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DIGITAL ANGIOGRAPHY SYSTEM
DAR-9400f
3D-ANGIO OPTION V4.0
DICOM CONFORMANCE STATEMENT

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Revision History

Rev.	Date	Content of Change
First	2009.6	Newly issued.

Table of Contents

[No Text]

1 Preface

This document is a DICOM conformance statement for 3D-ANGIO rendering application.

REND_DICOM_111 supports the following DICOM service:

- Service Class User (SCU)
- Service Class Provider (SCP)
- Store Service Class User (SCU)
- Print Service Class User (SCU)

2 Implementation Model

2.1 Application Data Flow Diagram

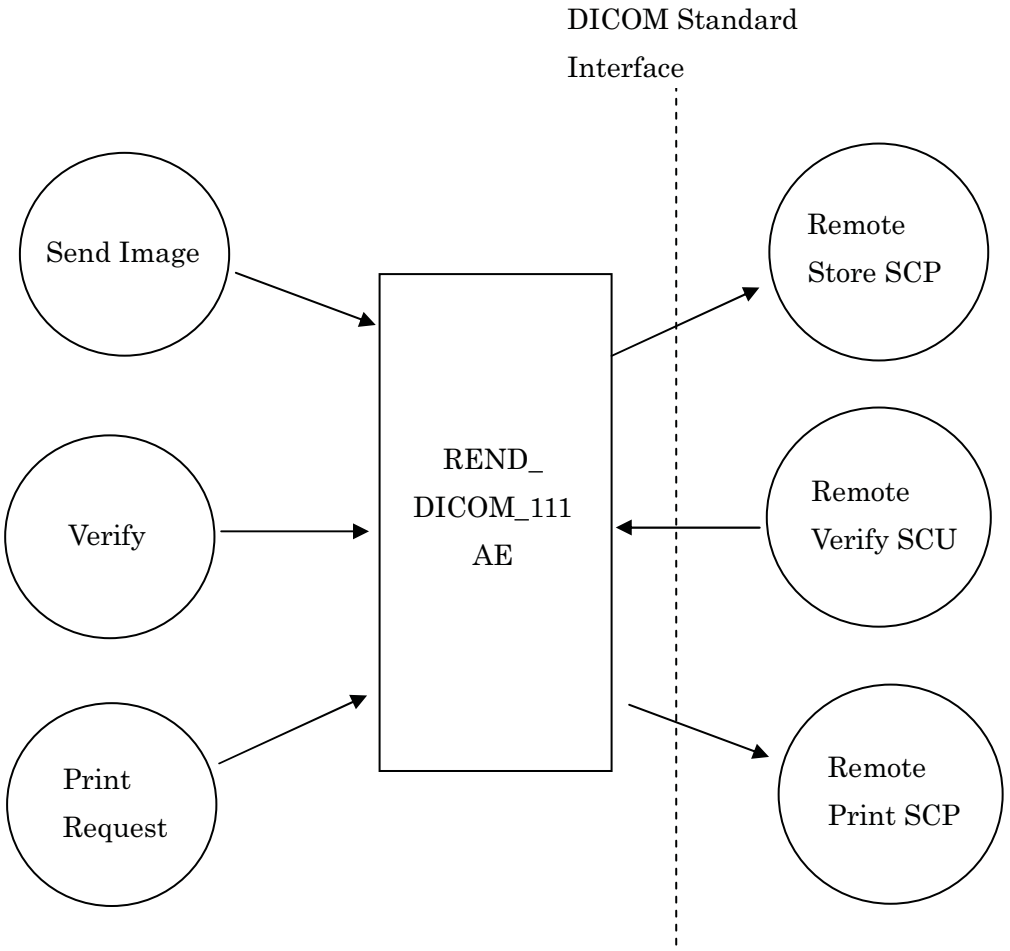

Fig. 1 Application Data Flow Diagram

See Fig.1 for application data flow diagram.
All DICOM service will be provided when an operator startup REND_DICOM_111.
Association of DICOM AE with REND_DICOM_111 must set by support engineer in advance.

Association of image store service to remote AE is run when an operator specifies to send images by manual. Operator should select either of a patient, study, series or image from REND_DICOM__111, and send DICOM image data to remote AE.

