



DICOM Conformance Statement

Medweb RIS/PACS

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Medweb

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Medweb Image Server DICOM Conformance Statement
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Revision History:

2.1 July 1, 1998 Document created and substantially revised from 1995 version.

2.2 Feb 27, 2007 New SOP Classes and transfer syntaxes added to the document.

Table of Contents

| | | |
|-------|---|----|
| 1 | Implementation Model..... | 5 |
| 1.1 | Application Data Flow Diagram..... | 5 |
| 1.2 | Functional Definitions of AE's | 6 |
| 1.3 | Sequencing of Real-World Activities..... | 6 |
| 2 | AE Specification..... | 6 |
| 2.1 | Supported SOP Classes | 6 |
| 2.1.1 | Association Establishment Policies..... | 8 |
| 2.1.2 | Association Initiation by Real-World Activity | 9 |
| 2.1.3 | Association Acceptance Policy | 11 |
| 3 | Communication Profiles | 19 |
| 3.1 | TCP/IP Stack..... | 19 |
| 3.1.1 | Physical Media Support | 19 |
| 4 | Extensions/Specializations/Privatization..... | 19 |
| 4.1 | Standard Extended/Specialized/Private SOPs | 19 |
| 4.1.1 | Mitra's Report Information SOP Class | 19 |
| 4.1.2 | Proposed Presentation Contexts – Mitra's Report Information..... | 19 |
| 4.1.3 | SOP Specific Conformance for Mitra's Report Information SOP Class | 20 |
| 5 | Configuration..... | 20 |
| 6 | Support of Extended Character Sets | 20 |

List of Tables

| | |
|---|----|
| Table 1. Conformance as an SCU and SCP | 7 |
| Table 2. Conformance as an SCP only..... | 8 |
| Table 3. Conformance to private SOP classes | 8 |
| Table 4. Presentation context for the verification SOP class..... | 9 |
| Table 5. Proposed presentation contexts for storage SOP classes presentation context..... | 11 |
| Table 6. Proposed presentation context transfer syntaxes..... | 11 |
| Table 7. Acceptable presentation contexts for verification service class..... | 12 |
| Table 8. Presentation contexts for storage service classes..... | 13 |
| Table 9. Transfer syntax for storage SOP contexts | 14 |
| Table 10. Acceptable presentation contexts for query/retrieve service classes | 15 |
| Table 11. Transfer syntaxes offered by query/retrieve classes | 15 |
| Table 12. Supported query attributes..... | 16 |
| Table 13. Acceptable presentation contexts for results management service classes | 17 |
| Table 14. Transfer syntaxes for results management SOP classes..... | 17 |
| Table 15. Detached results management supported commands and attributes | 17 |
| Table 16. Detached interpretation management supported commands and attributes..... | 18 |
| Table 17. Presentation contexts for Mitra's report information SOP class | 19 |
| Table 18. Transfer syntax for the report information SOP class | 20 |

This DICOM Conformance Statements details the supported DICOM functionality of the Medweb Image Web Server. The Web Server is a networked web server that collects DICOM images and reports, and makes them available for use by viewing applications. The Web Server supports other interfaces in addition to DICOM. These other interfaces may be referenced in this document, but only the DICOM interface capabilities will be thoroughly specified.

The Web Server receives pushed studies as they are generated, or is capable of limited query retrieval from other systems, receiving both DICOM and HL7 messages. The web server self maintains, and typically clears older studies based on their review date.

Users view the integrated studies using either a stand alone client application or by a plug-in, installed in a compatible web browser on a standard high-end PC. The client offers many tools and functions for analyzing and viewing these studies. Selected images can be e-mailed to other computers that have the plug-in installed or saved in several standard file image formats such as JPEG and BMP. There is an option to include a copy of the plug-in with the images that are emailed.

1 Implementation Model

The Web Server receives and stores images and their associated reports from imaging devices, PACS systems and HIS/RIS systems and makes them available to DICOM and Web enabled viewing stations. The following list shows the specific functionality available on the Web Server:

- Receive DICOM images and store them for retrieval by viewing workstations.
- Retrieve radiology reports for a given set of exams and store them for retrieval.
- Transmit images and reports to viewing workstations.

1.1 Application Data Flow Diagram

Figure 1-1 depicts the application data flow for the Web Server. In this diagram, the Web Server entity is seen as the hub for collecting images and reports, and then making them available to viewers, or perhaps other data users.

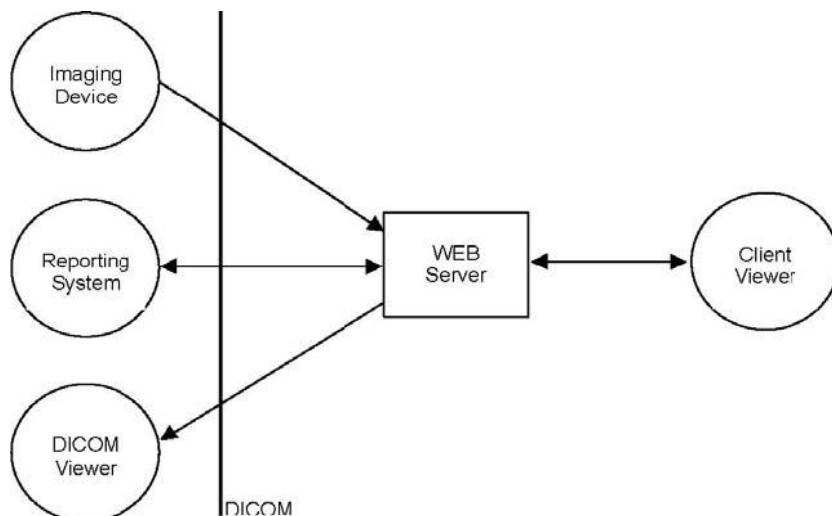


Figure 1. Implementation Model

Image acquisition devices, or any device capable of transmitting DICOM images, send the image information to the Web Server. Image reports can arrive in a similar, asynchronous nature from any device with access to them. If the Web Server entity detects that it needs the reports for a particular exam, it will attempt to retrieve the reports from the information system, or any other device configured to possess them.

