

**DICOM
CONFORMANCE
STATEMENT
FOR zioTerm2009**

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0 DICOM CONFORMANCE STATEMENT OVERVIEW

This document is the DICOM Conformance Statement for zioTerm2009.

zioTerm2009 supports the following DICOM services:

- Verification Service Class User (SCU)
- Verification Service Class Provider (SCP)
- Storage Service Class User (SCU)
- Storage Service Class Provider (SCP)
- Query/Retrieve Service Class User (SCU)
- Print Management Service Class User (SCU)
- Write files on General Purpose CD-R(FSC)

IMPLEMENTATION MODEL

0.1 Application Data Flow

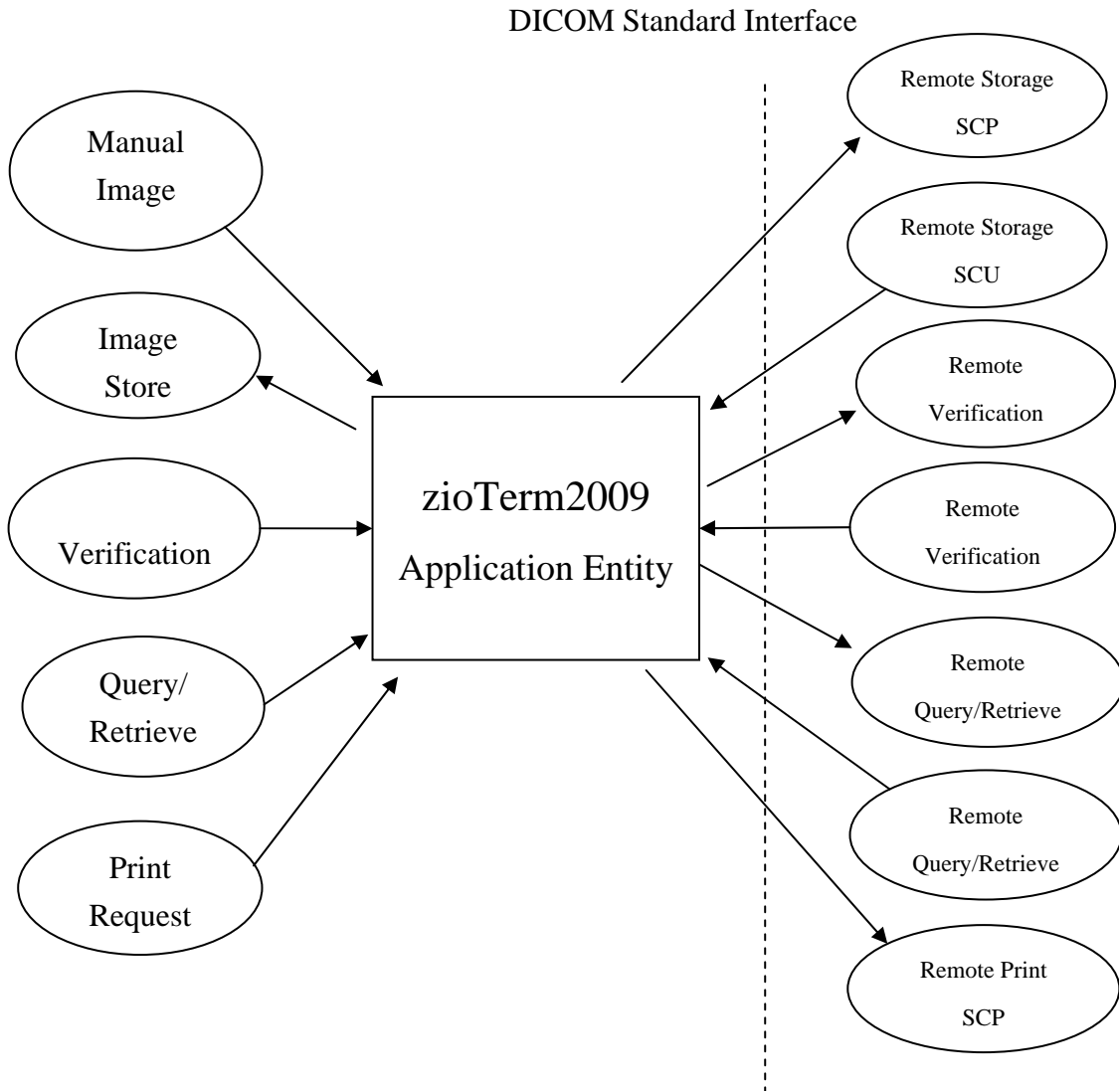


Figure 1 : Application Data Flow Diagram

zioTerm2009 implementation model is shown in Figure 1.

