

DICOM Conformance Statement

Application Annex:

Allura 3D-RA R6.4/**3D-RA R6.4**

On Interventional Workspot R1.4



Issued by:

Philips Medical Systems Nederland BV, a Philips Healthcare company,

P.O. Box 10.000
5680 DA Best
The Netherlands

Email: dicom@philips.com

Internet: <http://www.healthcare.philips.com/connectivity>

Document Number: ICAP-PF.0020400

Date: 10-Jan-2017

Table of Contents

1. INTRODUCTION	4
1.1. REVISION HISTORY	4
1.2. TERMINOLOGY	4
2. DATA SPECIFICATIONS	5
2.1. SUPPORTED IOD'S	5
2.1.1. Acceptance Criteria	5
2.1.2. Contents of Created IOD's	6
2.1.2.1. CT Image Storage SOP Class	6
2.1.2.2. Secondary Capture Image Storage SOP class	9
2.1.2.3. Multiframe True Color Secondary Capture Image Storage SOP class	11
2.1.2.4. X-Ray Angiographic Image Storage SOP Class	14
2.1.2.5. X-Ray 3D Angiographic Image Storage	17
2.1.2.6. Raw data Storage SOP class	21

1. Introduction

This DICOM Conformance Statement annex is applicable to the Allura 3D-RA R6.4/**3D-RA R6.4** later referred to as Allura 3D-RA R6.4/3D-RA R6.4 Application. In general the Allura 3D-RA R6.4/**3D-RA R6.4** Application allows for generating three-dimensional volumes from XA data and for viewing and analyzing XA images and derived data.

The following analysis packages are offered by Allura 3D-RA R6.4/**3D-RA R6.4** Application (licensing might be applicable):

- Advanced Vessel Analysis (AVA)
- Virtual Stenting

1.1. Revision History

The revision history below provides dates and differences among individual document versions.

Table 1: Revision History

Document Version	Date of Issue	Status	Description
00	01-Mar-2016	Authorized	Initial Version for Allura 3D-RA R6.4/ 3D-RA R6.4 on Interventional Workspot R1.4.x where x is 0 or higher
01	17-Nov-2016	Authorized	Editorial changes
02	10-Jan-2017	Authorized	Updated value for Manufacturer (0008, 0070) from "Philips Medical Systems" to "Philips".

1.2. Terminology

DICOM	Digital Imaging and Communications in Medicine
IOD	Information Object Definition
UID	Unique Identifier
VR	Value Representation
XA	X-Ray Angiography
AVA	Advanced Vessel Analysis

2. Data Specifications

2.1. Supported IOD's

This section specifies each IOD accepted and / or created by Allura 3D-RA R6.4/3D-RA R6.4 Application.

ACCEPTED	The applicable IOD is accepted for storage in the repository of the hosting platform and supported for import Allura 3D-RA R6.4/3D-RA R6.4 Application for viewing and analysis.
CREATED	The Allura 3D-RA R6.4/3D-RA R6.4 Application supports generation of derived data by using the applicable IOD and is able to store this data in the repository of the hosting platform.

Table 2: Supported IOD's

Name	IOD UID	Support	
		ACCEPTED	CREATED
X-Ray 3D Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.13.1.1	No	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	No	Yes
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Yes	No
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	No	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	No	Yes
Embedded Document	1.3.46.670589.2.8.1.1	No	Yes

2.1.1. Acceptance Criteria

This section specifies the acceptance criteria applied by Allura 3D-RA R6.4/3D-RA R6.4 Application to which a dataset should adhere before it can be imported into the application. This can be criteria on the highest level (e.g. data from a certain manufacturer or system model) or certain DICOM attributes mandatory to be present into the dataset holding a specific value. In case one or more Philips private attributes are required, then a list of supported Philips system models will be mentioned.