Remote viewing stations can retrieve the images and their associated reports (if they exist) from the Web Server entity. Web-enabled viewers get the information through a non-DICOM interface. DICOM-enabled workstations can receive the images when the Web server entity is instructed to send them to the workstation.

1.2 Functional Definitions of AE's

The Web Server is the only defined DICOM application entity (AE). This AE primarily operates as a provider of numerous image storage SOP classes, the query/retrieve SOP class and the results management SOP class. Other DICOM SOP classes are available to facilitate the primary classes and service/maintenance functions.

1.3 Sequencing of Real-World Activities

Images stored by the Web Server become available immediately after they are initially processed, regardless of the availability of report information. In some cases, there will be no reports available. When the Web server receives a set of images that it knows contains one or more reports, the Web Server will retrieve those reports. Once a report arrives at, and is processed by, the Web Server, it become available to user applications.

Image objects are temporarily stored on the Web Server. The two ways to remove an image object from the Web Server are:

- manually, through requests entered at the Server console, and
- automatically, in which the Server will remove the oldest objects to make room for new ones.

A user can *hold* an image set on the Web Server by explicitly making the request at the viewing station or the Server console.

2 AE Specification

2.1 Supported SOP Classes

The Web Server AE provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU and an SCP:

| SOP Class UID | SOP Class Name |
|-------------------------------|------------------------------------|
| 1.2.840.10008.1.1 | Verification |
| 1.2.840.10008.5.1.4.1.1.1 | Computed Radiography Image Storage |
| 1.2.840.10008.5.1.4.1.1.1.1 | Dig XRay Image - Presentation |
| 1.2.840.10008.5.1.4.1.1.1.1.1 | Dig XRay Image - Processing |
| 1.2.840.10008.5.1.4.1.1.1.2 | Dig Mammo Image - Presentation |
| 1.2.840.10008.5.1.4.1.1.1.2.1 | Dig Mammo Image - Processing |

| | |
|--------------------------------|--|
| 1.2.840.10008.5.1.4.1.1.1.3 | Dig Intra-Oral Image - Presentation |
| 1.2.840.10008.5.1.4.1.1.1.3.1 | Dig Intra-Oral Image - Processing |
| 1.2.840.10008.5.1.4.1.1.2 | CT Image Storage |
| 1.2.840.10008.5.1.4.1.1.3 | Ultrasound Multi-frame Image Storage |
| 1.2.840.10008.5.1.4.1.1.4 | MR Image Storage |
| 1.2.840.10008.5.1.4.1.1.5 | NM Image Storage (1993-Ret) |
| 1.2.840.10008.5.1.4.1.1.6 | US Image Storage (1993-Ret) |
| 1.2.840.10008.5.1.4.1.1.6.1 | US Image Storage |
| 1.2.840.10008.5.1.4.1.1.7 | Secondary Capture Image Storage |
| 1.2.840.10008.5.1.4.1.1.12.1 | X-Ray Angiographic Image Storage |
| 1.2.840.10008.5.1.4.1.1.12.2 | X-Ray Radiofluoroscopic Image Storage |
| 1.2.840.10008.5.1.4.1.1.12.3 | XRAY Angio Bi-Plane (Retired) |
| 1.2.840.10008.5.1.4.1.1.20 | Nuclear Medicine Image Storage |
| 1.2.840.10008.5.1.4.1.1.77.1.1 | VL Endoscopic Image |
| 1.2.840.10008.5.1.4.1.1.77.1.2 | VL Microscopic Image |
| 1.2.840.10008.5.1.4.1.1.77.1.3 | VL Slide-Coordinates Microscopic |
| 1.2.840.10008.5.1.4.1.1.77.1.4 | VL Photographic Image |
| 1.2.840.10008.5.1.4.1.1.481.1 | RT Image Storage |
| 1.2.840.10008.5.1.4.1.1.128 | Positron Emission Tomography Image Storage |

Table 1. Conformance as an SCU and SCP

The Web Server AE provides Standard Conformance to the following private SOP Classes as an SCU:

| SOP Class UID | SOP Class Name |
|-------------------------------|--|
| 1.2.840.10008.5.1.4.1.1.8 | Standalone Overlay Storage |
| 1.2.840.10008.5.1.4.1.1.88.1 | Structured Report Text Storage |
| 1.2.840.10008.5.1.4.1.1.88.2 | Structured Report Audio Storage |
| 1.2.840.10008.5.1.4.1.1.88.3 | Comprehensive SR |
| 1.2.840.10008.5.1.4.1.1.88.4 | Structured Report Comprehensive Storage |
| 1.2.840.10008.5.1.4.1.1.88.50 | Mammography CAD SR |
| 1.2.840.10008.5.1.4.1.1.88.65 | Chest CAD SR |
| 1.2.840.10008.5.1.4.1.1.9 | Standalone Curve Storage |
| 1.2.840.10008.5.1.4.1.1.9.1 | Waveform Storage |
| 1.2.840.10008.5.1.4.1.1.9.1.1 | ECG Waveform Storage |
| 1.2.840.10008.5.1.4.1.1.9.1.2 | General ECG Waveform Storage |
| 1.2.840.10008.5.1.4.1.1.9.1.3 | Ambulatory ECG Waveform Storage |
| 1.2.840.10008.5.1.4.1.1.9.2.1 | Hemodynamic Waveform Storage |
| 1.2.840.10008.5.1.4.1.1.9.3.1 | Cardiac Electrophysiology Waveform Storage |
| 1.2.840.10008.5.1.4.1.1.9.4.1 | Basic Voice Audio Waveform Storage |
| 1.2.840.10008.5.1.4.1.1.10 | Standalone Modality LUT |
| 1.2.840.10008.5.1.4.1.1.11 | Standalone VOI LUT |
| 1.2.840.10008.5.1.4.1.1.11.1 | Greyscale Presentation State |
| 1.2.840.10008.5.1.4.1.1.129 | Standalone PET Curve Storage |
| 1.2.840.10008.5.1.4.1.1.481.2 | RT Dose Storage |
| 1.2.840.10008.5.1.4.1.1.481.3 | RT Structure Set Storage |

