DICOM Conformance Statement
for
Cedara WebScheduler™ 1.1

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1 Conformance Statement Overview

The Cedara WebScheduler™ provides a means for a clinic or other medical facility to schedule clinical imaging procedures for diagnostic imaging devices. The DICOM functionality provided by this software is the ability to provide an electronic worklist of these scheduled procedures and their associated patient information to the acquisition modality.

An overview of the network services supported by the Cedara WebScheduler is provided by the following table:

<table>
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<th>Table 1-1 - NETWORK SERVICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOP Classes</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>Workflow Management</td>
</tr>
<tr>
<td>Modality Worklist</td>
</tr>
<tr>
<td>Information Model – FIND</td>
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3 Introduction

3.1 Audience

This document is written for the people that need to understand how Cedara WebScheduler 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.

3.2 Remarks
The scope of this DICOM Conformance Statement is to facilitate integration between Cedara WebScheduler 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.

3.3 Terms and Definitions
The terms and definitions used in this document are DICOM terminology and it is expected that the reader has an understanding of them. For formal definitions of terminology, reference the DICOM 3.0 Standard documentation.

3.4 Basics of DICOM Communication
It is expected that the reader has an understanding of the basics of DICOM communication. For further information on this topic, reference the DICOM 3.0 Standard documentation.

3.5 Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE</td>
<td>Application Entity</td>
</tr>
<tr>
<td>DICOM</td>
<td>Digital Imaging and Communications in Medicine</td>
</tr>
<tr>
<td>DNS</td>
<td>Domain Name System</td>
</tr>
<tr>
<td>IOD</td>
<td>Information Object Definition</td>
</tr>
<tr>
<td>IPv4</td>
<td>Internet Protocol version 4</td>
</tr>
<tr>
<td>IPv6</td>
<td>Internet Protocol version 6</td>
</tr>
<tr>
<td>MWL</td>
<td>Modality Worklist</td>
</tr>
</tbody>
</table>
### References

3.7 Implementation Model

3.7.1 Application Data Flow

The Cedara WebScheduler’s Workflow AE provides access to scheduled procedure information (and therefore patient information related to those scheduled procedures) stored within its database. The application data flow in the above diagram can be described as follows:

- The Workflow AE receives requests from remote application entities to provide a worklist of scheduled procedures. When the “Query Modality Worklist” remote real-world activity occurs, the remote application entity queries the Workflow Application Entity for worklist items, specifying a set of matching criteria defining the workitems in which it is interested. The Workflow Application Entity then queries its local database for instances matching those search criteria (for supported matching keys) in the “Query Scheduled Procedures” local real-world activity, and returns the results.

3.7.2 Functional Definition of AE’s
3.7.2.1 **Functional Definition of Workflow Application Entity**

The Workflow AE is a Windows service that is automatically started with the system and remains running.

The Workflow Application Entity monitors for association requests from remote application entities, waiting for requests for modality worklists via the Modality Worklist Information Model – FIND SOP class. Upon detecting such a request and successful negotiation of the association, it will interpret the request using supported matching keys as the criteria to search its local database for matching workitems. In accordance with the Modality Worklist Information Model – FIND SOP class, it will respond with all matching results.

### 3.7.3 Sequencing of Real World Activities

![Diagram of Workflow and Acquisition Modality with activities: 1. Query Worklist, 2. Find Matching Scheduled Procedures, 3. Return Workitems]

The sequencing of real-world activities is limited to the above sequencing.

### 3.8 AE SPECIFICATIONS

#### 3.8.1 Workflow AE Specifications

#### 3.8.1.1 SOP Classes

Cedara WebScheduler provides Standard Conformance to the following SOP Classes:
Table 3-1 – SOP CLASSES FOR AE WORKFLOW

<table>
<thead>
<tr>
<th>SOP Class Name</th>
<th>SOP Class UID</th>
<th>User of Service (SCU)</th>
<th>Provider of Service (SCP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verification</td>
<td>1.2.840.10008.1.1</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Modality Worklist Information Model – FIND</td>
<td>1.2.840.10008.5.1.4.31</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3.8.1.2 Association Policies

3.8.1.2.1 General
Cedara WebScheduler does not initiate associations.

The Application Context Name for DICOM 3.0 is the only Application Context accepted.

