

Mowbray MWL Server  
DICOM Conformance Statement

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# Revision History

|  |  |  |
| --- | --- | --- |
| Date | Author | Comments |
| 6 April 2009 | Clinton Chau | Draft for review |

# Introduction

The ClearCanvas Mowbray Modality Worklist Server (Mowbray) is an application, which responds to queries for work list information. Mowbray employs DICOM connectivity to ensure interoperability with other ClearCanvas products and also with products from other vendors. A particular emphasis is made on interoperability issues defined in the IHE Technical Framework (Revision 3.0).

This Conformance Statement (CS) specifies the compliance of Mowbray to DICOM 3.0 Standard. It details the DICOM Service Classes, supported by the product and their roles. Refer to Part 2 of DICOM 3.0 Standard for more information about the structure and terminology in this document.

This Conformance Statement applies in particular to the customized implementation for the Joint Department of Medical Imaging of UHN, Mount Sinai Hospital and Women’s College Hospital.

# Integration Issues

This DICOM Conformance Statement by itself is not sufficient to guarantee successful interoperability between ClearCanvas and equipment from other vendors. The following considerations should be made:

* The integration of equipment is the responsibility of the user, (or user’s agent) who should assess the application requirements and design a working, safe and reliable solution.
* When the comparison of this DICOM Conformance Statement with a DICOM Conformance Statement from another vendor indicates that connectivity should be possible it is the responsibility of the user (or user’s agent) to verify this by carrying out validation tests and by checking whether all required functionality is met.
* With regard to the future evolution of the DICOM 3.0 standard ClearCanvas reserves the right to make changes to the ClearCanvas architecture, related to the issues, described in this document. The user (or user’s agent) should ensure that any equipment connected via DICOM to ClearCanvas equipment also follows the future evolution of the DICOM 3.0 standard.
* Failure to do so may result in loss of connectivity.

# Application Data Flow Diagram



Figure

Mowbray is always waiting for incoming DICOM connections, and it is possible for Mowbray to service multiple simultaneous connections. When a DICOM connection appears the association request is parsed to see if the service being requested is supported. If so, an association is created.

# AE Functional Definitions

The two services supported by Mowbray are:

* Verfication, to verify that a DICOM connection can be made to Mowbray, and
* Worklist, to provide worklist information to a querying entity.

# Sequencing of Real World Activities

There are no specific requirements for the sequencing of real world activities. Mowbray does not commit changes to database of worklist information, so there is no risk of compromising data integrity. Mowbry simply returns information that is in the database the moment that data is committed by other entities.

# AE Specifications – Mowbray AE

This Application Entity provides Standard Conformance to the following DICOM 3.0 Standard SOP classes as SCP:

|  |  |
| --- | --- |
| SOP Class Name | SOP Class UID |
| Verification | 1.2.840.10008.1.1 |
| Basic Worklist Management | 1.2.840.10008.5.1.4.31 |

Table

# AE Specifications – Association Establishment Policies

The DICOM Application Context Name, which is always accepted, is:

|  |  |
| --- | --- |
| Application Context Name | 1.2.840.10008.3.1.1.1 |

Table

The maximum number of Presentation Contexts accepted is the number present in Table 4. The user info items, sent are:

* Maximum PDU Length
* Implementation Class UID
* Implementation Version Name
* SCU/SCP Role Negotiation

The AE will accept any PDU length, offered on associations initiated by remote applications. In practice it will be limited by the amount of the available system resources. It is, therefore recommended that it does not exceed 64 Kbytes.

Mowbray will not release an association unless an abnormal event occurs. The association is always released by the invoking AE. In case of abnormal conditions, occurring during its work, if necessary, Mowbray will first try to release the association orderly. If this attempt is not successful, then the association will be aborted. In some extreme critical situations of system and/or protocol errors, Mowbray will try to preserve its reliability by closing down the network connection without the association being first released or aborted in an orderly manner.

# AE Specifications – Number of Associations

The number of simultaneous associations supported by Mowbray is theoretically unlimited. In practice the number of simultaneous associations will be limited by the kernel parameters of the underlying transport protocol and the resources available (CPU, memory and network interfaces).