| | |
|-------------------------------|---|
| 1.2.840.10008.5.1.4.1.1.481.4 | RT Beams Treatment Rec |
| 1.2.840.10008.5.1.4.1.1.481.5 | RT Plan Storage |
| 1.2.840.10008.5.1.4.1.1.481.6 | RT Brachy Treatment Record |
| 1.2.840.10008.5.1.4.1.1.481.7 | RT Treatment Summary Record |
| 1.2.840.10008.5.1.4.1.2.1.1 | Patient Root Q/R Model - FIND |
| 1.2.840.10008.5.1.4.1.2.1.2 | Patient Root Q/R Model - MOVE |
| 1.2.840.10008.5.1.4.1.2.2.1 | Study Root Q/R Model - FIND |
| 1.2.840.10008.5.1.4.1.2.2.2 | Study Root Q/R Model - MOVE |
| 1.2.840.10008.5.1.4.1.2.3.1 | Patient/Study Q/R Model - FIND |
| 1.2.840.10008.5.1.4.1.2.3.2 | Patient/Study Q/R Model - MOVE |
| 1.2.840.10008.3.1.2.5.4 | Detached Results Management Meta SOP Class |
| 1.2.840.10008.3.1.2.5.1 | Detached Results Management SOP Class |
| 1.2.840.10008.3.1.2.6.1 | Detached Interpretation Management SOP Class |
| 1.2.840.10008.1.20.1 | Storage Commitment Push Model SOP Class |
| 1.2.840.10008.5.1.4.31 | Modality Worklist Information Model-FIND |
| 1.2.840.10008.5.1.4.32.1 | General Purpose Worklist Information Model - FIND |

Table 2. Conformance as an SCP only

The Web Server AE provides Standard Conformance to the following private SOP Classes as an SCU:

| SOP Class UID | SOP Class Name |
|------------------------|--------------------------------------|
| 1.2.840.113532.3500.8 | Mitra Report Information Model –FIND |
| 1.2.840.113888.6.1.1.1 | Medweb Analyze 75 Storage |

Table 3. Conformance to private SOP classes

2.1.1 Association Establishment Policies

2.1.1.1 General

The Web Server requests DICOM associations as needed and releases them when the operation is completed. The real-world action causing the Web Server to request an association is specific to each SOP class and explained in the following sections. By default, the Web Server uses a maximum PDU length of 16-Kbytes.

The Web Server uses a single AE Title for all associations. The default AE Title is **medweb**. The default value can be changed by setting the value in the configuration from an HTML management form or a management screen present on the Server console.

2.1.1.2 Number of Associations

The number of simultaneous associations which the Web Server may support is limited to the available system resources. There is also a maximum limit of 20 simultaneous connections imposed by the Web Server AE, although the configuration can further limit this number through restrictions placed on particular remote applications.

2.1.1.3 Asynchronous Nature

The Web Server does not negotiate asynchronous window operations and therefore supports only the default, single outstanding operation at any point in time.

2.1.1.4 Implementation Identifying Information

The Web Server AE is identified with the following implementation identifiers:

Implementation Class UID: **2.16.840.1.113888.0.2.0.7**

Implementation Version Name: **MEDWEB-4.5.47**

These values are defined in the Web Server configuration and cannot be changed by the user.

2.1.2 Association Initiation by Real-World Activity

There are three situations under which the Web Server will initiate a DICOM association. The first is when the Server needs to retrieve one or more exam reports related to a set of images. When images arrive at the Web Server, the software will check to see if the reports already exist. If not, the application will attempt to retrieve them from a configured report server. This operation occurs using a private SOP classes defined in section 4.

The second situation that causes the Web Server to initiate a DICOM association is when it needs to send image or report information to a DICOM AE. This condition occurs when the Server administrator, or some other user, requests from the Web Server console interface that information be transmitted to a selected destination.

The third reason for the Web Server to initiate a DICOM association is when it uses the DICOM Verification SOP class to test for presence of other AEs on the network.

2.1.2.1 Real-World Activity - Verification

2.1.2.1.1 Associated Real-World Activity - Verification

The Web Server uses DICOM's Verification SOP Class to test the availability of configured DICOM AE's. This SOP Class is used only in a service or maintenance mode.

2.1.2.1.2 Proposed Presentation Contexts - Verification

The table below contains the presentation contexts proposed by the Web Server when it requests an association for the Verification SOP Class.

| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
|-----------------|-------------------|---------------------------|-------------------|------|----------------------|
| Name | UID | Name List | UID List | | |
| Verification | 1.2.840.10008.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |

Table 4. Presentation context for the verification SOP class

2.1.2.1.3 SOP Specific Conformance for Verification SOP Class

The Web Server provides standard conformance to the Verification SOP Class.

