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**NEOVISTA**  
**I-PACS CX**

医用画像管理システム  
**NEOVISTA**  
**I-PACS CX**

Version 1.00

**DICOM3.0**  
**Conformance**  
**Statement**  
**For PACS Viewer**

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## *Revision History*

<b>Date</b>	<b>Version</b>	<b>Change</b>
2016-07-05	V1.00	First edition
2017-04-22	V1.00	Changed the design of cover page.
2017-09-25	V1.00	Updated for SOP Classes Supported, and Presentation Context List.

## **NOTE**

If you cannot find the answer to your questions in any of the documentation, contact I-PACS CX Technical Support. Please include any relevant logs, usage descriptions, or other data that may be helpful in diagnosing the problem in your submission.

## ***1 Introduction***

This conformance statement (CS) specifies the compliances of I-PACS CX Viewer to DICOM. It details the DICOM Service Classes and the roles that are supported by this product.

## 2 DICOM Conformance Statement

This conformance statement (CS) specifies the compliance of I-PACS CX Viewer to DICOM.

It details the DICOM Service Classes and the roles that are supported by this product.

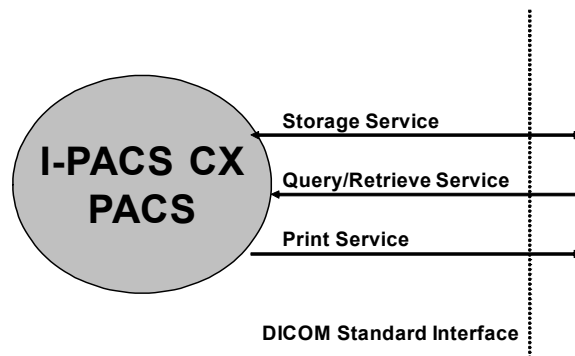
I-PACS CX Viewer is a powerful web-based 3D-enabled DICOM viewing station running on Microsoft Windows. It uses DICOM services to store images, to export images to other DICOM applications, to import images from other DICOM applications, and to print images to DICOM-compliant printers.

Note that the format for this article strictly follows that of the DICOM Standard Part 2 (Conformance) Annex A. Thus, it is advised for the readers to refer to that part of the standard while reading this article.

### 2.1 Implementation Model

#### 2.1.1 Application Data Flow Diagram

The basic and specific application models for I-PACS CX Viewer are shown in the following figure.



I-PACS CX Viewer uses DICOM protocol to send images and GSPS Information Objects, to query studies/series/images and GSPS Information Objects, to print images, and to receive images and GSPS Information Objects from other hosts.

I-PACS CX Viewer is related to the following Real World Activities:

- Send images and GSPS Information Objects to a remote host
- Receive images and GSPS Information Objects from remote hosts
- Query studies, series or images and GSPS Information Objects from a remote host
- Print grayscale and color images to a remote DICOM printer

Users can send images at Worklist or Viewer of I-PACS CX Viewer.

All the remote DICOM applications must be manually configured on I-PACS CX Viewer.

#### 2.1.2 Fundamental Definition of AE's

I-PACS CX Viewer supports the following functions:

- Access to patient demographics and pixel data in the remote database
- Initiate a DICOM association to send images and Grayscale Presentation State IEs to a remote host
- Respond to DICOM associations to receive images and Grayscale Presentation State IEs from remote hosts
- Initiate a DICOM association to print images to a remote host

### 2.1.3 Sequencing of Real-World Activities

Not Applicable

## 2.2 AE Specifications

### 2.2.1 SOP Classes Supported

I-PACS CX Viewer provides conformance to the following SOP Classes as an SCU.

