DICOM CONFORMANCE STATEMENT

Medical Exposure Management Information System

onti

Contents

1 INTRODUCTION

1.1 DOCUMENT HISTORY

Date	Revision	Author	Description
October 31, 2023, 2023	1.0	PDRadiopharma Inc.	Initial Version

1.2 IMPORTANT

- The copyright of this document belongs to PDRadiopharma Inc.
- This content is subject to change without notice.
- Reproduction, duplication, modification, etc. of part or all of this document without permission from our company is prohibited.
- onti is a trademark of PDRadiopharma Inc. This manual may include trademarks or registered trademarks of other companies.

This document is written for the people that need to understand how the onti Software 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. Also note that this document is formatted according to the DICOM 3.0 Specification, Part 2: Conformance.

The scope of this DICOM Conformance Statement is to facilitate integration between the "onti" Software 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.

- 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.
- The ”onti” product participate in an industry-wide testing program sponsored by Integrating the Healthcare Enterprise (IHE). Together with the IHE Technical Framework, may facilitate the process of validation testing.

2 CONFORMANCE STATEMENT OVERVIEW

The product name is ”onti”. This product is a system that implements DICOM services necessary for recording and managing medical exposures. It is also possible to download the worklist from the information system. Table 1 overview the network services supported by onti.

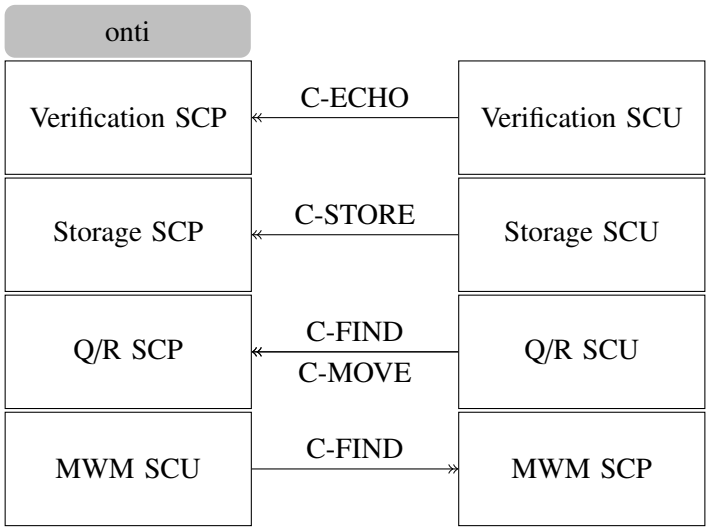
Table 1: Network Services

SOP Classes	**User of Service (SCU)**	**Provider of Service (SCP)**
Transfer		
Computed Radiography Image Storage	No	Yes
Digital X-Ray Image Storage – For Presentation	No	Yes
Digital Mammography X-Ray Image Storage For Presentation	No	Yes
CT Image Storage	No	Yes
MR Image Storage	No	Yes
Ultrasound Image Storage	No	Yes
Secondary Capture Image Storage	No	Yes
X-Ray Angiographic Image Storage	No	Yes
X-Ray Radiofluoroscopic Image Storage	No	Yes
Nuclear Medicine Image Storage	No	Yes
X-Ray Radiation Dose SR Storage	No	Yes
Radiopharmaceutical Radiation Dose SR Storage	No	Yes
Positron Emission Tomography Image Storage	No	Yes
RT Structure Set Storage	No	Yes
Query/Retrieve		
Study Root Information Model – FIND	No	Yes
Study Root Information Model – MOVE	No	Yes
Workflow Management		
Modality Worklist	Yes	No

3 NETWORK

3.1 DICOM DATA FLOW DIAGRAM

Figure 1 ：DICOM DATA FLOW DIAGRAM



3.1.1 Functional Definition of AE's

- Verification SCP
  - After setting the conditions of the remote AE (AE Title, IP Address, Port Number), establish an association with the remote AE using the C-ECHO protocol.
- Storage SCP
  - After setting the conditions of the remote AE (AE Title, IP Address, Port Number), an object is received from the remote AE using the C-STORE protocol.
- Query/Retrieve SCP
  - After setting the conditions of the remote AE (AE Title, IP Address, Port Number), it returns search results to the request from the remote AE using the C-FIND protocol.