2.1.2.2 Real-World Activity – Storage

2.1.2.2.1 Associated Real-World Activity - Storage

The Web Server uses DICOM's Storage SOP Classes to send image messages to remote AEs under next conditions:

- when manually instructed to do so via the Server console's user interface;

- when the auto-routing/forwarding rule is executed
- when a remote AE requests, through a DICOM C-MOVE request, that the Server transmit a set of images to a specified AE.

2.1.2.2.2 Proposed Presentation Contexts - Storage

The table below contains the proposed presentation contexts the Web Server uses when it requests an association for any of the Storage SOP Classes.

| Abstract Syntax | | Transfer Syntax | Role | Extended Negotiation |
|--|--------------------------------|-----------------|------|----------------------|
| Name | UID | | | |
| Computed Radiography Storage | 1.2.840.10008.5.1.4.1.1.1 | See Table 6 | SCU | None |
| Dig XRay Image – Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | See Table 6 | SCU | None |
| Dig XRay Image – Processing | 1.2.840.10008.5.1.4.1.1.1.1.1 | See Table 6 | SCU | None |
| Dig Mammo Image – Presentation | 1.2.840.10008.5.1.4.1.1.1.2 | See Table 6 | SCU | None |
| Dig Mammo Image – Processing | 1.2.840.10008.5.1.4.1.1.1.2.1 | See Table 6 | SCU | None |
| Dig Intra-Oral Image - Presentation | 1.2.840.10008.5.1.4.1.1.1.3 | See Table 6 | SCU | None |
| Dig Intra-Oral Image – Processing | 1.2.840.10008.5.1.4.1.1.1.3.1 | See Table 6 | SCU | None |
| Positron Emission Tomography Image Storage | 1.2.840.10008.5.1.4.1.1.128 | See Table 6 | SCU | None |
| Standalone PET Curve Storage | 1.2.840.10008.5.1.4.1.1.129 | See Table 6 | SCU | None |
| RT Image Storage | 1.2.840.10008.5.1.4.1.1.481.1 | See Table 6 | SCU | None |
| CT Image Storage | 1.2.840.10008.5.1.4.1.1.2 | See Table 6 | SCU | None |
| Ultrasound Multi-frame Image Storage | 1.2.840.10008.5.1.4.1.1.3 | See Table 6 | SCU | None |
| MR Image Storage | 1.2.840.10008.5.1.4.1.1.4 | See Table 6 | SCU | None |
| NM Image Storage (1993-Ret) | 1.2.840.10008.5.1.4.1.1.5 | See Table 6 | SCU | None |
| Ultrasound Image Storage (1993-Ret) | 1.2.840.10008.5.1.4.1.1.6 | See Table 6 | SCU | None |
| Ultrasound Image Storage | 1.2.840.10008.5.1.4.1.1.6.1 | See Table 6 | SCU | None |
| Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7 | See Table 6 | SCU | None |
| VL Endoscopic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.1 | See Table 6 | SCU | None |
| VL Microscopic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.2 | See Table 6 | SCU | None |
| VL Slide-Coordinates Microscopic Storage | 1.2.840.10008.5.1.4.1.1.77.1.3 | See Table 6 | SCU | None |

| | | | | |
|---------------------------------------|--------------------------------|-------------|-----|------|
| VL Photographic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.4 | See Table 6 | SCU | None |
| X-Ray Angiographic Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | See Table 6 | SCU | None |
| X-Ray Radiofluoroscopic Image Storage | 1.2.840.10008.5.1.4.1.1.12.2 | See Table 6 | SCU | None |
| Nuclear Medicine Image Storage | 1.2.840.10008.5.1.4.1.1.20 | See Table 6 | SCU | None |

Table 5. Proposed presentation contexts for storage SOP classes presentation context

The table below contains the transfer syntaxes offered by each of the Storage SOP class presentation contexts listed in Table 5.

| Transfer Syntax | |
|---|------------------------|
| Name List | UID List |
| JPEG 2000 Image Compression (Lossless Only) | 1.2.840.10008.1.2.4.90 |
| JPEG 2000 Image Compression | 1.2.840.10008.1.2.4.91 |
| Implicit VR Little Endian | 1.2.840.10008.1.2 |
| Explicit VR Little Endian | 1.2.840.10008.1.2.1 |
| Explicit VR Big Endian | 1.2.840.10008.1.2.2 |

Table 6. Proposed presentation context transfer syntaxes

2.1.2.2.3 SOP Specific Conformance for Storage SOP Classes

If multiple image messages are queued for transmission, the Web Server will attempt to establish a single DICOM association and transmit all of the messages over it, provided the appropriate presentation context was accepted by the SCP. A new association is requested if/when the study UID changes. Upon successful transmission of a Storage C-STORE message, the Web Server does nothing to the original copy of the image instance. Images on the Web Server remain on the Server until they become the oldest image object in the database, at which time the Web Server deletes it. Users (at both the viewing workstation and Server console) can mark an image instance as permanent in which case, the Web Server will not age the data.

If the Web Server fails to transmit the message to the remote AE, the object is removed from the queue and retried when a timer expires. The timeout period defaults to one minute. The Web Server will continue to retransmit the image object until it succeeds or the request is removed from the queue manually through the Server console.

The Web Server will ignore DICOM warning messages and treat them as successful C-STOREs. When the Web Server transmits an object that it received from some imaging or acquisition device, it does not alter the object information. Since the object transmitted from this AE is not created by it, the exact object definition is not known and therefore cannot be included in this Conformance Statement.

