



# **DICOM Conformance Statement**

Date 09.03.2021  
Build 2791





## Conformance Statement Overview

### Transfer/Display

SOP Class UID	SOP Class Name	Method
1.2.840.10008.5.1.4.1.1.1	Computed Radiography Image Storage	SCP
1.2.840.10008.5.1.4.1.1.1.1	Digital X-Ray Image Storage For Presentation	SCP
1.2.840.10008.5.1.4.1.1.1.2	Digital Mammography X-Ray Image Storage For Presentation	SCP
1.2.840.10008.5.1.4.1.1.1.3	Digital Intraoral X-Ray Image Storage For Presentation	SCP
1.2.840.10008.5.1.4.1.1.104.1	Encapsulated PDF Storage	SCP
1.2.840.10008.5.1.4.1.1.11.1	Grayscale Softcopy Presentation State Storage	SCP
1.2.840.10008.5.1.4.1.1.11.4	Blending Softcopy Presentation State Storage	SCP
1.2.840.10008.5.1.4.1.1.12.1	X-Ray Angiographic Image Storage	SCP
1.2.840.10008.5.1.4.1.1.12.2	X-Ray Radiofluoroscopic Image Storage	SCP
1.2.840.10008.5.1.4.1.1.128	Positron Emission Tomography Image Storage	SCP
1.2.840.10008.5.1.4.1.1.13.1.3	Breast Tomosynthesis Image Storage	SCP
1.2.840.10008.5.1.4.1.1.131	Basic Structured Display Storage	SCP
1.2.840.10008.5.1.4.1.1.14.1	Intravascular Optical Coherence Tomography Image Storage For Presentation	SCP
1.2.840.10008.5.1.4.1.1.2	CT Image Storage	SCP
1.2.840.10008.5.1.4.1.1.2.1	Enhanced CT Image Storage	SCP
1.2.840.10008.5.1.4.1.1.20	Nuclear Medicine Image Storage	SCP
1.2.840.10008.5.1.4.1.1.3	Ultrasound Multiframe Image Storage Retired	SCP
1.2.840.10008.5.1.4.1.1.3.1	Ultrasound Multiframe Image Storage	SCP
1.2.840.10008.5.1.4.1.1.4	MR Image Storage	SCP
1.2.840.10008.5.1.4.1.1.4.1	Enhanced MR Image Storage	SCP
1.2.840.10008.5.1.4.1.1.481.2	RT Dose Storage	SCP
1.2.840.10008.5.1.4.1.1.481.3	RT Structure Set Storage	SCP
1.2.840.10008.5.1.4.1.1.481.5	RT Plan Storage	SCP
1.2.840.10008.5.1.4.1.1.6	Ultrasound Image Storage Retired	SCP
1.2.840.10008.5.1.4.1.1.6.1	Ultrasound Image Storage	SCP
1.2.840.10008.5.1.4.1.1.6.2	Enhanced US Volume Storage	SCP
1.2.840.10008.5.1.4.1.1.66.1	Spatial Registration Storage	SCP
1.2.840.10008.5.1.4.1.1.66.4	Segmentation Storage	SCP
1.2.840.10008.5.1.4.1.1.7	Secondary Capture Image Storage	SCP
1.2.840.10008.5.1.4.1.1.7.4	Multiframe True Color Secondary Capture Image Storage	SCP
1.2.840.10008.5.1.4.1.1.77.1.1	VL Endoscopic Image Storage	SCP
1.2.840.10008.5.1.4.1.1.77.1.4	VL Photographic Image Storage	SCP
1.2.840.10008.5.1.4.1.1.77.1.5.1	Ophthalmic Photography 8 Bit Image Storage	SCP
1.2.840.10008.5.1.4.1.1.88.11	Basic Text SR Storage	SCP
1.2.840.10008.5.1.4.1.1.88.22	Enhanced SR Storage	SCP
1.2.840.10008.5.1.4.1.1.88.33	Comprehensive SR Storage	SCP
1.2.840.10008.5.1.4.1.1.88.35	Extensible SR Storage	SCP
1.2.840.10008.5.1.4.1.1.88.50	Mammography CADSR Storage	SCP
1.2.840.10008.5.1.4.1.1.88.59	Key Object Selection Document Storage	SCP
1.2.840.10008.5.1.4.1.1.88.65	Chest CADSR Storage	SCP
1.2.840.10008.5.1.4.1.1.88.67	X-Ray Radiation Dose SR Storage	SCP
1.2.840.10008.5.1.4.1.1.88.68	Radiopharmaceutical Radiation Dose SR Storage	SCP



1.2.840.10008.5.1.4.1.1.9.1.1	12-lead ECG Waveform Storage	SCP
1.2.840.10008.5.1.4.1.1.9.1.2	General ECG Waveform Storage	SCP
1.2.840.10008.5.1.4.1.1.9.3.1	Cardiac Electrophysiology Waveform Storage	SCP