SOP Class Name	SOP Class UID
Standard CR Image Storage	1.2.840.10008.5.1.4.1.1.1
Standard Digital X-ray Image Storage (presentation, processing)	1.2.840.10008.5.1.4.1.1.1.1 1.2.840.10008.5.1.4.1.1.1.1.1
Standard Mammography Image Storage (presentation, processing)	1.2.840.10008.5.1.4.1.1.1.2 1.2.840.10008.5.1.4.1.1.1.2.1
Standard Intra-oral X-ray Image Storage (presentation, processing)	1.2.840.10008.5.1.4.1.1.1.3 1.2.840.10008.5.1.4.1.1.1.3.1
Standard CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1
Standard US Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Standard MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
Standard US Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Standard Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Standard Overlay Storage	1.2.840.10008.5.1.4.1.1.8
Twelve Lead ECG Storage	1.2.840.10008.5.1.4.1.1.9.1.1
Standard Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10
Standard VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Standard X-ray Angio Image Storage	1.2.840.10008.5.1.4.1.1.12.1
Standard X-ray Radio Fluoroscopy Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Standard NM Image Storage	1.2.840.10008.5.1.4.1.1.20
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2
Standard VL Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.77.2
Standard VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
Standard Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1
Standard VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
Standard Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1
Standard VL Slide Microscopic Storage	1.2.840.10008.5.1.4.1.1.77.1.3
Standard VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
Standard Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1
Standard Ophthalmic Photographic 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1
Standard Ophthalmic Photographic 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2
Structured Reporting Storage (Basic Text, Enhanced SR, Comprehensive)	1.2.840.10008.5.1.4.1.1.88.11 1.2.840.10008.5.1.4.1.1.88.22 1.2.840.10008.5.1.4.1.1.88.33
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65
Standard PET Image Storage	1.2.840.10008.5.1.4.1.1.128

Standard PET Curve Storage	1.2.840.10008.5.1.4.1.1.129
Standard RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1

Table 2-1: SOP Classes Supported as an SCU

### 2.2.1.1 Association Establishment Policies

#### 2.2.1.1.1 General

Before any SOP Classes can be exchanged between I-PACS CX Viewer and other DICOM applications, an association stage takes place to negotiate and exchange the capabilities of the SCU and SCP. I-PACS CX Viewer and other DICOM applications establish an association by using the Association Services of the DICOM Upper Layer. During association establishment stage, I-PACS CX Viewer negotiates the supported SOP classes.

The DICOM Application Context Name (ACN), which is always proposed, is:

<b>Application Context Name</b>	<b>1.2.840.10008.3.1.1.1</b>
---------------------------------	------------------------------

The Maximum Length PDU negotiation is included in all association establishment requests. However, the Maximum Length PDU for an association cannot be greater than:

<b>Maximum Length PDU</b>	<b>64234 bytes</b>
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The SOP Class Extended Negotiation is not supported. The user information items sent by this application are:

- Maximum PDU Length
- Implementation UID

#### 2.2.1.1.2 Number of Associations

The number of associations as an SCU is always 1 (one). This means I-PACS CX Viewer makes only one association to the other DICOM application. Also I-PACS CX Viewer does not make multiple associations when transferring images to multiple DICOM applications.

#### 2.2.1.1.3 Asynchronous Nature

Asynchronous mode is not supported. All operations will be performed synchronously.

#### 2.2.1.1.4 Implementation Identifying Information

The Implementation Version Name and the Implementation Class UID are as follows:

<b>Implementation Version Name</b>	<b>KM_CX_4.5</b>
<b>Implementation Class UID</b>	<b>1.2.392.200036.9107.660</b>



### 2.2.1.2 Association Initiation Policy

I-PACS CX Viewer initiates a new association to transfer images. This association corresponds to two Real-World Activities.

#### 2.2.1.2.1 Real-World Activity – Send DICOM Images, SRs and Presentation States to others

##### 2.2.1.2.1.1 Associated Real-World Activity

Users can send all images of specified studies at Worklist of I-PACS CX Viewer or can send user-selected images at the Viewer Window of I-PACS CX Viewer.

All Grayscale Presentation State Objects associated with selected images will be automatically sent to the same destination. Alternatively a user can explicitly select which GSPS IEs shall be sent together with the images or to send a GSPS IE without the images,

##### 2.2.1.2.1.2 Proposed Presentation Contexts

Transfer Syntax Table - Proposed	
Transfer Syntax	UID
Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2
JPEG Baseline Transfer Syntax	1.2.840.10008.1.2.4.50
JPEG Extended Transfer Syntax	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical, First-Order Prediction Transfer Syntax	1.2.840.10008.1.2.4.70
JPEG2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
JPEG2000 Image Compression	1.2.840.10008.1.2.4.91
RLE Transfer Syntax	1.2.840.10008.1.2.5