2.1.3 Association Acceptance Policy

The Web Server accepts associations for each of the SOP classes it supports as an SCP as defined in section 2. The Web Server runs daemon processes that are continuously available to accept additional DICOM associations, provided the maximum number of associations has not been reached.

2.1.3.1 Real-World Activity - Verification

2.1.3.1.1 Associated Real-World Activity - Verification

The Web Server will accept Verification association requests and respond to SCUs that wish to verify that this AE is available for all supported DICOM transactions.

2.1.3.1.2 Presentation Context Table – Verification

The table below contains the Verification SOP class presentation contexts that the Web Server will accept.

| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
|-----------------|-------------------|---------------------------|-------------------|------|----------------------|
| Name | UID | Name List | UID List | | |
| Verification | 1.2.840.10008.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCP | None |

Table 7. Acceptable presentation contexts for verification service class

2.1.3.1.3 SOP Specific Conformance for Verification SOP Class

The Web Server provides standard conformance to the Verification SOP Class and will return one of the following statuses:

| Status Value | Meaning |
|--------------|----------------------------------|
| 0000H | Operation completed successfully |

2.1.3.1.4 Presentation Context Acceptance Criterion - Verification

The Web Server will always accept a Verification SOP class presentation context as long as the requesting AE is granted the appropriate permissions through the Web Server's configuration parameters.

2.1.3.1.5 Transfer Syntax Selection Policies - Verification

Since there is no dataset defined in this SOP class, only the default transfer syntax applies. Therefore it is the only transfer syntax supported.

2.1.3.2 Real-World Activity - Storage

2.1.3.2.1 Associated Real-World Activity - Storage

The Web Server will accept Storage class association requests and receive image objects from SCUs that attempt to store image objects.

2.1.3.2.2 Presentation Context Table – Storage

The table below contains the storage presentation contexts that the Web Server will accept.

| Abstract Syntax | | Transfer Syntax | Role | Extended Negotiation |
|------------------------------|---------------------------|-----------------|------|----------------------|
| Name | UID | | | |
| Computed Radiography Storage | 1.2.840.10008.5.1.4.1.1.1 | See Table 9 | SCP | None |

| | | | | |
|--|--------------------------------|-------------|-----|------|
| Dig XRay Image – Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | See Table 9 | SCP | None |
| Dig XRay Image – Processing | 1.2.840.10008.5.1.4.1.1.1.1.1 | See Table 9 | SCP | None |
| Dig Mammo Image – Presentation | 1.2.840.10008.5.1.4.1.1.1.2 | See Table 9 | SCP | None |
| Dig Mammo Image – Processing | 1.2.840.10008.5.1.4.1.1.1.2.1 | See Table 9 | SCP | None |
| Dig Intra-Oral Image - Presentation | 1.2.840.10008.5.1.4.1.1.1.3 | See Table 9 | SCP | None |
| Dig Intra-Oral Image – Processing | 1.2.840.10008.5.1.4.1.1.1.3.1 | See Table 9 | SCP | None |
| Positron Emission Tomography Image Storage | 1.2.840.10008.5.1.4.1.1.128 | See Table 9 | SCP | None |
| Standalone PET Curve Storage | 1.2.840.10008.5.1.4.1.1.129 | See Table 9 | SCP | None |
| RT Image Storage | 1.2.840.10008.5.1.4.1.1.481.1 | See Table 9 | SCP | None |
| CT Image Storage | 1.2.840.10008.5.1.4.1.1.2 | See Table 9 | SCP | None |
| Ultrasound Multi-frame Image Storage | 1.2.840.10008.5.1.4.1.1.3 | See Table 9 | SCP | None |
| MR Image Storage | 1.2.840.10008.5.1.4.1.1.4 | See Table 9 | SCP | None |
| NM Image Storage (1993-Ret) | 1.2.840.10008.5.1.4.1.1.5 | See Table 9 | SCP | None |
| Ultrasound Image Storage (1993-Ret) | 1.2.840.10008.5.1.4.1.1.6 | See Table 9 | SCP | None |
| Ultrasound Image Storage | 1.2.840.10008.5.1.4.1.1.6.1 | See Table 9 | SCP | None |
| Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7 | See Table 9 | SCP | None |
| VL Endoscopic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.1 | See Table 9 | SCP | None |
| VL Microscopic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.2 | See Table 9 | SCP | None |
| VL Slide-Coordinates Microscopic Storage | 1.2.840.10008.5.1.4.1.1.77.1.3 | See Table 9 | SCP | None |
| VL Photographic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.4 | See Table 9 | SCP | None |
| X-Ray Angiographic Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | See Table 9 | SCP | None |
| X-Ray Radiofluoroscopic Image Storage | 1.2.840.10008.5.1.4.1.1.12.2 | See Table 9 | SCP | None |
| Nuclear Medicine Image Storage | 1.2.840.10008.5.1.4.1.1.20 | See Table 9 | SCP | None |

Table 8. Presentation contexts for storage service classes

The table below contains the transfer syntaxes offered by each of the Storage SOP class presentation contexts listed in Table 8.