## Query/Retrieve

SOP Class UID	SOP Class Name	Method
1.2.840.10008.5.1.4.1.2.2.1	Study Root Query/Retrieve Information Model – FIND	SCU
1.2.840.10008.5.1.4.1.2.2.2	Study Root Query/Retrieve Information Model – MOVE	SCU
1.2.840.10008.5.1.4.1.2.2.3	Study Root Query/Retrieve Information Model – GET	SCU

## Transfer Syntaxes Supported

Transfer Syntax UID	Transfer Syntax Name
1.2.840.10008.1.2	Implicit VR Little Endian
1.2.840.10008.1.2.1	Explicit VR Little Endian
1.2.840.10008.1.2.4.50	JPEG Baseline 1
1.2.840.10008.1.2.4.51	JPEG Extended 24
1.2.840.10008.1.2.4.57	JPEG Lossless Non Hierarchical 14
1.2.840.10008.1.2.4.70	JPEG Lossless
1.2.840.10008.1.2.4.80	JPEGLS Lossless
1.2.840.10008.1.2.4.90	JPEG 2000 Lossless Only
1.2.840.10008.1.2.4.91	JPEG 2000

## WADO Services Supported

Network Service	Method
WADO - URI - Retrieve Imaging Document	SCU



# Content

Introduction.....	2
Audience.....	2
Remarks.....	2
Terms and Definitions.....	3
Abbreviations.....	4
References.....	7
Networking.....	8
Implementation Model.....	9
Application Data Flow.....	9
Functional Definition of AE's.....	10
Sequencing of Real-World Activities.....	10
AE Specifications.....	10
FIND-SCU.....	11
SOP Classes.....	11
Association Policies.....	11
Association Initiation Policy.....	11
STORAGE-SCP.....	14
SOP Classes.....	14
Association Policies.....	16
Association Initiation Policy.....	16
GET-SCU.....	18
SOP Classes.....	18
Association Policies.....	18
Association Initiation Policy.....	18
SOP Specific Conformance to C-FIND SOP Classes.....	19
MOVE-SCU.....	20
SOP Classes.....	20
Association Policies.....	20
Association Initiation Policy.....	20
SOP Specific Conformance to C-FIND SOP Classes.....	20
WADO-URI Specification.....	21
WADO-URI Retrieve Imaging Document.....	21
Media Interchange.....	22
Implementation Model.....	22
Application Data Flow.....	22
Functional Definitions of AE's.....	22
Sequencing of Real-World Activities.....	22
AE Specifications.....	23
MEDIA-FSR.....	23
File Meta Information for the Application Entity.....	23
Real World Activities.....	23
Support of Character Set.....	24
Overview.....	24
Character Sets.....	24
Security.....	25



# Introduction

The introduction specifies product and relevant disclaimers as well as any general information.

## Audience

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

## Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between VISUAPPS Viewer and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. DICOM by itself does not guarantee interoperability. The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality. This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

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

VISUAPPS Viewer has participated in an industry-wide testing program sponsored by Integrating



the Healthcare Enterprise (IHE). The IHE Integration Statement for VISUAPPS Viewer, together with the IHE Technical Framework, may facilitate the process of validation testing.

## Terms and Definitions

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

**Abstract Syntax** – the information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples : Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.

**Application Entity (AE)** – an end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

**Application Entity Title (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 object definition; a data element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

**Information Object Definition (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. The Attributes may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: MR Image IOD, CT Image IOD, Print Job IOD.

**Joint Photographic Experts Group (JPEG)** – a set of standardized image compression techniques, available for use by DICOM applications.

**Media Application Profile** – the specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs)

**Module** – a set of Attributes within an Information Object Definition that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

**Negotiation** – 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. Presentation Context – the set of DICOM network services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.

**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 (SOP) Class** – the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

**Service/Object Pair (SOP) Instance** – an information object; a specific occurrence of information exchanged in a SOP Class. Examples: a specific x-ray image.

**Session** – is a self-contained working set within the Viewer's application. Usually a Session is assigned to a human user. However a user may use multiple sessions concurrently (e.g., as a worklist entity). A session contains a set of loaded data and provides a display access for multiple views (e.g., web browser windows). Sessions can not communicate with each other.

**Steering application** – is an overarching application (e.g. HIS, RIS, Patient-Portal) for which VISUAPPS Viewer enables image display. Usually the steering application drives the live-cycle and the data loading of the viewer. The specification of the interfacing between steering application and VISUAPPS Viewer is beyond the scope of this document.

**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) [PixelData], (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.