Table 3: Accepted system models

Manufacturer	Modality	System Model Name(s)
Not applicable	Not applicable	Not applicable

Table 4: Accepted transfer syntaxes per IOD

IOD		Transfer Syntax	
Name	UID	Name	UID
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Big Endian	1.2.840.10008.1.2.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	RLE Lossless	1.2.840.10008.1.2.5
		Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Big Endian	1.2.840.10008.1.2.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1

		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70
		RLE Lossless	1.2.840.10008.1.2.5
		Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Big Endian	1.2.840.10008.1.2.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70
		RLE Lossless	1.2.840.10008.1.2.5

Table 5: Accepted attribute values

Attribute Name	Attribute Number	Values / Comments
Not applicable	Not applicable	Not applicable

2.1.2. Contents of Created IOD's

This section specifies in detail the attribute contents of created data objects. Attributes are grouped together by its corresponding module as specified by DICOM standard. Philips private attributes are excluded for specification.

Abbreviations used in the Module table for the column "Presence of Value" are:

- ALWAYS The attribute is always present with a value
- EMPTY The attribute is always present without any value (attribute sent zero length)
- VNAP The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
- ANAP The attribute is present under specified condition – if present then it will always have a value

The abbreviations used in the Module table for the column "Source" are:

- AUTO The attribute value is generated automatically
- CONFIG The attribute value source is a configurable parameter
- COPY The attribute value source is another SOP instance
- FIXED The attribute value is hard-coded in the application
- IMPLICIT The attribute value source is a user-implicit setting
- MPPS The attribute value is the same as that use for Modality Performed Procedure Step
- MWL The attribute value source is a Modality Worklist
- USER The attribute value source is explicit user input

2.1.2.1. CT Image Storage SOP Class

Table 6: IOD of Created CT Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS

Patient Study	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	Image Plane Module	ALWAYS
	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	CT Image Module	ALWAYS
	VOI LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 7: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	AUTO	
Patient ID	0010,0020	LO		ALWAYS	AUTO	
Issuer of Patient ID	0010,0021	LO		VNAP		
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

Table 8: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Accession Number	0008,0050	SH			AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO	

Table 9: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Admitting Diagnoses Description	0008,1080	LO		ALWAYS	AUTO	

Table 10: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Performing Physician's Name	0008,1050	PN		ALWAYS	AUTO	
Patient Position	0018,5100	CS		EMPTY	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Laterality	0020,0060	CS		ANAP	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	
Performed Procedure Step ID	0040,0253	SH		ALWAYS	AUTO	

Table 11: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	
Position Reference Indicator	0020,1040	LO		VNAP	AUTO	

Table 12: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH				
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ALWAYS	CONFIG	
Device Serial Number	0018,1000	LO		ANAP	AUTO	
Software Versions	0018,1020	LO	1.4.x	ALWAYS	CONFIG	where "x" is the detailed application SW version.

Table 13: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		VNAP		
Content Date	0008,0023	DA		ANAP		
Content Time	0008,0033	TM		ANAP		
Acquisition Number	0020,0012	IS		VNAP		
Instance Number	0020,0013	IS		ANAP		
Burned in Annotation	0028,0301	CS		VNAP		
Lossy Image Compression	0028,2110	CS		VNAP		

Table 14: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Slice Thickness	0018,0050	DS		VNAP		
Image Position (Patient)	0020,0032	DS		ALWAYS		
Image Orientation (Patient)	0020,0037	DS		ALWAYS		
Slice Location	0020,1041	DS		ANAP		
Pixel Spacing	0028,0030	DS		ALWAYS		

Table 15: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US	0000	ALWAYS	AUTO	
Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED	
Bits Allocated	0028,0100	US	16	ALWAYS	FIXED	
Bits Stored	0028,0101	US	16	ALWAYS	FIXED	
High Bit	0028,0102	US	15	ALWAYS	FIXED	
Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

Table 16: CT Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	DERIVED, SECONDARY	ALWAYS	FIXED	

