcedureStepStartDate	(0040,0244)	Yes	Yes	Supported
PerformedProcedureStepStartTime	(0040,0245)	Yes	Yes	Supported
RequestAttributeSequence	(0040,0275)	Yes	Yes	Supported
>RequestedProcedureID	(0040,1001)	Yes	Yes	
>ScheduledProcedureStepID	(0040,0009)	Yes	Yes	
Instance Level (May be used for All instances, Study's instance, Study Series's instance resource query)				
SOPClassUID	(0008,0016)	Yes	Yes	
SOPInstanceUID	(0008,0018)	Yes	Yes	
Retrieve URL	(0008,1190)	Yes	Yes	Will be present if the Instance is retrievable by the Retrieve Transaction
InstanceNumber	(0020,0013)	Yes	Yes	
Rows	(0028,0010)	Yes	Yes	Will be present if known
Columns	(0028,0011)	Yes	Yes	Will be present if known

5.3.3. Worklist Web Service – N/A

Not applicable, not implemented by product.

5.3.4. Non-Patient Instance Web Service – N/A

Not applicable, not implemented by product.

5.3.5. Notification Web Service – N/A

Not applicable, not implemented by product.

5.4. Media Service

The implementation model identifies the DICOM Application Entities for Media in specific implementation and relates the Application Entities to Real-World Activities.

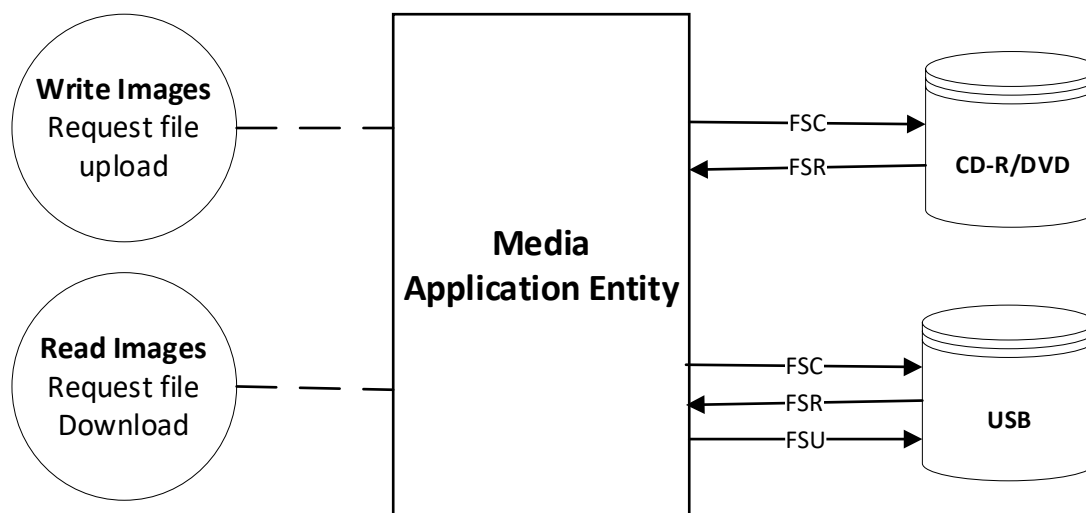


Figure 5-13: Media Interchange Application Data Flow Diagram

The Media AE acts as a FSR, for CD-R,DVD and USB when reading the directory of the medium. The Media AE acts as a FSC for CD-R,DVD and USB when writing the selected images in a patient folder onto the medium. The Media AE acts as a FSU for USB, when updating a study with new instances or replacing an existing instance in media.

5.4.1. File Set Creator (FSC)

Advanced Visualization Workspace supports creating the Basic Directory IOD as a File Set Creator as defined in Appendix A.1.

For a list of supported Media Application Profiles, see Section 1.4 in the Overview.

For a list of supported SOP Classes, see Section 1.1 in the Overview.

5.4.2. File Set Reader (FSR)

Advanced Visualization Workspace supports the Media Application Profiles listed in Section 1.4 in the Overview.

For a list of supported SOP Classes, see Section 1.1 in the Overview.

To display or process DICOM Instances contained on the Media, see Section 5.2.5.2.

5.4.3. File Set Updater (FSU)

Advanced Visualization Workspace supports creating the Basic Directory IOD as defined in Appendix A.1.

For a list of supported Media Application Profiles, see Section 1.4 in the Overview.

For a list of supported SOP Classes, see Section 1.1 in the Overview.

5.5. Real Time Video Service – N/A

Not implemented.

5.6. Cross Service Considerations – N/A

Not implemented.

5.7. Specific Character Sets

For Specific Character Sets supported in addition to the default character repertoire, refer to Section 1.7 for the Values for Specific Character Set (0008,0005).

6. Configuration

Throughout all subsections the following Values can be used in the "Configurable" column:

- USER: The parameter is configurable by the user.
- SERVICE: The parameter is configurable by service personnel.
- FIXED: The parameter is not configurable (it has a fixed Value). The Value is required for the configuration of the remote system.
- N/A: The parameter is not applicable for the local or the remote system.

6.1. General Configuration Parameters

Table below lists general configuration parameters applicable across all supported DICOM Services.

Table 6-1: General Configuration Parameters

Parameter	Configurable	Default Value	Comments
General Parameters			
Network - Computer Name	SERVICE		<hostname> Set by installation
Institution Name	SERVICE	Philips Portal	
Institution Address	SERVICE	Philips Portal	
Institution Department Name	SERVICE	Philips Portal	
DICOM Priority	SERVICE	Medium	
Local - Auto Delete Enabled	SERVICE	Unchecked	
Local - Auto Delete - Execute Only Once	SERVICE	Unchecked	
Days to retain Study	SERVICE	14	
Temp device – Auto Delete – Days to keep study	SERVICE	14	
Local – Auto Delete – Enabled	SERVICE	Unchecked	
Local - Auto Delete - Days to keep study	SERVICE	14	
Auto Delete - Start when Free space is less than (Gigabytes)	SERVICE	100	

Parameter	Configurable	Default Value	Comments
Auto Delete - Stop when Free space is at (Gigabytes)	SERVICE	250	
Auto Import – Enable	SERVICE	Unchecked	
Auto Import - Input Folder Name	SERVICE		
Auto Import - Failed Folder Name	SERVICE		
Auto Import - Import Type	SERVICE	DICOM	
Auto Import - Polling Interval In Seconds	SERVICE	60	
Image Direction – Transversal	SERVICE	Feet to Head	
Image Direction – Sagittal	SERVICE	Right to Left	
Image Direction – Coronal	SERVICE	Posterior to Anterior	
Maximum PDU size as SCU	SERVICE	65536	
Maximum PDU size as SCP	SERVICE	16352	
Transfer Syntax support	SERVICE	ELE, ILE, JPEG, JPEG Lossless, RLE	
TCP/IP Settings			
Network IP	SERVICE		Set by installation
Network NetMask	SERVICE		Set by installation
Network Gateway	SERVICE		Set by installation
IP Filter Mode	SERVICE	All	
DICOM Services Parameters			
Additional Local System AE Title (add/remove)	SERVICE		
Additional Local System IP Address (add/remove)	SERVICE		
System Port	SERVICE	104	
System - AE Title	SERVICE	DATABASE	
Max PDU	SERVICE	65K Bytes	Advanced Settings>Device Settings
ARTimer	SERVICE	5	Advanced Settings>Device Settings

6.2. Configuration of DIMSE Services

The tables in the following subsections show the configuration parameters required for DIMSE Services.

In order to identify whether Advanced Visualization Workspace is a SCU, the following applies:

- SCU: The (Secured) Local Calling AET and Remote Called AET parameters are present.

6.2.1. Basic Worklist Management Service Configuration

Table 6-2 lists Worklist Service configuration parameters:

Table 6-2: Worklist Service Parameters

Local Worklist Configuration Parameters - Worklist Service			
Parameter	Configurable	Default Value	Comments
Calling AE Title (SCU)	SERVICE	DATABASE	
Port	SERVICE	104	
Association Timeout In Seconds	SERVICE	120	
Query Response Size	SERVICE	100	
Multi Modality Query	SERVICE	Unchecked	
Remote Configuration Parameters - Worklist Service			
Called AE Title (SCP)	SERVICE	DICOM_MWL	
IP Address	SERVICE		
Host Name	SERVICE		
Port	SERVICE	104	

6.2.2. Modality Performed Procedure Step Service Configuration – N/A

Not implemented.

6.2.3. Unified Worklist and Procedure Step Service Configuration – N/A

Not implemented.

6.2.4. Instance Availability Notification Service Configuration – N/A

Not implemented.

6.2.5. Storage Service Configuration

Table below lists Storage Service configuration parameters:

Table 6-3: Storage Service Parameters

Local Configuration Parameters - Storage Service			
Parameter	Configurable	Default Value	Comments
Store Service Timeout in Seconds	SERVICE	300 s	
Calling AE Title(SCU)	SERVICE	DATABASE	
IP Address	SERVICE		
Port	SERVICE	104	
Enable	SERVICE	Checked	Enable device in remote devices
Large Archive	SERVICE	Unchecked	

Local Configuration Parameters - Storage Service			
Parameter	Configurable	Default Value	Comments
Archive	SERVICE	Unchecked	
Supported Transfer Syntax as SCU	SERVICE	ELE, ILE, JPEG, JPEG Lossless, RLE	Advanced Settings>Device Settings
Remote Configuration Parameters - Storage Service			
Association Timeout In Seconds	Service	120	
Called AE Title (SCP)	SERVICE	DICOM_STORE	
Port	FIXED	104	For studies to be displayed only (not imported in DB/cache, the default port is 110)
Supported Transfer Syntax as SCP	SERVICE	ELE, ILE	Advanced Settings>Device Settings
Device Name	SERVICE	<Device name> - working with Storage commitment or < Device name> - working without Storage commitment	

6.2.6. Storage Commitment Service Configuration

Table below lists Storage Commitment Service configuration parameters:

Table 6-4: Storage Commitment Service Parameters

Local Configuration Parameters - Storage Commitment Service			
Parameter	Configurable	Default Value	Comments
Storage Commitment Service Timeout in Seconds	SERVICE	300	
Remote Configuration Parameters - Storage commitment Service			
Association Timeout In Seconds	SERVICE	120 s	
Called AE Title (SCP)	SERVICE	DICOM_STORE_SC	
Port	SERVICE	104	
Device Name	SERVICE	<Device name> - working with Storage commitment	

6.2.7. Query/Retrieve Service Configuration

Table below lists Query/Retrieve Service configuration parameters:

Table 6-5: Query/Retrieve Service Parameters

Local Configuration Parameters - Query/Retrieve Service			
Parameter	Configurable	Default Value	Comments
Query Service Timeout in Seconds	SERVICE	180 s	
Retrieve Service Timeout in Seconds	SERVICE	300 s	
Remote Configuration Parameters - Query/Retrieve Service			
Device Name	SERVICE	<Device name> - working with Storage commitment or < Device name> - working without Storage commitment	
Query Called AE Title (SCP)	SERVICE	DICOM_QUERY	
Query Port	SERVICE	104	
Query Lowest Support Level	SERVICE	Image	
Query Response Size	SERVICE	100	
Query Association Timeout In Seconds	SERVICE	300 s	
Retrieve Called AE Title (SCP)	SERVICE	DICOM_MOVE	
Retrieve Port	SERVICE	104	
Retrieve Association Timeout In Seconds	SERVICE	120 s	
Retrieve Multiple Associations Supported	SERVICE	Unchecked	
Retrieve Maximum Number of Association Allowed	SERVICE	3	

6.2.8. Print Management Service Configuration

Printers are configurable by a selection of the default printer types. Every printer type has a fixed configuration, but can be extended with new ones. The default printer settings are defined in the printer configuration file.

Table below lists Print Management Service configuration parameters:

Table 6-6: Print Management Service Parameters

Local Configuration Parameters - Print Management Service			
Parameter	Configurable	Default Value	Comments
Print Service Timeout in Seconds	SERVICE	300	
Calling AE Title(SCU)	SERVICE	DATABASE	
Remote Configuration Parameters - Print Management Service			

Local Configuration Parameters - Print Management Service			
Parameter	Configurable	Default Value	Comments
Association Timeout In Seconds	SERVICE	150	
Called AE Title (SCP)	SERVICE	AE_PRINT	
Port	SERVICE	104	
Printer Name	SERVICE		Product / Model Name

6.2.9. Verification Service Configuration

Table 6-7: Verification Service Parameters

Local Configuration Parameters - Print Management Service			
Parameter	Configurable	Default Value	Comments
Verify Service Timeout in Seconds	SERVICE	60 s	
Calling AE Title(SCU)	SERVICE	DATABASE	
Remote Configuration Parameters - Print Management Service			
Called AE Title (SCP)	SERVICE		Uses the AE title of the remote service to test the verification
Port	SERVICE	104	

6.3. Configuration of DICOM Web Services

The WADO-RS service can be configured on the DICOM Node configuration page, by enabling the WADO functionality. The WADO-RS URL and the Port number can be configured.

The tables in the following subsections show the configuration parameters required for DICOM Web Services.

To identify whether Advanced Visualization Workspace is an user agent, the following applies:

- User agent: The (Secured) Remote Retrieve URL is present at the Remote configuration parameters.

6.3.1. URI Web Service Configuration – N/A

Not implemented.