Table 3-2 – DICOM APPLICATION CONTEXT

<table>
<thead>
<tr>
<th>Application Context Name</th>
<th>1.2.840.10008.3.1.1.1</th>
</tr>
</thead>
</table>

The maximum PDU size accepted is 65536.

3.8.1.2.2 Number of Associations
Cedara WebScheduler does not initiate associations.

Table 3-3 – NUMBER OF ASSOCIATIONS INITIATED FOR AE WORKFLOW

| Maximum number of simultaneous Associations | 0 |

Cedara WebScheduler accepts associations to receive C-FIND requests for the Modality Worklist Information Model – FIND SOP class. It expects to receive associations from multiple acquisition modalities at a time, therefore supports multiple simultaneous associations. There is currently no limit to the number of associations supported, however, only a limited number of queries will be actively processed simultaneously (a default of 5). Queries exceeding this limit will be temporarily queued and serviced immediately after others complete. The installer of the Cedara WebScheduler is cautioned that the server hardware configuration should be sized and tested under maximum expected usage scenarios.

Table 3-4 – NUMBER OF ASSOCIATIONS ACCEPTED FOR AE WORKFLOW

| Maximum number of simultaneous Associations | Unlimited |

3.8.1.2.3 Asynchronous Nature
Cedara WebScheduler does not support asynchronous communication (multiple outstanding transactions over a single Association).
### Table 3-5 – ASYNCHRONOUS NATURE AS AN SCP FOR AE WORKFLOW

| Maximum number of outstanding transactions | 1 |

#### 3.8.1.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

<table>
<thead>
<tr>
<th>Table 3-6 – DICOM IMPLEMENTATION CLASS AND VERSION AE WORKFLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation Class UID</td>
</tr>
<tr>
<td>Implementation Version Name</td>
</tr>
</tbody>
</table>

#### 3.8.1.3 Association Initiation Policy

The Cedara WebScheduler will not initiate Associations under any circumstances.

#### 3.8.1.4 Association Acceptance Policy

##### 3.8.1.4.1 Activity – Request Verification

**3.8.1.4.1.1 Description and sequencing of Activities**

A remote AE sends an Echo Request to verify that the Workflow AE is alive at the expected Presentation Address and responding to requests.

**3.8.1.4.1.2 Accepted Presentation Contexts**

Cedara WebScheduler is capable of accepting the Presentation Contexts shown in the following table:

<table>
<thead>
<tr>
<th>Table 3-7 – ACCEPTABLE PRESENTATION CONTEXTS FOR ACTIVITY REQUEST VERIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation Context Table</td>
</tr>
<tr>
<td>Abstract Syntax</td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Verification</td>
</tr>
</tbody>
</table>

##### 3.8.1.4.1.3 SOP Specific Conformance for SOP Class(es)

The Workflow AE provides Standard conformance to the DICOM Verification service class.

##### 3.8.1.4.2 Activity – Query Modality Worklist

**3.8.1.4.2.1 Description and sequencing of Activities**

Using the Cedara WebScheduler, the user can schedule diagnostic imaging procedures on any imaging resource managed by the application. The unit of scheduling is one Requested Procedure, containing one or more Scheduled Procedure Steps comprising a...
single “appointment” or “order”. During scheduling, the user is required to verify that insurance preauthorization has been performed or determined to not be needed and that the procedure questionnaire has been positively confirmed with the patient. An “order” where these criteria are not satisfied is incomplete and will not be returned in a Modality Worklist query. “Orders” marked as having been completed will also not be returned.

On the remote acquisition modality, the user either chooses to retrieve a worklist or the system is configured to automatically retrieve a worklist. The stimulus for this remote activity is outside of the scope of the Cedara WebScheduler.

From the Workflow AE viewpoint, the activity is triggered when the remote AE initiates an Association to the Workflow AE. After successful negotiation of the Association, the Workflow AE expects to receive a C-FIND request for the Modality Worklist Information Model – FIND SOP class. The Workflow AE will then send one C-FIND response for each scheduled procedure step within an “appointment” or “order” scheduled within the system that match the supported matching key provided in the request. After one C-FIND response for each SPS is sent, a final C-FIND response containing the final status of the operation will be sent; the total C-FIND responses is therefore equal to the number of SPSs plus one.

After all C-FIND responses have been sent, the Workflow AE will leave the Association open for a configurable time period before it attempts to close it.