KVP	0018,0060	DS		VNAP	AUTO	
Acquisition Number	0020,0012	IS		VNAP		
Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED	
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	FIXED	
Bits Allocated	0028,0100	US	16	ALWAYS	FIXED	
Bits Stored	0028,0101	US	16	ALWAYS	FIXED	
High Bit	0028,0102	US	15	ALWAYS	FIXED	
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	

Table 17: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS	Value 1: Allura 3D-RA R6.4/3D-RA R6.4 Window Width as set in histogram, converted to Hounsfield, XperCT Abdominal:60, XperCT Neuro:40	ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	

Table 18: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	CONDITIONAL	FIXED	
Instance Creation Date	0008,0012	DA		ALWAYS		
Instance Creation Time	0008,0013	TM		ALWAYS		
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.2	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS		

2.1.2.2. Secondary Capture Image Storage SOP class

Table 19: IOD of Created Secondary Capture Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	CONDITIONAL
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SOP Common Module	ALWAYS
	Extended DICOM and private attributes	CONDITIONAL

Table 20: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	AUTO	
Patient ID	0010,0020	LO		ALWAYS	AUTO	
Patient's Birth Date	0010,0030	DA		ALWAYS	AUTO	
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

Table 21: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Accession Number	0008,0050	SH		VNAP		
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO	

Table 22: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	
Related Series Sequence	0008,1250	SQ		VNAP		
>Study Instance UID	0020,000D	UI		ALWAYS		
>Series Instance UID	0020,000E	UI		ALWAYS		
>Purpose of Reference Code Sequence	0040,A170	SQ		EMPTY		

Table 23: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH				
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ALWAYS	CONFIG	
Device Serial Number	0018,1000					
Software Versions	0018,1020	LO	1.4.x	ALWAYS	CONFIG	where "x" is the detailed application SW version.

Table 24 : SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ANAP		
Conversion Type	0008,0064	CS	WSD	ALWAYS		

Table 25: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		ALWAYS		
Patient Orientation	0020,0020	CS		VNAP		

Table 26: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Planar Configuration	0028,0006	US		ALWAYS		
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	8	ALWAYS		
Bits Stored	0028,0101	US	8	ALWAYS		
High Bit	0028,0102	US	7	ALWAYS		
Pixel Representation	0028,0103	US	0000	ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

Table 27: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

Table 28 : Extended DICOM and private attributes for Secondary Capture Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Requested Procedure ID	0040,1001	SH		ANAP		

2.1.2.3. Multiframe True Color Secondary Capture Image Storage SOP class

Table 29: IOD of Created Multiframe True Color Secondary Capture Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	CONDITIONAL
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Cine Module	CONDITIONAL
	Multi-Frame Module	ALWAYS
	Multi-Frame Functional Groups Module	OPTIONAL
	SC Multi-frame Image Module	ALWAYS
	SOP Common Module	ALWAYS
	Extended DICOM and private attributes	CONDITIONAL

Table 30: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
----------------	-----	----	-------	-------------------	--------	---------

Patient's Name	0010,0010	PN		VNAP	AUTO	
Patient ID	0010,0020	LO		VNAP	AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		VNAP	AUTO	

Table 31: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP		
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	

Table 32: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP	AUTO	
Series Time	0008,0031	TM		ANAP	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ANAP	AUTO	
Related Series Sequence	0008,1250	SQ		ANAP		
>Study Instance UID	0020,000D	UI		ALWAYS		
>Series Instance UID	0020,000E	UI		ALWAYS		
>Purpose of Reference Code Sequence	0040,A170	SQ		VNAP		

Table 33: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH				
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ALWAYS	CONFIG	
Device Serial Number	0018,1000					
Software Versions	0018,1020	LO	1.4.x	ALWAYS	CONFIG	where "x" is the detailed application SW version.

