

Modality Worklist Server



DICOM Conformance Statement

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1. Introduction

The Insignia Medical systems Modality Worklist Server (MWLS) is an application, which responds to queries for work list information.

The MWLS employs DICOM connectivity with the other components of the Insignia Medical Systems PACS to provide future upgrading and interoperability of all Insignia Medical Systems products, as well as with PACS and medical devices of other vendors. A particular emphasis is made on interoperability issues defined in the IHE Technical Framework (Revision 3.0) and the Modality Interface DICOM Conformance Requirements (Revision 1.0) of The Department Of Veterans Affairs (VA).

This Conformance statement (CS) specifies the compliance of the Insignia Medical Systems MWLS 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.

1.1. References, Definitions and Abbreviations

Refer to Part 2 of DICOM V3.0 Standard for more information about the structure and terminology in this document.

1.2. Integration Issues

This DICOM Conformance Statement by itself is not sufficient to guarantee successful interoperability between Insignia Medical Systems 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 Insignia Medical Systems reserves the right to make changes to the Insignia Medical Systems architecture, related to the issues, described in this document. The user (or user's agent) should ensure that any equipment connected via DICOM to Insignia Medical Systems equipment also follows the future evolution of the DICOM 3.0 standard. Failure to do so may result in loss of connectivity.

1.3. Trademarks

All trade names mentioned in this document are recognised.