| Transfer Syntax | |
|--|------------------------|
| Name List | UID List |
| JPEG Baseline (Process 1) | 1.2.840.10008.1.2.4.50 |
| JPEG Extended (Process 2 & 4) | 1.2.840.10008.1.2.4.51 |
| JPEG Extended (Process 3 & 5) | 1.2.840.10008.1.2.4.52 |
| JPEG Spectral Selection, Non-Hierarchical (Process 6 & 8) | 1.2.840.10008.1.2.4.53 |
| JPEG Spectral Selection, Non-Hierarchical (Process 7 & 9) | 1.2.840.10008.1.2.4.54 |
| JPEG Full Progression, Non-Hierarchical (Process 10 & 12) | 1.2.840.10008.1.2.4.55 |
| JPEG Full Progression, Non-Hierarchical (Process 11 & 13) | 1.2.840.10008.1.2.4.56 |
| JPEG Lossless, Non-Hierarchical (Process 14) | 1.2.840.10008.1.2.4.57 |
| JPEG Lossless, Non-Hierarchical (Process 15) | 1.2.840.10008.1.2.4.58 |
| JPEG Extended, Hierarchical (Process 16 & 18) | 1.2.840.10008.1.2.4.59 |
| JPEG Extended, Hierarchical (Process 17 & 19) | 1.2.840.10008.1.2.4.60 |
| JPEG Spectral Selection, Hierarchical (Process 20 & 22) | 1.2.840.10008.1.2.4.61 |
| JPEG Spectral Selection, Hierarchical (Process 21 & 23) | 1.2.840.10008.1.2.4.62 |
| JPEG Full Progression, Hierarchical (Process 24 & 26) | 1.2.840.10008.1.2.4.63 |
| JPEG Full Progression, Hierarchical (Process 25 & 27) | 1.2.840.10008.1.2.4.64 |
| JPEG Lossless, Hierarchical (Process 28) | 1.2.840.10008.1.2.4.65 |
| JPEG Lossless, Hierarchical (Process 29) | 1.2.840.10008.1.2.4.66 |
| JPEG Lossless, Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]) | 1.2.840.10008.1.2.4.70 |
| JPEG-LS Lossless Image Compression | 1.2.840.10008.1.2.4.80 |
| JPEG-LS Near-lossless Image Compression | 1.2.840.10008.1.2.4.81 |
| JPEG 2000 Image Compression (Lossless Only) | 1.2.840.10008.1.2.4.90 |
| JPEG 2000 Image Compression | 1.2.840.10008.1.2.4.91 |
| Implicit VR Little Endian | 1.2.840.10008.1.2 |
| Explicit VR Little Endian | 1.2.840.10008.1.2.1 |
| Explicit VR Big Endian | 1.2.840.10008.1.2.2 |

Table 9. Transfer syntax for storage SOP contexts

2.1.3.2.3 SOP Specific Conformance for Storage SOP Classes

The Web Server provides Level 2 (full) conformance to the Storage SOP Classes listed in Table 8. Valid status codes returned to the SCU include the following:

| Status Value | Meaning |
|--------------|-----------------------------------|
| 0000H | Operation completed successfully |
| A700H | Temporary lack of resources |
| A700H | Data set does not match SOP Class |
| C000H | Failed to parse object |

Image objects are temporarily stored on the Web Server. The two ways to remove an image object from the Web Server are manually, through requests entered at the Server console, and automatically, in which the Server will remove the oldest objects to make room for new ones. A user can *hold* an image set on the Web Server by explicitly making the request at the view station or Server console.

2.1.3.2.4 Presentation Context Acceptance Criterion - Storage

The Web Server will accept any requested Storage SOP class presentation context defined in Table 2-5 as long as the requesting AE is granted the appropriate permissions through the Web Server's configuration parameters.

2.1.3.2.5 Transfer Syntax Selection Policies - Storage

If multiple transfer syntaxes are offered in the requested presentation context, the Web Server will select the first one it encounters that matches any of the syntaxes listed in Table 9.

2.1.3.3 Real-World Activity – Query/Retrieve

2.1.3.3.1 Associated Real-World Activity – Query/Retrieve

The Web Server will accept Query/Retrieve SOP class association requests and return database matches from SCUs that query the Server, and send images to the requested AE, provided the requesting AE is configured to make such a request and the destination AE is known to the Web Server.

2.1.3.3.2 Presentation Context Table – Query/Retrieve

The table below contains the query/retrieve presentation contexts that the Web Server will accept.

| Abstract Syntax | | Transfer Syntax | Role | Extended Negotiation |
|----------------------------|-----------------------------|-----------------|------|----------------------|
| Name | UID | | | |
| Patient Root Model – FIND | 1.2.840.10008.5.1.4.1.2.1.1 | See Table 11 | SCP | None |
| Patient Root Model - MOVE | 1.2.840.10008.5.1.4.1.2.1.2 | See Table 11 | SCP | None |
| Study Root Model - FIND | 1.2.840.10008.5.1.4.1.2.2.1 | See Table 11 | SCP | None |
| Study Root Model – MOVE | 1.2.840.10008.5.1.4.1.2.2.2 | See Table 11 | SCP | None |
| Patient/Study Model - FIND | 1.2.840.10008.5.1.4.1.2.3.1 | See Table 11 | SCP | None |
| Patient/Study Model - MOVE | 1.2.840.10008.5.1.4.1.2.3.2 | See Table 11 | SCP | None |

Table 10. Acceptable presentation contexts for query/retrieve service classes

The table below contains the transfer syntaxes offered by each of the Query/Retrieve SOP class presentation contexts listed in Table 10.

| Transfer Syntax | |
|---------------------------|---------------------|
| Name List | UID List |
| Implicit VR Little Endian | 1.2.840.10008.1.2 |
| Explicit VR Little Endian | 1.2.840.10008.1.2.1 |
| Explicit VR Big Endian | 1.2.840.10008.1.2.2 |

Table 11. Transfer syntaxes offered by query/retrieve classes

2.1.3.3.3 SOP Specific Conformance for Query/Retrieve SOP Class

The Web Server provides standard conformance to the query/retrieve SOP Classes listed in Table 10.