6.3.2. Studies Web Service Configuration

6.3.2.1. Retrieve Transaction (WADO-RS) Configuration

The Retrieve Transaction is also known as WADO-RS. Table below lists configuration parameters for the Retrieve Transaction of the Studies Web Service as Origin Server:

Table 6-8: Retrieve Transaction Configuration Parameters

Local Configuration Parameters - Retrieve Transaction			
Parameter	Configurable	Default Value	Comments
Secured Local Retrieve Imaging Doc Set URL (Base URI)	FIXED	https://<hostname>:443/DicomRS/wado	
Secured Port	FIXED	443	

6.3.2.2. Store Transaction (STOW-RS) Configuration

The Store Transaction is also known as STOW-RS. Table below lists configuration parameters for the Store Transaction of the Studies Web Service as Origin Server:

Table 6-9: Store Transaction Parameters

Local Configuration Parameters - Store Transaction			
Parameter	Configurable	Default Value	Comments
Secured Store local Origin Server URL (Base URI)	FIXED	https://<hostname>:443/DicomRS/stow	
Secured Port	FIXED	443	
Accepted Content Types	FIXED	multipart/related; type="application/dicom"	
Response Content Type	FIXED	application/json	Always JSON (ApplicationJsonStream). Not application/dicom+xml as standard specifies.
MIME Buffer Size	FIXED	50 MB (50 * 1024 * 1024)	Per-request in-memory buffer for both MultiPartRelatedDicomMIMEParser and ApplicationDicomMIMEParser.
Max Payload Size	FIXED	No limit	But since the Dicom Web runs on Owin and it delegates to Http.sys which has a limit of ~ 28.6 MB
Max Instances Per Request	FIXED	No limit	MIME parser iterates all parts until stream ends.
Commit Timeout	FIXED	180 seconds	
Cancellation Support	FIXED	Disabled	CancellationToken support exists but is commented out
Request Timeout	FIXED	No limit	No explicit timeout on STOW ingestion path.

Local Configuration Parameters - Store Transaction			
Parameter	Configurable	Default Value	Comments
Study UID Validation	FIXED	Enabled when Study UID in URL	string.CompareOrdinal() — rejects mismatched instances with 0xA900.

6.3.2.3. Search Transaction (QIDO-RS) Configuration

The Search Transaction service is also known as QIDO-RS. Table below lists configuration parameters for the Search Transaction of the Studies Web Service as Origin Server:

Table 6-10: Search Transaction Parameters

Local Configuration Parameters - Search Transaction			
Parameter	Configurable	Default Value	Comments
Secured Search local Origin Server URL (Base URI)	FIXED	https ://<hostname>:443/qido	
Secured Port	FIXED	443	
Response Content Type	FIXED	application/json	
Max Results Per Response	FIXED	100	DicomWebConstants.QidoScpTransferCapacity = 100 — hard cap, not configurable
Default Query Timeout	FIXED	10,000 ms (10 seconds)	DicomWebConstants.QidoDefaultTimeout = 10000 — overridable per-request via Timeout HTTP header
Timeout Header	SERVICE	Timeout	Parsed from request headers by QidoRequestParser; value in milliseconds as integer
Pagination — offset + limit required together	FIXED	Both or neither	If only one is provided → ArgumentException("Limit and Offset has to be present in the query"). Offset must be equal to zero.

6.3.3. Worklist Web Service Configuration – N/A

Not applicable, not implemented by product.

6.3.4. Non-Patient Instances (NPI) Web Service Configuration – N/A

Not applicable, not implemented by product.

6.4. Configuration of Media Storage Service

Table below lists configuration parameters for the Media Storage service.

Table 6-11: Media Storage Service Parameters

Local Configuration Parameters - Media Storage Service			
Parameter	Configurable	Default Value	Comments
Source Application Entity Title	SERVICE		-

6.5. Configuration of Real Time Video Service – N/A

Not applicable, not implemented by product.

6.6. Configuration of Audit Trail - Syslog

Table below lists configuration parameters for the Audit Trail Originator.

Table 6-12: Audit Trail Originator Parameters

Originator Audit Trail Message Transmission-SYSLOG Parameters			
Parameter	Configurable	Default Value	Comments
Central Audit Trail Records	SERVICE	DISABLED	-
Remote Host name/IP	SERVICE		-
Remote Port number	SERVICE	514	-
UDP Protocol	SERVICE		-
TLS Protocol	SERVICE	DISABLED	-
Certificate	SERVICE		-

7. Network and Media Communication Details

7.1. General

The interaction of the AEs is depicted in “Figure 1-1: Overview of Implemented Services”.

7.1.1. General Association Parameters

Association parameters are specified in each AE in section 7.2 Specifications.

7.2. Specifications

7.2.1. DICOM Manager Application Entity

7.2.1.1. Sequencing of Real-World Activities for DICOM Manager

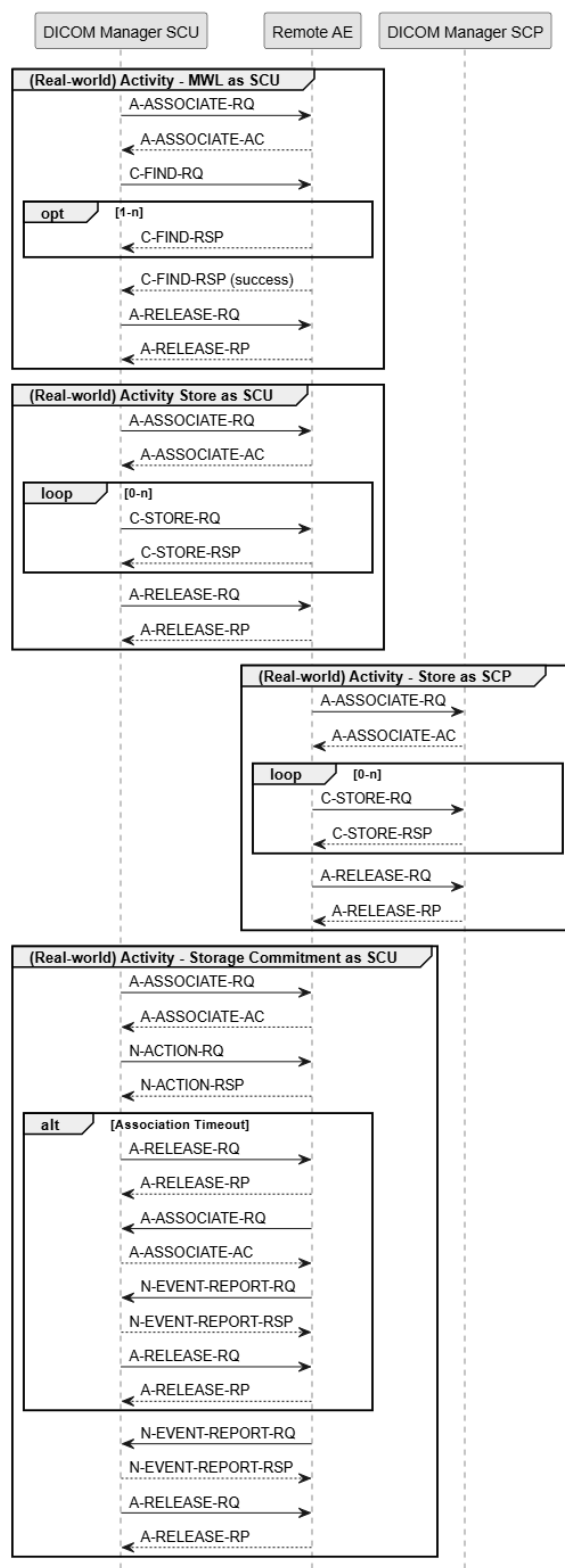


Figure 7-1: Sequencing of Real-World Activities for MWL and Storage

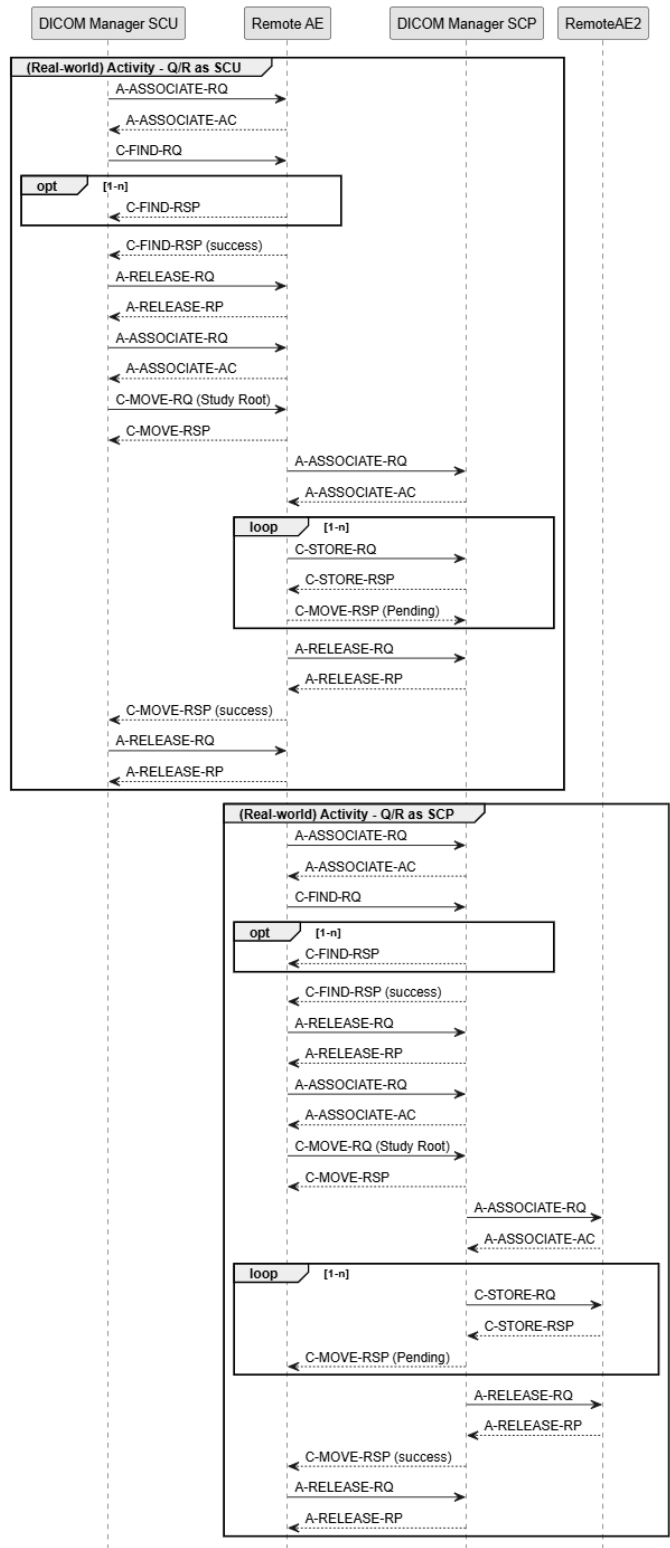


Figure 7-2: Sequencing of Real-World Activities for Query Retrieve

7.2.1.2. Association Parameters of DICOM Manager

Table below lists Association parameters applicable to DICOM Manager AE.

Table 7-1: Association Parameters for DICOM Manager AE

	Name	Value
Networking Services	Application Context Name	1.2.840.10008.3.1.1.1
	Implementation Class UID	1.3.46.670589.50.1.15.0
	Implementation Version Name	AVW_15.0
	Maximum PDU Length	65K
	ARTIM Timeout	5 s
	Maximum number of simultaneous Associations as Association Initiator	50
	Maximum number of simultaneous Associations as Association Acceptor	50
	Maximum number of outstanding asynchronous Transactions	1

7.2.1.3. Association Initiation

This section details the Association policies of the Application Entity when it is initiating an Association.

7.2.1.3.1. Real-World Activity Modality Worklist

DICOM - Manager initiates an association to the MWL SCP. The DICOM-Manager sends a C-FIND-RQ to the MWL SCP and the applicable patient list is returned.

7.2.1.3.2. Real-World Activity Storage

DICOM Manager AE provides standard conformance to the DICOM V3.0 Storage Service Class as an SCU for SOP Classes mentioned in the previous section.

Any unsuccessful status (error or warning), returned in the C-STORE Response, results in termination of sending further C-STORE requests (if any in the queue) and reporting of the error to the system log file and UI (Queue Manager)

There are two timeouts for the association. One timeout, "Association Timeout" is used to close an idle association. For C-STORE the default is 120 sec and can be configured per remote DICOM node. The other timeout is "Service Timeout" which detects that no data is transmitted over the association and closes it. The default "Service Timeout" for C-STORE is 5 minutes.

7.2.1.3.3. Real-World Activity Storage Commitment

DICOM-Manager will attempt to initiate a new association when requested to commit the images that were stored on a remote device, which supports the storage Commitment Service.

The associated real world activity for the N-ACTION is a storage commitment request to the remote storage device.

The associated real world activity for the N-EVENT-REPORT operation is the completion of the storage commitment by the remote device.

This can be as Synchronous storage commitment as the N-EVENT-REPORT-RQ is received inside the configure timeout or as Asynchronous storage commitment after the Release-RQ by the timeout is already send to the remote system.

DICOM-Manager will issue a failure status if it is unable to properly handle the storage commitment report event.

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association.

DICOM-Manager provides standard conformance to the DICOM V3.0 Storage Commitment Service Class using Push Model as an SCU.

Multiple N-ACTION-RQ can be performed over a single association. Multiple N-EVENT-REPORT-RQ can be accepted over a single association. After all N-ACTION-RQ that are waiting in the stack are issued, association will be closed with the timeout which is configurable.

A remote system reports about storage commitment completion using an N-EVENT-REPORT-RQ command. The system can also accept the N-EVENT-REPORT-RQ commands over a separate association initiated by the remote system, using reverse role negotiation.

Storage Commitment for individual images are grouped into large "chunks" and issued as a single Storage Commitment request.

7.2.1.3.4. Real-World Activity Query/Retrieve

DICOM-Manager initiates an association when the user clicks on one of the icons in the devices tool-bar. The DICOM-Manager searches (C-FIND) by Study Level following by Series level and, optionally (configurable), by Image Level.

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. Note that Query Retrieve service is supported only for Raw Data Object.