Table 2-2: Transfer Syntax List – Proposed

Presentation Context Table – Proposed				
Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class Name	SOP Class UID			
CR Image Storage	1.2.840.10008.5.1.4.1.1.1	All from Table 2-3	SCU	None
Digital X-ray Image Storage (Presentation, Processing)	1.2.840.10008.5.1.4.1.1.1.1 1.2.840.10008.5.1.4.1.1.1.1.1	All from Table 2-3	SCU	None
Mammography Image Storage (Presentation, Processing)	1.2.840.10008.5.1.4.1.1.1.2 1.2.840.10008.5.1.4.1.1.1.2.1	All from Table 2-3	SCU	None
Intra-oral X-ray Image Storage (Presentation, Processing)	1.2.840.10008.5.1.4.1.1.1.3 1.2.840.10008.5.1.4.1.1.1.3.1	All from Table 2-3	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	All from Table 2-3	SCU	None
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	All from Table 2-3	SCU	None

US Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	All from Table 2-3	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	All from Table 2-3	SCU	None
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	All from Table 2-3	SCU	None
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	All from Table 2-3	SCU	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	All from Table 2-3	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	All from Table 2-3	SCU	None
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	All from Table 2-3	SCU	None
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	All from Table 2-3	SCU	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	All from Table 2-3	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	All from Table 2-3	SCU	None
X-ray Angio Image Storage	1.2.840.10008.5.1.4.1.1.12.1	All from Table 2-3	SCU	None
X-ray Radio Fluoroscopy Image Storage	1.2.840.10008.5.1.4.1.1.12.2	All from Table 2-3	SCU	None
NM Image Storage	1.2.840.10008.5.1.4.1.1.20	All from Table 2-3	SCU	None
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	All from Table 2-3	SCU	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	All from Table 2-3	SCU	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	All from Table 2-3	SCU	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	All from Table 2-3	SCU	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	All from Table 2-3	SCU	None
Basic Text Structured Report	1.2.840.10008.5.1.4.1.1.88.1.1	All from Table 2-3	SCU	None
Enhanced Structured Report	1.2.840.10008.5.1.4.1.1.88.2.2	All from Table 2-3	SCU	None
Comprehensive Structured Reporting	1.2.840.10008.5.1.4.1.1.88.3.3	All from Table 2-3	SCU	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.5.9	All from Table 2-3	SCU	None
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	All from Table 2-3	SCU	None
Standard PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	All from Table 2-3	SCU	None
Standard RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	All from Table 2-3	SCU	None

Table 2-3: Presentation Context List – Proposed

**2.2.1.2.1.2.1 SOP Specific Conformance for Instance Storage SOP Classes**

This implementation can perform multiple C-STORE operations over a single association. Upon receiving a C-STORE confirmation containing a Successful status, this implementation will perform the next C-STORE operation. The association will be maintained if possible. Upon receiving a C-STORE confirmation containing an Error or a Refused status, this implementation will terminate the association. The current C-STORE operation is considered as failed. Upon receiving a C-STORE confirmation containing a Warning status, this implementation will treat it as a Success response.

The following timers are related to the Image Storage SCU. If any of these timers expires, the connection is closed and the operation is considered as failed.

Timer Name	Default (in sec.)	Meaning
ARTIM_TIMEOUT	90	The number of seconds to use as timeout waiting for association request or waiting for the peer to shut down an association.
ASSOC_REPLY_TIMEOUT	60	The number of seconds to wait for reply to associate request.
RELEASE_TIMEOUT	60	The number of seconds to wait for reply to associate response.
WRITE_TIMEOUT	60	The numbers of seconds to wait for a network write to be accepted.
CONNECT_TIMEOUT	60	The numbers of seconds to wait for a network connect to be accepted.
INACTIVITY_TIMEOUT	60	The number of seconds to wait for data between TCP/IP packets.

Table 2-4: Timers for the Image Storage SCU

When I-PACS CX Viewer initiates an association to issue a C-STORE operation, the image will be transmitted with the same elements in which it was received.

**2.2.1.3 Association Acceptance Policy**

**2.2.1.3.1 Real-World Activity – Print Studies and Images to a DICOM-compliant printer**

**2.2.1.3.1.1 Associated Real-World Activity**

I-PACS CX Viewer allows the user to select images at its Viewer windows and print them into a DICOM-compliant printer. It also allows the user to manipulate some print parameters like the number of films and film format. When the user pressed “Print” button at the Print Configuration dialog box, I-PACS CX Viewer tries to establish an association to the DICOM-compliant printer and sends images for printing.

**2.2.1.3.1.2 Proposed Presentation Contexts**

The proposed Presentation Context table for the Print Management SCU is as shown in the following table.