Valid status codes returned to the SCU include the following:

| FIND Status Value | Meaning |
|-------------------|-----------------------------------|
| 0000H | Operation completed successfully |
| A700H | Temporary lack of resources |
| A700H | Data set does not match SOP Class |
| C000H | Failed to process request |
| FE00H | Request cancelled by user |
| FF00H | Matches are continuing |

The Web Server does not support extended negotiation and therefore does not perform relational queries. The table below lists the attributes the Web Server supports in FIND requests

| Tag | Description | Query Level |
|--|----------------------|-----------------|
| (0010,0010) | Patient's Name | Patient/Study * |
| (0010,0020) | Patient ID | Patient/Study * |
| (0010,0030) | Patient's Birth Date | Patient |
| (0010,0032) | Patient's Birth Time | Patient |
| (0010,0040) | Patient's Sex | Patient |
| (0008,0020) | Study Date | Study |
| (0008,0030) | Study Time | Study |
| (0008,0050) | Accession Number | Study |
| (0020,0010) | Study ID | Study |
| (0020,000D) | Study Instance UID | Study |
| (0008,0060) | Modality | Series |
| (0020,0011) | Series Number | Series |
| (0020,000E) | Series Instance UID | Series |
| (0020,0013) | Image Number | Image |
| (0008,0018) | SOP Instance UID | Image |
| * Attributes with a Query Level of <i>Patient/Study</i> are those that exist in patient-level queries when using Patient Root models and in study-level queries when using the Study Root model. | | |

Table 12. Supported query attributes

2.1.3.3.4 Presentation Context Acceptance Criterion – Query/Retrieve

The Web Server will accept any requested Query/Retrieve SOP class presentation context defined in Table 10 as long as the requesting AE is granted the appropriate permissions through the Web Server's configuration parameters.

2.1.3.3.5 Transfer Syntax Selection Policies – Query/Retrieve

If multiple transfer syntaxes are offered in the requested presentation context, the Web Server will select the first one it encounters that matches any of the syntaxes listed in Table 11.

2.1.3.4 Real-World Activity – Results Management

2.1.3.4.1 Associated Real-World Activity – Results Management

The Web Server will accept Verification association requests and respond to SCUs that wish to verify that this AE is available for all supported DICOM transactions.

2.1.3.4.2 Presentation Context Table – Results Management

The table below contains the Results Management presentation contexts that the Web Server will accept.

| Abstract Syntax | | Transfer Syntax | Role | Extended Negotiation |
|--|-------------------------|-----------------|------|----------------------|
| Name | UID | | | |
| Detached Results Management Meta SOP Class | 1.2.840.10008.3.1.2.5.4 | See Table 14 | SCP | Role Neg. |
| Detached Results Management SOP Class | 1.2.840.10008.3.1.2.5.1 | See Table 14 | SCP | Role Neg. |

| | | | | |
|--|-------------------------|--------------|-----|-----------|
| Detached Interpretation Management SOP Class | 1.2.840.10008.3.1.2.6.1 | See Table 14 | SCP | Role Neg. |
|--|-------------------------|--------------|-----|-----------|

Table 13. Acceptable presentation contexts for results management service classes

The table below contains the transfer syntaxes offered by each of the Results Management SOP class presentation contexts listed in Table 13.

| Transfer Syntax | |
|---------------------------|---------------------|
| Name List | UID List |
| Implicit VR Little Endian | 1.2.840.10008.1.2 |
| Explicit VR Little Endian | 1.2.840.10008.1.2.1 |
| Explicit VR Big Endian | 1.2.840.10008.1.2.2 |

Table 14. Transfer syntaxes for results management SOP classes

2.1.3.4.3 SOP Specific Conformance for Results Management SOP Classes

The Web Server provides standard conformance to the Results Management SOP Classes listed in Table 13. Status codes returned to the SCU include the following:

| Status Value | Meaning |
|--------------|----------------------------------|
| 0000H | Operation completed successfully |

The Web Server supports the following commands for each of the listed Results Management service classes. There is a table for the detached results and detached interpretation SOP classes. The listed attributes define those that the command supports.

| Service Class | Command | Description | Tag |
|------------------------------|------------------------|------------------------------------|-------------|
| Detached Results Management | N-GET | Referenced Study Sequence | (0008,1110) |
| | | >Referenced SOP Class UID | (0008,1150) |
| | | >Referenced SOP Instance UID | (0008,1155) |
| | | Results ID | (4008,0040) |
| | | Referenced Interpretation Sequence | (4008,0050) |
| | | >Referenced SOP Class UID | (0008,1150) |
| | | >Referenced SOP Instance UID | (0008,1155) |
| | | Impressions | (4008,0300) |
| | | All other Attributes | |
| | N-EVENT-REPORT Created | Instance Creation Date | (0008,0012) |
| | | >Referenced SOP Class UID | (0008,1110) |
| | | Instance Creation Time | (0008,1155) |
| | | Instance Creator UID | (0008,0013) |
| | | Results ID | (0008,0014) |
| | | Referenced Interpretation Sequence | (4008,0040) |
| | | >Referenced SOP Class UID | (4008,0050) |
| | | >Referenced SOP Instance UID | (0008,1150) |
| All other defined Attributes | (0008,1155) | | |
| N-EVENT-REPORT Deleted | Results ID | (4008,0040) | |