On receiving a Query Response with Study Instance UID (0020,000D) attribute not present in Study Level for Study Root, AVW does not display the study. On receiving a Query Response with Series Instance UID (0020, 000E) attribute not present in Series Level for Study Root, AVW displays the study and does not display the series. On receiving a Query Response with SOP Instance UID (0008,0018) attribute not present in Image Level, AVW does not display the image and only shows the study and the series which it belongs to. If any of the Unique Keys are not present, then AVW logs the message on the Log Viewer.

On receiving a Query Response with a required attribute not present in Study Level, AVW displays Study, Series and Image level information with an empty value for that required attribute. On receiving a Query Response with a required attribute not present in Series Level, AVW displays Study, Series level information with value being empty for that required attribute in Series level. On receiving a Query Response with required attribute missing in Image Level, AVW displays Study, Series and Image level information with value being empty for the required attribute.

The RWA Move Remote Images involves the retrieve of images on a remote system by moving (copying) the matching images from the remote database to another database.

The operator is able to copy the selected images in a patient folder from a remote database to another, local or remote, database by means of the copy tool in the DICOM Manager data handling facility. The DICOM Manager initiates for each copy request an association to the selected peer entity (Remote AE) and uses it to send the Retrieve (C-MOVE) request (and receive the associated responses). The association is released after the final Retrieve (C-MOVE) response for the related request has been received with the status success / failure.

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association.

DICOM-Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCU for the SOP Class Study Root Query/Retrieve Information Model - Move.

If AVW receives A-ABORT message while performing retrieve, the message is logged and can be shown in the log viewer.

7.2.1.3.5. Real-World Activity Verification

For each Verify Application Level Communication request, an association towards the remote system is established and a C-ECHO request is transmitted. Once the response is received, the association is closed.

7.2.1.4. Association Acceptance

7.2.1.4.1. Real-World Activity Storage

The real world activity associated with the C-STORE operation is the storage of the image in the memory of the system upon which DICOM Manager is running in order to make it available for immediate processing by applications. DICOM Manager will issue a failure status if it is unable to store the image in the memory.

DICOM Manager provides standard conformance to the DICOM V3.0 Storage Service Class as a SCP. DICOM Manager conforms to the SOPs of the Storage Service Class at Level 2 (Full). In case of a successful C-STORE, the stored image may be accessed by the processing applications.

AVW displays the Patient Name and Patient ID as “UNKNOWN” on receiving a Store Request for patient data which contains empty values for Patient Name and Patient ID attributes

AVW records in the Log Viewer logs if there is a network reply timeout during import.

On receiving an A-ABORT message while performing import, AVW logs the occurrence of the abort in the log viewer.

AVW is able to import objects that contain non-Philips private attributes.

AVW is able to import objects with retired date and time format.

It is possible for AVW to import object after the demographics information has undergone modification for that patient.

If an object containing a value for Modality, which is not supported by the Value Representation rules for CS, is imported into AVW, AVW corrects the value while displaying the object on the Patient Directory.

If an object containing a value for Modality, which is not any of the defined terms, is imported into AVW, AVW displays the value as is on the Patient Directory, for that object but records it in the Log Viewer.

AVW displays a message to the user if import operation is interrupted during data transfer.

7.2.1.4.2. Real-World Activity Verification

A remote system requests verification from DICOM Manager using the C-ECHO command.

DICOM Manager (C-ECHO SCP) provides standard conformance to the DICOM V3.0 verification SOP Class.

7.2.1.4.3. Real-World Activity Query/Retrieve

The Real World activity associated with the C-FIND-SCP is querying of the local data base based on C-FIND-RQ from the remote DICOM node. DICOM Manager will issue a failure status if it is unable to process the query request.

DICOM Manager provides standard conformance to the DICOM 3.0 Query/Retrieve Service Class as an SCP for the following SOP Class: Study Root Query/Retrieve Information Model - FIND, UID=1.2.840.10008.5.1.4.1.2.2.1.

The Real World activity associated with the C-MOVE command is retrieval of images from the disk and storage of the images to a remote system using a C-STORE command. DICOM Manager will issue a failure status if it is unable to process the transfer request.

DICOM Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCP for the following SOP Class: Study Root Query/Retrieve Information Model - MOVE, UID=1.2.840.10008.5.1.4.1.2.2.2. Prioritization of C-MOVE requests is not supported.

DICOM Manager does not support relational C-MOVE requests. All images requested in the C-MOVE will be sent over a single association.

During Move operation, if AVW receives an A-ABORT message, the Move operation does not continue but the Store sub operations are successful.

7.2.2. Print Manager Application Entity

7.2.2.1. Sequencing of Real-World Activities for Print Manager

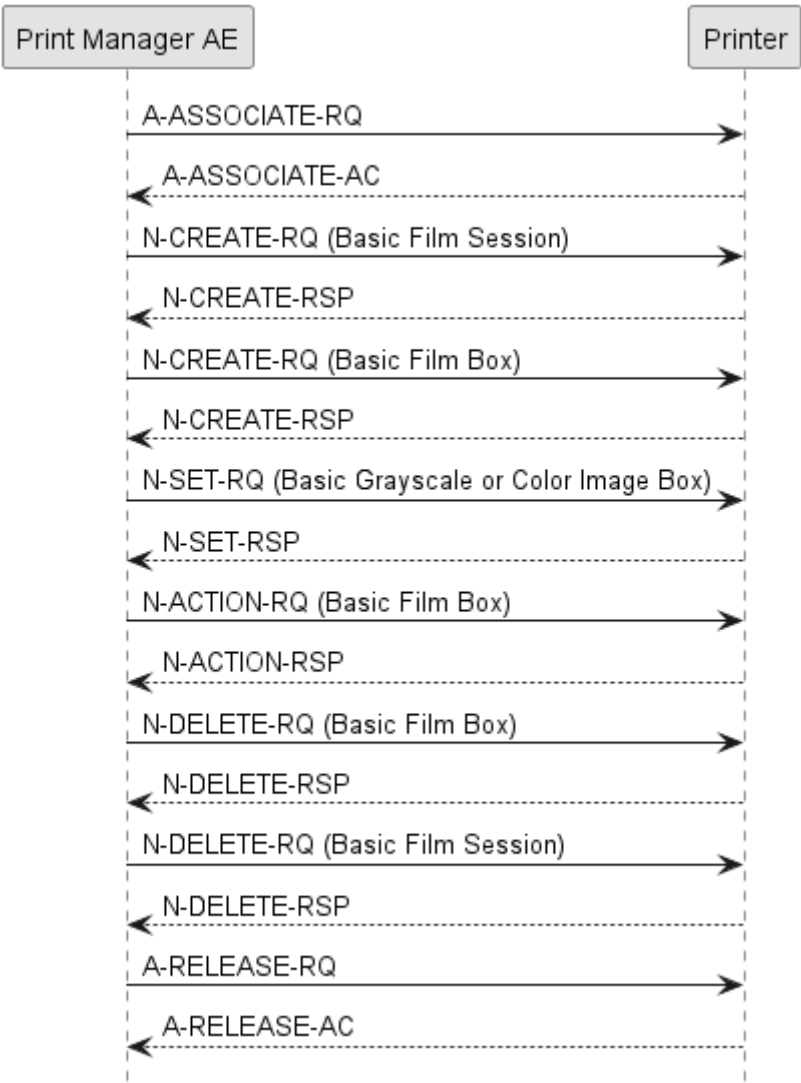


Figure 7-3: Real World Activity – Print Management as SCU

7.2.2.2. Association Parameters of Print Manager

Table below lists Association parameters applicable to Print Manager AE.

Table 7-2: Association Parameters for Print Manager AE

	Name	Value
Networking Services	Application Context Name	1.2.840.10008.3.1.1.1
	Implementation Class UID	1.3.46.670589.50.1.15.0
	Implementation Version Name	AVW_15.0

	Name	Value
	Maximum PDU Length	Default: 4096
	ARTIM Timeout	Default: 30s
	Maximum number of simultaneous Associations as Association Initiator	1
	Maximum number of outstanding asynchronous Transactions	1

7.2.2.3. Association Initiation

7.2.2.3.1. Real-World Activity Print

After selecting the print destination (out of choice list of configured printers) and some print parameters (depending on the configuration and the selected printer; these values can be configured too), Print-Manager initiates an association when a print job is submitted to a DICOM printer (when the user clicks on the print button in the film view). The association is left open after the job is completed for a configurable time-out (so that if there are other jobs to the same printer, they will be done on the same association). Jobs to different printers are performed simultaneously.

Normally, when the job is completed and there are no other jobs to the same printer, the Print manager does close the association with an A-RELEASE request. If a TCP/IP connection timeout occurs, then the association is closed. In this case, a new association is set up when needed.

7.2.2.4. Association Acceptance – N/A

Not implemented.

7.2.3. WebDICOM Application Entity

7.2.3.1. Sequencing of Real-World Activities for WebDicom AE

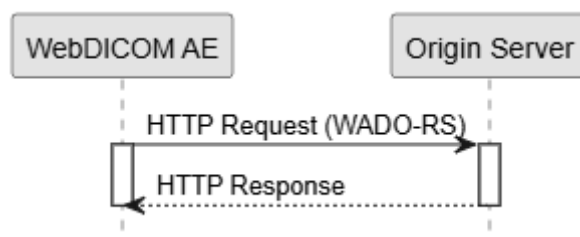


Figure 7-4: Real World Activity – WebDICOM as User Agent

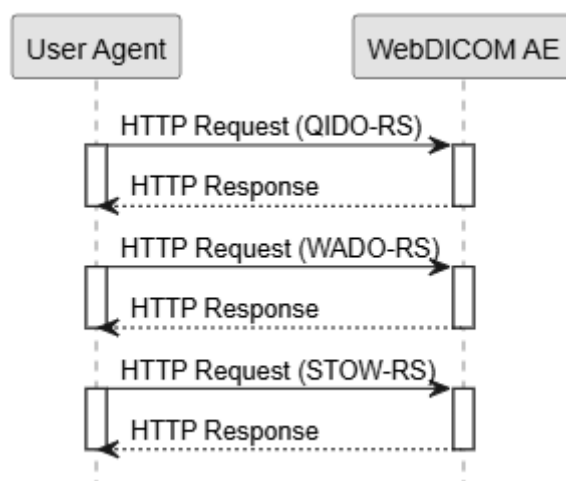


Figure 7-5: Real World Activity – WebDICOM as Origin Server

7.2.3.2. Request Parameters of Webservices Application Entity

Table below lists Association parameters applicable to Webservices Application Entity

Table 7-3: Association Parameters for Webservices Application Entity

	Name	Value
Networking Services	Application Context Name	1.2.840.10008.3.1.1.1
	Implementation Class UID	1.3.46.670589.50.1.15.0
	Implementation Version Name	AVW_15.0
Webservices	Maximum number of connections supported as User agent	None
	Maximum number of connections supported as Origin server	None

7.2.3.3. Request Initiation as User Agent – N/A

No applicable, not implemented.

7.2.3.4. Request Acceptance as Origin Server

This section details the HTTP service policies of the Application Entity when it accepts and processes DICOMweb service requests.

7.2.3.4.1. Real-World Activity WADO-RS as Origin Server

When the HTTP server receives a GET request at the /wado/studies endpoint, the WadoController takes control and first validates that the provided Study Instance UID exists in the system. The WadoRequestParser analyzes the incoming request headers, particularly the Accept header, to understand the client's capabilities and preferences. It extracts any specified transfer syntax requirements and validates that the requested media type is supported. The server then creates a DicomWebResponseWriter configured to generate a multipart/related response with appropriate boundary markers. The WadoScpServiceProvider queries the storage backend to locate all DICOM instances belonging to the requested study. For each instance found, the system retrieves the complete DICOM object from persistent

storage. If the client requested a specific transfer syntax that differs from the stored format, the system performs the necessary conversion. Each DICOM object is then written to the HTTP response stream, preceded by multipart headers indicating the content type and length. The streaming nature of the response means that data begins flowing to the client as soon as the first object is ready, significantly reducing the time to first image. This process continues until all instances in the study have been transmitted, at which point the final multipart boundary is written and the HTTP connection is closed.