Table 34 : SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ANAP		
Conversion Type	0008,0064	CS	WSD	ALWAYS		

Table 35: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP		

Patient Orientation	0020,0020	CS		VNAP		
Burned in Annotation	0028,0301	CS		ANAP		

Table 36: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Planar Configuration	0028,0006	US		ALWAYS		
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	8	ALWAYS		
Bits Stored	0028,0101	US	8	ALWAYS		
High Bit	0028,0102	US	7	ALWAYS		
Pixel Representation	0028,0103	US	0000	ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

Table 37: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time	0018,1063	DS		ALWAYS	AUTO	

Table 38: Multi-Frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	DS		ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT		ALWAYS	AUTO	

Table 39: Multi-Frame Functional Groups Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Number of Frames	0028,0008	IS		ALWAYS	AUTO	

Table 40: SC Multi-Frame Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Increment Pointer	0028,0009	AT		ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS		ALWAYS	AUTO	

Table 41: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7.4	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

Table 42 : Extended DICOM and private attributes for Multiframe True Color Secondary Capture Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	LO		ANAP		
Requested Procedure ID	0040,1001	LO		ANAP		

2.1.2.4. X-Ray Angiographic Image Storage SOP Class

Table 43: IOD of Created X-Ray 3D Angiographic Image Storage Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Cine Module	ALWAYS
	Multi-Frame Module	ALWAYS
	X-Ray Image Module	ALWAYS
	X-Ray Acquisition Module	ALWAYS
	XA Positioner Module	ALWAYS
	VOI LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 44: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP		
Patient ID	0010,0020	LO		VNAP		
Patient's Birth Date	0010,0030	DA		VNAP		
Patient's Sex	0010,0040	CS		VNAP		

Table 45: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP		
Study Time	0008,0030	TM		VNAP		
Accession Number	0008,0050	SH		VNAP		
Referring Physician's Name	0008,0090	PN		VNAP		
Study Instance UID	0020,000D	UI		ALWAYS		
Study ID	0020,0010	SH		VNAP		

Table 46: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP		
Series Time	0008,0031	TM		ANAP		
Modality	0008,0060	CS		ALWAYS		
Performing Physician's Name	0008,1050	PN		ANAP		

Related Series Sequence	0008,1250	SQ		ANAP		
>Study Instance UID	0020,000D	UI		ALWAYS		
>Series Instance UID	0020,000E	UI		ALWAYS		
>Purpose of Reference Code Sequence	0040,A170	SQ		VNAP		
Series Instance UID	0020,000E	UI		ALWAYS		
Series Number	0020,0011	IS		VNAP		
Laterality	0020,0060	CS		ANAP		

Table 47: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	VNAP		
Institution Name	0008,0080	LO		ANAP		
Station Name	0008,1010	SH		ANAP		
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ANAP		
Device Serial Number	0018,1000	LO		ANAP		
Software Versions	0018,1020	LO	1.4.x	ANAP		where "x" is the detailed application SW version.

Table 48: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP		
Patient Orientation	0020,0020	CS		ANAP		
Icon Image Sequence	0088,0200	SQ		ANAP		
>Samples per Pixel	0028,0002	US		ALWAYS		
>Photometric Interpretation	0028,0004	CS		ALWAYS		
>Rows	0028,0010	US		ALWAYS		
>Columns	0028,0011	US		ALWAYS		
>Bits Allocated	0028,0100	US		ALWAYS		
>Bits Stored	0028,0101	US		ALWAYS		
>High Bit	0028,0102	US		ALWAYS		
>Pixel Representation	0028,0103	US		ALWAYS		
>Pixel Data	7FE0,0010	UN		ANAP		

Table 49: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rows	0028,0010	US		ALWAYS		
Columns	0028,0011	US		ALWAYS		
>Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Bits Allocated	0028,0100	US		ALWAYS		
Bits Stored	0028,0101	US		ALWAYS		
High Bit	0028,0102	US		ALWAYS		
Pixel Representation	0028,0103	US		ALWAYS		
Pixel Data	7FE0,0010	UN		ANAP		