# AE Specifications – Asynchronous Nature

The Insignia Medical Systems MWLS AE does not support asynchronous operations (multiple concurrent operations on one association) and all operations are performed synchronously.

# AE Specifications – Implementation Identifying Information

The Implementation UID for this implementation is:

|  |  |
| --- | --- |
| Mowbray Implementation Class UID | 1.3.6.1.4.1.25403.1.1.1 |
| Mowbray Implementation Class Version | DICOM 0.1 |

Table

# Association Initiation by Real-World Activity

Mowbray does not initiate DICOM connections with other AE’s.

# Association Acceptance Policy

Mowbray accepts associations when a real world activity MWLS REQUEST takes place. The MWLS REQUEST activity is defined as any activity, involving:

* Verification of the connection from another AE (CECHO)
* A request from a modality, or other entity, for queering the work list (MWL CFIND)

Mowbray will accept an association request from any AE title.

Mowbray will not release an association unless an abnormal event occurs. In such a case, when needed, Mowbray will first try to release the association orderly. If this attempt is not successful, then the association will be aborted. In some extreme critical situations of system and/or protocol errors, Mowbray will try to preserve its reliability by closing down the network connection without the association been first released or aborted orderly.

# Real-World Activity MWLS Request

The associated real-world activity is one or a combination of:

* MWLS Verification
* Work List Query

Mowbray will return a status of SUCCESS after successful execution of the command, sent in the request. It will return an error status if the request cannot be satisfied because of resource limitations or if a system error occurs during the execution process.

# Presentation Context Table

Mowbray will accept any of the presentation contexts shown below (Table 4):

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Presentation Context Table | | | | | |
| **Abstract Syntax** | | **Transfer Syntax** | | **Role** | **Extended Negotiation** |
| **Name** | **UID** | **Name** | **UID** |
| Verification | 1.2.840.10008.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCP | None |
| Explicit VR Little Endian | 1.2.840.10008.1.2.1 | SCP | None |
| Basic Worklist Management FIND | 1.2.840.10008.5.1.4.31 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCP | None |
| Explicit VR Little Endian | 1.2.840.10008.1.2.1 | SCP | None |

Table

# SOP Verification Class

Mowbray provides standard conformance to this class.