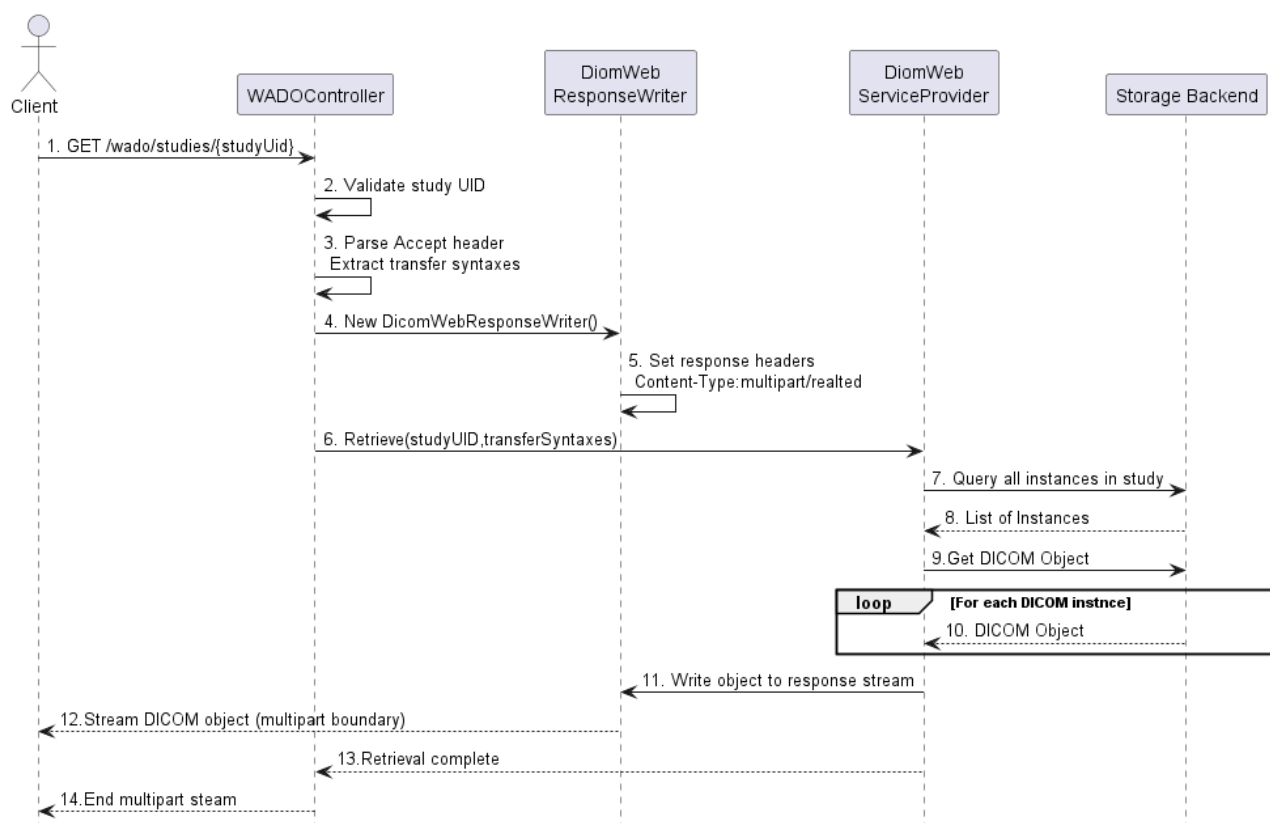


Figure 7-6: Real World Activity – WebDICOM AE (WADO-RS)

7.2.3.4.2. Real-World Activity QIDO-RS as Origin Server

When the QIDO Controller receives a GET request at any of its endpoints (/qido/studies, /qido/series, /qido/instances), it first extracts the complete query string from the request URI. This string contains all the search parameters provided by the client. The QidoRequestParser processes the request headers to identify the target repository (device ID) and any timeout specifications.

The UriParserFactory then analyzes the query parameters using HttpUtility.ParseQueryString. It distinguishes between standard DICOM attribute queries and special control parameters like limit and offset. For each DICOM attribute in the query, the system converts the hexadecimal tag string to a DictionaryTag object and prepares the value for matching.

The QidoScpServiceProvider executes the actual database query, applying all specified filters to the DICOM metadata stored in the system. The query engine supports various matching types including exact matches,

wildcard searches (using * and ? characters), and date range queries. The results are automatically limited to a maximum of 100 records per the system configuration, with clients using pagination to retrieve additional results if needed.

All matching DICOM objects are serialized into a JSON array format, with each attribute represented by its tag, value representation (VR), and actual value(s). The `DicomWebResponseWriter` sets the appropriate Content-Type header (`application/dicom+json`) and transmits the response. The server then closes the connection, having completed the stateless query operation.

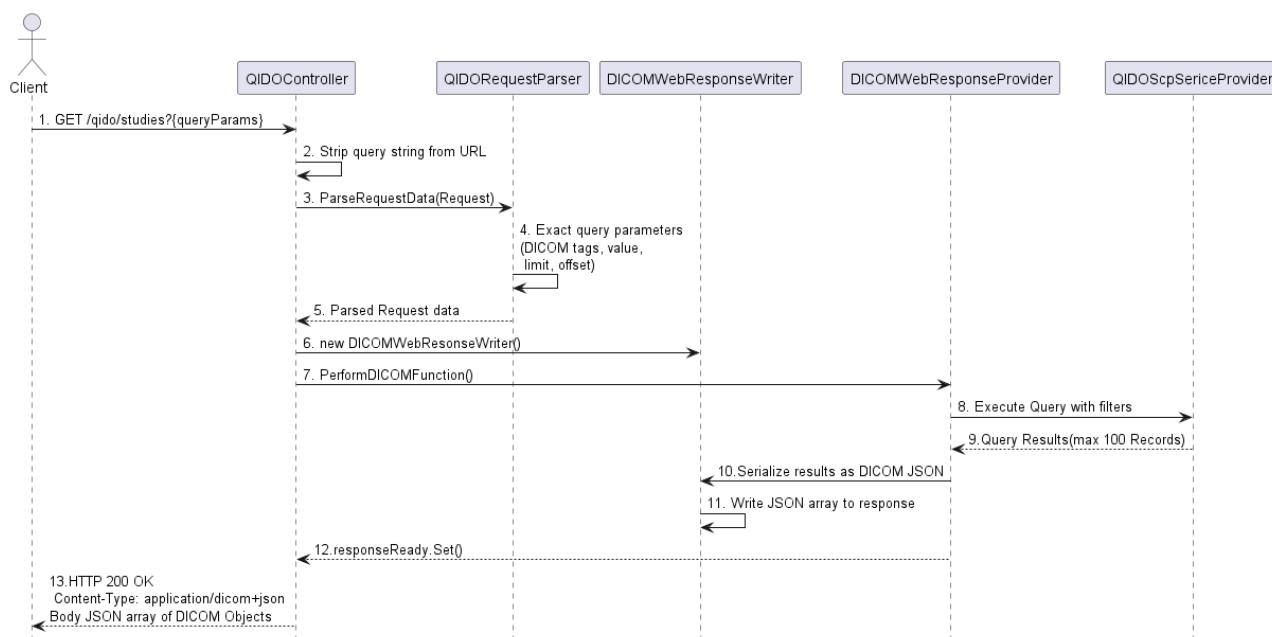


Figure 7-7: Real World Activity – WebDICOM AE (QIDO-RS)

7.2.3.4.3. Real-World Activity STOW-RS as Origin Server

When the HTTP server receives a POST request at the `/stow/studies` endpoint, the `StowController` first validates that the Content-Type header correctly specifies `multipart/related` with `application/dicom` type. A `StowImportSession` is created to track the entire storage operation, providing a context for managing multiple instances and correlating responses.

The MIME parser begins reading the incoming stream, processing each multipart part sequentially. For each part, it extracts the DICOM object from the boundary-delimited section and deserializes it from DICOM Part 10 format back into a structured `DicomObject`. The validation process checks that all required DICOM attributes are present, verifies that the SOP Class UID is supported, and ensures that Study, Series, and Instance UIDs are properly formatted.

Validated objects are passed to the storage backend for persistence. The system records the success or failure of each storage operation, maintaining detailed status information within the import session. This includes specific error codes for any failures, such as duplicate instances, validation errors, or storage subsystem issues.

Once all parts have been processed, the server compiles a comprehensive response in JSON format. This response includes a list of all successfully stored instances with their UIDs, as well as any failures with appropriate error codes and descriptions. The HTTP response is sent with status 200 OK, and the connection is closed, having completed the storage transaction.

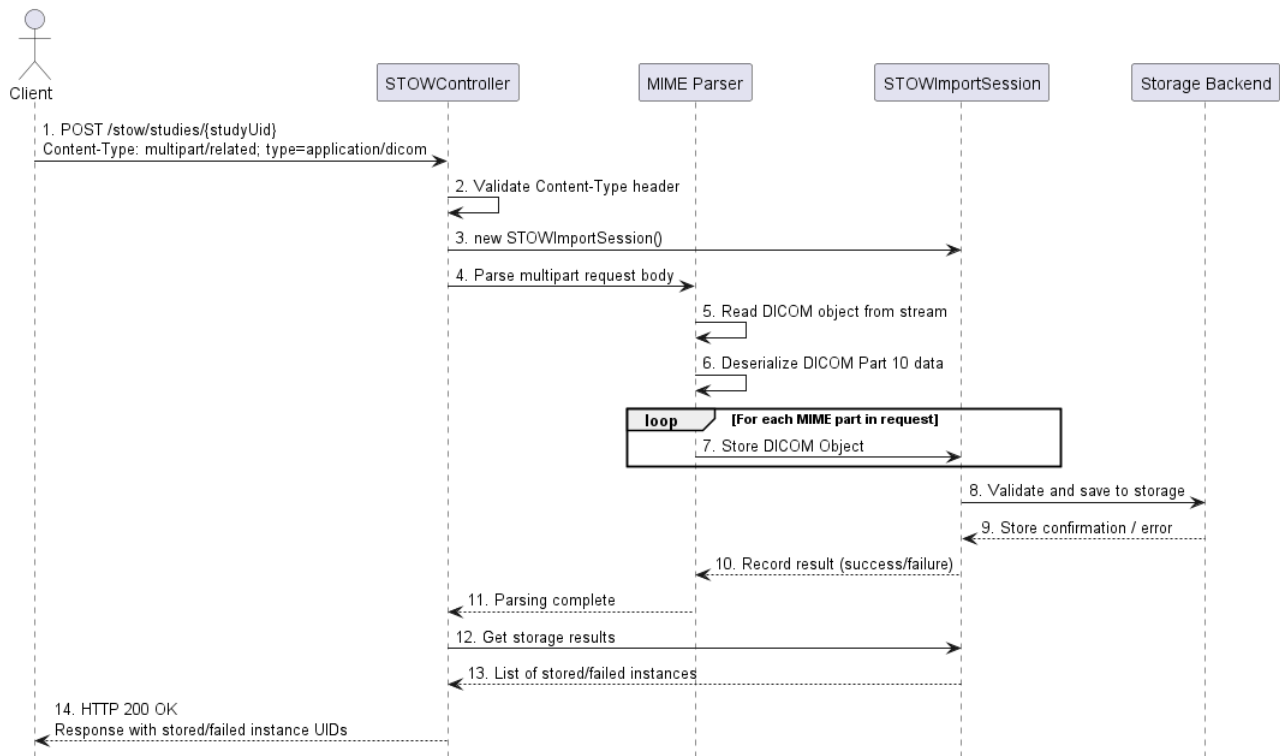


Figure 7-8: Real World Activity – WebDICOM AE (STOW-RS)

7.2.4. Media Application Entity

The Advanced Visualization Workspace V15.1.3 can Write and Read CD, DVD and USB.

The Media AE in a Advanced Visualization Workspace V15.1.3 supports the following functions for CD, DVD and USB as FSR:

- Read the DICOMDIR File from the medium (representing the directory of the DICOM File(s) as recorded on the medium). This information may be displayed as an ordered list of icon images and, if present, with pertinent identifying information (patient name, etc.).
- Read the selected image from the medium and display it on the monitor of the workstation. This information is displayed as an ordered list of frames of the selected image or as a dynamic review of the selected image.

And for CD, DVD and USB as FSC:

- Initialize the medium.

- Write a DICOM File-set onto the medium.
- Create a DicomDIR File.

And for USB as FSU:

- Initialize the medium.
- Write a DICOM File-set onto the medium.
- Extend the existing DICOM File-set and update the DicomDIR File accordingly (DICOM Media Storage Service Class).

7.2.4.1. Sequencing of Real-World Activities for Media

A Real World Activity of the Media AE is: The user selects a set of object to write these to the CD, DVD or USB. Then the CD, DVD or USB will be created with the selected objects. Once the CD, DVD or USB has been created, the user can read this CD, DVD or USB on the Advanced Visualization Workspace V15.1.3 or for transport to another device for reading.

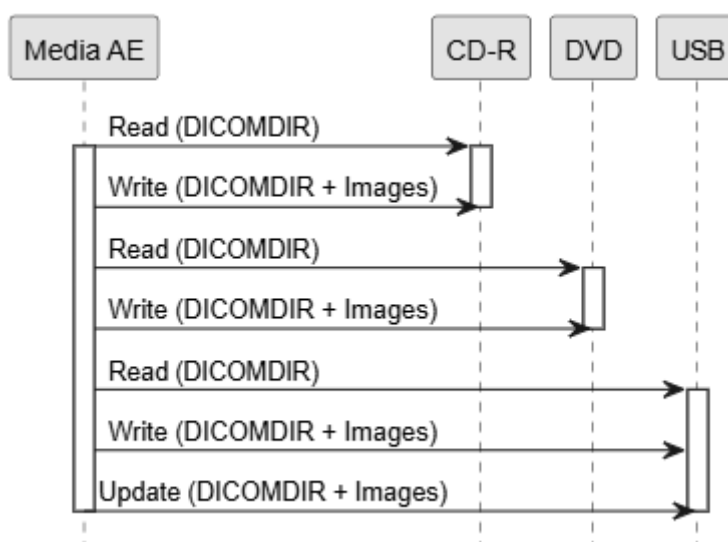


Figure : Sequencing of Real-World Activities for Media

7.2.4.2. Association Parameters of Media

Table below lists Association parameters applicable to Media AE.

Table 7-4: Association Parameters for Media AE

	Name	Value
Media Services	File Meta Information Version	
	Implementation Class UID	1.3.46.670589.50.1.15.0
	Implementation Version Name	AVW_15.0
	Max PDU Size	Minimum 2Kbytes

The Application Entity title is registered into the DICOM File Meta Information header and is supported by the CD,DVD-Writer (CD/DVD write option) or USB acting as an FSC.

7.2.4.3. Association Initiation

7.2.4.3.1. Real-World Activity Media

The AE specification contains a description of the Real-World Activities, which invoke the particular AE.

RWA - Read File-set

When an image transfer from CD, DVD or USB is initiated then the Media AE acts as an FSR using the interchange option to import SOP Instances from the CD, DVD or USB medium.

RWA - Create File-set

When an image transfer to CD, DVD or USB is initiated then the Media AE acts as an FSC using the interchange option to export SOP Instances from the local database to a CD, DVD or USB medium.

RWA - Update File-set

When an update of an image transfer to USB is initiated then the Media AE acts as an FSU using the interchange option to export SOP Instances from the local database to the USB medium.

Media Storage Application Profile

The Media AE supports the RWA Write Images for the STD-CTMR-CD, STD-GEN-CD, STD-GEN-DVD-JPEG and STD-GEN-USB-JPEG Application Profiles.