In the case that the MWL SCU sends a C-CANCEL during the operation, the Workflow AE will immediately (as soon as the request is read from the network and processed) stop sending C-FIND responses and respond to the C-CANCEL request. The SCU may receive C-FIND responses after issuing the C-CANCEL, but the number received should be minimal.
A possible sequence of interactions between the Workflow AE and an Acquisition Modality (e.g. an image acquisition device supporting the Modality Worklist Information Model - FIND SOP Class as an SCU) is illustrated in the figure above:

1. The Acquisition Modality opens an association with the Workflow AE.
2. A C-FIND request is sent to the Workflow AE specifying the matching criteria defining the workitems of interest to the Acquisition Modality.
3. A C-FIND response is sent to the Acquisition Modality for each scheduled SPS matching the request.
3. A final C-FIND response is sent to the Acquisition Modality with the status of the overall operation.

3.8.1.4.2.2 Accepted Presentation Contexts

Cedara WebScheduler is capable of accepting the Presentation Contexts shown in the following table:
Table 3-8 – ACCEPTABLE PRESENTATION CONTEXTS FOR ACTIVITY QUERY MODALITY WORKLIST

<table>
<thead>
<tr>
<th>Presentation Context Table</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abstract Syntax</strong></td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Modality Worklist Information Model – FIND</td>
</tr>
</tbody>
</table>

3.8.1.4.2.3 SOP Specific Conformance for SOP Class(es)

The Workflow AE supports matching on any optional matching key attributes as described in the following table:

Table 3-9 – MODALITY WORKLIST OPTIONAL MATCHING KEYS SUPPORTED

<table>
<thead>
<tr>
<th>Description/Module</th>
<th>Tag</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imaging Service Request</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accession Number</td>
<td>(0008,0050)</td>
<td></td>
</tr>
<tr>
<td>Requesting Physician</td>
<td>(0032,1032)</td>
<td></td>
</tr>
<tr>
<td>Referring Physician’s Name</td>
<td>(0008,0090)</td>
<td></td>
</tr>
<tr>
<td><strong>Requested Procedure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study Instance UID</td>
<td>(0020,000D)</td>
<td></td>
</tr>
<tr>
<td><strong>Patient Demographic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Birth Date</td>
<td>(0010,0030)</td>
<td></td>
</tr>
</tbody>
</table>

The Workflow AE supports case insensitive searching on Person Name VR elements. It does not support fuzzy or semantic searching on Person Name VR elements.

The Workflow AE does not use the Specific Character Set attribute if provided in the request.

The Workflow AE supports optional return key attributes as described in the following table:
Table 3-10 – MODALITY WORKLIST OPTIONAL RETURN KEYS SUPPORTED

<table>
<thead>
<tr>
<th>Description/Module</th>
<th>Tag</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Requested Procedure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requested Procedure Location</td>
<td>(0040,1005)</td>
<td></td>
</tr>
<tr>
<td>Requested Procedure Comments</td>
<td>(0040,1400)</td>
<td></td>
</tr>
<tr>
<td><strong>Patient Identification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient’s Mother’s Birth Name</td>
<td>(0010,1060)</td>
<td></td>
</tr>
<tr>
<td><strong>Patient Demographic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Size</td>
<td>(0010,1020)</td>
<td></td>
</tr>
<tr>
<td>Patient Address</td>
<td>(0010,1040)</td>
<td></td>
</tr>
<tr>
<td>Patient Telephone Numbers</td>
<td>(0010,2154)</td>
<td></td>
</tr>
<tr>
<td><strong>Patient Medical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Smoking Status</td>
<td>(0010,21A0)</td>
<td></td>
</tr>
<tr>
<td>Patient’s Last Menstrual Date</td>
<td>(0010,21D0)</td>
<td></td>
</tr>
<tr>
<td>Additional Patient History</td>
<td>(0010,21B0)</td>
<td></td>
</tr>
</tbody>
</table>

The Workflow AE may return C-FIND response statuses as specified in the following table:

Table 3-11 – MWL C-FIND RESPONSE STATUS REASONS

<table>
<thead>
<tr>
<th>Service Status</th>
<th>Further Meaning</th>
<th>Error Code</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success</td>
<td>Query was received, processed, and results returned without error.</td>
<td>0x0000</td>
<td></td>
</tr>
<tr>
<td>Failure</td>
<td>The query failed.</td>
<td>0xC000</td>
<td>There may be many reasons, including failure to parse the request, internal software failure, or failure to communicate the results</td>
</tr>
<tr>
<td>Cancelled</td>
<td>The query was cancelled.</td>
<td>0xFE00</td>
<td></td>
</tr>
</tbody>
</table>

3.9 NETWORK INTERFACES

3.9.1 Physical Network Interface
Cedara WebScheduler supports and listens for communication on one or more network interfaces installed on the system and communicates over TCP/IP. It is not dependent on a specific physical network medium, provided they support TCP/IP.

3.9.2 Additional Protocols
Cedara WebScheduler conforms to the System Management Profiles listed in the Table below.
Table 3-12 – SUPPORTED SYSTEM MANAGEMENT PROFILES

<table>
<thead>
<tr>
<th>Profile Name</th>
<th>Actor</th>
<th>Protocols Used</th>
<th>Optional Transactions</th>
<th>Security Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Address Management</td>
<td>DNS Client</td>
<td>DNS</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

3.9.2.1 DNS
DNS can be used for address resolution. The identity of a DNS server shall be configured during the system’s O/S installation. If a DNS server is not in use, local mapping between hostname and IP address can be manually configured via the O/S.

3.9.3 IPv4 and IPv6 Support
This product only supports IPv4.

3.10 CONFIGURATION

3.10.1 AE Title/Presentation Address Mapping

3.10.1.1 Local AE Titles
The default AE title for the Workflow AE is MWL_SCP and the default port is 1104.

These are currently only manually configurable by the installer of the software (a Merge OEM partner). The means to configure the above parameters is not communicated in this document.

3.10.1.2 Remote AE Title/Presentation Address Mapping
There is no configuration of remote AEs provided. The Workflow AE will accept associations from any remote AE.

3.10.2 Parameters
There are currently no configurable parameters for the Cedara WebScheduler Workflow AE.

4 MEDIA INTERCHANGE
The Cedara WebScheduler does not provide media interchange functionality.

5 SUPPORT OF CHARACTER SETS
The Cedara WebScheduler does not support any additional character sets above and beyond the default.

6 SECURITY
Cedara WebScheduler does not support any specific security measures.
It is assumed that Cedara WebScheduler 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 Cedara WebScheduler.

b. Firewall or router protections to ensure that Cedara WebScheduler 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 Virtual Private Network (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.

Due to the open nature of the Workflow AE, accepting associations from any remote AE, the application should be used within a secure, trusted network environment.

7 ANNEXES

7.1 IOD CONTENTS

7.1.1 Created SOP Instance(s)
Cedara WebScheduler does not create SOP instances.

7.1.2 Usage of Attributes from received IOD’s
Cedara WebScheduler does not receive SOP instances.

7.1.3 Attribute Mapping
Cedara WebScheduler does not map attributes in any way.

7.1.4 Coerced/Modified fields
Cedara WebScheduler does not coerce or modify attributes in any way.

7.2 DATA DICTIONARY OF PRIVATE ATTRIBUTES
Cedara WebScheduler does not use private attributes in any way.

7.3 CODED TERMINOLOGY AND TEMPLATES
Cedara WebScheduler provides the installed site an ability to define and import a procedure library containing Requested Procedures. These Requested Procedures support associated CPT codes that can be defined in the procedure library and are imported and/or updated at the time the library is imported.

Each “appointment” or “order” within the application has one associated Requested Procedure and therefore (optionally) one associated CPT code which will be transmitted in the MWL C-FIND response in the Requested Procedure Code Sequence (0032,1064).
CPT versions 4 and 5 are supported, but are as defined by the site in the site-defined procedure library.

Cedara WebScheduler does not use templates.

**7.4 GRAYSCALE IMAGE CONSISTENCY**

Cedara WebScheduler does not use, and has no functionality that contributes to or uses, grayscale image consistency in any way.

**7.5 STANDARD EXTENDED/SPECIALIZED/PRIVATE SOP CLASSES**

Cedara WebScheduler does not extend or specialize existing SOP Classes nor does it define private SOP Classes.

**7.6 PRIVATE TRANSFER SYNTAXES**

Cedara WebScheduler does not support private transfer syntaxes.