**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.

**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.

## Abbreviations





---

AE

Application Entity



AET	Application Entity Title
CAD	Computer Aided Detection
CDA	Clinical Document Architecture
CD-R	Compact Disk Recordable
CSE	Customer Service Engineer
CR	Computed Radiography
CT	Computed Tomography
DHCP	Dynamic Host Configuration Protocol
DICOM	Digital Imaging and Communications in Medicine
DIT	Directory Information Tree (LDAP)
DN	Distinguished Name (LDAP)
DNS	Domain Name System
DX	Digital X-ray
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
GSDF	Grayscale Standard Display Function
GSPS	Grayscale Softcopy Presentation State
HIS	Hospital Information System
HL7	Health Level 7 Standard
IHE	Integrating the Healthcare Enterprise
IOD	Information Object Definition
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Organization for Standards
IO	Intra-oral X-ray
JPEG	Joint Photographic Experts Group
LDAP	Lightweight Directory Access Protocol
LDIF	LDAP Data Interchange Format
LUT	Look-up Table
MAR	Medication Administration Record
MPEG	Moving Picture Experts Group
MG	Mammography (X-ray)
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance Imaging
MSPS	Modality Scheduled Procedure Step
MTU	Maximum Transmission Unit (IP)
MWL	Modality Worklist
NM	Nuclear Medicine
NTP	Network Time Protocol
O	Optional (Key Attribute)
OP	Ophthalmic Photography
OSI	Open Systems Interconnection
PACS	Picture Archiving and Communication System
PET	Positron Emission Tomography
PDU	Protocol Data Unit
R	Required (Key Attribute)
RDN	Relative Distinguished Name (LDAP)
RF	Radiofluoroscopy
RIS	Radiology Information System.
RT	Radiotherapy
SC	Secondary Capture



---

SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
SPS	Scheduled Procedure Step
SR	Structured Reporting
TCP/IP	Transmission Control Protocol/Internet Protocol
U	Unique (Key Attribute)
UL	Upper Layer
US	Ultrasound
VL	Visible Light
VR	Value Representation
WADO	Web Access to DICOM Persistent Objects
XA	X-ray Angiography

## References

- NEMA PS3 Digital Imaging and Communications in Medicine (DICOM) Standard, available free at <http://medical.nema.org/>