Table 50: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time	0018,1063	DS		ANAP		

Table 51: Multi-Frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS		
Frame Increment Pointer	0028,0009	AT		ALWAYS		

Table 52: X-Ray Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS		
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Frame Increment Pointer	0028,0009	AT		ANAP		
Bits Allocated	0028,0100	US		ALWAYS		
Bits Stored	0028,0101	US		ALWAYS		
High Bit	0028,0102	US		ALWAYS		
Pixel Representation	0028,0103	US		ALWAYS		
Pixel Intensity Relationship	0028,1040	CS		ALWAYS		

Table 53: X-Ray Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
KVP	0018,0060	DS		VNAP		
Exposure Time	0018,1150	IS		ANAP		
X-Ray Tube Current	0018,1151	IS		ANAP		
Radiation Setting	0018,1155	CS		ALWAYS		

Table 54: XA Positioner Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Positioner Motion	0018,1500	CS		ANAP		
Positioner Primary Angle	0018,1510	DS		VNAP		
Positioner Secondary Angle	0018,1511	DS		VNAP		

Table 55: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ANAP		
Window Width	0028,1051	DS		ANAP		

Table 56: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.12.1	ALWAYS		
SOP Instance UID	0008,0018	UI		ALWAYS		
Instance Number	0020,0013	IS		ANAP		

2.1.2.5. X-Ray 3D Angiographic Image Storage

Table 57: IOD of Created X-Ray 3D Angiographic Image Storage Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
	Enhanced Series Module	ALWAYS
Image	Frame Of Reference Module	ALWAYS
	General Equipment Module	ALWAYS
	Enhanced General Equipment Module	ALWAYS
	Image Pixel Module	ALWAYS
	Acquisition Context Module	ALWAYS
	Multi-frame Functional Groups Module	ALWAYS
	X-Ray 3D Image Module	ALWAYS
	X-Ray 3D Reconstruction Module	ALWAYS
	SOP Common Module	ALWAYS

Table 58: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP		
Patient ID	0010,0020	LO		VNAP		
Patient's Birth Date	0010,0030	DA		VNAP		
Patient's Sex	0010,0040	CS		VNAP		

Table 59: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP		
Study Time	0008,0030	TM		VNAP		
Accession Number	0008,0050	SH		VNAP		
Referring Physician's Name	0008,0090	PN		VNAP		
Study Instance UID	0020,000D	UI		ALWAYS		
Study ID	0020,0010	SH		VNAP		

Table 60: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP		
Series Time	0008,0031	TM		ANAP		
Modality	0008,0060	CS	XA	ALWAYS		
Performing Physician's Name	0008,1050	PN		ANAP		

Series Instance UID	0020,000E	UI		ALWAYS		
Laterality	0020,0060	CS		ANAP		
Performed Procedure Step Start Date	0040,0244	DA		ANAP		
Performed Procedure Step Start Time	0040,0245	TM		ANAP		
Performed Procedure Step ID	0040,0253	SH		ANAP		

Table 61: Enhanced Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Number	0020,0011	IS		ALWAYS		

Table 62: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS		
Position Reference Indicator	0020,1040	LO		VNAP		

Table 63: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	VNAP		
Institution Name	0008,0080	LO		ANAP		
Station Name	0008,1010	SH		ANAP		
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ANAP		
Device Serial Number	0018,1000	LO		ANAP		
Software Versions	0018,1020	LO	1.4.x	ANAP		where "x" is the detailed application SW version.

Table 64: Enhanced General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH				
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ALWAYS	CONFIG	
Device Serial Number	0018,1000					
Software Versions	0018,1020	LO	1.4.x	ALWAYS	CONFIG	where "x" is the detailed application SW version.