2. Implementation Model

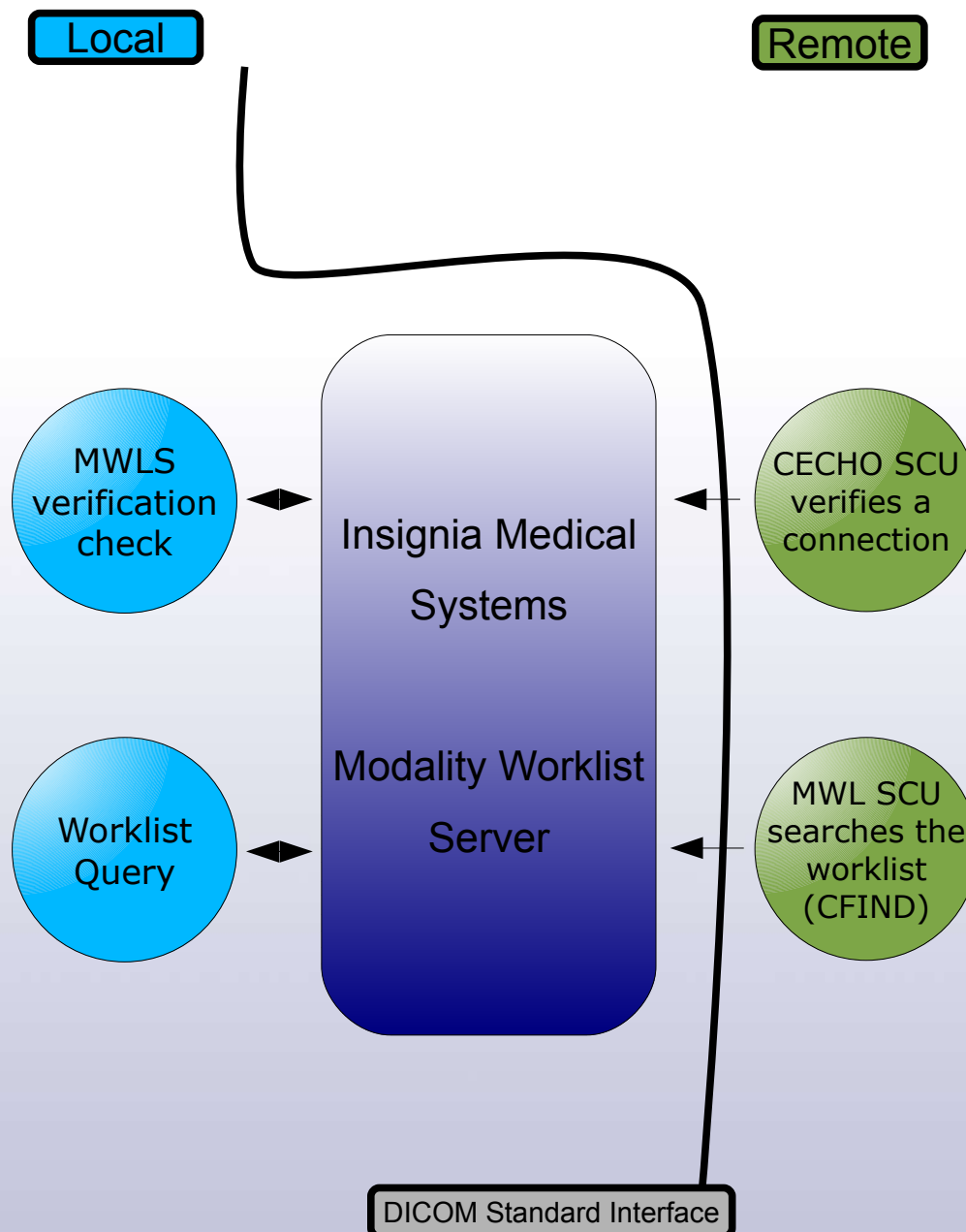
2.1. Application Data Flow Diagram

The MWLS AE is permanently listening for incoming connections. When a connection call arrives, the association request is examined, and if the service is supported, the association is established.

A "CECHO SCU AE" initiates an association in order to verify the DICOM connection to the MWLS. This will cause the MWLS to respond with a status of SUCCESS.

A "MWL SCU" (Modality Work List SCU) initiates an association in order to search for work list information of interest.

Figure 1. Implementation Model



2.2. AE Functional Definitions

The Insignia Medical Systems MWLS AE supports the following services:

- Verification of DICOM connectivity
- Query of work list

2.3. Sequencing of Real World Activities

There are no specific requirements for the sequencing of the real world activities. Information is available for queering at any time. MWLS should be able to maintain the integrity of the database in any sequence of events on the interface.

3. AE Specifications

3.1. Insignia Medical Systems MWLS AE

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

Table 1

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

3.2. Association Establishment Policies

3.2.1. General

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

Table 2

Application Context Name	1.2.840.10008.3.1.1.1
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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.

The Insignia Medical Systems MWLS AE 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, the MWLS 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, the MWLS will try to preserve its reliability by closing down the network connection without the association being first released or aborted in an orderly manner.

3.2.2. Number of Associations

The number of simultaneous associations supported, as a Service Class Provider 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).

3.2.3. 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.

3.2.4. Implementation Identifying Information

The Implementation UID for this Implementation is:

Table 3

MWLS Implementation Class UID	1.2.840.113773.7.14
MWLS Implementation Version	According to product release documentation

3.3. Association Initiation by Real-World Activity

MWLS does not initiate associations with other AE's.

3.4. Association Acceptance Policy

The Insignia Medical Systems MWLS AE 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)

The Insignia Medical Systems MWLS AE will only accept an association request from an AE title, which is known, to it. This means, that the requesting title should be present in the list, supported by the AET List Service (private class), or in the local AET list, configured for each AE.

The Insignia Medical Systems MWLS AE will not release an association unless an abnormal event occurs. In such a case, when needed, the MWLS 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, the MWLS will try to preserve its reliability by closing down the network connection without the association been first released or aborted orderly.

3.4.1. Real world activity MWLS REQUEST

3.4.2. Associated Real-World Activity

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

- MWLS Verification
- Work List Query

The MWLS 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.

3.4.3. Presentation Context Table

The MWLS will accept any of the presentation contexts shown in table 4 below.

Table 4

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name	UID		Negotiation
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	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

3.5. SOP Verification Class

Insignia Medical Systems MWLS provides a standard conformance to this class.

3.6. SOP Specific Conformance to Query/Retrieve Class

Insignia Medical Systems MWLS provides a standard conformance to this class. Keys Supported for Insignia Medical Systems MWLS are shown in table 5 below.