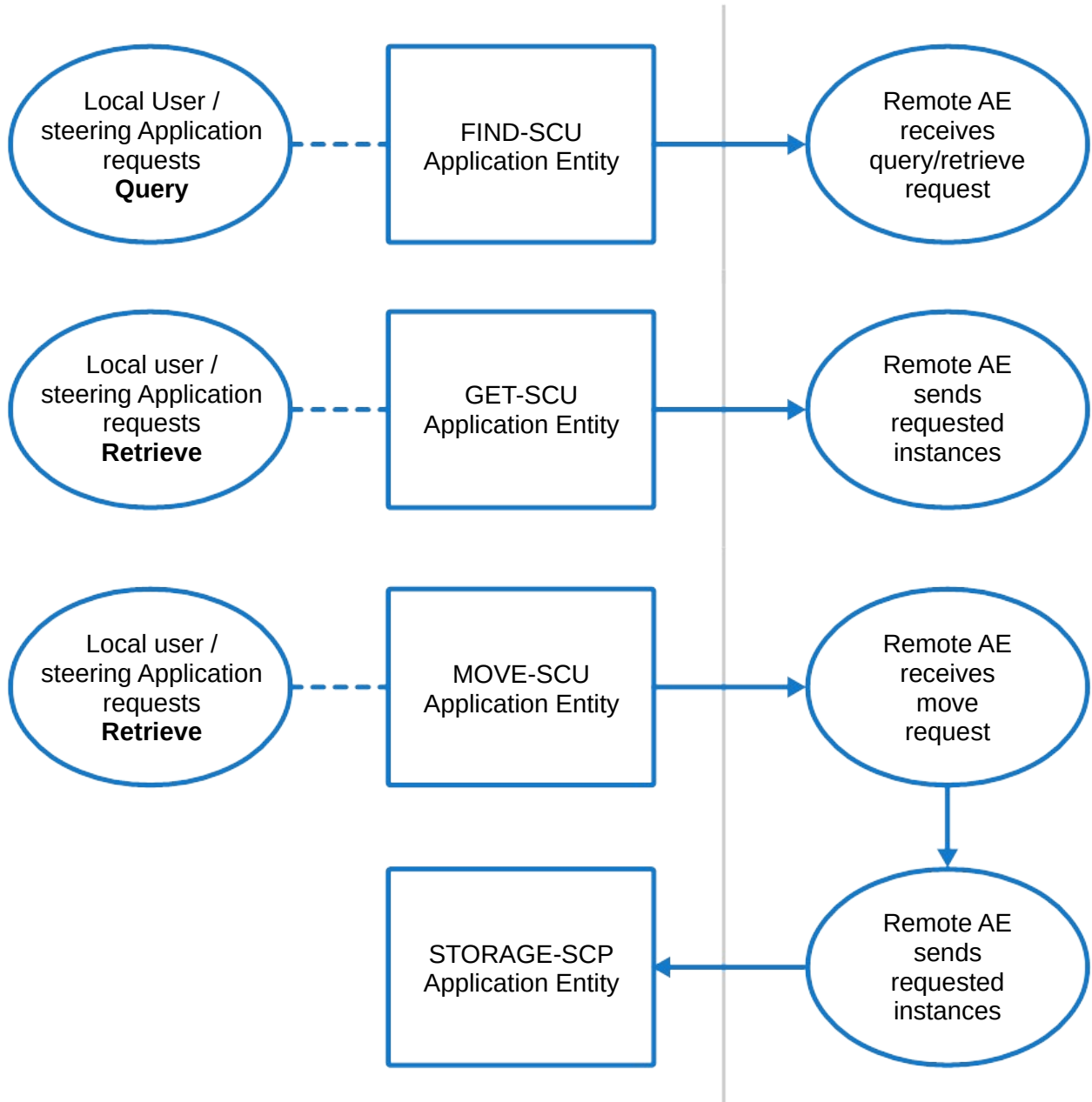


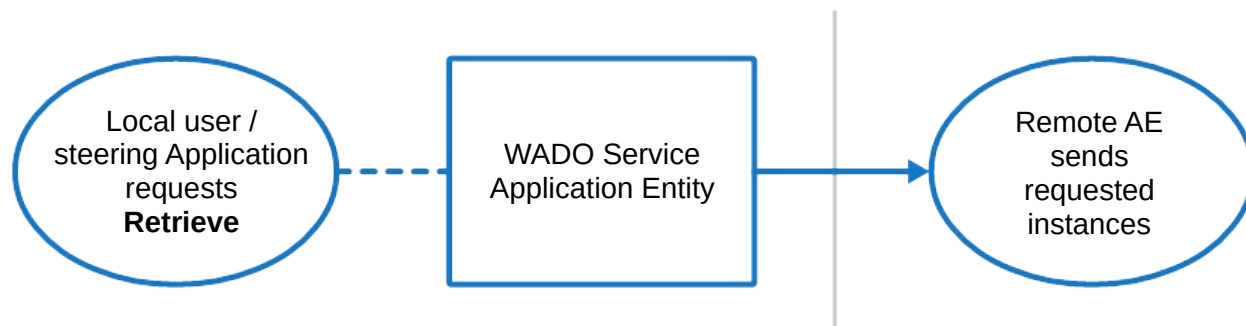
# Networking



# Implementation Model

## Application Data Flow





## Functional Definition of AE's

### FIND-SCU

FIND-SCU is either activated by the steering application, or through the user interface when a user selects a remote AE to query (from a preconfigured list), then initiates a query. Queries are performed recursively from the study through the series and instance levels until all matching instances have been listed.

### GET-SCU

GET-SCU is either activated by the steering application, or through the user interface when a user selects a study, series or instance for retrieval. A connection to the remote AE is established to immediately retrieve the requested instances.

### MOVE-SCU

MOVE-SCU is either activated by the steering application, or through the user interface when a user selects a study, series or instance for retrieval. A connection to the remote AE is established to initiate and monitor the retrieval and the STORAGE-SCP AE receives the retrieved instances.

### STORAGE-SCP

STORAGE-SCP waits in the background for connections, will accept associations with Presentation Contexts for SOP Classes of the Storage Service Class, and will assign the received instances to the initiating viewing session. No data will be stored locally. Note: The STORAGE SCP will only be available after the first MOVE initiation.

### WADO Service

WADO is either activated by the steering application, or through the user interface when a user selects a study, series or instance for retrieval. A sequence of http requests is issued to the remote AE. The requested instances are expected to be retrieved in the http GET response body.

## Sequencing of Real-World Activities

All SCP activities are performed asynchronously in the background and not dependent on any sequencing.

All SCU activities are per Session sequentially initiated by the steering application, or through the user interface, and another activity may not be initiated until the prior activity has completed.

## AE Specifications



## FIND-SCU

### SOP Classes

FIND-SCU provide Standard Conformance to the following SOP Class

SOP Class UID	SOP Class Name	Method
1.2.840.10008.5.1.4.1.2.2.1	Study Root Query/Retrieve Information Model – FIND	SCU

Table 1 FIND-SCU SOP Classes

### Association Policies

FIND-SCU initiates but never accepts associations.

Maximum PDU size received	16KB
Maximum number of simultaneous associations	1
Implementation Class UID	1.2.40.0.13.1.1
Implementation Version Name	dcm4che-2.0

Table 2 FIND-SCU Association Policies

### Association Initiation Policy

#### Description and Sequencing of Activities

A single attempt will be made to query the remote AE. If the query fails, for whatever reason, no retry will be performed.

#### Proposed Presentation Contexts

VISUAPPS Viewer will initiate any of the Presentation Contexts listed in Table Table 3 for c-find.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
See Table 1	See Table 1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Table 3: Proposed Presentation Contexts for FIND-SCU

#### Extended Negotiation

No extended negotiation is performed. In particular, relational queries are not supported.