Transfer Syntax Table - Proposed	
Transfer Syntax	UID
Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2

Table 2-5: Transfer Syntax List - Proposed

Presentation Context Table – Proposed				
Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class Name	SOP Class UID			
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	All from Table 2-16	SCU	None
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	All from Table 2-16	SCU	None
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	All from Table 2-16	SCU	None

Table 2-6: Presentation Context List - Proposed

If at least one of the images selected is a color image (= “Color Print”), I-PACS CX Viewer proposes following Presentation Contexts in the association request:

Presentation Context Table – Proposed				
Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class Name	SOP Class UID			
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	All from Table 2-16	SCU	None
Basic Annotation Box SOP Class	1.2.840.10008.5.1.1.15	All from Table 2-16	SCU	None

Table 2-7: Basic Color Print Management Meta SOP Class List

### 2.2.1.3.1.2.1 SOP Specific Conformance for Basic Grayscale Print Management SOP Classes

I-PACS CX Viewer supports the following mandatory SOP Classes which are defined under the Basic Grayscale Print Management Meta SOP Class.

SOP Class Name	SOP Class UID
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23
Printer SOP Class	1.2.840.10008.5.1.1.16

Table 2-8: Mandatory Print SOP Classes supported by the Grayscale Print SCU

The following timers are related to the Print Management SCU.

If any of these timers expires, the connection is closed and the operation is considered as failed.

Timer Name	Default (in sec.)	Meaning
ARTIM_TIMEOUT	90	The number of seconds to use as timeout waiting for association request or waiting for the peer to shut down an association.
ASSOC_REPLY_TIMEOUT	60	The number of seconds to wait for reply to associate request.
RELEASE_TIMEOUT	60	The number of seconds to wait for reply to associate response.
WRITE_TIMEOUT	60	The number of seconds to wait until a network write is completed.
CONNECT_TIMEOUT	60	The number of seconds to wait until a network session is associated.
INACTIVITY_TIMEOUT	60	The number of seconds to wait for data between TCP/IP packets.

Table 2-9: Timers for the Print SCU

### 2.2.1.3.1.2.2 Basic Film Session SOP Class

I-PACS CX Viewer supports the following DIMSE Service Elements for Basic Film Session SOP Class.

N-CREATE – Requests to create an instance of Basic Film Session.

Attribute	DICOM Tag	Default Value
Number of Copies	(2000,0010)	1
Print Priority	(2000,0020)	MED
Medium Type	(2000,0030)	CLEAR FILM
Film Destination	(2000,0040)	PROCESSOR
Film Session Label	(2000,0050)	Institution Name – site configurable

Table 2-10: Attribute Values supported by Basic Film Session SOP Class

**2.2.1.3.1.2.3 Basic Film Box SOP Class**

I-PACS CX Viewer supports the following DIMSE Service Elements for Basic Film Box SOP Class.

N-CREATE – Requests to create an instance of Basic Film Box.

N-ACTION – Requests to print the Film Box onto Printer.

N-DELETE – Request to delete the Film Box instance.

<b>Attribute</b>	<b>DICOM Tag</b>	<b>Default Value</b>
Image Display Format	(2010,0010)	STANDARD\C,R – configurable
Referenced Film Session Sequence	(2010,0500)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
Referenced Presentation LUT Sequence	(2050,0500)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
Film Orientation	(2010,0040)	PORTRAIT
Film Size Id	(2010,0050)	14INX17IN
Magnification Type	(2010,0060)	BILINEAR
Border Density	(2010,0100)	BLACK
Empty Image Density	(2010,0110)	BLACK
Min Density	(2010,0120)	0
Max Density	(2010,0130)	65535
Trim	(2010,0140)	NO

Table 2-11: Attribute Values supported by Basic Film Box SOP Class

#### 2.2.1.3.1.2.4 Basic Grayscale Image Box SOP Class

I-PACS CX Viewer supports the following DIMSE Service Elements for Basic Grayscale Image Box SOP Class

N-SET - Requests to set the Image Box attributes.