REND_DICOM_111 request to the verify service from remote AE.
REND_DICOM_111 response to the verify service from remote AE.
REND_DICOM_111 startup association to request print service.

2.2 AE's Functional Description

REND_DICOM_111 supports the following functions.

- Accept the association from remote AE.
- Startup the association.
- Send DICOM image data (SCU).
- Request remote AE for the verify service (SCU).
- Respond to the verify service from remote AE (SCP).
- Request remote AE for the print service (SCU).

2.3 Sequencing of Real World Activity

Not applicable.

3 AE Specifications

REND_DICOM_111 provides Standard Conformance to the following DICOM SOP Class as SCP:

Table 1

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1

REND_DICOM_111 provides Standard Conformance to the following DICOM SOP Class as SCU:

Table 2

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1
Secondary Acquired Image Information Object	1.2.840.10008.5.1.4.1.1.7
Basic Gray Scale Print Administration Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Color Print Administration Meta SOP Class	1.2.840.10008.5.1.1.18

3.1 Association Establishment Policies

3.1.1 General

The following Application Context Name is acceptable.

Table 3

DICOM Application Context	1.2.840.10008.3.1.1.1

Maximum PDU size is 65536 (64K).

3.1.2 Number of Associations

Acceptable number of association is “1” at a time.

3.1.3 Asynchronous Nature

Not supporting asynchronous operation and does not asynchronous operation window negotiation.

3.1.4 Implementation Identifying Information

Implementation Class UID and Implementation Version Name are shown in the table below.

Table 4

Implementation UID	1.2.392.200080.100
Implementation Name	REND_DICOM_111

3.2 Association Initiation by Real World Activity.

REND_DICOM_111 runs association between remote AE by operator with manual transfer for the following operation:

A. Verification
B. Transfer by manual
C. Print

3.2.1 Real World Activity A, B, C

Three Real World Activity (A, B, C) will startup DICOM association.

3.2.1.1 Related Real World Activity

Request C-ECHO to remote AE on verify and show the result.

Send DICOM image data to remote AE by manual transfer.

Specify the crisscross film format and send DICOM image data. Print request will be in cue mode and processed on background.

3.2.1.2 Request of Presentation Context

REND_DICOM_111 requests the following presentation context in the table.

Table 5

Presentation Context					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
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
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 Little Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Standard, JPEG 8 bit Lossy image compression default transfer syntax	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Lossless, Nonhierarchical, First order prediction	1.2.840.10008.1.2.4.70	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCU	None
Basic Gray Scale Print Administration 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 Administration Meta SOP class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.2.1.3 SOP Specific Conformance

3.2.1.3.1 SOP Specific Conformance for Verification SOP Class

REND_DICOM_111 provides the standard conformance as SCP of Verification SOP class.

3.2.1.3.2 SOP Specific Conformance for Storage SOP Class

REND_DICOM_111 can operate C-STORE several times at one association as a storage service user. When C-STORE is succeeded, REND_DICOM_111 will transfer the manually selected DICOM image data to remote AE. When association or transfer is failed, display an error message. When it is in the warning mode, processing will be stopped. Expanded negotiation is not supported.

3.2.1.3.3 SOP Specific Conformance for Print Administration Service Class

Switch color and gray scale by manual.
If association or sending data is failed, display error message. Expanded negotiation is not supported.

Support SOP class in the table 6 as a print administration service class.

Table 6

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 Gray Scale 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

3.2.1.3.3.1 Basic Film Session SOP Class

Support N_CREATE as SCU of DIMSE.
Support attribute of table 7. Other attributes are not set, and using default of printer is expected.

Table 7

Attribute Name	Tag	Attribute
Number of Copies	(2000,0010)	1 to 1000
Copy Priority	(2000,0020)	MED

3.2.1.3.3.2 Basic Film Box SOP Class

Support N_CREATE, N_ACTION and N_DELETE as SCU of DIMSE service.

Support attribute of table 8. Other attributes are not set, and using default of printer is expected.