#### SOP Specific Conformance to C-FIND SOP Classes

All queries are initiated at the highest level of the information model (the STUDY level), and then for each response received, recursively repeated at the next lower levels (the SERIES and then IMAGE levels), in order to completely elucidate the "tree" of instances available on the remote AE (from which the user may subsequently request a retrieval at any level).



Name	Tag	Method
Study Date	(0008,0020)	S,*,U,R
Study Time	(0008,0030)	S,*,U,R
Accession Number	(0008,0050)	S,*,U
Patient's Name	(0010,0010)	S,*,U
Patient's ID	(0010,0020)	S,*,U
Study ID	(0020,0010)	S,*,U
Study Instance UID	(0020,000D)	UNIQUE
Modalities In Study	(0008,0061)	S,*,U
SOP Classes In Study	(0008,0062)	U
Number Of Study Related Instances	(0020,1208)	U
Referring Physician Name	(0008,0090)	S,*,U
Study Description	(0008,1030)	S,*,U
Procedure Code Sequence	(0008,1032)	U
Referenced Study Sequence	(0008,1110)	U
Referenced Patient Sequence	(0008,1120)	U
Issuer Of Patient ID	(0010,0021)	S,*,U
Patient Birth Date	(0010,0030)	S,*,U,R
Patient Birth Time	(0010,0032)	S,*,U,R
Patient Sex	(0010,0040)	S,*,U

Table 4: **Study-level request identifiers for study-root query**

Name	Tag	Method
Modality	(0008,0060)	S,*,U
Series Description	(0008,103E)	S,*,U
Series Instance UID	(0020,000E)	UNIQUE
Series Number	(0020,0011)	S,*,U
Number Of Series Related Instances	(0020,1209)	U
Performed Procedure Step Start Date	(0040,0244)	U
Performed Procedure Step Start Time	(0040,0245)	U
Series Date	(0008,0021)	S,*,U,R
Request Attributes Sequence	(0040,0275)	U
Referenced Request Sequence	(0040,A370)	U

Table 5: **Series-level request identifiers for study-root query**





Name	Tag	Method
Study Instance UID	(0020,000D)	UNIQUE
Series Instance UID	(0020,000E)	UNIQUE
SOP Instance UID	(0008,0018)	S,*,U
SOP Class UID	(0008,0016)	S,*,U
Instance Availability	(0008,0056)	S,*,U
Instance Number	(0020,0013)	S,*,U
Rows	(0028,0010)	U
Columns	(0028,0011)	U
Bits Allocated	(0028,0100)	U
Number Of Frames	(0028,0008)	U
Content Date	(0008,0023)	S,*,U,R
Content Time	(0008,0033)	S,*,U,R
Referenced Request Sequence	(0040,A370)	U
Content Template Sequence	(0040,A504)	U
Concept NameCode Sequence	(0040,A043)	U

Table 6: Instance-level request identifiers for study-root query

The types of matching supported by the C-FIND SCU. An "S" indicates the identifier attribute uses *Single-value matching*, an "R" indicates *Range matching*, an "\*" indicates *Wildcard matching*, a "U" indicates *Universal matching*, and an "L" indicates that *UID lists* are sent. "UNIQUE" indicates that this is the unique key for that query level, in which case Universal matching or Single-value matching is used depending on the query level.

#### Transfer Syntax Selection Policies

VISUAPPS Viewer will choose first encountered supported Transfer Syntax. If no Transfer Syntax is supported the request will fail.