Attribute	DICOM Tag	Default Value
Image Position	(2020,0010)	image-dependent
Polarity	(2020,0020)	NORMAL
Preformatted Grayscale Image Sequence	(2020,0110)	
> Samples per Pixel	(0028,0002)	1
> Photometric Interpretation	(0028,0004)	MONOCHROME2
> Rows	(0028,0010)	image-dependent
> Columns	(0028,0011)	image-dependent
> Pixel Aspect Ratio	(0028,0034)	1\1
> Bits Allocated	(0028,0100)	8
> Bits Stored	(0028,0101)	8
> High Bit	(0028,0102)	7
> Pixel Representation	(0028,0103)	0
> Pixel Data	(7FE0,0010)	
Requested Image Size	(2020,0030)	
Requested Decimate/Crop Behavior	(2020,0040)	

Table 2-12: Attribute Values supported by Basic Grayscale Image Box SOP Class

#### 2.2.1.3.1.2.5 SOP Specific Conformance for Presentation LUT SOP Class

If support for the Presentation LUT SOP Class has been negotiated and the selected Presentation Profile specifies a Presentation LUT, I-PACS CX Viewer creates a Presentation LUT SOP instance immediately after the retrieval of the well-known Printer SOP Instance. If creation of the Presentation LUT SOP instance fails, I-PACS CX Viewer renders the pixel data according the requested Presentation LUT and sends P-values as pixel data in the N-SET requests for each Basic Grayscale Image Box.

The following elements may be sent as part of the N-CREATE request:

Attribute	DICOM Tag	Default Value
Presentation LUT Sequence	(2050,0010)	
>LUT Descriptor	(0028,3002)	
>LUT Explanation	(0028,3003)	
>LUT Data	(0028,3006)	
Presentation LUT Shape	(2050,0020)	

Table 2-13: DIMSE Service Group N-Create Attributes List

### 2.2.1.3.1.2.6 SOP Specific Conformance for Basic Annotation Box SOP Class

If support for the Basic Annotation Box SOP Class has been negotiated and the selected Presentation Profile specifies Annotation Boxes, I-PACS CX Viewer issues a single N-SET request for each Basic Annotation Box SOP instance, which were implicitly created as part of each Basic Film Box.

The following elements may be sent as part of the N-SET request:

Attribute	DICOM Tag	Default Value
Annotation position	(2030,0010)	
Text String	(2030,0020)	

Table 2-14: DIMSE Services Applicable to Basic Annotation Box N-SET Attributes

### 2.2.1.3.1.2.7 Printer SOP Class

I-PACS CX Viewer issues the request to retrieve the following attributes from DICOM-compliant printer.

C-GET - Request to retrieve printer information.

Attribute	DICOM Tag	Default Value
Printer Status	(2110,0010)	printer-dependent
Printer Status Info	(2110,0020)	printer-dependent
Printer Name	(2110,0030)	printer-dependent
Manufacturer	(0008,0070)	printer-dependent
Manufacturer Model Name	(0008,1090)	printer-dependent
Device Serial Number	(0018,1000)	printer-dependent
Software Versions	(0018,1020)	printer-dependent
Last Calibration Date	(0018,1200)	printer-dependent
Last Calibration Time	(0018,1201)	printer-dependent

Table 2-15: Attribute Values retrieved by Printer SOP Class



**2.2.1.3.1.3 SOP Specific Conformance for Basic Color Print Management Meta SOP Classes**

I-PACS CX Viewer supports the following mandatory SOP Classes which are defined under the Basic Color Print Management Meta SOP Class.

SOP Class Name	SOP Class UID
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
Printer SOP Class	1.2.840.10008.5.1.1.16

Table 2-16: Mandatory Print SOP Classes supported by the Color Print SCU

Timers in Table 2-16 are also applicable to the Color Print Management SCU. If any of these timers expires, the connection is closed and the operation is considered as failed.

**2.2.1.3.1.3.1 Basic Film Session SOP Class – same as Section 2.2.1.3.2.2.2**

**2.2.1.3.1.3.2 Basic Film Box SOP Class – same as Section 2.2.1.3.2.2.3**

**2.2.1.3.1.3.3 Basic Color Image Box SOP Class**

I-PACS CX Viewer supports the following DIMSE Service Elements for Basic Color Image Box SOP Class

N-SET - Requests to set the Image Box attributes.