The DICOMDIR file will be extended when new images are written. In case some attributes are not present in an image but are specified as mandatory in the DICOMDIR definition in DICOM Media, a generated value will be filled in.

Implementation remarks and restrictions:

When writing the DICOMDIR records, key values are generated when no value of the corresponding attribute is supplied, according to the following tables.

The data selected to write to the media must fit on the currently inserted media. If it does not fit, an error is generated and it is up to the operator to re-select a smaller amount of data to be written to the media. The system will not request additional media or write across multiple media.

7.3. Status Codes

The following sections describe the Status Codes supported by the system for each implemented service as well as the reason for issuing specific Status codes or the associated behavior when receiving it.

7.3.1. General AE Communication and Failure Behavior and Handling

7.3.1.1. Communication Failure Behavior as Association Initiator

Table below describes behavior of the AE if a communication failure occurs when it initiated an Association.

Table 7-5: DICOM Communication Failure Behavior as Association Initiator

Failure	Failure Behavior
Timeout	A release request is sent in order to close the association. There are two timeouts for the association. One timeout, "Association Timeout" is used to close an idle association. The other timeout is "Service Timeout" which detects that no data is transmitted over the association and closes it.
Association aborted	The connection is closed. The reason is logged and reported to the user in the log viewer. When receiving association accept with no presentation context item; When receiving association accept where all items in the presentation context item list are not accepted by remote system; When an association timeout (configurable per remote device) expired (timeout which determines how long to keep an idle association); When receiving a PDU whose size is bigger than the agreed max PDU size.
Network Disconnect	System tries to disconnect before receiving an association accept but after sending association request

7.3.1.2. Communication Failure Handling as Association Acceptor

Table below describes how the AE responds when it receives an Association request that leads to a failure in communication.

Table 7-6: DICOM Communication Failure Handling as Association Acceptor

Exception	Failure response
Failure during processing of an Association request	ABORT message is sent out and the connection is closed.
Unrecognized PDU	ABORT message is sent out and the connection is closed.
Unrecognized Called AE	AE responds with Association-RJ
Application Context name not supported	AE responds with Association-RJ
Unrecognized presentation context item list	AE responds with Association-RJ
Protocol version not supported	AE responds with Association-RJ

7.3.2. DIMSE Services

7.3.2.1. Basic Worklist Management Service

7.3.2.1.1. SCU of the Modality Worklist Information Model Find SOP Class - C-FIND

Table below lists the Status Codes that the SCU of the Modality Worklist Information Model Find SOP Class supports for the C-FIND message and defines the application behavior when encountering the listed Status Codes.

Table 7-7: Status Codes for C-FIND of the Modality Worklist Information Model SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Matching is complete	0000	Successfully returned all matching information
-	Other status codes	anything else	Matching is incomplete/failed a message is logged.

7.3.2.1.2. SCP of the Modality Worklist Information Model Find SOP Class - C-FIND – N/A

Not implemented.

7.3.2.2. Modality Performed Procedure Step Service – N/A

Not implemented.

7.3.2.3. Unified Worklist und Procedure Step Service – N/A

Not implemented.

7.3.2.4. Instance Availability Notification Service – N/A

Not implemented.

7.3.2.5. Storage Service

7.3.2.5.1. SCU of the Storage SOP Classes - C-STORE

Table below lists the Status Codes that the SCU of the Storage SOP Class supports for the C-STORE message and defines the application behavior when encountering the listed Status Codes.

Table 7-8: Status Codes C-STORE for the Storage SOP Classes - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	Storage successful.
Warning	Coercion of Data Elements	B000	Warning status is treated as success.
	Data Set does not match SOP Class	B007	Warning status is treated as success.
	Elements Discarded	B006	Warning status is treated as success.
	Attribute list error	0107	Message by transfer result – Attribute List Error
Failure	SOP Class not supported	0112	Message by transfer result - Unknown reason.
	Invalid Object Instance	0117	Message by transfer result –Invalid Object Instance

Service Status	Further Meaning	Status Code	Behavior
	Duplicate Invocation	0210	Message by transfer result – Duplicate Invocation
	Mistyped Argument	0212	Message by transfer result – Mistyped Argument
	Out of Resources	A701	Message by transfer result - Out of Resources.
	Error - Data Set does not match SOP Class	A901	Message by transfer result – Dataset does not match SOP Class.
	Error – Cannot Understand	C000	Message by transfer result - Store failed.
	Out of Resources	A702	Message by transfer result - Out of Resources.
	Referenced SOP Class not supported	0122	Message by transfer result – Dataset does not match SOP Class
	Processing failure	0110	Message by transfer result - Unknown reason.

7.3.2.5.2. SCP of the Storage SOP Classes - C-STORE

Table below lists the Status Codes that the SCP of the Storage SOP Classes supports for the C-STORE message and defines conditions in which the listed Status Codes are sent.

Table 7-9: Status Codes C-STORE of the Storage SOP Classes - SCP

Service Status	Further Meaning	Status Codes	Related Fields	Condition
Success	Success	0000	N/A	Whenever the store operation succeeded.
Failure	Out of Resources	A700	N/A	Whenever the store operation failed the information is logged on The Log Viewer. When an object not containing either the Study Instance UID, Series Instance UID or SOP Instance UID. When an object encoded in a transfer syntax other than the one negotiated.
	Error: Cannot understand	C000-CFFF	N/A	Whenever the store operation failed the information is logged on The Log Viewer. When a different SOP class is used in the C-Store-RQ command set than the one negotiated, during import, (The SOP Class of the dataset being the same as that negotiated).

7.3.2.6. Storage Commitment Service

7.3.2.6.1. SCU of the Storage Commitment Push Model SOP Class - N-ACTION

Table below lists the Status Codes that the SCU of the Storage Commitment Push Model SOP Class supports for the N-ACTION message and defines the application behavior when encountering the listed Status Codes.

Table 7-10: Status Codes for N-ACTION-RQ of the Storage Commitment Push Model SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The request for storage commitment is successful.
-	Other status codes	anything else	The request for storage commitment is marked as failed.

7.3.2.6.2. SCU of the Storage Commitment Push Model SOP Class - N-EVENT-REPORT

Table below lists the Status Codes that the SCU of the Storage Commitment Push Model SOP Class supports for the N-EVENT-REPORT message and defines the application behavior when encountering the listed Status Codes.

Table 7-11: Status Codes for N-EVENT-REPORT-RSP for the Storage Commitment Push Model SOP Class -SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The request for storage commitment is successful.
-	Other status codes	anything else	The request for storage commitment is marked as failed.

7.3.2.6.3. SCP of the Storage Commitment Push Model SOP Class - N-ACTION – N/A

Not implemented.

7.3.2.6.4. SCP of the Storage Commitment Push Model SOP Class - N-EVENT-REPORT – N/A

Not implemented.

7.3.2.7. Query/Retrieve Service

7.3.2.7.1. SCU of the Query/Retrieve FIND SOP Classes - C-FIND

Table below lists the Status Codes that the SCU of any of the Query/Retrieve FIND SOP Class supports for the C-FIND message and defines the application behavior when encountering the listed Status Codes.

Table 7-12: Status Codes C-FIND for Query/Retrieve FIND SOP Classes – SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Matching is complete	0000	Matching is successful.
Failure	Refused: Out of Resources	A700	Matching is not successful.
	Error: Identifier does not match SOP Class	A900	Matching is not successful.
	Error: Unable to process	C000	Matching is not successful.
	Error – More than 1 match found	C100	Matching is not successful.

Service Status	Further Meaning	Status Code	Behavior
	Error – Unable to support requested template	C200	Matching is not successful.
Cancel	Matching terminated due to cancel	FE00	Matching is not successful.

7.3.2.7.2. SCU of the Query/Retrieve MOVE SOP Classes - C-MOVE

Table below lists the Status Codes that the SCU of any of the Query/Retrieve MOVE SOP Class supports for the C-MOVE message and defines the application behavior when encountering the listed Status Codes.

Table 7-13: Status Codes C-MOVE for Query/Retrieve MOVE SOP Classes - SCU

Service Status	Further Meaning	Status Codes	Related Fields	Behavior
Success	Sub-operations Complete - No Failures	0000	N/A	Storage successful
Warning	Sub-operations Complete - One or more Failures	B000	N/A	Message by transfer result - Sub operations complete one or more failures.
Failed	Out of Resources - Unable to calculate number of matches	A701	N/A	Message by transfer result - Unable to calculate number of matches.
	Out of Resources - Unable to perform sub-operations	A702	N/A	Message by transfer result - Unable to perform sub operations
	Move Destination unknown	A801	N/A	Message by transfer result - Move Destination Unknown.
	Identifier does not match SOP Class	A900	N/A	Message by transfer result - Identifier does not match SOP Class.
	Unable to process	C000-CFFF	N/A	Message by transfer result - Unable to process.
Cancel	Sub-operations terminated due to Cancel Indication	FE00	N/A	Move operation cancelled.

If AVW receives A-ABORT message while performing retrieve, the message is logged and can be shown in the log viewer.

7.3.2.7.3. SCP of the Query/Retrieve FIND SOP Classes - C-FIND

Table below lists the Status Codes that the SCP of any of the Query/Retrieve FIND SOP Classes supports for the C-FIND message and defines conditions in which the listed Status Codes are sent.

Table 7-14: Status Codes C-FIND for Query/Retrieve FIND SOP Classes - SCP

Service Status	Further Meaning	Status Code	Condition
Success	Matching is complete - No final identifier is supplied	0000	Matching successful.
Failure	Error: Unable to process	C000-CFFF	Whenever the C-FIND operation failed.

Service Status	Further Meaning	Status Code	Condition
Cancel	Matching terminated due to cancel	FE00	When receiving a cancel C-FIND request.
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	For every C-FIND response received.

The cancellation of the C-FIND operation is supported. However, some C-FIND responses may be forwarded before the C-FIND cancel takes effect.

7.3.2.7.4. SCP of the Query/Retrieve MOVE SOP Classes - C-MOVE

Table below lists the Status Codes that the SCP of any of the Query/Retrieve MOVE SOP Classes supports for the C-MOVE message and defines conditions in which the listed Status Codes are sent.

Table 7-15: Status Codes C-MOVE for Query/Retrieve MOVE SOP Classes - SCP

Service Status	Further Meaning	Status Codes	Related Fields sent in the response	Condition	Action on the Store due the condition
Success	Sub-operations Complete - No Failures	0000	N/A		Whenever the move operation succeeded.
Warning	Sub-operations Complete - One or more Failures	B000	N/A		Whenever one of the store operations failed
Failed	Move Destination unknown	A801	N/A		Whenever the move destination is unknown to the system.
	Unable to process	Cxxx	N/A		Whenever the move operation failed.
Cancel	Sub-operations terminated due to Cancel Indication	FE00	N/A	User indication	When receiving a cancel move request.
Pending	Sub-operations are continuing	FF00	N/A		For every store response received.

During Move operation, if AVW receives an A-ABORT message, the Move operation does not continue but the Store sub operations are successful.

7.3.2.8. Print Management Service

7.3.2.8.1. SCU of the Basic Film Session SOP Class

7.3.2.8.1.1. SCU of the Basic Film Session SOP Class - N-CREATE

Table below lists the Status Codes that the SCU of the Basic Film Session SOP Class supports for the N-CREATE message and defines the application behavior when encountering the listed Status Codes.

Table 7-16: Status Codes for N-CREATE of the Basic Film Session SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The print job continues.
Warning	Memory allocation not supported	B600	The print job continues and the warning is logged.

7.3.2.8.1.2. SCU of the Basic Film Session SOP Class - N-SET – N/A

Not implemented.

7.3.2.8.1.3. SCU of the Basic Film Session SOP Class - N-DELETE

Table below lists the Status Codes that the SCU of the Basic Film Session SOP Class supports for the N-DELETE message and defines the application behavior when encountering the listed Status Codes.

Table 7-17: Status Codes for N-DELETE of the Basic Film Session SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
Other than Success	Other status codes	anything else	On any other status then success, the job remains in the queue manager, with status failed.

7.3.2.8.1.4. SCU of the Basic Film Session SOP Class - N-ACTION – N/A

Not implemented.

7.3.2.8.2. SCU of the Basic Film Box SOP Class

7.3.2.8.2.1. SCU of the Basic Film Box SOP Class - N-CREATE

Table below lists the Status Codes that the SCU of the Basic Film Box SOP Class supports for the N-CREATE message and defines the application behavior when encountering the listed Status Codes.

Table 7-18: Status Codes for N-CREATE of the Basic Film Box SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
Warning	Attribute List Error	0107	The print job continues and the warning is logged.
	Attribute Value Out of Range	0116	The print job continues and the warning is logged.
	Requested Min Density or Max Density outside of printer's operating range	B605	The print job continues and the warning is logged.
	One or more data elements were modified or discarded during the processing of a data set	B000-B007	The print job continues and the warning is logged.

Service Status	Further Meaning	Status Code	Behavior
Failure	There is an existing Film Box that has not been printed	C616	The print job is marked as failed and the reason is logged.

7.3.2.8.2.2. SCU of the Basic Film Box SOP Class - N-SET – N/A

Not implemented.

7.3.2.8.2.3. SCU of the Basic Film Box SOP Class - N-DELETE

Table below lists the Status Codes that the SCU of the Basic Film Box SOP Class supports for the N-DELETE message and defines the application behavior when encountering the listed Status Codes.

Table 7-19: Status Codes for N-DELETE of the Basic Film Box SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
Warning	Attribute List Error	0107	The print job continues and the warning is logged.
	Attribute Value Out of Range	0116	The print job continues and the warning is logged.
	Requested Min Density or Max Density outside of printer's operating range	B605	The print job continues and the warning is logged.
	One or more data elements were modified or discarded during the processing of a data set	B000-B007	The print job continues and the warning is logged.
Failed	Other status codes	anything else	On any other status then success, the job remains in the queue manager, with status failed.