## **STORAGE-SCP**

### **SOP Classes**

STORAGE-SCP provide Standard Conformance to the following SOP Classes



SOP Class UID	SOP Class Name	Method
1.2.840.10008.5.1.4.1.1.1	Computed Radiography Image Storage	SCU
1.2.840.10008.5.1.4.1.1.1.1	Digital X-Ray Image Storage For Presentation	SCU
1.2.840.10008.5.1.4.1.1.1.2	Digital Mammography X-Ray Image Storage For Presentation	SCU
1.2.840.10008.5.1.4.1.1.1.3	Digital Intraoral X-Ray Image Storage For Presentation	SCU
1.2.840.10008.5.1.4.1.1.104.1	Encapsulated PDF Storage	SCU
1.2.840.10008.5.1.4.1.1.11.1	Grayscale Softcopy Presentation State Storage	SCU
1.2.840.10008.5.1.4.1.1.11.4	Blending Softcopy Presentation State Storage	SCU
1.2.840.10008.5.1.4.1.1.12.1	X-Ray Angiographic Image Storage	SCU
1.2.840.10008.5.1.4.1.1.12.2	X-Ray Radiofluoroscopic Image Storage	SCU
1.2.840.10008.5.1.4.1.1.128	Positron Emission Tomography Image Storage	SCU
1.2.840.10008.5.1.4.1.1.13.1.3	Breast Tomosynthesis Image Storage	SCU
1.2.840.10008.5.1.4.1.1.131	Basic Structured Display Storage	SCU
1.2.840.10008.5.1.4.1.1.14.1	Intravascular Optical Coherence Tomography Image Storage For Presentation	SCU
1.2.840.10008.5.1.4.1.1.2	CT Image Storage	SCU
1.2.840.10008.5.1.4.1.1.2.1	Enhanced CT Image Storage	SCU
1.2.840.10008.5.1.4.1.1.20	Nuclear Medicine Image Storage	SCU
1.2.840.10008.5.1.4.1.1.3	Ultrasound Multiframe Image Storage Retired	SCU
1.2.840.10008.5.1.4.1.1.3.1	Ultrasound Multiframe Image Storage	SCU
1.2.840.10008.5.1.4.1.1.4	MR Image Storage	SCU
1.2.840.10008.5.1.4.1.1.4.1	Enhanced MR Image Storage	SCU
1.2.840.10008.5.1.4.1.1.481.2	RT Dose Storage	SCU
1.2.840.10008.5.1.4.1.1.481.3	RT Structure Set Storage	SCU
1.2.840.10008.5.1.4.1.1.481.5	RT Plan Storage	SCU
1.2.840.10008.5.1.4.1.1.6	Ultrasound Image Storage Retired	SCU
1.2.840.10008.5.1.4.1.1.6.1	Ultrasound Image Storage	SCU
1.2.840.10008.5.1.4.1.1.6.2	Enhanced US Volume Storage	SCU
1.2.840.10008.5.1.4.1.1.66.1	Spatial Registration Storage	SCU
1.2.840.10008.5.1.4.1.1.66.4	Segmentation Storage	SCU
1.2.840.10008.5.1.4.1.1.7	Secondary Capture Image Storage	SCU
1.2.840.10008.5.1.4.1.1.7.4	Multiframe True Color Secondary Capture Image Storage	SCU
1.2.840.10008.5.1.4.1.1.77.1.1	VL Endoscopic Image Storage	SCU
1.2.840.10008.5.1.4.1.1.77.1.4	VL Photographic Image Storage	SCU
1.2.840.10008.5.1.4.1.1.77.1.5.1	Ophthalmic Photography 8 Bit Image Storage	SCU
1.2.840.10008.5.1.4.1.1.88.11	Basic Text SR Storage	SCU
1.2.840.10008.5.1.4.1.1.88.22	Enhanced SR Storage	SCU
1.2.840.10008.5.1.4.1.1.88.33	Comprehensive SR Storage	SCU
1.2.840.10008.5.1.4.1.1.88.35	Extensible SR Storage	SCU
1.2.840.10008.5.1.4.1.1.88.50	Mammography CADSR Storage	SCU
1.2.840.10008.5.1.4.1.1.88.59	Key Object Selection Document Storage	SCU
1.2.840.10008.5.1.4.1.1.88.65	Chest CADSR Storage	SCU
1.2.840.10008.5.1.4.1.1.88.67	X-Ray Radiation Dose SR Storage	SCU
1.2.840.10008.5.1.4.1.1.88.68	Radiopharmaceutical Radiation Dose SR Storage	SCU
1.2.840.10008.5.1.4.1.1.9.1.1	12-lead ECG Waveform Storage	SCU
1.2.840.10008.5.1.4.1.1.9.1.2	General ECG Waveform Storage	SCU

Table 7: **STORAGE-SCP SOP Classes**

## Association Policies

STORAGE-SCP accepts but never initiates associations.

Maximum PDU size received	16KB
Maximum number of simultaneous associations	configurable
Implementation Class UID	1.2.40.0.13.1.1
Implementation Version Name	dcm4che-2.0

Table 8: **STORAGE-SCP Association Policies**

## Association Initiation Policy

### Description and Sequencing of Activities

As Instances are retrieved they are kept in memory and assigned to the session which initiated the storage request.

### Acceptable Presentation Contexts

VISUAPPS Viewer will accept any of the Presentation Contexts listed in Table Table 9 for c-store.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
See Table 7	See Table 7	1.2.840.10008.1.2	Implicit VR Little Endian	SCU	None
		1.2.840.10008.1.2.1	Explicit VR Little Endian	SCU	None
		1.2.840.10008.1.2.4.50	JPEG Baseline 1	SCU	None
		1.2.840.10008.1.2.4.51	JPEG Extended 24	SCU	None
		1.2.840.10008.1.2.4.57	JPEG Lossless Non Hierarchical 14	SCU	None
		1.2.840.10008.1.2.4.70	JPEG Lossless	SCU	None
		1.2.840.10008.1.2.4.80	JPEGLS Lossless	SCU	None
		1.2.840.10008.1.2.4.90	JPEG 2000 Lossless Only	SCU	None
		1.2.840.10008.1.2.4.91	JPEG 2000	SCU	None

Table 9: **Acceptable Presentation Contexts for STORAGE-SCP**

### Extended Negotiation

No extended negotiation is performed. In particular, relational queries are not supported.