Table 8

Attribute Name	Tag	Attribute
Display Image Format	(2010,0010)	STANDARD\1,1 STANDARD\1,2 STANDARD\2,2 STANDARD\2,3 STANDARD\3,3 STANDARD\3,4 STANDARD\3,5 STANDARD\4,4 STANDARD\4,5 STANDARD\4,6 STANDARD\5,5
Film Direction	(2010,00,0040)	PORTRAIT

3.2.1.3.3.3 Basic Gray Scale Image Box SOP Class

Support N_SET as SCU of DIMSE service.

Support attribute of table 9. Other attributes are not set, and using default of printer is expected.

Table 9

Attribute Name	Tag	Attribute
Image Position	(2020,0010)	1 to 25
Basic Gray Scale Image Sequence	(2020,0110)	
> Sample 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
> Bits Stored	(0028,0101)	8
> High Bit	(0028,0102)	7
> Pixel Representation	(0028,0103)	0
> Pixel Data	(0028,0010)	

3.2.1.3.3.4 Basic Color Image Box SOP Class

Support N_SET as SCU of DIMSE service.

Support attribute of table 10. Other attributes are not set, and using default of printer is expected.

Table 10

Attribute Name	Tag	Attribute
Basic Color Image Sequence	(2020,00111)	
> Image Position	(2020,0010)	1 to 25
> Sample per Pixesl	(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)	

3.2.1.3.3.5 Printer SOP Class

Support N_GET as SCU of DIMSE service.

Support attribute of table 11.

Table 11

Attribute Name	Tag	Attribute
Printer Status	(2110,0010)	
Printer Status Information	(2110,0020)	
Printer Name	(2110,0030)	
Manufacturer	(0008,0070)	
Manufacturer Model Name	(0008,1090)	
System Serial Number	(0018,1000)	
Software Version	(0018,1020)	
Last Calibration Date	(0018,1200)	
Last Calibration Time	(0018,1201)	

3.3 Association Acceptance Policy

REND_DICOM_111 accepts the association from remote AE when the following conditions are acceptable.

- AE, which startup an association, is registered in REND_DICOM_111.
- It is an association for verification service.

3.3.1 Real World Activity

3.3.1.1 Related Real World Activity

REND_DICOM_111 is waiting for an association for verification service.
Accept the association if it is startup from the registered AE.

3.3.1.2 Acceptance of Presentation Context

REND_DICOM_111 accepts the following presentation context in the table.

Table 12

Presentation Context					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
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

3.3.1.3 SOP Specific Conformance

3.3.1.3.1 SOP Specific Conformance for Verification SOP Class

REND_DICOM_111 provides the standard conformance as SCP of verification SOP class.

3.3.1.4 Standard of Acceptance of Presentation Context

Accept several numbers of presentations are specified as follows.
(Abstract Syntax + (Transfer Syntax x Several numbers of presentation) x Several numbers of presentations
"Several numbers of" means more than 1 presentation.

3.3.1.5 Transfer Syntax Selection Policy

REND_DICOM_111 supports several number of transfer syntax. Selection rule is as follows.

1. Previously specified in the presentation context.

4 Communication Profiles

4.1 Supported Communication Stack (PS 3.8, PS 3.9)

Provides DICOM TCP/IP Network Communication Support as defined in DICOM Standard 3.8.

4.2 OSI Stack

OSI stack is not supported.

4.3 TCP/IP Stack

REND_DICOM_111 inherits TCP/IP stack from execution environment OS.

4.4 API

API is not applicable.

4.5 Physical Media Support

Not supported.

4.6 Stack Between 2 Points

Stack between 2 points are not supported.

5 Extension/Specialization/Privatization

5.1 Standard Extension/Specialization/Private SOP

Not applicable.

6 Configuration

6.1 AE Title/Presentation Address

AE title and presentation address will be configured, when installing REND_DICOM_111 by support engineer.

6.2 Configurable Parameters

The following parameters are configurable. It is configured when installing by support engineer.

- AE title
- IP address
- Port number

7 Supporting Extended Character Sets

Extended Character Sets are not supported.

8 Appendix

The following is the attribute list when REND_DICOM_111 sends SC SOP instance.