Table 5

Tag Name	Tag	VR/VM	Key Type
Scheduled Procedure Step Module			
Scheduled Procedure Step ID	40, 09	SH	1 Return
Scheduled Procedure Step Description	40, 07	LO	1 Return
Scheduled Action Item Code Value	08,100	SH	1C Return
Scheduled Station AE Title	40, 01	AE	R Match
Modality	8, 60	CS	R Match
Scheduled Procedure Start Date	40, 02	DA	R Match
Scheduled Procedure Start Time	40, 03	TM	R Match
Scheduled Performing Physician Name	40, 06	PN	R Match
Scheduled Procedure Step Status	40,20	CS	3 Match
Scheduled Procedure Step Location	40, 11	SH	3 Match
Requested Procedure Module			
Requested Procedure ID	40, 1001	SH	1 Return
Requested Procedure Description	32, 1060	LO	1 Return
Requested Procedure Code Value	08,100	SH	1C Return
Study Instance UID	20, 0D	UI	1 Return
Requested Procedure Priority	40, 1003	CS	2 Match

Names Of Intended Recipients Of Results	40, 1010	PN/1-3	3 Return
Requested Procedure Comments	40,1400	LT (restricted to 512 chars)	3 Return
Imaging Service Request Module			
Accession Number	8, 50	SH	2 Match
Referring Physician Name	8, 90	PN	2 Return
Requesting Physician	32, 1032	PN	2 Return
Requesting Service	32, 1033	LO	3 Return
Visits Module			
Admission ID	38, 10	LO	2 Return
Current Patient Location	38, 0300	LO	3 Return
Patient Identification			
Patient Name	10, 10	PN	R Match
Patient ID	10, 20	LO	R Match
Other Patient IDs	10,1000	LO/1-3	3 Return
Patient Birth Date	10, 30	DA	2 Return
Patient Sex	10, 40	CS	2 Return
Patient Comments	10, 4000	LT (restricted to 512 chars)	3 Return

Status responses, returned by Insignia Medical Systems MWLS are shown in table 6 below.

Table 6

STATUS CODE (Hexadecimal)	RELATED FIELDS	STATUS TYPE	MEANING	DATA SET (IDENTIFIER)
0000	None	Success	Operation has been successfully completed.	No
FF00	None	Pending	Matches are continuing. Current match is supplied in the identifier and any optional keys are supported in the same manner as required keys.	Yes
FFF1	None	Pending	Matches are continuing. Current match is supplied in the identifier. WARNING, that one or more optional keys are not supported for existence	Yes
A900	(0000,0902)	Failed	Identifier does not match SOP Class (Invalid Identifier received from SCU)	No
C000	(0000,0902)	Failed	Unable to process due to a system congestion	No
0110	(0000,0902)	Failed	Processing Failure (System Failure)	No

3.6.1. Presentation Context Acceptance Criterion

Insignia Medical Systems MWLS will accept any number of presentation contexts up to the maximum number, listed in table 4.

3.6.2. Transfer Syntax Selection Policies

Section is not applicable.

4. Communication Profiles

4.1. Supported Communication Stacks – TCP/IP Stack

The Insignia Medical Systems MWLS AE provides DICOM V3.0 Standard TCP/IP network communication support as defined in PS3.8 of the DICOM standard.

The Insignia Medical Systems MWLS AE inherits the TCP/IP stack from the operating system of the computer system upon which the MWLS AE is executing. The platform can be a variation of UNIX or Windows.

4.2. API

The MWLS uses the Insignia Medical Systems Application-Programming Interface as the interface to the TCP/IP stack in two modifications: Windows Sockets 2.1 and UNIX Berkeley Sockets

4.3. 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.

5. Configuration

5.1. AE Title/Presentation address mapping

The mapping is performed dynamically at run time by the AET List service (private class). The list is encrypted and initially is set up through a configuration tool, running anywhere in the PACS network. When the AET List service is not supported, each PACS AE, including Insignia Medical Systems MWLS, uses a local list, which can be set through ordinary tools, available on any system. In this case, the user can change the application entity title at the time of integration of the device within their system. The default name will be MC-ISIMS- (dongle number) as this will ensure uniqueness within a networked system. The port number is configurable and this must be noted so as not to conflict with another DICOM AE executing on the same machine.

5.2. Configurable Parameters

There are no parameters, related to the standard DICOM protocol, which need to be set by the user. The system automatically chooses the optimal parameters for parameters like PDU size, number of simultaneous associations' etc. All parameters can be set up dynamically at run time by the PACS Control service (private class). When this service is not supported, the user can initially set up manually the following parameters:

- Association Request/Reject/Release time-out (default is 60 seconds)
- Inter-block communication time-out (default is INFINITE)
- AE Titles List
- MWLS Network Address (Host Name) and Port
- MWLS AE Title

5.3. Support of Extended Character Sets

ISO-IR 100.

5.4. Extensions, Specialisations and Privatisations

Section is not applicable.