### SOP Specific Conformance to C-FIND SOP Classes

When displaying an image in the viewing application, the newest Grayscale Softcopy Presentation State containing references to the image will be automatically applied and the GSPS Presentation Label and Presentation description will be displayed. The user has the option to select any other Presentation States that also references the image. If no Presentation State references the image then no Presentation State will be applied by default.

### Transfer Syntax Selection Policies



---

VISUAPPS Viewer will choose first encountered supported Transfer Syntax. If no Transfer Syntax is supported the request will fail.



## GET-SCU

### SOP Classes

GET-SCU provide Standard Conformance to the following SOP Class

SOP Class UID	SOP Class Name	Method
1.2.840.10008.5.1.4.1.2.2.3	Study Root Query/Retrieve Information Model – GET	SCU

Table 10: GET-SCU SOP Classes

### Association Policies

GET-SCU initiates but never accepts associations.

Maximum PDU size received	16KB
Maximum number of simultaneous associations	1
Implementation Class UID	1.2.40.0.13.1.1
Implementation Version Name	dcm4che-2.0

Table 11: GET-SCU Association Policies

### Association Initiation Policy

#### Description and Sequencing of Activities

If the requested SOP classes are not yet available from a previous query request or provided by the steering application, a study-level c-find request with the identifier "SOP Classes in Study" (0008,0062) is performed. If the field is not filled by the remote AE, the SOP classes are collected drilling down series and instance level.

- 1) The c-get association will be negotiated based on the available SOP Classes.
- 2) The data will be retrieved in the same association.
- 3) The c-get association will be closed.

#### Proposed Presentation Contexts

VISUAPPS Viewer will initiate any of the Presentation Contexts listed in Table Table 12 for c-get.



Presentation Context Table						
Abstract Syntax		Transfer Syntax			Role	Ext. Neg.
Name	UID	Name	UID			
See Table 10	See Table 10	1.2.840.10008.1.2	Implicit VR Little Endian	SCU	None	
See Table 7	See Table 7	1.2.840.10008.1.2	Implicit VR Little Endian	SCU	None	
		1.2.840.10008.1.2.1	Explicit VR Little Endian	SCU	None	
		1.2.840.10008.1.2.4.50	JPEG Baseline 1	SCU	None	
		1.2.840.10008.1.2.4.51	JPEG Extended 24	SCU	None	
		1.2.840.10008.1.2.4.57	JPEG Lossless Non Hierarchical 14	SCU	None	
		1.2.840.10008.1.2.4.70	JPEG Lossless	SCU	None	
		1.2.840.10008.1.2.4.80	JPEGLS Lossless	SCU	None	
		1.2.840.10008.1.2.4.90	JPEG 2000 Lossless Only	SCU	None	
		1.2.840.10008.1.2.4.91	JPEG 2000	SCU	None	

Table 12: **Proposed Presentation Contexts for GET-SCU**

### Extended Negotiation

No extended negotiation is performed. In particular, relational queries are not supported.

### SOP Specific Conformance to C-FIND SOP Classes

Only a single information model, Study Root, is supported. A retrieval will be performed at the STUDY, SERIES or IMAGE level depending on what level of entity has been selected by the steering application or the user in the browser.

### Transfer Syntax Selection Policies

VISUAPPS Viewer will choose first encountered supported Transfer Syntax. If no Transfer Syntax is supported the request will fail.



## MOVE-SCU

### SOP Classes

MOVE-SCU provide Standard Conformance to the following SOP Class

SOP Class UID	SOP Class Name	Method
1.2.840.10008.5.1.4.1.2.2.2	Study Root Query/Retrieve Information Model – MOVE	SCU

Table 13: MOVE-SCU SOP Classes

### Association Policies

MOVE-SCU initiates but never accepts associations.

Maximum PDU size received	16KB
Maximum number of simultaneous associations	1
Implementation Class UID	1.2.40.0.13.1.1
Implementation Version Name	dcm4che-2.0

Table 14: MOVE-SCU Association Policies

### Association Initiation Policy

#### Description and Sequencing of Activities

If the requested SOP classes are not yet available from a previous query request or provided by the steering application, a study-level c-find request with the identifier "SOP Classes in Study" (0008,0062) is performed. If the field is not filled by the remote AE, the SOP classes are collected drilling down series and instance level.

- 1) The c-move association will be negotiated based on the available SOP Classes.
- 2) While the move operation is in progress the status is observed.
- 3) The c-move association will be closed.

#### Proposed Presentation Contexts

VISUAPPS Viewer will initiate any of the Presentation Contexts listed in Table Table 15 for c-move.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
See Table Table 13	See Table Table 13	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Table 15: Proposed Presentation Contexts for MOVE-SCU

#### Extended Negotiation

No extended negotiation is performed. In particular, relational queries are not supported.