7.3.2.8.2.4. SCU of the Basic Film Box SOP Class - N-ACTION

Table below lists the Status Codes that the SCU of the Basic Film Box SOP Class supports for the N-ACTION message and defines the application behavior when encountering the listed Status Codes.

Table 7-20: Status Codes for N-ACTION of the Basic Film Box SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Film accepted for printing	0000	The print job continues.
Warning	Attribute List Error	0107	The print job continues and the warning is logged.
	Attribute Value Out of Range	0116	The print job continues and the warning is logged.
	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	B603	The print job continues and the warning is logged and reported to the user.

Service Status	Further Meaning	Status Code	Behavior
	Image size is larger than Image Box size. The image has been demagnified.	B604	The print job continues and the warning is logged and reported to the user.
	Image size is larger than Image Box size. The image has been cropped to fit.	B609	The print job continues and the warning is logged and reported to the user.
	Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit.	B60A	The print job continues and the warning is logged and reported to the user.
	One or more data elements were modified or discarded during the processing of a data set	B000 - B007	The print job continues and the warning is logged.
Failed	Unable to create Print Job SOP Instance; print queue is full.	C602	The print job is marked as failed and the reason is logged and reported to the user.
	Image size is larger than Image Box size.	C603	The print job is marked as failed and the reason is logged and reported to the user.
	Combined Print Image Size is larger than Image Box size.	C613	The print job is marked as failed and the reason is logged and reported to the user.

7.3.2.8.3. SCU of the Basic Grayscale Image Box SOP Class - N-SET

Table below lists the Status Codes that the SCU of the Basic Grayscale Image Box SOP Class supports for the N-SET message and defines the application behavior when encountering the listed Status Codes.

Table 7-21: Status Codes for N-SET of the Grayscale Image Box SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The print job continues
Warning	Attribute list error	0107	The print job is continues and the warning is logged.
	Attribute out of range	0116	The print job is continues and the warning is logged.
	Image size is larger than Image Box size. The image has been demagnified.	B604	The print job continues, the warning is logged and reported to the user.
	Requested Min Density or Max Density outside of printer's operating range.	B605	The print job continues, the warning is logged and reported to the user.
	Image size is larger than Image Box size. The image has been cropped to fit.	B609	The print job continues, the warning is logged and reported to the user.
	Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit.	B60A	The print job continues, the warning is logged and reported to the user.
	One or more data elements were modified or discarded during the processing of a data set	B000 - B007	The print job is continues and the warning is logged.

7.3.2.8.4. SCU of the Basic Color Image Box SOP Class - N-SET

Table below lists the Status Codes that the SCU of the Basic Color Image Box SOP Class supports for the N-SET message and defines the application behavior when encountering the listed Status Codes.

Table 7-22: Status Codes for N-SET of the Color Image Box SOP Class - SCU

Service Status	Further Meaning	Status Code	Behavior
Success	Image successfully stored in Image Box	0000	The print job continues
Warning	Attribute list error	0107	The print job continues and the warning is logged.
	Attribute out of range	0116	The print job continues and the warning is logged.
	Image size is larger than Image Box size. The image has been demagnified.	B604	The print job continues and the warning is logged and reported to the user.
	Requested Min Density or Max Density outside of Printer's operating Range	B605	The print job continues and the warning is logged and reported to the user.
	Image size is larger than Image Box size. The image has been cropped to fit.	B609	The print job continues and the warning is logged and reported to the user.
	Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit.	B60A	The print job continues and the warning is logged and reported to the user.
Failed	One or more data elements were modified or discarded during the processing of a data set	B000 - B007	The print job continues and the warning is logged.
	All other errors than found in this list	anything else	The print job is marked as failed and the reason is logged and reported to the user.

7.3.2.8.5. SCU of the Printer SOP Class – N/A

Not implemented.

7.3.2.8.6. SCU of the Basic Annotation Box SOP Class - N-SET - N/A

Not implemented.

7.3.2.8.7. SCU of the Print Job SOP Class - N/A

Not implemented.

7.3.2.8.8. SCU of the Presentation LUT SOP Class - N/A

Not implemented.

7.3.2.8.9. SCU of the Printer Configuration Retrieval SOP Class - N-GET - N/A

Not implemented.

7.3.3. DICOM Web Services

7.3.3.1. General Status Codes

This section describes the common Status Code behavior and handling all the supported transaction.

7.3.3.1.1. Common Transaction as Origin Server

Table below lists the Status Codes that an origin server supports for all transactions and the conditions in which the listed Status Codes are sent:

Table 7-23: Status Codes of Origin Server for all Transactions

Status	Code	Condition
Success	200 (Success)	Successful retrieval or stored
Client Error	400 (Bad Request)	Invalid Parameters and format errors
	401 (Unauthorized)	Missing authentication credentials like IAM token
Server Error	500 (Internal Server Error)	Unhandled exceptions and failures
	503 (Service Unavailable)	Should be available when service is not available and thrown from load balancer

7.3.3.1.2. Common Transaction as User Agent - N/A

Not applicable, user agent not implemented.

7.3.3.2. URI Web Service – N/A

Not implemented.

7.3.3.3. Studies Web Service

7.3.3.3.1. Retrieve Transaction as Origin Server

Table below lists the Status Codes that a user agent supports for the Retrieve Transaction of the Studies Web Service and defines the application behavior when encountering the listed Status Codes:

Table 7-92: Status Codes of Origin Server for Retrieve Transaction

Status	Code	Behavior
Failure	400 (Bad Request)	The request is malformed or contains invalid parameters.
	404 (Not Found)	The requested DICOM entity (study, series, or instance) does not exist in the storage device. Thrown as DataNotFoundException when WadoExportTask.Transfer() finds no matching identifiers.
	405 (Method Not Allowed)	Wrong HTTP method

7.3.3.3.2. Retrieve Transaction as User Agent – N/A

Not applicable, not implemented.

7.3.3.3.3. Store Transaction as Origin Server

Table below lists the Status Codes that an origin server supports for the Store Transaction of the Studies Web Service and the conditions in which the listed Status Codes are sent:

Table 7-24: Status Codes of Origin Server for Store Transaction

Status	Code	Condition
Success	202 (Accepted)	HTTP Status Code
Failure	272 (Processing failure)	Payload Status code. Message by transfer result - Unknown reason.
	290(Referenced SOP Class not supported)	Payload Status code. Message by transfer result – Dataset does not match SOP Class.
	400 (Bad Request)	HTTP/HTTPS Status Code
	409 (Conflict)	Storage failure for STOW HTTPS Status Code

7.3.3.3.4. Store Transaction as User Agent – N/A

Not implemented.

7.3.3.3.5. Search Transaction as Origin Server

Table below lists the Status Codes that an origin server supports for the Search Transaction of the Studies Web Service and the conditions in which the listed Status Codes are sent:

Table 7-25: Status Codes of Origin Server for Search Transaction

Status	Code	Condition
Success	200 (OK)	
	204 (No Content)	

7.3.3.3.6. Search Transaction as User Agent – N/A

Not implemented.

7.3.3.4. Worklist Web Service – N/A

Not applicable, not implemented by product.

7.3.3.5. Non-Patient Instance Web Service – N/A

Not applicable, not implemented by product

8. Security

8.1. Introduction

The security section describes security features implemented by this product. It includes descriptions of non-DICOM network protocols, information to configure firewalls and application whitelists, lists of supported DICOM security profiles as well as Web Security features. Additionally, secured media storage, VPN, etc. are also specified in this security section.

8.2. External Network Requirements

There is need of HSP IAM url to be configured and will be used for authentication for the DICOM Webservices (WebDicom AE).

8.3. TCP Port Configuration

See Section 6 Configuration for information on the usage of ports for DICOM and other protocols. This section contains helpful information for product administrators to configure firewalls, application whitelists, etc.

8.4. DICOM Security Profiles Support

8.4.1. Secure Use and User Identity Profiles

Table below lists the Secure Use and User Identity Profiles:

Table 8-1: Secure Use and User Identity Profiles

Profile	Creator/Sender	Consumer/Receiver	Reference
Audit Trail Message Format	Yes	No	C.2.2
Audit Trial Message Transmission Profile - SYSLOG-TLS	Yes	No	C.2.3
Audit Trial Message Transmission Profile - SYSLOG-UDP	Yes	No	C.2.4

8.4.2. Secure Transport Connection Profiles

Secure communication is achieved using the native transport security mechanisms provided by the underlying operating system. The operating system is responsible for TLS protocol handling, cipher suite negotiation, certificate validation, and cryptographic operations. The application does not implement or override cryptographic algorithms or secure transport protocols.

8.4.3. Media Storage Security Profiles - N/A

Not implemented.

8.4.4. Attribute Confidentiality Profiles

Table below lists supported Attribute Confidentiality Profiles and options:

Table 8-2: Attribute Confidentiality Profiles

Profile	Option	AE	De-identifier	Re-identifier	Configurable
Basic Application Level Confidentiality		DICOM Manager	Yes	No	Yes

Profile	Option	AE	De-identifier	Re-identifier	Configurable
	Basic Profile	DICOM Manager	Yes	No	Yes

This is applicable when de-identification is requested.

De-identification of personal data constitutes “processing” under the Philips Privacy Rules (and many country laws).

Personal and specifically, sensitive data may only be de-identified by Philips Healthcare under certain conditions. Processing of medical images (sensitive data) may require verifiable, documented authorization or consent. This important aspect of data processing is governed and mandated by Philips Privacy Rules, to which all Philips Employees must adhere.

See Appendix C.2.6 for implementation details.

8.4.5. Digital Signature Profiles - N/A

Not implemented.

8.4.6. Additional DICOM Security Profiles – N/A

Not implemented.

8.5. User Identity Negotiation Support – N/A

Not implemented.

8.6. Web Services Security Features

Access Authorization and HTTP Headers:

The implementation features a pluggable **Security Provider Framework** (ISecurityProvider) that allows for custom security parameter injection

It supports IAM Integration via an iamSecret parameter during server startup.

Web Server Attack Handling:

- Exception/Error Handling

FhirExceptionHandlerAttribute is a global exception filter that catches all unhandled exceptions and returns sanitized OperationOutcome responses — preventing stack trace leakage.

Known FhirExceptionHandler instances return their specific status codes; unknown exceptions return 500 InternalServerError with a generic OperationOutcome.

- Authentication Enforcement

Missing or invalid tokens result in 400 BadRequest responses with minimal information disclosure.

Failed introspection returns 401 Unauthorized ("Not Enough Scope or Permissions found") or 408 RequestTimeout.

- HSDP API Signature Verification

The SecureApiRequest class generates HMAC-SHA256 API signatures for all outgoing API calls to prevent tampering and replay attacks. The signature includes the signed date, method, URI, query parameters, and body.

- Compression Handling

CompressionHandler handles GZip decompression of incoming requests in a controlled manner, mitigating potential compression-bomb vectors by processing in-pipeline.

Credentials Storage Protection:

- AWS Secrets Manager

The HsdpAuthentication class fetches IAM credentials (ClientId, ClientSecret, IamBaseEndpoint, OrgId, Scopes) from AWS Secrets Manager at runtime.

- The BasicAuthToken is computed at runtime from ClientId:ClientSecret (Base64-encoded), not stored persistently

The AuthorizationHandler skips logging the Authorization header to prevent credential leakage in logs

Retry & Error Handling

The secrets fetch has exponential backoff retry logic (up to 2 retries with 1s/2s delays), with non-retryable errors (e.g., InvalidSecretId, AccessDenied) failing fast.

Cross-Origin Resource Sharing (CORS):

CORS is enabled in the **OWIN startup pipeline** in

CorsOptions.AllowAll is an open CORS policy that permits:

All origins (*)

All HTTP methods

All headers

Credentials support

Provisioning, Deprovisioning, Load Balancing, Failover:

- Provisioning/Deprovisioning of IAM identities and policies is delegated to the HSDP IAM platform (external).
- Load balancing would be handled at the infrastructure/deployment layer (e.g., AWS ALB, reverse proxy) — the OWIN self-hosted server does not implement load balancing internally.

- Failover: The HsdpAuthentication class implements retry with exponential backoff for secrets retrieval (limited failover).
- The introspect call in AuthorizationHandler has a 30-second timeout but no circuit-breaker or failover to alternate IAM endpoints.
- Warm-up: The Host class performs a server warm-up call on startup to preload FHIR DLLs, which helps with service readiness.

Use of HTTP Headers (Authorization: Bearer):

The AuthorizationHandler explicitly checks for the Authorization: Bearer scheme.

When calling the IAM introspect endpoint, the system sends its own Authorization: Basic header (Base64-encoded ClientId:ClientSecret) for service-to-service authentication.

Certificate Management Tools and Process:

The system has a robust X.509 certificate validation framework:

- Certificate Validation Callback

RestRequest implements DefaultValidationCallback which validates SSL certificates against multiple error conditions and throws typed exceptions.

Certificate Revocation List (CRL) checking is enabled

ServicePointManager.CheckCertificateRevocationList = true;

- Error Status Tracking

CertificateErrorStatus enum is a [Flags] enum covering: RemoteCertificateNotAvailable, RemoteCertificateNameMismatch, Revoked, Expired, UntrustedRoot, InvalidCertificate.

- Certificate Exception Handling

InvalidCertificateException is a serializable custom exception carrying the CertificateErrorStatus for downstream handling.

- Custom Callbacks

The RestClient exposes a CertificateValidationCallback property (RemoteCertificateValidationCallback) allowing consumers to plug in their own certificate validation logic.

- HTTPS Support

FhirRestConfiguration supports a secureCommunication flag that switches between http and https schemes via GetScheme().

Annexes

A Information Object Definitions (IODs)

This section describes all the SOP Instances natively created by Advanced Visualization Workspace V15.1.3.