All DICOM services are provided through zioTerm2009, which is launched by an operator.

The remote DICOM Application Entities (AE), which are associated with zioTerm2009, should have been configured by the support engineers beforehand.

Association of image store service to remote AE is activated when an operator manually calls for transfer. An operator indicates the transfer DICOM image data to remote AE after he selects the one of patients, studies, series or images on zioTerm2009.

zioTerm2009 send request for the Verification service to the remote AE.

zioTerm2009 responds to the Verification service from remote AE.

The association for storage service is invoked from remote AE. And its association is received and accepted by zioTerm2009, remote AE begins to transfer the DICOM image data.

zioTerm2009 starts up the association for Query/Retrieve and Print service requests to remote AE.

zioTerm2009 also supports export data to General Purpose CD-R media (Figure 2).

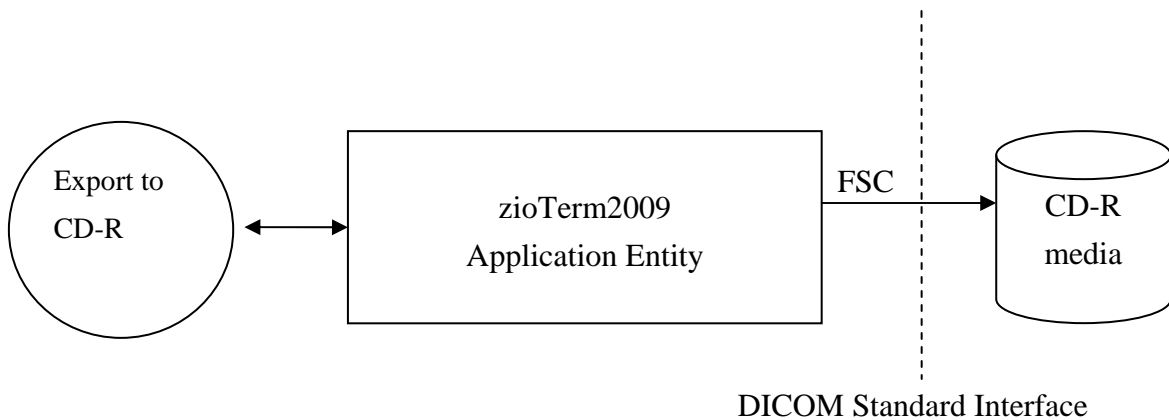


Figure 2 : Application Data Flow Diagram for DICOM CD-R

0.2 Functional Definition of AE's

zioTerm2009 supports the following functions:

- Receive and accept associations from remote AE
- Initiate associations
- Send DICOM image data (SCU)
- Receive DICOM image data (SCP)
- Send request for Verification service to remote AE (SCU)
- Respond to Verification service from remote AE (SCP)
- Send request for Query service to remote AE (SCU)
- Send request for Retrieve service to remote AE (SCU)

- Send request for Print service to remote AE (SCU)
- Export data to General Purpose CD-R (FSC)

0.3 Sequencing of Real-World Activities

Sequencing of Real-World Activities is not applied.

1 AE SPECIFICATIONS

The Network capabilities of zioTerm2009 are specified in section 2.1, and Media capabilities are specified in section 3.

1.1 Network Specification

zioTerm2009 provides Standard Conformance to the following SOP Classes.

Table 1: SOP Classes for zioTerm2009

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No

1.1.1 Association Policies

1.1.1.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed.

Table 2: DICOM Application Context

DICOM Application Context Name	1.2.840.10008.3.1.1.1
--------------------------------	-----------------------

Max PDU size is 65536 (64K) as default.

1.1.1.2 Number of Associations

zioTerm2009 accepts Associations for the Storage SOP Class.

Table 3: Number of Associations Accepted for AE Storage

Maximum number of simultaneous Associations	16
---	----

1.1.1.3 Asynchronous Nature

zioTerm2009 does not support asynchronous operations (or sub-operations) window negotiation.

1.1.1.4 Implementation Identifying Information

The implementation information for this Application Entity is.

Table 4: DICOM Implementation Class and Version for AE Storage

Implementation Class UID	1.2.392.200080.100.200
Implementation Version Name	ZIO_DCM_SVR_200

1.1.2 Association Initiation Policy

zioTerm2009 initiates the association between the remote AE at:

- A Verification
- B Manual Transfer
- C Query/Retrieve
- D Print

by operator's interaction.