  - Transmits the requested image to the remote AE using the C-MOVE protocol.

- MWM SCU
  - After setting the conditions of the remote AE (AE Title, IP Address, Port Number), retrieve the Worklist from the remote AE using the C-FIND protocol.

Sequencing of Real-World Activities: Not applicable.

3.2 AE SPECIFICATIONS

3.2.1 Verification SCP

- SOP Class
  - Table2, The Verification SCP AE provides Standard Conformance to the following SOP Class.
- Association Policies
  - General
    - Table3, The DICOM standard application context name for DICOM 3.0 is always proposed.
  - Number of Associations
    - Does not support simultaneous associations. Maximum one.
  - Asynchronous Nature
    - Does not support asynchronous communication.
- Association Acceptance Policy
  - Negotiates for an Association establishment request by C-ECHO of the remote AE (SCU).
  - Accepts a request from a remote AE (SCU) to establish an association by C-ECHO and returns a ”normal” or ” error” response to the remote AE (SCU) after the internal processing.
- Accepted Presentation Contexts
  - Table4, Accept the Presentation Context.
- SOP specific conformance for Verification SOP Class
  - Provides standard conformance to the Verification SCP Class that can be received as an SCP.
  - Use C-STORE

Table 2: Standard Conformance to the following SOP Class

SOP Class Name	**SOP Class UID**	**SCP**
Verification	1.2.840.10008.1.1	Yes

Table 3: Application Context Name

Application Context Name	1.2.840.10008.3.1.1.1

Table 4: Presentation Context

Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name**	**UID**		**Negotiation**
Verification C-ECHO	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008. 1.2	SCP	None

3.2.2 Storage SCP

- SOP Class
  - Table5, The Storage SCP AE provides Standard Conformance to the following SOP Class.
- Association Policies
  - General
    - Table6, The DICOM standard Application Context Name for DICOM is always accepted.
  - Number of Associations
    - Does not support simultaneous associations. Maximum one.
  - Asynchronous Nature
    - Does not support asynchronous communication.
- Association Acceptance Policy
  - Receives a request by C-STORE of a remote AE (SCU).
  - Receives a request by C-STORE from a remote AE (SCU) for a Receivable class Object (Images and Dose SR).
  - Received objects are stored in the specified local location.
- Accepted Presentation Contexts
  - Accepts the Presentation Context of Table7 and Table8.
- SOP specific conformance for Storage SOP Class
  - Provides standard conformance to the Storage SOP Class that can be received as an SCP.
  - Use C-STORE

Table 5: Standard Conformance to the following SOP Class

SOP Classes	**SOP Class UID**	**SCP**
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	Yes
Radiopharmaceutical Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.68	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes

Table 6: Application Context Name

Application Context Name	1.2.840.10008.3.1.1.1

Table 7: Abstract Syntax

Name List	**UID List**	**Role**	**Extended Negotiation**
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	SCP	None
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	SCP	None
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	SCP	None
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	SCP	None
Radiopharmaceutical Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.68	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	SCP	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	SCP	None

Table 8: 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
JPEG Lossless, Nonhierarchical, First- Order Prediction	1.2.840.10008.1.2.4.70
JPEG-LS Lossless Image Compression	1.2.840.10008.1.2.4.80
JPEG 2000 Image Compression (Lossless)	1.2.840.10008.1.2.4.90
JPEG 2000 Image Compression (Lossy)	1.2.840.10008.1.2.4.91

