



Sante Worklist Server

HL7 And DICOM Conformance Statement

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About this document

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HL7 Conformance Statement

1. Overview

This HL7 conformance statement outlines the HL7 capabilities of Sante Worklist Server system, describing how it implements HL7 messaging for clinical data exchange.

2. Intended audience

This conformance statement is aimed at:

- system integrators of medical equipment who are responsible for integrating Sante Worklist Server with related products, such as PACS or medical imaging scanners.
- Software designers implementing HL7 interfaces.

The reader of this document is assumed to have a working understanding of the IHE Radiology Technical Framework and HL7 standard, and this document should be read in conjunction with that standard.

3. References

- Health Level Seven Standard: <https://www.hl7.org>
- IHE home: <https://www.ihe.net>
- IHE Radiology Technical Framework https://www.ihe.net/Technical_Frameworks
- DICOM Standard <https://www.dicomstandard.org/>

4. Communication Protocols

- **TCP communications**

Sante Worklist Server supports a TCP/IP interface for receiving HL7 messages using the Minimal Lower Layer Protocol (MLLP). Messages received via the socket must conform to the MLLP format as follows:

- Each message must begin with a Start Block code (0x0B)
- Each segment within the message must be terminated with a Carriage Return code (0x0D)
- Each message must be terminated by an End Block code (0x1C) followed by a Carriage Return code (0x0D)

When importing messages via the TCP/IP interface, an acknowledgement messages are generated.

The port on which Sante Worklist Server accepts incoming messages is configurable by the program's administrator.

- **Monitoring Folder**

The program supports importing messages from files written to a monitoring folder. The files must have a .txt or .hl7 extension. When importing messages via the monitoring folder, no acknowledgement messages are generated. The files are deleted after they are imported. If the import fails, the failed file is given a .err extension and is not deleted.

The monitoring folder in which Sante Worklist Server accepts incoming messages is configurable by the program's administrator.

5. Supported HL7 Messages

Message Type	Event Type	Description	Notes
ORM	O01	General Order Message	Supports laboratory and radiology orders.

6. Inbound messages

Successfully received messages generate records in the database of Sante Worklist Server. The database field / HL7 field mapping can be configured by the program's administrator. The default mapping is:

Database field	Default HL7 field
PATIENT_ID*	PID-3
PATIENT_NAME*	PID-5
PATIENT_BIRTHDATE	PID-7
PATIENT_SEX	PID-8
PATIENT_TELEPHONE_NUMBER	PID-13
PATIENT_ADDRESS	PID-11
SCHEDULED_PROCEDURE_STATUS	ORC-5
ACCESSION_NUMBER	ORC-2
REQUESTING_PHYSICIAN_NAME	OBR-16
REFERRING_PHYSICIAN_NAME	PV1-8
REQUESTED_PROCEDURE_DESCRIPTION	OBR-4
MODALITY	OBR-18
STUDY_DESCRIPTION	OBR-20
START_DATE_TIME	ORC-15
TECHNICIAN_NAME	OBR-34
SCHEDULED_PROCEDURE_STEP_ID	OBR-4
SCHEDULED_STATION_AE_TITLE	OBR-21
SCHEDULED_STATION_NAME	OBR-24
REQUESTED_PROCEDURE_ID	OBR-4
REQUESTED_PROCEDURE_PRIORITY	OBR-27
STUDY_INSTANCE_UID	ZDS-1

(* = required field)

7. Enter Booking

The HL7 message for supplying this information is ORM^O01 with NW in ORC-1 (Order message – new order). The information that is required for the booking entry is:

- Patient Name
- Patient ID

8. Update Booking

The HL7 message for supplying this information is ORM^O01 with XO or SC in ORC-1 (Order message –change order request). The information that is required for updating the booking is:

- Patient Name
- Patient ID
- Requested Procedure ID
- Scheduled Station AE Title

9. Cancel Booking

The HL7 message for supplying this information is ORM^O01 with CA in ORC-1 (Order message – cancel order request). The information that is required for canceling the booking is:

- Patient Name
- Patient ID
- Requested Procedure ID
- Scheduled Station AE Title

10. Acknowledgements

Whenever an incoming HL7 message via the TCP/IP interface requests an acknowledgement (field MSH-15 has the value AL or SU), an acknowledgement message is returned. If the message is successfully processed, the acknowledgement code used is AA. If processing fails, the acknowledgement code is set to AE. The program can be configured to return an acknowledgement message regardless of the value of field MSH-15. Acknowledge messages are built using the same start and end indicators and segment separator as in the input messages.