1.1.2.1 Activities A, B, C, D

Each of the above activities (A, B, C, D) initiates the DICOM association.

1.1.2.1.1 Description and Sequencing of Activities

At Verification, zioTerm2009 sends C-ECHO request to remote AE and displays results.

At Manual Transfer, it sends DICOM image data to remote AE.

At Query/Retrieve, it queries about remote AE DICOM image data information, and it receives necessary data.

At Print, it sends the DICOM image data after film's width/height format has been specified.

Print requests are queued and processed background.

1.1.2.1.2 Proposed Presentation Contexts

zioTerm2009 is capable of proposing the Presentation Contexts shown in the following table.

Table 5: Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non- Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non- Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non- Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

1.1.2.1.3 SOP Specific Conformance

1.1.2.1.3.1 SOP Specific Conformance for Verify SOP Class

zioTerm2009 provides standard conformance as SCU of Verify SOP Class.

1.1.2.1.3.2 SOP Specific Conformance for Storage SOP Class

zioTerm2009 can execute multiple C-STORE as storage service user with a single association. If C-STORE is successful, zioTerm2009 transfers selected DICOM image data as interaction to remote AE. If association or transfer fails, zioTerm2009 displays error messages. If a response status for C-STORE is warning, then zioTerm2009 terminates the following processes. No extended negotiation is performed.

1.1.2.1.3.3 SOP Specific Conformance for Query/Retrieve Information Model - FIND

zioTerm2009 does not support relational queries. No extended negotiation is performed. The following table shows available keys for queries.

Table 6: Study Level Request Attributes for Study Root Query/Retrieve Information Model

Attribute Name	Tag	Type
Study Date	(0008,0020)	R
Study Time	(0008,0030)	R
Accession Number	(0008,0050)	R
Patient's Name	(0010,0010)	R
Patient ID	(0010,0020)	R
Study ID	(0020,0010)	R
Study Instance UID	(0020,000d)	U
Number of Study Related Series	(0020,1206)	O
Number of Study Related Instances	(0020,1208)	O
Modalities in Study	(0008,0061)	O
Study Description	(0008,1030)	O

Table 7: Series Level Request Attributes for Study Root Query/Retrieve Information Model

Attribute Name	Tag	Type
Modality	(0008,0060)	R
Series Number	(0020,0011)	R
Study Instance UID	(0020,000d)	U(*)
Series Instance UID	(0020,000e)	U
Number of Series Related Instances	(0020,1209)	O
Series Description	(0008,103e)	O
Protocol Name	(0018,1030)	O

(*): Higher level unique key

Table 8: Image Level Request Attributes for Study Root Query/Retrieve Information Model

Attribute Name	Tag	Type
Instance Number	(0020,0013)	R
SOP Instance UID	(0008,0018)	U
Study Instance UID	(0020,000d)	U(*)
Series Instance UID	(0020,000e)	U(*)

(*): Higher level unique key

1.1.2.1.3.4 SOP Specific Conformance for Query/Retrieve Information Model - MOVE

zioTerm2009 does not support relational retrievals. No extended negotiation is performed.

1.1.2.1.3.5 SOP Specific Conformance for Print Management Service Class

Switching between Color and Grayscale is manual. If the association or data transfer fails, then error messages are displayed. No extended negotiation is performed.

zioTerm2009 supports the following SOP classes as defined by the Print management Service Class.

Table 9: SOP Classes for Print Management Service 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
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

1.1.2.1.3.5.1 Basic Film Session SOP Class

The zioTerm2009 provides the following support for the Basic Film Session attributes sent by the N-CREATE DIMSE service's SCU.

Table 10: Basic Film Session SOP Class Request Attributes

Attribute	Tag	Valid Range
Number of Copies	(2000,0010)	1 - 1000
Print Priority	(2000,0020)	MED
Medium Type	(2000,0030)	CLEAR FILM BLUE FILM PAPER
Film Destination	(2000,0040)	MAGAZINE PROCESSOR BIN_1 BIN_2 BIN_3 BIN_4 BIN_5 BIN_6 BIN_7 BIN_8 BIN_9 BIN_10

It is expected that the other attributes are not set and use printer's default values.

1.1.2.1.3.5.2 Basic Film Box SOP Class

The zioTerm2009 provides the following support for the Basic Film Box attributes sent by the N-CREATE, N-ACTION and N-DELETE service's SCU.