IE	Module	Reference	
		Written Standard	Usage
Patient	Patient	C.7.1.1	M
Study	General Study	C.7.2.1	M
	Patient Study	C.7.2.2	U
Series	General Series	C.7.3.1	M
Equipment	General Equipment	C.7.5.1	U
	SC Equipment	C.8.6.1	M
Image	General Image	C.7.6.1	M
	Image Pixel	C.7.6.3	M
	SC Image	C.8.6.2	M
	Overlay Plane	C.9.2	U
	Modality LUT	C.11.1	U
	VOI LUT	C.11.2	U
	SOP Common	C.12.1	M

Patient

Attribute Name	Tag	Type	Possible Values
Patient's Name	(0010, 0010)	2	
Patient ID	(0010, 0020)	2	
Patient's Birth Date	(0010, 0030)	2	
Patient's Sex	(0010, 0040)	2	
Patient Comments	(0010, 4000)	3	A zero-length value is encoded.

General Study

Attribute Name	Tag	Type	Possible Values
Study Instance UID	(0020, 000D)	1	
Study Date	(0008, 0020)	2	
Study Time	(0008, 0030)	2	
Referring Physician's Name	(0008, 0090)	2	
Study ID	(0020, 0010)	2	
Accession Number	(0008, 0050)	2	

Patient Study

Attribute Name	Tag	Type	Possible Values
Patient's Age	(0010, 1010)	3	

General Series

Attribute Name	Tag	Type	Possible Values
Modality	(0008, 0060)	1	"XA"
Series Instance UID	(0020, 000E)	1	
Series Number	(0020, 0011)	2	
Laterality	(0020, 0060)	2C	A zero-length value is encoded.
Body Part Examined	(0018, 0015)	3	A zero-length value is encoded.

CR Series

Attribute Name	Tag	Type	Possible Values
View Position	(0018, 5101)	2	A zero-length value is encoded.

General Equipment

Attribute Name	Tag	Type	Possible Values
Manufacturer	(0008, 0070)	2	"SHIMADZU CORP"
Institution Name	(0008, 0080)	3	

SC Equipment

Attribute Name	Tag	Type	Possible Values
Conversion Type	(0008, 0064)	1	“WSD”

General Image

Attribute Name	Tag	Type	Possible Values
Instance Number (former Image Number)	(0020, 0013)	2	
Patient Orientation	(0020, 0020)	2C	A zero-length value is encoded.
Image Date	(0008, 0023)	2C	
Image Time	(0008, 0033)	2C	
Image Type	(0008, 0008)	3	“DERIVED\SECONDARY”
Image Comments	(0020, 4000)	3	

Image Pixel

Attribute Name	Tag	Type	Possible Values
Samples per Pixel	(0028, 0002)	1	Number of samples (planes) in this image. Monochrome image has “ 1 ”. Color image has “ 3 ”.
Photometric Interpretation	(0028, 0004)	1	Specifies the intended interpretation of the pixel data. Monochrome image has “ MONOCHROME2 ”. Color image has “ RGB ”.
Rows	(0028, 0010)	1	“ 512 ” (with equal number of columns)
Columns	(0028, 0011)	1	“ 512 ” (with equal number of rows)
Bits Allocated	(0028, 0100)	1	“ 8 ”
Bits Stored	(0028, 0101)	1	“ 8 ”
High Bit	(0028, 0102)	1	“ 7 ”
Pixel Representation	(0028, 0103)	1	“ 0 ”
Pixel Data	(7FE0, 0010)	1	
Planar Configuration	(0028, 0006)	1C	Only for color image.
Pixel Aspect Ratio	(0028, 0034)	1C	

Contrast/Bolus Module

Attribute Name	Tag	Type	Possible Values
Contrast/Bolus Agent	(0018, 0010)	2	“NONE”

SC Image

Attribute Name	Tag	Type	Possible Values
(None)			

Overlay Plane

Attribute Name	Tag	Type	Possible Values
(None)			

Modality LUT

Attribute Name	Tag	Type	Possible Values
(None)			

VOI LUT

Attribute Name	Tag	Type	Possible Values
Window Center	(0028, 1050)	3	" 127 " (Only for Monochrome image.)
Window Width	(0028, 1051)	1C	" 256 " (Only for Monochrome image.)

SOP Common

Attribute Name	Tag	Type	Possible Values
SOP Class UID	(0008, 0016)	1	"1.2.840.10008.5.1.4.1.1.7"
SOP Instance UID	(0008, 0018)	1	