Attribute	DICOM Tag	Default Value
Image Position	(2020,0010)	image-dependent
Polarity	(2020,0020)	NORMAL
Preformatted Color Image Sequence	(2020,0110)	
> Samples per Pixel	(0028,0002)	3
> Photometric Interpretation	(0028,0004)	RGB
> Planar Configuration	(0028,0006)	1
> Rows	(0028,0010)	image-dependent
> Columns	(0028,0011)	image-dependent
> Pixel Aspect Ratio	(0028,0034)	1\1
> Bits Allocated	(0028,0100)	8
> Bits Stored	(0028,0101)	8
> High Bit	(0028,0102)	7
> Pixel Representation	(0028,0103)	0
> Pixel Data	(7FE0,0010)	

Table 2-17: Attribute Values supported by Basic Grayscale Image Box SOP Class

**2.2.1.4 Association Acceptance Policy**

**2.2.1.4.1 Real-World Activity – Receive DICOM Images from others**

**2.2.1.4.1.1 Associated Real-World Activity**

I-PACS CX Viewer is always waiting for a remote host to send images to it. The received images are stored in the remote database and remote file system.

**2.2.1.4.1.2 Presentation Context Table**

<b>Transfer Syntax Table - Accepted</b>	
<b>Transfer Syntax</b>	<b>UID</b>
Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2
JPEG Baseline Transfer Syntax	1.2.840.10008.1.2.4.50
JPEG Extended Transfer Syntax	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
JPEG2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
JPEG2000 Image Compression	1.2.840.10008.1.2.4.91
RLE Transfer Syntax	1.2.840.10008.1.2.5

Table 2-18: Transfer Syntax List – Accepted for Storage Service

<b>Transfer Syntax Table – Accepted</b>	
<b>Transfer Syntax</b>	<b>UID</b>
Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2

Table 2-19: Transfer Syntax List – Accepted for Query/Retrieve Service

**2.2.1.4.1.2.1 SOP Specific Conformance for Verification SOP Class**

I-PACS CX Viewer provides standard conformance to the DICOM Verification Service Class.

**2.2.1.4.1.2.2 SOP Specific Conformance for Patient Root Query/Retrieve (FIND) SOP Class**

This implementation performs a C-FIND operation over an association.

The following timers are related to the Query/Retrieve SCU.

If any of these timers expires, the connection is closed and the operation is considered as failed.

Timer Name	Default (in sec.)	Meaning
ARTIM_TIMEOUT	90	The number of seconds to use as timeout waiting for association request or waiting for the peer to shut down an association.
ASSOC_REPLY_TIMEOUT	60	The number of seconds to wait for reply to associate request.
RELEASE_TIMEOUT	60	The number of seconds to wait for reply to associate response.
WRITE_TIMEOUT	60	The number of seconds to wait until a network write is completed.
CONNECT_TIMEOUT	60	The number of seconds to wait until a network session is associated.
INACTIVITY_TIMEOUT	60	The number of seconds to wait for data between TCP/IP packets.

Table 2-20: Timers for the Query/Retrieve SCU

The following required and optional keys are supported for Patient Root FIND. The fields Patient ID, Patient's Name, Study ID, Study Date, Accession Number and Study Description may be queried based on user specification. All other values for fields are requested as part of the query.

Description	Element Tag	Type	Note
Patient's Name	(0010,0010)	R	
Patient ID	(0010,0020)	R	
Patient Sex	(0010,0040)	O	

Table 2-21: Patient Level Keys for Patient Root Query/Retrieve Information Model

Description	Element Tag	Type	Note
Study ID	(0020,0010)	R	
Study Date	(0008,0020)	R	
Accession Number	(0008,0050)	R	
Study Description	(0008,1050)	O	
Study Instance UID	(0020,000D)	U	

Table 2-22: Study Level Keys for Patient Root Query/Retrieve Information Model

Description	Element Tag	Type	Note
Series Number	(0020,0011)	R	
Series Date	(0008,0021)	O	
Modality	(0008,0060)	R	
Series Description	(0008,103E)	O	

Series Instance UID	(0020,000E)	U	
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Table 2-23: Series Level Keys for Patient Root Query/Retrieve Information Model

Description	Element Tag	Type	Note
Instance Number	(0020,0013)	R	
Acquisition Date	(0008,0022)	O	
Instance Date	(0008,0023)	O	
SOP Instance UID	(0008,0018)	U	

Table 2-24: Instance Level Keys for Patient Root Query/Retrieve Information Model

**2.2.1.4.1.2.3 SOP Specific Conformance for Patient Root Query/Retrieve (MOVE) SOP Class**

This implementation performs a C-MOVE operation over an association. Timers in Table 2-8 are also applicable to the Patient Root Query/Retrieve SCU.