Table 15. Detached results management supported commands and attributes

| Service Class | Command | Description | Tag | |
|------------------------------------|----------------------------|-----------------------------------|---|-------------|
| Detached Interpretation Management | N-GET | Specific Character Set | (0008,0005) | |
| | | Referenced Results Sequence | (0008,1100) | |
| | | >Referenced SOP Class UID | (0008,1150) | |
| | | >Referenced SOP Instance UID | (0008,1155) | |
| | | Interpretation Text | (4008,010B) | |
| | | Interpretation ID | (4008,0200) | |
| | | Interpretation Type ID | (4008,0210) | |
| | | Interpretation Status ID | (4008,0212) | |
| | | All other Attributes | | |
| | N-SET | Interpretation Status ID | (4008,0212) | |
| | N-EVENT-REPORT Created | Instance Creation Date | Instance Creation Date | (0008,0012) |
| | | | Referenced Results Sequence | (0008,1100) |
| | | | >Referenced SOP Class UID | (0008,1150) |
| | | | >Referenced SOP Instance UID | (0008,1155) |
| | | | Instance Creation Time | (0008,0013) |
| | | | Instance Creator UID | (0008,0014) |
| | | | Interpretation Type ID | (4008,0210) |
| | | | Interpretation Status ID | (4008,0212) |
| | | | All other defined Attributes | |
| | N-EVENT-REPORT Recorded | Interpretation Recorded Date | Interpretation Recorded Date | (4008,0100) |
| | | | Interpretation Recorded Time | (4008,0101) |
| | | | Interpretation Recorder | (4008,0102) |
| | | | Interpretation Type ID | (4008,0210) |
| | | | Interpretation Status ID | (4008,0212) |
| | | | Reference to Recorded Sound | (4008,0103) |
| | N-EVENT-REPORT Transcribed | Interpretation Transcription Date | Interpretation Transcription Date | (4008,0108) |
| | | | Interpretation Author | (4008,010C) |
| | | | Interpretation Transcription Time | (4008,0109) |
| | | | Interpretation Type ID | (4008,0210) |
| | | | Interpretation Status ID | (4008,0212) |
| | N-EVENT-REPORT Approved | Interpretation Approver | Interpretation Approver | (4008,0111) |
| | | | >Interpretation Approval Dates | (4008,0112) |
| | | | >Interpretation Approval Times | (4008,0113) |
| | | | >Physicians Approving Interpretation | (4008,0114) |
| | | | Interpretation Diagnosis Description | (4008,0115) |
| | | | Interpretation Diagnosis Codes Sequence | (4008,0117) |
| | | | >Code Value | (0008,0100) |
| | | | >Coding Scheme Designator | (0008,0102) |
| | | | >Code Meaning | (0008,0104) |
| | | | Interpretation Status ID | (4008,0212) |
| | N-EVENT-REPORT Deleted | | | |
| | N-EVENT-REPORT Updated | All updated attributes | | |

Table 16. Detached interpretation management supported commands and attributes

2.1.3.4.4 Presentation Context Acceptance Criterion – Results Management

The Web Server will accept any requested Results Management SOP class presentation context defined in Table 15 as long as the requesting AE is granted the appropriate permissions through the Web Server's configuration parameters.

2.1.3.4.5 Transfer Syntax Selection Policies – Results Management

If multiple transfer syntaxes are offered in the requested presentation context, the Web Server will select the first one it encounters that matches any of the syntaxes listed in Table 16.

3 Communication Profiles

3.1 TCP/IP Stack

The only supported DICOM protocol stack is TCP/IP. The supported TCP/IP stack is suitable for communications over both local and wide area networks.

By default, the Web server accepts all requests for DICOM associations on port 104. This value is configurable and can be defined in the configuration file.

3.1.1 Physical Media Support

The Web Server communicates via standard 10/100-Base-T Ethernet. Adapters are available that enable the Web server to communicate with all other common forms of Ethernet. Routers are available to allow communications with other wide area network hardware, frame relay, ISDN, voice modem and wireless services.

4 Extensions/Specializations/Privatization

4.1 Standard Extended/Specialized/Private SOPs

The Web Server supports Mitra Imaging Inc.'s private Report Information SOP class as defined in the following section.

4.1.1 Mitra's Report Information SOP Class

The Web Server supports Mitra's private Report Management SOP class as an SCU. The SCU uses DICOM's C-FIND DIMSE service to retrieve information about reports stored on the SCP.

4.1.2 Proposed Presentation Contexts – Mitra's Report Information

The table below contains the presentation contexts proposed by the Web Server when it requests an association for Mitra's Report Information SOP Class.

| Abstract Syntax | | Transfer Syntax | Role | Extended Negotiation |
|---------------------------------|-----------------------|-----------------|------|----------------------|
| Name | UID | | | |
| Mitra Report Information – FIND | 1.2.840.113532.3500.8 | See Table 18 | SCP | None |

Table 17. Presentation contexts for Mitra's report information SOP class

The table below contains the transfer syntaxes offered by the Report Information SOP class presentation contexts listed in Table 17.

| Transfer Syntax | |
|---------------------------|-------------------|
| Name List | UID List |
| Implicit VR Little Endian | 1.2.840.10008.1.2 |

Table 18. Transfer syntax for the report information SOP class

4.1.3 SOP Specific Conformance for Mitra's Report Information SOP Class

Since the private Report Information SOP class returns a fixed set of attributes in the FIND responses regardless of the attributes listed in the FIND request, the Web Server will accept the entire list and then only use the specific attributes it needs. For a complete list of returned attributes, refer to the SCP's Conformance Statement.

5 Configuration

All information on configuring the DICOM interfaces can be found in the Web Server's Service Manual.

6 Support of Extended Character Sets

The Web Server supports the following character sets.

- ISO-IR 6 Basic G0 Set
- ISO-IR 100 Latin Alphabet No. 1