In the "Source" column, the following Values can be used:

- FIXED: The Value is pre-defined and cannot be modified.
- GENERATED: The Value is generated by the system.
- CONFIGURATION: The Value is copied from the system configuration.
- MWL: The Value is copied from a Modality Worklist entry.

- **QUERY:** The Value is determined by performing a query of any of the supported Query/Retrieve Services.
- **USER:** The Value is entered by the user.
- **SCANNED:** The Value is read from a barcode scanner or similar device.
- **EMPTY:** The Attribute is sent with a zero-length Value.
- **SRC_INSTANCE:** The Value is copied from previously created/received SOP Instances.

The "Presence" columns reflect the usage of the Module, Functional Group Macro, Attributes, or Value in the Advanced Visualization Workspace V15.1.3 Implementation and is not necessarily the same as defined in the DICOM Standard. For the "Presence" column the following Values can be used:

- **ALWAYS:** the module, functional group macro, Attributes or Value is always present.
- **CONDITIONAL:** the presence of the module, functional group macro, Attributes or Value is dependent on a condition. The condition must be listed in the "Conditions" column.
- **SRC_COPY:** The presence of the Attributes and Values depends on the availability of these in the source instances, which are used for copying this information.
- **EMPTY:** The Attribute is present but without a Value (zero length).

In this General DICOM Conformance Statement only the Basic Directory IOD is specified as its applicable to all clinical applications on Advanced visualization Workspace V15.1.3. The following lists the DICOM Conformance Statements for each clinical application Annex available on Advanced visualization Workspace V15.1.3. Each DICOM Conformance Statement contains the specifications of the created IODs:

- DICOM Conformance Statement - CT Applications on Advanced Visualization Workspace V15.1.3 – 2399301
- DICOM Conformance Statement - MR Applications on Advanced Visualization Workspace V15.1.3– 2399302
- DICOM Conformance Statement - Multi Modality Applications on Advanced Visualization Workspace V15.1.3 – 2399303
- DICOM Conformance Statement - NM Applications on Advanced Visualization Workspace V15.1.3– 2399304

A.1 Basic Directory IOD

Table below defines the structure of the Basic Directory IOD.

Table A-1: Basic Directory IOD

Attribute Name	Tag	Source	Presence of Attribute	Presence of Value	Value	Conditions	Comments
File Set Identification Module							
File-set ID	(0004,1130)	GENERATED	ALWAYS	EMPTY			-
Specific Character Set of File-set Descriptor File	(0004,1142)	GENERATED	CONDITIONAL	ALWAYS			-
File Meta Information	(0002,0000)	GENERATED	ALWAYS	ALWAYS			-

Group Length							
File Meta Information Version	(0002,0001)	GENERATED	ALWAYS	ALWAYS			-
Media Storage SOP Class UID	(0002,0002)	GENERATED	ALWAYS	ALWAYS	1.2.840.10008.1.3.10		-
Media Storage SOP Instance UID	(0002,0003)	GENERATED	ALWAYS	ALWAYS			-
Transfer Syntax UID	(0002,0010)	GENERATED	ALWAYS	ALWAYS			-
Implementation Class UID	(0002,0012)	FIXED	ALWAYS	ALWAYS	1.3.46.670589.50.1.15.0		-
Implementation Version Name	(0002,0013)	FIXED	ALWAYS	ALWAYS	AVW_15.0		-
Source Application Entity Title	(0002,0016)	GENERATED	ALWAYS	ALWAYS			-
Directory Information Module							
Offset of the First Directory Record of the Root Directory Entity	(0004,1200)	GENERATED	ALWAYS	ALWAYS			-
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	GENERATED	ALWAYS	ALWAYS			-
File-set Consistency Flag	(0004,1212)	GENERATED	ALWAYS	ALWAYS			-
Directory Record Sequence	(0004,1220)	GENERATED	ALWAYS	ALWAYS			-
>Offset of the Next Directory Record	(0004,1400)	GENERATED	ALWAYS	ALWAYS			-
>Record In-use Flag	(0004,1410)	GENERATED	ALWAYS	ALWAYS			-
>Offset of Referenced Lower-Level Directory Entity	(0004,1420)	GENERATED	ALWAYS	ALWAYS			-

>Directory Record Type	(0004,1430)	GENERATED	ALWAYS	ALWAYS			-
>Referenced File ID	(0004,1500)	GENERATED	ALWAYS	ALWAYS			-
>Referenced Sop Class UID In File	(0004,1510)	GENERATED	ALWAYS	ALWAYS			-
>Ref SOP Instance UID In File	(0004,1511)	GENERATED	ALWAYS	ALWAYS			-
>Referenced Transfer Syntax UID in File	(0004,1512)	GENERATED	ALWAYS	ALWAYS			-
Patient Keys							
Offset Of The Next Directory Record	(0004,1400)	GENERATED	ALWAYS	ALWAYS			-
Record In Use Flag	(0004,1410)	GENERATED	ALWAYS	ALWAYS			-
Offset of Referenced Lower-Level Directory Entity	(0004,1420)	GENERATED	ALWAYS	ALWAYS			-
Directory Record Type	(0004,1430)	FIXED	ALWAYS	ALWAYS	PATIENT		-
Specific Character Set	(0008,0005)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Patient's Name	(0010,0010)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Patient ID	(0010,0020)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Patient's Birth Date	(0010,0030)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Patient's Birth Time	(0010,0032)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Patient's Sex	(0010,0040)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Patient's Size	(0010,1020)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Patient's Weight	(0010,1030)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Retrieve AE Title	(0008,0054)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Study Keys							
Offset Of The Next Directory Record	(0004,1400)	GENERATED	ALWAYS	ALWAYS			-
Record In Use Flag	(0004,1410)	GENERATED	ALWAYS	ALWAYS			-

Offset of Referenced Lower-Level Directory Entity	(0004,1420)	GENERATED	ALWAYS	ALWAYS			-
Directory Record Type	(0004,1430)	FIXED	ALWAYS	ALWAYS	STUDY		-
Specific Character Set	(0008,0005)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Study Date	(0008,0020)	SRC_INSTANCE	SRC_COPY	SRC_COPY			Date on which this Study was created.
Study Time	(0008,0030)	SRC_INSTANCE	SRC_COPY	SRC_COPY			Time on which this Study was created.
Accession Number	(0008,0050)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Retrieve AE Title	(0008,0054)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Modalities in Study	(0008,0061)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Institution Name	(0008,0080)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Referring Physician's Name	(0008,0090)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Study Description	(0008,1030)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Name of Physician(s) Reading Study	(0008,1060)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Operator's Name	(0008,1070)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Study Instance UID	(0020,000D)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Study ID	(0020,0010)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Number Of Study Related Series	(0020,1206)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Number Of Study Related Instances	(0020,1208)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Performed Procedure Step Description	(0040,0254)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Series Keys							

Offset Of The Next Directory Record	(0004,1400)	GENERATED	ALWAYS	ALWAYS			-
Record In Use Flag	(0004,1410)	GENERATED	ALWAYS	ALWAYS			-
Offset of Referenced Lower-Level Directory Entity	(0004,1420)	GENERATED	ALWAYS	ALWAYS			-
Directory Record Type	(0004,1430)	FIXED	ALWAYS	ALWAYS	SERIES		-
Specific Character Set	(0008,0005)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Series Date	(0008,0021)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Content Date	(0008,0023)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Series Time	(0008,0031)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Content Time	(0008,0033)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Modality	(0008,0060)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Manufacturer	(0008,0070)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Station Name	(0008,1010)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Series Description	(0008,103E)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Body Part Examined	(0018,0015)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Software Version(s)	(0018,1020)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Protocol Name	(0018,1030)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Series Instance UID	(0020,000E)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Series Number	(0020,0011)	SRC_INSTANCE	SRC_COPY	SRC_COPY			1 (if empty)
Number of Series Related Instances	(0020,1209)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Number of Frames	(0028,0008)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Performed Procedure Step Start Date	(0040,0244)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Performed Procedure Step Start Time	(0040,0245)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-

Image Keys							
Offset Of The Next Directory Record	(0004,1400)	GENERATED	ALWAYS	ALWAYS			-
Record In Use Flag	(0004,1410)	GENERATED	ALWAYS	ALWAYS			-
Offset of Referenced Lower-Level Directory Entity	(0004,1420)	GENERATED	ALWAYS	ALWAYS			-
Directory Record Type	(0004,1430)	FIXED	ALWAYS	ALWAYS	IMAGE		-
Referenced File ID	(0004,1500)	GENERATED	ALWAYS	ALWAYS			-
Referenced Sop Class UID In File	(0004,1510)	GENERATED	ALWAYS	ALWAYS			-
Ref Sop Instance UID In File	(0004,1511)	GENERATED	ALWAYS	ALWAYS			-
Referenced Transfer Syntax UID in File	(0004,1512)	GENERATED	ALWAYS	ALWAYS			-
Specific Character Set	(0008,0005)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Image Type	(0008,0008)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Contrast/Bolus Agent	(0018,0010)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
SOP Class UID	(0008,0016)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
SOP Instance UID	(0008,0018)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Acquisition Date	(0008,0022)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Content Date	(0008,0023)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Acquisition Time	(0008,0032)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Content Time	(0008,0033)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Slice Thickness	(0018,0050)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
KVP	(0018,0060)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Table Height	(0018,1130)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Instance Number	(0020,0013)	SRC_INSTANCE	SRC_COPY	SRC_COPY			1 (if empty)
Image Position (Patient)	(0020,0032)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-

Slice Location	(0020,1041)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Image Comments	(0020,4000)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Image Orientation (Patient)	(0020,0037)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Frame of Reference UID	(0020,0052)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Samples per Pixel	(0028,0002)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Photometric Interpretation	(0028,0004)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Planar Configuration	(0028,0006)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Number of Frames	(0028,0008)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Rows	(0028,0010)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Columns	(0028,0011)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Pixel Spacing	(0028,0030)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Bits Allocated	(0028,0100)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Bits Stored	(0028,0101)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
High Bit	(0028,0102)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Pixel Representation	(0028,0103)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Window Center	(0028,1050)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Window Width	(0028,1051)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Burned In Annotation	(0028,0301)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Rescale Intercept	(0028,1052)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Rescale Slope	(0028,1053)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-
Rescale Type	(0028,1054)	SRC_INSTANCE	SRC_COPY	SRC_COPY			-

B Structured Report Content Encoding - N/A

Not implemented.

C Security Details

This section provides additional details about security features that are formally described in Section 8.

C.1 External Network Requirement Details

C.1.1 Basic Time Synchronization

The Basic Time Synchronization profile as NTP Client is supported. Advanced Visualization Workspace V15.1.3 conforms to the IHE CT Profile as Time Client actor. It is possible to synchronize time client with the NTP Timeserver using serviceability. The NTP Timeserver is an element of Hospital Infrastructure.

C.1.2 Basic Network Address Management – N/A

Not Implemented.

C.1.3 Application Configuration Management - N/A

Not Implemented.

C.1.4 DNS Service Discovery – N/A

Not Implemented.

C.2 DICOM Security Profile Details

C.2.1 Online Electronic Storage Secure Use - N/A

Not implemented.

C.2.2 Audit Trail Messages

Table C-2 specifies the DICOM Audit Messages that Advanced Visualization Workspace can detect and report. It defines the list of triggers that will cause the Audit Message to be generated and if these triggers can be configured or not. It also specifies whether the content of the Audit Message can be configured or not.

Table C-2: DICOM Specific Audit Messages

Audit Message	Used	Supported Triggers	Configurable Triggers	Configurable Message	Comments
Application Activity	Yes		No	No	Actor-start-stop
Audit Log Used	Yes		No	No	
Begin Transferring DICOM Instances	Yes		No	No	Begin-storing-instances
Data Export	Yes		No	No	
Data Import	Yes		No	No	
DICOM Instance Accessed	Yse		No	No	Study-Object-Event / Study-used
DICOM Instance Transferred	Yes		No	No	Instances-Stored
DICOM Study Deleted	Yes		No	No	Instances-deleted
Network Entry	No	No	No	No	Not implemented
Query	Yes		No	No	Query Information

Audit Message	Used	Supported Triggers	Configurable Triggers	Configurable Message	Comments
Security Alert	Yes		No	No	Node-Authentication-failure
User Authentication	Yes		No	No	
Order Record	No	No	No	No	Not implemented
Patient Record	No	No	No	No	Not implemented
Procedure Record	No	No	No	No	Not implemented

C.2.3 Audit Trial Message Transmission Profile - SYSLOG - TLS

See Section 6.6 Audit Trail Syslog Configuration for information about Syslog-TLS parameters.

C.2.4 Audit Trial Message Transmission Profile - SYSLOG - UDP

See Section 6.6 Audit Trail Syslog Configuration for information about Syslog-UDP parameters.

C.2.5 Secure Transport Connection Details – N/A

Not implemented.

C.2.6 Attribute Confidentiality Details

Table C-6 provides the list of Attributes and the action when de-identifying instances. Supported Action Codes are defined in PS 3.15 Section E.1.