Table 11: Basic Film Box SOP Class Request Attributes

Attribute	Tag	Valid Range
Image Display Format	(2010,0010)	STANDARD\C,R C=[1..8] R=[1..8]
Film Orientation	(2010,0040)	PORTRAIT LANDSCAPE
Min Density	(2010,0120)	
Max Density	(2010,0130)	
Configuration Information	(2010,0150)	

It is expected that the other attributes are not set and use printer's default values.

1.1.2.1.3.5.3 Basic Grayscale Image Box SOP Class

The zioTerm2009 provides the following support for the Basic Grayscale Image Box attributes sent by the N-SET service's SCU.

Table 12: Basic Grayscale Image Box SOP Class Request Attributes

Attribute	Tag	Valid Range
Image Box Position	(2020,0010)	1 - 25
Basic Grayscale Image Sequence	(2020,0110)	
> Samples per Pixel	(0028,0002)	1
> Photometric Interpretation	(0028,0004)	MONOCHROME1 MONOCHROME2
> Rows	(0028,0010)	
> Columns	(0028,0011)	
> Pixel Aspect Ratio	(0028,0034)	1 : 1
> Bits Allocated	(0028,0100)	8 or 16
> Bits Stored	(0028,0101)	8 - 16
> High Bit	(0028,0102)	7 - 15
> Pixel Representation	(0028,0103)	0
> Pixel Data	(7FE0,0010)	
Min Density	(2010,0120)	
Max Density	(2010,0130)	
Configuration Information	(2010,0150)	
Requested Image Size	(2020,0030)	

It is expected that the other attributes are not set and use printer's default values.

1.1.2.1.3.5.4 Basic Color Image Box SOP Class

The zioTerm2009 provides the following support for the Basic Color Image Box attributes sent by the N-SET service's SCU.

Table 13: Basic Color Image Box SOP Class Request Attributes

Attribute	Tag	Valid Range
Basic Color Image Sequence	(2020,0111)	
> Image Box Position	(2020,0010)	1 - 25
> Samples per Pixel	(0028,0002)	3
> Photometric Interpretation	(0028,0004)	RGB
> Rows	(0028,0010)	
> Columns	(0028,0011)	
> 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)	

1.1.2.1.3.5.5 Printer SOP Class

The zioTerm2009 provides the following support for the Printer attributes sent by the N-GET service's SCU.

Table 14: Printer SOP Class Request Attributes

Attribute	Tag	Valid Range
Printer Status	(2110,0010)	
Printer Status Info	(2110,0020)	
Printer Name	(2110,0030)	
Manufacturer	(0008,0070)	
Manufacturer's Model Name	(0008,1090)	
Device Serial Number	(0018,1000)	
Software Version(s)	(0018,1020)	
Date of Last Calibration	(0018,1200)	
Time of Last Calibration	(0018,1201)	

1.1.3 Association Acceptance Policy

zioTerm2009 accepts the remote AE's associations when all the following condition are met:

- AE which has established associations is registered in zioTerm2009
- Associations for verification service or storage service
- zioTerm2009 is in the association acceptable state

1.1.3.1 Real-World Activities

1.1.3.1.1 Description and Sequencing of Real-World Activities

The zioTerm2009 awaits the associations for Storage and Verification services.
If the association proposed from registered AE, it is accepted.

1.1.3.1.2 Proposed Presentation Contexts

zioTerm2009 is capable of proposing the Presentation Contexts shown in the following table.

Table 15: Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None

1.1.3.1.3 SOP Specific Conformance

1.1.3.1.3.1 SOP Specific Conformance for Verification SOP Class

zioTerm2009 provides Standard Conformance as SCP of Verification SOP Class.

1.1.3.1.3.2 SOP Specific Conformance for Storage SOP Class

zioTerm2009 can execute multiple C-STORE as Storage Service provider with a single association. The zioTerm2009 is Level 2 (Full) conformant as a Storage Service provider. No attributes are overridden and modified. If C-STORE is successful, zioTerm2009 stores the DICOM image data to hard disk. The data stored in a hard disk is enabled to access through the user of the OS service or the zioTerm2009. The data stored is enable to delete, copy or move by operator's interaction. In the case of association or receiving failure, error messages are shown. No extended negotiation is performed.

1.1.3.1.4 Accepted Presentation Contexts

zioTerm2009 is capable of proposing multiple Presentation Contexts. The specification is shown as follows:

(Abstract Syntax + (Transfer Syntax * Number of Syntax)) * Number of Syntax

In this case, number of syntax is equal to or greater than 1.