#### SOP Specific Conformance to C-FIND SOP Classes

Only a single information model, Study Root, is supported. A retrieval will be performed at the STUDY, SERIES or IMAGE level depending on what level of entity has been selected by the steering application or the user in the browser.

#### Transfer Syntax Selection Policies

VISUAPPS Viewer will choose first encountered supported Transfer Syntax. If no Transfer Syntax is supported the request will fail.





## WADO-URI Specification

The VISUAPPS Viewer sends WADO-URI requests to a remote WADO Server. The required information (i.e.: study-, series-, instance-uid) is either provided by the steering application or a DICOM query.

The system composes a WADO-URI request message on initiating a retrieve action. The action can be performed only on Image level for which WADO-URI request messages are sent to the WADO server.

## WADO-URI Retrieve Imaging Document

Parameter	Restrictions	
Transfer Syntaxes Supported	1.2.840.10008.1.2	Implicit VR Little Endian
	1.2.840.10008.1.2.1	Explicit VR Little Endian
	1.2.840.10008.1.2.4.50	JPEG Baseline 1
	1.2.840.10008.1.2.4.51	JPEG Extended 24
	1.2.840.10008.1.2.4.57	JPEG Lossless Non Hierarchical 14
	1.2.840.10008.1.2.4.70	JPEG Lossless
	1.2.840.10008.1.2.4.80	JPEGLS Lossless
	1.2.840.10008.1.2.4.90	JPEG 2000 Lossless Only
	1.2.840.10008.1.2.4.91	JPEG 2000
SOP Class restrictions	-	
Size restriction	-	
Anonymization	-	



# Media Interchange

## Implementation Model

### Application Data Flow

The application is a javascript-based client-server application that provides a user interface, network support and media support as a File Set Reader.

Conceptually it may be modeled as the following single AE:

— MEDIA-FSR, which loads a user-selected PS 3.10 compliant file, which may be a DICOMDIR or an image or spectroscopy object, either from the local file system or from PS 3.12 compliant media according to one of the General Purpose Media Application Profiles of PS 3.11 (CD-R or DVD-RAM)

In effect, the application is media-neutral, since the user is required to browse and locate the DICOMDIR file. Furthermore, any DICOM image or spectroscopy object encoded in one of the standard uncompressed Transfer Syntaxes may be loaded, even in the absence of a PS 3.10 compliant meta-information header, in which case a "best guess" at the Transfer Syntax will be made. Compressed Transfer Syntaxes are not supported, which limits the Media Application Profiles supported.

### Functional Definitions of AE's

#### MEDIA-FSR

MEDIA-FSR is activated through the user interface to select directories, images and spectra for display.

### Sequencing of Real-World Activities

All FSR activities are per Session sequentially initiated by the steering application, or through the user interface, and another activity may not be initiated until the prior activity has completed.



# AE Specifications

## MEDIA-FSR

MEDIA-FSR provides standard conformance to the Media Storage Service Class.

Application Profiles Supported	Real World Activity	Role
STD-GEN-CD	Load directory or file	FSR
STD-GEN-DVD-RAM	Load directory or file	FSR

Table 16: **Application Profiles, Activities, and roles for MEDIA-FSR**

## File Meta Information for the Application Entity

Not applicable, since MEDIA-FSR is not an FSC or FSU.

## Real World Activities

### Activity – Load Directory or File

MEDIA-FSR is activated through the user interface when a user selects the File load operation. If the loaded file is a DICOMDIR, a browser will be displayed, from which instances may be selected and in turn loaded for display.



# Support of Character Set

## Overview

Support extends to correctly decoding and displaying the correct symbol for all names and strings found in the DICOMDIR, in storage instances from media and received over the network. No specific support for sorting of strings other than in the default character set is provided in the browsers.

The character set support is limited by the browser's character set display capabilities.

## Character Sets

In addition to the default character repertoire, the Defined Terms for Specific Character Set in Table 17 are supported:

Character Set Description	Defined Term ISO_IR 100
Latin alphabet No. 1	ISO_IR 100
Latin alphabet No. 2	ISO_IR 101
Latin alphabet No. 3	ISO_IR 109
Latin alphabet No. 4	ISO_IR 110
Cyrillic	ISO_IR 144
Arabic	ISO_IR 127
Greek	ISO_IR 126
Hebrew	ISO_IR 138
Japanese	ISO 2022 IR 13
Japanese	ISO 2022 IR 87
Korean	ISO 2022 IR 149

Table 17: Supported specific character set defined terms



# Security

VISUAPPS Viewer does not support any specific security measures. It is assumed that VISUAPPS Viewer is used within a secured environment. It is assumed that a secured environment includes at a minimum:

- a. Firewall or router protections to ensure that only approved external hosts have network access to the application.
- b. Firewall or router protections to ensure that the application only has network access to approved external hosts and services.
- c. Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a VPN)

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.