Table 65: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Rows	0028,0010	US		ALWAYS		
Columns	0028,0011	US		ALWAYS		
Bits Allocated	0028,0100	US		ALWAYS		
Bits Stored	0028,0101	US		ALWAYS		
High Bit	0028,0102	US		ALWAYS		
Pixel Representation	0028,0103	US		ALWAYS		

Pixel Data	7FE0,0010	UN		ANAP		
------------	-----------	----	--	------	--	--

Table 66: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		VNAP		
Concept Name Code Sequence	0040,A043	SQ		ALWAYS		

Table 67: Multi-frame Functional Groups Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS		
Content Time	0008,0033	TM		ALWAYS		
Instance Number	0020,0013	IS		ALWAYS		
Number of Frames	0028,0008	IS		ALWAYS		
Shared Functional Groups Sequence	5200,9229	SQ		VNAP		
>Pixel Measures Sequence	0028,9110	SQ		ALWAYS		
>>Slice Thickness	0018,0050	DS		ALWAYS		
>>Pixel Spacing	0028,0030	DS		ALWAYS		
>Frame Anatomy Sequence	0020,9071	SQ		ALWAYS		
>>Frame Laterality	0020,9072	CS		ALWAYS		
>>Anatomic Region Sequence	0008,2218	SQ		ALWAYS		
>>>Code Value	0008,0100	SH		ALWAYS		
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS		
>>>Code Meaning	0008,0104	LO		ALWAYS		
Per-frame Functional Groups Sequence	5200,9230	SQ		ALWAYS		
>Frame Content Sequence	0020,9111	SQ		ALWAYS		
>Plane Position Sequence	0020,9113	SQ		ALWAYS		
>>Image Position (Patient)	0020,0032	DS		ANAP		
>Plane Orientation Sequence	0020,9116	SQ		ALWAYS		
>>Image Orientation (Patient)	0020,0037	DS		ANAP		
>Derivation Image Sequence	0008,9124	SQ		ANAP		
>>Source Image Sequence	0008,2112	SQ		VNAP		
>>Derivation Code Sequence	0008,9215	SQ		ALWAYS		
>>>Code Value	0008,0100	SH		ALWAYS		
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS		
>>>Code Meaning	0008,0104	LO		ALWAYS		
>Frame VOI LUT Sequence	0028,9132	SQ		ALWAYS		
>>Window Center	0028,1050	DS		ALWAYS		
>>Window Width	0028,1051	DS		ALWAYS		
>X-Ray 3D Frame Type Sequence	0018,9504	SQ		ANAP		
>>Frame Type	0008,9007	CS	DERIVED\PRIMARY\ VOLUME\NONE	ALWAYS		
>>Reconstruction Index	0020,9536	US		ALWAYS		
>>Pixel Presentation	0008,9205	CS	MONOCHROME	ALWAYS		
>>Volumetric Properties	0008,9206	CS		ALWAYS		
>>Volume Based Calculation Technique	0008,9207	CS	NONE	ALWAYS		

Table 68: X-Ray 3D Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS		
Content Qualification	0018,9004	CS	PRODUCT	ALWAYS		
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Bits Allocated	0028,0100	US		ALWAYS		
Bits Stored	0028,0101	US		ALWAYS		
High Bit	0028,0102	US		ALWAYS		
Burned In Annotation	0028,0301	CS	NO	ALWAYS		
Lossy Image Compression	0028,2110	CS	00	ALWAYS		
Presentation LUT Shape	2050,0020	CS	IDENTITY	ALWAYS		
Pixel Presentation	0008,9205	CS		ALWAYS		
Volumetric Properties	0008,9206	CS		ALWAYS		
Volume Based Calculation Technique	0008,9207	CS	NONE	ALWAYS		