1.1.3.1.5 Transfer Syntax Selection Policy

zioTerm2009 supports various Transfer Syntax. The selection is decided as follows:

1. The priority list of Transfer Syntax is configured.
2. Propose the Transfer Syntax in order.
3. First conformed Transfer Syntax is selected.

1.2 NETWORK PROFILE

1.2.1 Supported Protocol Stacks(PS 3.8, PS 3.9)

zioTerm2009 provides DICOM V3.0 TCP/IP Network Protocol Stacks support in which stacks are defined in DICOM Standards PS 3.8.

1.2.2 OSI Stack

OSI Stack is not supported.

1.2.3 TCP/IP Stack

zioTerm2009 inherits TCP/IP Stack from runtime environment OS.

1.2.4 API

APIs are not released.

1.2.5 Physical Device Support

zioTerm2009 inherits Physical Device Support from runtime environment OS.

1.2.6 Point-to-point stack

Point-to-point stack is not supported.

1.3 STANDARD EXTENDED/SPECIALIZED/PRIVATE SOP CLASSES

1.3.1 Extended CT, MR, Nuclear Medicine, Positron Emission Tomography, X-Ray Angiographic objects

zioTerm2009 is making the following extensions to CT, MR, Nuclear Medicine, Positron Emission Tomography and X-Ray Angiographic SOP Classes:

Table 16: PRIVATE CREATOR IDENTIFICATION : ZIO_DICOM_WORKSPACE_01

Tag	Attribute Name	Type	VR
(7109,00XX)	Private Creator	3	LO
(7109,XX21)	Private Data 1	3	OB
(7109,XX23)	Private Data 2	3	OB

1.3.2 Extended Secondary Capture object

zioTerm2009 is making the following extensions to Secondary Capture SOP Class:

Table 17: PRIVATE CREATOR IDENTIFICATION : ZIO_DICOM_WORKSPACE_01

Tag	Attribute Name	Type	VR
(7109,00XX)	Private Creator	3	LO
(7109,XX21)	Private Data 1	3	OB
(7109,XX23)	Private Data 2	3	OB
(7109,XX30)	Private Data 3	3	DS
(7109,XX31)	Private Data 4	3	DS
(7109,XX32)	Private Data 5	3	DS
(7109,XX33)	Private Data 6	3	UI
(7109,XX34)	Private Data 7	3	CS

1.3.3 Private SOP Classes

zioTerm2009 defines the following Private SOP Classes:

Table 18: Private SOP Classes

SOP Class Name	SOP Class UID
Live Capture	1.2.392.200080.300.500

1.4 Configuration

1.4.1 AE Title/Presentation Address Mapping

AE Title/Presentation Address Mapping are set while in installation by the support engineer.

1.4.2 Parameters

The following parameters are available. These are configured during installation by the support engineer.

- AE Title
- IP Address
- Port Number
- Directories to store images

- Priority of Transfer Syntax
- Embed Private Attributes in Secondary Capture Images or not

2 MEDIA INTERCHANGE

2.1 IMPLEMENTATION MODEL

2.1.1 Application Data Flow

Application Data Flow is shown in Figure 2.

2.2 AE SPECIFICATIONS

2.2.1 Application Entity Specification

zioTerm2009 provides Standard Conformance to the DICOM Media Storage Service Class. The Application Profiles and Roles are listed below.

Table 19: Application Profiles, Activities and Roles

Application Profiles Supported	Real World Activity	Role
STD-GEN-CD	Export to CD-R	FSC

2.2.1.1 Real-World Activities

2.2.1.1.1 Activity - Export to CD-R

zioTerm2009 acts as an FSC when requested to export SOP Instances from the local database to a CD-R medium.

The user will be prompted to insert an empty CD-R for each export job. The contents of the export job will be written together with a corresponding DICOMDIR to a single-session CD-R. Writing in multi-session mode is not supported. The user can cancel an export job in the job queue.

2.2.1.1.1.1 Media Storage Application Profiles

zioTerm2009 supports the STD-GEN-CD Application Profile.

3 SUPPORT OF CHARACTER SETS

zioTerm2009 supports the following extended character sets:

- ISO-8859-1 (ISO-IR 100 Latin-1)
- JIS X 0201 (ISO-IR 13 Japanese katakana and ISO-IR 14 Japanese romaji)
- JIS X 0208 (ISO-IR 87 Japanese kanji, hiragana and katakana)
- JIS X 0212 (ISO-IR 159 Supplementary Japanese kanji)