3.2.3 Query/Retrieve SCP

- SOP Class
  - Table9, The Query/Retrieve SCP AE provides Standard Conformance to the following SOP Class.
- Association Policies
  - General
    - Table10, The DICOM standard Application Context Name for DICOM is always accepted.
  - Number of Associations
    - Does not support simultaneous associations. Maximum one.
  - Asynchronous Nature
    - Does not support asynchronous communication.
- Association Acceptance Policy
  - Returns matching information for a C-FIND request from a remote AE (SCU).
  - When a C-MOVE request is received from a remote AE (SCU), the result of the request is returned.
  - For a C-FIND request from a remote AE (SCU), the contents of the request are checked against the internal database and the matching information is returned.
  - When a C-MOVE request is received from a remote AE (SCU), it returns the result (success/failure) of the transfer of the request contents.
- Accepted Presentation Contexts
  - Accepts the Presentation Context of Table11.
- SOP specific conformance for Query SOP Class
  - 3 levels (Study, Series, Image) are supported for C-FIND requests. The standard search item is Table12.
- SOP specific conformance for Retrieve SOP Class
  - Use C-MOVE
  - The transfer syntax supported Table13.

Table 9: Standard Conformance to the following SOP Class

SOP Classes	SOP Class UID	SCP
Study Root Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes
Study Root Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes

Table 10: Application Context Name

Application Context Name	1.2.840.10008.3.1.1.1

Table 11: Presentation Context

Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID List	Name	UID List		Negotiation
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

Table 12: Search

Level	Attribute Name	Tag	Type
Study	Study Date	0008, 0020	Required Key
	Study Time	0008, 0030	Required Key
	Accession Number	0008, 0050	Required Key
	Study ID	0020, 0010	Required Key
	Study Instance UID	0020, 000D	Unique Key
	Study Description	0008, 1030	Option
Series	Modality	0008, 0060	Required Key
	Series Number	0008, 0011	Required Key
Image	SOP Instance UID	0008, 0018	Unique Key
	Instance Number	0020, 0013	Required Key

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
JPEG Lossless, Nonhierarchical, First – Order Prediction	1.2.840.10008.1.2.4.70
JPEG-LS Lossless Image Compression	1.2.840.10008.1.2.4.80
JPEG 2000 Image Compression (Lossless)	1.2.840.10008.1.2.4.90
JPEG 2000 Image Compression (Lossy)	1.2.840.10008.1.2.4.91

3.2.4 MWM SCU

- SOP Class
  - Table14, The MWM SCU AE provides Standard Conformance to the following SOP Class.
- Association Policies
  - General
    - Table15, The DICOM standard Application Context Name for DICOM is always accepted.
  - Number of Association
    - Does not support simultaneous associations.
    - One Association is started at a time for each worklist request.
  - Asynchronous Nature
    - Does not support asynchronous communication.
- Association Acceptance Policy
  - A Worklist query request is initiated.
  - Requests C-FIND. Send to remote AE (SCP).
  - Get response from the remote AE (SCP).
- Accepted Presentation Contexts
  - Accepts the Presentation Context of Table16.
- SOP specific conformance for Modality Worklist
  - Attributes are DICOM standard.

Table 14: Standard Conformance to the following SOP Class

SOP Class	**SOP Class UID**	**SCU**
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes

Table 15: Application Context Name

Application Context Name	1.2.840.10008.3.1.1.1

Table 16: Presentation Context

Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name**	**UID**		**Negotiation**
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.3 COMMUNICATION PROFILES

- Supported Communication Stack
  - DICOM Part 8: TCP/IP Network Communication
- TCP/IP Stack
  - Use the TCP/IP stack of the Microsoft Windows Operating System.

3.4 CONFIGURATION

- Mapping
  - AE Title, TCP/IP and Port Number are set.
- Parameter
  - Setting
    - AE Title（Default: onti_ae）
    - TCP/IP
    - Port Number
    - MWM – SCU（Search acquisition item settings.）

4 SUPPORT OF EXTENDED CHARACTER SETS

Table17, This product supports the following character sets.

Table 17: character sets

ISO	
ISO 2022 IR 6	Default (ISO 646)
ISO 2022 IR 87	JIS X 0208 (Kanji)
ISO 2022 IR 100	