Table 69: X-Ray 3D Reconstruction Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
X-Ray 3D Reconstruction Sequence	0018,9530	SQ		ALWAYS		
>Application Name	0018,9524	LO	Interventional Workspot	ALWAYS		
>Application Version	0018,9525	LO	1.4.3	ALWAYS		
>Application Manufacturer	0018,9526	LO	Philips Medical Systems	ALWAYS		
>Algorithm Type	0018,9527	CS	FILTER_BACK_PROJ	ALWAYS		
>Acquisition Index	0020,9518	US	1	ALWAYS		

Table 70: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP		
Patient Orientation	0020,0020	CS		ANAP		
Icon Image Sequence	0088,0200	SQ		ANAP		
>Samples per Pixel	0028,0002	US		ALWAYS		
>Photometric Interpretation	0028,0004	CS		ALWAYS		
>Rows	0028,0010	US		ALWAYS		
>Columns	0028,0011	US		ALWAYS		
>Bits Allocated	0028,0100	US		ALWAYS		
>Bits Stored	0028,0101	US		ALWAYS		
>High Bit	0028,0102	US		ALWAYS		
>Pixel Representation	0028,0103	US		ALWAYS		
>Pixel Data	7FE0,0010	OB/OW		ANAP		

Table 71: X-Ray 3D Angiographic Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
X-Ray 3D Acquisition Sequence	0018,9507	SQ		ALWAYS		
>Detector Type	0018,7004	CS		VNAP		

Table 72: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.13.1.1	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
Instance Number	0020,0013	IS		ANAP		

Table 73: Extended DICOM and private attributes for X-Ray 3D Angiographic Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Conversion Type	0008,0064	CS		ANAP		
Application Version	0018,9525	LO		ANAP		
Window Center	0028,1050	DS		ANAP		
Window Width	0028,1051	DS		ANAP		
Requested Procedure ID	0040,1001	SH		ANAP		

2.1.2.6. Raw data Storage SOP class

Table 74: IOD of Created Raw Data Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference	OPTIONAL
Equipment	General Equipment Module	ALWAYS
Image	Acquisition Context Module	ALWAYS
	Raw Data Module	ALWAYS
	SOP Common Module	ALWAYS
	Extended DICOM and Private Attributes	OPTIONAL

Table 75 : Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	AUTO	
Patient ID	0010,0020	LO		ALWAYS	AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

Table 76 : General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO	
Accession Number	0008,0050	SH		EMPTY	AUTO, USER	

Table 77 : General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP	AUTO	
Series Time	0008,0031	TM		ANAP	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Description	0008,103E	LO		ANAP		
Performing Physicians' name	0008,1050	PN		ANAP		
Related Series Sequence	0008,1250	SQ		ANAP		
>Study Instance UID	0020,000D	UI		ALWAYS		
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		VNAP		
Series Instance UID	0020,000E	UI		ALWAYS		
Series Number	0020,0011	IS		VNAP	AUTO	
Laterality	0020,0060	CS		ANAP		
Performed Procedure Step Start Date	0040,0244	DA		ANAP		
Performed Procedure Step Start Time	0040,0245	TM		ANAP		
Performed Procedure Step ID	0040,0253	SH		ANAP		

Table 78: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	
Position Reference Indicator	0020,1040	LO		VNAP	AUTO	

Table 79: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH				
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ALWAYS	CONFIG	
Device Serial Number	0018,1000					
Software Versions	0018,1020	LO	1.4.x	ALWAYS	CONFIG	where "x" is the detailed application SW version.

Table 80: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		VNAP	AUTO	

Table 81: Raw Data Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Creator Version UID	0008,9123	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

Table 82: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.66	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Original Specialized SOP Class UID	0008,001B	UI		VNAP	AUTO	
Instance Creation Date	0008,0012	DA		VNAP	AUTO	
Instance Creation Time	0008,0013	TM		VNAP	AUTO	
Instance Number	0020,0013	IS		VNAP		

Table 83: Extended DICOM and private attributes for Raw Data Image Storage SOP class

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date	0040,A121	DA		VNAP	AUTO	
Time	0040,A122	TM		VNAP	AUTO	