11. Supported Charsets

The default charset of the program is UTF-8, and it can be configured by the program's administrator.

12. Auto-generated Study Instance UID

The program can auto-generate Study Instance UIDs when this field is required by a modality and is not included in the HL7 messages.

DICOM Conformance Statement

1. Overview

This DICOM Conformance Statement describes the support for the C-FIND request and response service for Modality Worklist Management (MWL) in the Sante Worklist Server. The server enables DICOM-compliant modalities (such as CT, MRI, and ultrasound systems) to query and retrieve scheduled procedure information. It can also retrieve worklist entries from other worklist servers. This statement is intended for developers and system integrators to ensure seamless interoperability with the Sante Worklist Server.

2. Intended audience

This conformance statement is aimed at:

- system integrators of medical equipment who are responsible for integrating Sante Worklist Server with related products, such as PACS or medical imaging scanners.
- Software designers implementing HL7 interfaces.

The reader of this document is assumed to have a working understanding of the DICOM standard, and this document should be read in conjunction with that standard.

3. References

- DICOM Standard <https://www.dicomstandard.org/>

4. DICOM Communication Services

Sante Worklist Server implements the Modality Worklist Information Model - FIND to support DICOM modality worklist queries. The server allows modalities to query for scheduled procedures and returns matching entries based on the query parameters provided.

- DICOM Service Class: Modality Worklist Information Model - FIND
- SOP Class UID: 1.2.840.10008.5.1.4.31
- Communication Protocol: DICOM over TCP/IP
- Transfer Syntax: Implicit VR Little Endian (1.2.840.10008.1.2)
- Max PDU Size: 16384 bytes

5. Application Entity (AE) Specifications

Parameter	Value
AE Title	SANTEWL1
Supported SOP Class	Modality Worklist Information Model - FIND
Transfer Syntax	Implicit VR Little Endian (1.2.840.10008.1.2)
Max PDU Size	16384 bytes
Supported DICOM Service	C-FIND

6. C-FIND Request (Query Keys)

The C-FIND request allows modalities to query the worklist for scheduled procedures. Sante Worklist Server supports the following attributes as query keys:

DICOM Tag	Attribute Name	Description
(0010,0010)	Patient Name	Patient's full name
(0010,0020)	Patient ID	Unique identifier of the patient
(0010,0030)	Patient Birth Date	Patient's date of birth
(0010,0040)	Patient Sex	Patient's sex
(0008, 0050)	Accession Number	Accession Number
(0040,0002)	Scheduled Procedure Step Start Date	Start date of the procedure
(0040,0003)	Scheduled Procedure Step Start Time	Start time of the procedure
(0008,0060)	Modality	Requested modality (e.g., CT, MR)
(0040,0001)	Scheduled Station AE Title	AE title of the scheduled station

7. C-FIND Response (Worklist Entries)

When a C-FIND request is received, Sante Worklist Server processes the query and returns matching worklist entries. Each entry includes the key attributes specified in the C-FIND request, for example:

DICOM Tag	Attribute Name	Description
(0010,0010)	Patient Name	Full name of the patient
(0010,0020)	Patient ID	Unique identifier of the patient
(0010,0030)	Patient Birth Date	Patient's date of birth
(0008,0060)	Modality	Modality type (e.g., CT, MR)
(0040,0100)	Scheduled Procedure Step Sequence	Detailed information about the procedure step
(0040,0002)	Scheduled Procedure Step Start Date	Date the procedure is scheduled
(0040,0003)	Scheduled Procedure Step Start Time	Time the procedure is scheduled
(0040,0010)	Scheduled Station Name	Name of the scheduled station
(0040,0001)	Scheduled Station AE Title	AE title of the scheduled station

8. Error Handling and Status Codes

Sante Worklist Server responds to C-FIND requests with appropriate DICOM status codes depending on the result of the query.

Status Code	Description
0x0000	Success
0xA700	Out of Resources
0xA900	Identifier does not match SOP Class

Status Code	Description
0xC000	Unable to process

9. Network Configuration

Sante Worklist Server communicates over TCP/IP using the DICOM protocol. The following network settings must be configured:

Parameter	Value
AE Title	Configurable Application Entity Title for the worklist server
Port	787 (default, configurable)

10. Conclusion

This DICOM Conformance Statement outlines the capabilities of Sante Worklist Server for handling C-FIND requests and responses for modality worklist management. The server is designed to seamlessly integrate with DICOM-compliant modalities to provide accurate scheduling and worklist information. For further technical details or troubleshooting, please consult the system administrator or refer to the program's user manual.