SOP Specific Conformance to Query/Retrieve Class

| Module | Description | Tag | Matching Support | Return Support |
| --- | --- | --- | --- | --- |
| Scheduled Procedure Step | Scheduled Procedure Step Sequence | (0040,0100) | R / Yes | 1 / Yes |
| >Scheduled Station AE Title | (0040,0001) | R / No[[1]](#footnote-1) | 1 / Yes1 |
| >Scheduled Procedure Step Start Date | (0040,0002) | R / Yes | 1 / Yes |
| >Scheduled Procedure Step Start Time | (0040,0003) | R / No | 1 / Yes |
| >Modality | (0008,0060) | R / Yes | 1 / Yes |
| >Scheduled Performing Physician’s Name | (0040,0006) | R / No | 2 / Null |
| >Scheduled Procedure Step Description | (0040,0007) | O / No | 1C / Yes |
| >Scheduled Station Name | (0040,0010) | O / No | 2 / No |
| >Scheduled Procedure Step Location | (0040,0011) | O / No | 2 / No |
| >Scheduled Protocol Code Sequence | (0040,0008) | O / No | 1C / No |
| >Pre-Medication | (0040,0012) | O / No | 2C / No |
| >Scheduled Procedure Step ID | (0040,0009) | O / No | 1 / Yes |
| >Requested Contrast Agent | (0032,1070) | O / No | 2C / No |
| >Scheduled Procedure Step Status | (0040,0020) | O / No | 3 / No |
| Requested Procedure | Requested Procedure ID | (0040,1001) | O / No | 1 / Yes |
| Requested Procedure Description | (0032,1060) | O / No | 1C / Yes |
| Requested Procedure Code Sequence | (0032,1064) | O / No | 1C / No |
| Study Instance UID | (0020,000D) | O / No | 1 / Yes |
| Referenced Study Sequence | (0008,1110) | O / No | 2 / No |
| Requested Procedure Priority | (0040,1003) | O / No | 2 / No |
| Patient Transport Arrangements | (0040,1004) | O / No | 2 / No |
| Imaging Service Request | Accession Number | (0008,0050) | O / No | 2 / Yes |
| Requesting Physician | (0032,1032) | O / No | 2 / No |
| Referring Physician’s Name | (0008,0090) | O / No | 2 / Yes |
| Visit Identification | Admission ID | (0038,0010) | O / No | 2 / Yes |
| Visit Status | Current Patient Location | (0038,0300) | O / No | 2 / Yes |
| Visit Relationship | Referenced Patient Sequence | (0008,1120) | O / No | 2 / No |
| Patient Identification | Patient’s Name | (0010,0010) | R / Yes | 1 / Yes |
| Patient ID | (0010,0020) | R / Yes | 1 / Yes |
| Patient Demographic | Patient’s Birth Date | (0010,0030) | O / No | 2 / Yes |
| Patient’s Sex | (0010,0040) | O / No | 2 / Yes |
| Patient’s Primary Language Code Sequence | (0010,0101) | O / No | 3 / No |
| Patient’s Weight | (0010,1030) | O / No | 2 / No |
| Confidentiality Constraint on Patient Data | (0040,3001) | O / No | 2 / No |
| Patient Medical | Patient State | (0038,0500) | O / No | 2 / No |
| Pregnancy Status | (0010,21C0) | O / No | 2 / No |
| Medical Alerts | (0010,2000) | O / No | 2 / No |
| Allergies | (0010,2110) | O / No | 2 / No |
| Special Needs | (0038,0050) | O / No | 2 / No |
| Non Standard | Filler Order Number Imaging Service Request | (0040,2017) | O / No | 3 / Yes |
| Institution Name | (0008,0080) | O / No | 3 / Yes |

Table

Mowbray will possibly return the following status codes:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Status Code (hex) | Related Fields | Status Type | Meaning | Data Set (Identifier) |
| 0000 | None | Success | Operation has been successfully completed | No |
| A900 | (0000,0902) | Failed | Identifier does not match SOP Class (Invalid Identifier received from SCU) | No |
| 0101 | (0000,0902) | Failed | Processing failure (System Failure) | No |

# Presentation Context Acceptance Criterion

Mowbray will accept any context presentations specified in Table 4.

# Transfer Syntax Selection Policies

Mowbray prefers Explicit VR Little Endian, but will accept any transfer syntaxes that are specified in Table 4, and will also accept more than transfer syntax if more than one Presentation Context is proposed.

# Communication Profiles – Supported Communication Stacks

Mowbray provides DICOM V3.0 Standard TCP/IP network communication support as defined in PS3.8 of the DICOM standard.

Mowbray inherits the TCP/IP stack from the Windows operating system on which Mowbray is executing.

# API

Mowbray uses the ClearCanvas DICOM Toolkit as the interface to the Microsoft .NET Framework’s interfaces to the Windows Sockets library and the TCP/IP stack.

# Physical Media Support

The Insignia Medical Systems MWLS AE makes no assumptions and has no limitation pertaining to the physical media over which the TCP/IP stack is implemented, nor to the actual data-link control protocol, used between the nodes of the PACS.

# Configuration

The AE Title that Mowbray uses for associations and the listening port for DICOM associations is configurable in the application configuration file.

# Support of Extended Character Sets

Mowbray supports the full range of character sets specified in the DICOM standard.

# Extensions, Specializations and Privatizations

Not applicable.

1. Support for this tag is dependent on the backend worklist database. In cases where the Scheduled Station AE Title is not provided by the backend database, Mowbray will return whatever AE Title is sent as part of the query. The assumption is that if the querying AE is looking for worklist items intended for a specific AE, but the backend database does not support it, returning the sought-for AE Title is appropriate, as the backend database design seems to regard Scheduled Station AE Title as irrelevant. [↑](#footnote-ref-1)