- D: replace with a non-zero length Value that may be a dummy Value and consistent with the VR
- Z: replace with a zero-length Value, or a non-zero length Value that may be a dummy Value and consistent with the VR
- X: remove
- K: keep (unchanged for non-sequence Attributes)
- C: clean, that is replace with Values of similar meaning known not to contain identifying information and consistent with the VR
- U: replace with a non-zero length UID that is internally consistent within a set of Instances
- Z/D: Z unless D is required to maintain IOD conformance (Type 2 versus Type 1)
- X/Z: X unless Z is required to maintain IOD conformance (Type 3 versus Type 2)
- X/D: X unless D is required to maintain IOD conformance (Type 3 versus Type 1)
- X/Z/D: X unless Z or D is required to maintain IOD conformance (Type 3 versus Type 2 versus Type 1)
- X/Z/U*: X unless Z or replacement of contained instance UIDs (U) is required to maintain IOD conformance (Type 3 versus Type 2 versus Type 1 sequences containing UID references)

Table C-6: De-identified Elements and Actions

Attribute Name	Tag	Action	Encrypted	Comments
Basic Profile Option				
Instance Creation Date	(0008,0012)	K	N	
Instance Creation Time	(0008,0013)	K	N	
Instance Creator UID	(0008,0014)	K	N	
SOP Instance UID	(0008,0018)	U	N	
Study Date	(0008,0020)	K	N	
Series Date	(0008,0021)	K	N	
Acquisition Date	(0008,0022)	K	N	
Content Date	(0008,0023)	K	N	
Acquisition Datetime	(0008,002A)	K	N	
Study Time	(0008,0030)	K	N	
Series Time	(0008,0031)	K	N	
Acquisition Time	(0008,0032)	K	N	
Content Time	(0008,0033)	K	N	
Accession Number	(0008,0050)	Z	N	
Institution Name	(0008,0080)	Z	N	
Institution Address	(0008,0081)	Z	N	
Institution Code Sequence	(0008,0082)	K	N	
Referring Physician's Name	(0008,0090)	Z	N	
Referring Physician's Address	(0008,0092)	Z	N	
Referring Physician's Telephone Numbers	(0008,0094)	Z	N	
Referring Physician Identification Sequence	(0008,0096)	K	N	
Station Name	(0008,1010)	Z	N	
Study Description	(0008,1030)	K	N	
Series Description	(0008,103e)	K	N	
Institutional Department Name	(0008,1040)	Z	N	
Physician(s) Of Record	(0008,1048)	Z	N	
Physician(s) Of Record Identification Sequence	(0008,1049)	K	N	
Performing Physician's Name	(0008,1050)	Z	N	
Performing Physician Identification Sequence	(0008,1052)	K	N	
Name Of Physician(s) Reading Study	(0008,1060)	Z	N	

Attribute Name	Tag	Action	Encrypted	Comments
Physician(s) Reading Study Identification Sequence	(0008,1062)	K	N	
Operators' Name	(0008,1070)	Z	N	
Operator Identification Sequence	(0008,1072)	K	N	
>Person Identification Code Sequence	(0040,1101)	K	N	
Admitting Diagnoses Description	(0008,1080)	Z	N	
Referenced Study Sequence	(0008,1110)	K	N	
Referenced Patient Sequence	(0008,1120)	Z	N	
>Referenced SOP Instance UID	(0008,1155)	K	N	
Derivation Description	(0008,2111)	Z	N	
Identifying Comments	(0008,4000)	K	N	
Patient's Name	(0010,0010)	Z	N	
Patient ID	(0010,0020)	Z	N	
Issuer Of Patient ID	(0010,0021)	Z	N	
Patient's Birth Date	(0010,0030)	Z	N	
Patient's Birth Time	(0010,0032)	Z	N	
Patient's Sex	(0010,0040)	K	N	
Patient's Insurance Plan Code Sequence	(0010,0050)	Z	N	
Patient's Primary Language Code Sequence	(0010,0101)	K	N	
Other Patient IDs	(0010,1000)	Z	N	
Other Patient Names	(0010,1001)	Z	N	
Other Patient IDs Sequence	(0010,1002)	K	N	
Patient's Birth Name	(0010,1005)	Z	N	
Patient's Age	(0010,1010)	K	N	
Patient's Size	(0010,1020)	Z	N	
Patient's Weight	(0010,1030)	Z	N	
Patient's Address	(0010,1040)	Z	N	
Patient's Mother's Birth Name	(0010,1060)	Z	N	
Military Rank	(0010,1080)	Z	N	
Branch Of Service	(0010,1081)	Z	N	
Medical Record Locator	(0010,1090)	Z	N	
Medical Alerts	(0010,2000)	Z	N	

Attribute Name	Tag	Action	Encrypted	Comments
Allergies	(0010,2110)	Z	N	
Country Of Residence	(0010,2150)	Z	N	
Region Of Residence	(0010,2152)	Z	N	
Patient's Telephone Numbers	(0010,2154)	Z	N	
Ethnic Group	(0010,2160)	Z	N	
Occupation	(0010,2180)	Z	N	
Smoking Status	(0010,21A0)	Z	N	
Additional Patient History	(0010,21b0)	Z	N	
Pregnancy Status	(0010,21C0)	Z	N	
Last Menstrual Date	(0010,21D0)	Z	N	
Patient's Religious Preference	(0010,21F0)	Z	N	
Responsible Person	(0010,2297)	K	N	
Responsible Organization	(0010,2299)	K	N	
Patient Comments	(0010,4000)	Z	N	
Clinical Trial Sponsor Name	(0012,0010)	K	N	
Clinical Trial Protocol ID	(0012,0020)	K	N	
Clinical Trial Protocol Name	(0012,0021)	K	N	
Clinical Trial Site ID	(0012,0030)	K	N	
Clinical Trial Site Name	(0012,0031)	K	N	
Clinical Trial Subject ID	(0012,0040)	K	N	
Clinical Trial Subject Reading ID	(0012,0042)	K	N	
Clinical Trial Time Point ID	(0012,0050)	K	N	
Clinical Trial Time Point Description	(0012,0051)	K	N	
Clinical Trial Coordinating Center Name	(0012,0060)	K	N	
Clinical Trial Series ID	(0012,0071)	K	N	
Clinical Trial Series Description	(0012,0072)	K	N	
Contrast/Bolus Agent	(0018,0010)	K	N	
Contrast/Bolus Start Time	(0018,1040)	K	N	
Device Serial Number	(0018,1000)	K	N	
Date Of Secondary Capture	(0018,1012)	K	N	
Protocol Name	(0018,1030)	K	N	

Attribute Name	Tag	Action	Encrypted	Comments
Radiopharmaceutical Start DateTime	(0018,1078)	K	N	
Radiopharmaceutical Stop DateTime	(0018,1079)	K	N	
Date Of Last Calibration	(0018,1200)	K	N	
Acquisition Comments	(0018,4000)	K	N	
Date Of Last Detector Calibration	(0018,700C)	K	N	
Frame Acquisition DateTime	(0018,9074)	K	N	
Frame Reference DateTime	(0018,9151)	K	N	
Start Acquisition DateTime	(0018,9516)	K	N	
End Acquisition DateTime	(0018,9517)	K	N	
Contribution DateTime	(0018,A002)	K	N	
Study Instance UID	(0020,000D)	U	N	
Series Instance UID	(0020,000E)	U	N	
Study ID	(0020,0010)	K	N	
Frame Of Reference UID	(0020,0052)	K	N	
Synchronization Frame Of Reference UID	(0020,0200)	K	N	
Modified Image Date	(0020,3403)	K	N	
Image Comments	(0020,4000)	K	N	
Frame Comments	(0020,9158)	K	N	
Image Presentation Comments	(0028,4000)	K	N	
Study Verified Date	(0032,0032)	K	N	
Study Read Date	(0032,0034)	K	N	
Scheduled Study Start Date	(0032,1000)	K	N	
Scheduled Study Stop Date	(0032,1010)	K	N	
Requesting Physician	(0032,1032)	Z	N	
Requesting Service	(0032,1033)	K	N	
Study Arrival Date	(0032,1040)	K	N	
Study Completion Date	(0032,1050)	K	N	
Requested Procedure Description	(0032,1060)	K	N	
Study Comments	(0032,4000)	K	N	
Referenced Patient Alias Sequence	(0038,0004)	K	N	
Admission ID	(0038,0010)	Z	N	

Attribute Name	Tag	Action	Encrypted	Comments
Issuer Of Admission ID	(0038,0011)	K	N	
Issuer Of Admission ID Sequence	(0038,0014)	K	N	
Scheduled Admission Date	(0038,001A)	K	N	
Scheduled Admission Time	(0038,001B)	K	N	
Scheduled Discharge Date	(0038,001C)	K	N	
Scheduled Discharge Time	(0038,001D)	K	N	
Scheduled Patient Institution Residence	(0038,001E)	K	N	
Admitting Date	(0038,0020)	K	N	
Admitting Time	(0038,0021)	K	N	
Discharge Date	(0038,0030)	K	N	
Discharge Time	(0038,0032)	K	N	
Discharge Diagnosis Description	(0038,0040)	K	N	
Special Needs	(0038,0050)	Z	N	
Service Episode ID	(0038,0060)	K	N	
Service Episode Description	(0038,0062)	K	N	
Current Patient Location	(0038,0300)	Z	N	
Patient's Institution Residence	(0038,0400)	K	N	
Patient State	(0038,0500)	Z	N	
Visit Comments	(0038,4000)	K	N	
Scheduled Procedure Step Start Date	(0040,0002)	K	N	
Scheduled Procedure Step End Date	(0040,0004)	K	N	
Scheduled Performing Physician's Name	(0040,0006)	K	N	
Scheduled Procedure Step Description	(0040,0007)	K	N	
Scheduled Performing Physician Identification Sequence	(0040,000B)	K	N	
Scheduled Station Name	(0040,0010)	K	N	
Performed Station AE Title	(0040,0241)	K	N	
Performed Station Name	(0040,0242)	K	N	
Performed Location	(0040,0243)	K	N	
Performed Procedure Step Start Date	(0040,0244)	K	N	
Performed Procedure Step Start Time	(0040,0245)	K	N	
Performed Procedure Step End Date	(0040,0250)	K	N	

Attribute Name	Tag	Action	Encrypted	Comments
Performed Procedure Step End Time	(0040,0251)	K	N	
Performed Procedure Step ID	(0040,0253)	K	N	
Performed Procedure Step Description	(0040,0254)	K	N	
Request Attributes Sequence	(0040,0275)	Z	N	
Comments On The Performed Procedure Step	(0040,0280)	K	N	
Comments On Radiation Dose	(0040,0310)	K	N	
Requested Procedure ID	(0040,1001)	K	N	
Names Of Intended Recipients Of Results	(0040,1010)	Z	N	
Intended Recipients Of Results Identification Sequence	(0040,1011)	K	N	
Person Identification Code Sequence	(0040,1101)	K	N	
Person's Address	(0040,1102)	K	N	
Person's Telephone Numbers	(0040,1103)	K	N	
Requested Procedure Comments	(0040,1400)	K	N	
Issue Date Of Imaging Service Request	(0040,2004)	K	N	
Order Entered By	(0040,2008)	K	N	
Order Enterer's Location	(0040,2009)	K	N	
Order Callback Phone Number	(0040,2010)	K	N	
Imaging Service Request Comments	(0040,2400)	K	N	
Scheduled Procedure Step Start DateTime	(0040,4005)	K	N	
Scheduled Procedure Step Modification DateTime	(0040,4010)	K	N	
Expected Completion DateTime	(0040,4011)	K	N	
Human Performer's Name	(0040,4037)	K	N	
Verification DateTime	(0040,A030)	K	N	
Observation DateTime	(0040,A032)	K	N	
Verifying Observer Name	(0040,A075)	K	N	
Participation DateTime	(0040,A082)	K	N	
DateTime	(0040,A120)	K	N	
Date	(0040,A121)	K	N	
Person Name	(0040,A123)	K	N	
UID	(0040,A124)	K	N	
Referenced DateTime	(0040,A13A)	K	N	

Attribute Name	Tag	Action	Encrypted	Comments
Content Sequence	(0040,a730)	Z	N	
Template Version	(0040,DB06)	K	N	
Template Local Version	(0040,DB07)	K	N	
HL7 Document Effective Time	(0040,E004)	K	N	
Approval Status DateTime	(0044,0004)	K	N	
Product Expiration Datetime	(0044,000B)	K	N	
Substance Administration DateTime	(0044,0010)	K	N	
Presentation Creation Date	(0070,0082)	K	N	
Hanging Protocol Creation DateTime	(0072,000A)	K	N	
Selector PN Value	(0072,006A)	K	N	
Storage Media File-set UID	(0088,0140)	Z	N	
SOP Authorization DateTime	(0100,0420)	K	N	
Digital Signature DateTime	(0400,0105)	K	N	
Attribute Modification DateTime	(0400,0562)	K	N	
Structure Set Date	(3006,0008)	K	N	
Referenced Frame Of Reference UID	(3006,0024)	K	N	
ROI Interpreter	(3006,00A6)	K	N	
Related Frame Of Reference UID	(3006,00C2)	K	N	
Treatment Control Point Date	(3008,0024)	K	N	
First Treatment Date	(3008,0054)	K	N	
Most Recent Treatment Date	(3008,0056)	K	N	
Safe Position Exit Date	(3008,0162)	K	N	
Safe Position Return Date	(3008,0166)	K	N	
Treatment Date	(3008,0250)	K	N	
RT Plan Date	(300A,0006)	K	N	
Source Strength Reference Date	(300A,022C)	K	N	
Review Date	(300E,0004)	K	N	
Reviewer Name	(300E,0008)	K	N	
Interpretation Recorded Date	(4008,0100)	K	N	
Interpretation Recorder	(4008,0102)	K	N	
Interpretation Transcription Date	(4008,0108)	K	N	

Attribute Name	Tag	Action	Encrypted	Comments
Interpretation Transcriber	(4008,010A)	K	N	
Interpretation Author	(4008,010C)	K	N	
Interpretation Approval Date	(4008,0112)	K	N	
Physician Approving Interpretation	(4008,0114)	K	N	
Distribution Name	(4008,0119)	K	N	
Results Comments	(4008,4000)	K	N	
Overlay Comments	(60xx,4000)	K	N	

Note: Private DICOM attributes are defined freely by the creator of a DICOM object and may contain individually identifiable personal data. Private DICOM Attributes are neither modified nor deleted during the de-identification process on Advanced Visualization Workspace V15.1.3.

C.2.7 Digital Signature Details – N/A

Not implemented.

C.2.8 Additional DICOM Security Profile Details – N/A

Not implemented.

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