**2.2.1.4.1.2.4 SOP Specific Conformance for Study Root Query/Retrieve (FIND) SOP Class**

This implementation performs a C-FIND operation over an association. The following required and optional keys are supported for Study Root FIND. The fields Patient ID, Patient’s Name, Study ID, Study Date, Accession Number and Study Description may be queried based on user specification. All other values for fields are requested as part of the query.

Description	Element Tag	Type	Note
Patient ID	(0010,0020)	R	
Patient’s Name	(0010,0010)	R	
Study ID	(0020,0010)	R	
Study Date	(0008,0020)	R	
Accession Number	(0008,0050)	R	
Study Description	(0008,1050)	O	
Study Instance UID	(0020,000D)	U	

Table 2-25: Study Level Keys for Study Root Query/Retrieve Information Model

Description	Element Tag	Type	Note
Series Number	(0020,0011)	R	
Series Date	(0008,0021)	O	
Modality	(0008,0060)	R	
Series Description	(0008,103E)	O	
Series Instance UID	(0020,000E)	U	

Table 2-26: Series Level Keys for Study Root Query/Retrieve Information Model

Description	Element Tag	Type	Note
Instance Number	(0020,0013)	R	

Acquisition Date	(0008,0022)	O	
Instance Date	(0008,0023)	O	
SOP Instance UID	(0008,0018)	U	

Table 2-27: Instance Level Keys for Study Root Query/Retrieve Information Model

#### 2.2.1.4.1.2.5 SOP Specific Conformance for Study Root Query/Retrieve (MOVE) SOP Class

This implementation performs a C-MOVE operation over an association. Timers in Table 2-8 are also applicable to the Retrieve SCU.

#### 2.2.1.4.1.3 Presentation Context Acceptance Criterion

Not applicable since only a single presentation context for each Storage Service Class is supported.

#### 2.2.1.4.1.4 Transfer Syntax Selection Policies

Transfer syntaxes are accepted in the following order:

Transfer Syntax Name	Transfer Syntax UID
Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2
JPEG Baseline	1.2.840.10008.1.2.4.50
JPEG Extended Transfer Syntax	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
RLE Transfer Syntax	1.2.840.10008.1.2.5

Table 2-28: Transfer Syntax Acceptance Priority

## 2.3 Communication Profiles

### 2.3.1 Supported Communication Stacks

DICOM Upper Layer (Part 8) is supported using TCP/IP.

DICOM Secure Transport Connection Profiles (Part 15) is supported using The Basic TLS Secure Transport Connection Profile.

### 2.3.2 TCP/IP Stack

The TCP/IP stack is inherited from the Microsoft Windows Socket implementation.

#### 2.3.2.1 API

Not Applicable

#### 2.3.2.2 Physical Media Support

DICOM is indifferent to the physical medium over which TCP/IP executes (e.g. Ethernet, Fast-Ethernet, FDDI, ATM, etc)

### 2.3.3 Point-to-Point Stack

Not Applicable

### 2.3.4 Basic TLS Secure Transport Profile

A Basic TLS Secure Transport Profile supports all mechanisms in the table 2 -39. IP ports on which the profile accepts TLS connections is configurable by the application user. And the mechanism for key management based on X.509 certificate validation.

Supported TLS Feature	Minimum Mechanism
Entity Authentication RSA	RSA based certificates
Exchange of Master Secrets	RSA
Data Integrity	SHA
Privacy	Triple DES EDE, CBC, NULL

Table 2-29: Mechanisms for Basic TLS Secure Transport Profile

## 2.4 Extension/Specialization/Privatization

### 2.4.1 Standard Extended/Specialized/Private SOP

None Supported

### 2.4.2 Private Transfer Syntaxes

None Supported

## **2.5 Configuration**

### **2.5.1 AE Title / Presentation Address Mapping**

The Local AE Title is configurable in the Setting menu.

### **2.5.2 Configuration Parameters**

The following fields are configurable for this AE (local):

- Local AE Title
- Local IP Address
- Local TCP Port Number
- Accept/Reject Policy for unknown called/calling AE Title

## **2.6 Supported Extended Character Sets**

This implementation supports the following extended character set:

- ISO-IR 6 = Default repertoire
- ISO-IR 13 = Japanese, Katakana
- ISO-IR 87 = Japanese, Kanji
- ISO-IR 192 = Unicode, UTF-8









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