KONICA MINOLTA

ImagePilot

DICOM 3.0 Conformance Statement

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Revision History

Date	Version	Edited by	Description
01/05/2007	First edition	KONICA MINOLTA MEDICAL & GRAPHIC, INC	
27/06/2008	Rev.1	KONICA MINOLTA MEDICAL & GRAPHIC, INC	Articles relating CR Image Storage SOP Class are added.
07/06/2008	Rev.2	KONICA MINOLTA MEDICAL & GRAPHIC, INC	Attribute tag information of N-SET are modified.

CONFORMANCE STATEMENT OVERVIEW

This document "Conformance Statement" describes the compatibility of DICOM Interface for ImagePilot with DICOM PS3.2. Services provided by ImagePilot are listed below.

Table1-1: NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Storage		
CR(Computed Radiography) Image	Yes	Yes
CT Image Information Object Storage	Yes	Yes
US Multi-Frame Image Storage	Yes	Yes
MR Image Information Object Storage	Yes	Yes
US Image Storage	Yes	Yes
SC (Secondary Capture) Image Storage	Yes	Yes
VL Endoscopic Image Storage	Yes	Yes
VL Microscopic Image Storage	Yes	Yes
VL Slide-Coordinates Microscopic Image Storage	Yes	Yes
VL Photographic Image Storage	Yes	Yes
Grayscale Softcopy Presentation State Storage	Yes	Yes
Storage Commitment		
Storage Commitment Push Model	No	No
Print Management		
Basic Grayscale Print Management Meta	Yes	No
Presentation LUT	Yes	No
Workflow Management		
Modality Worklist Information Model-Find	No	No
Modality Performed Procedure Step	No	No

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1. INTRODUCTION

1.1 AUDIENCE

This document is prepared for hospital staff, medical device suppliers and software engineers/implementers, presuming they are familiar with DICOM Standard.

1.2 REMARKS

First of all, it should be noted that DICOM Standard itself does not guarantee interoperability of medical devices.

However, it allows with ease, implementing first validity verification of interoperating medical devices that support the same DICOM Services.

"Conformance Statement" is prepared to help networking "ImagePilot" to other DICOM devices, and it is presumed that the reader reads this document while referring to other documents describing DICOM Standard as well.

1.3 DEFINITIONS, TERM AND ABBREVIATIONS

AE	Application Entity
CD-R	Compact Disk Recordable
CR	Computerized Radiography
CT	Computerized Tomography
DICOM	Digital Imaging and Communications in Medicine
DVD-R	DVD-Recordable
FSC	File-Set Creator
FSR	File-Set Reader
FSU	File-Set Updater
IE	Information Entity
IOD	Information Object Definition
ISO	International Standards Organization
MR	Magnetic Resonance
PDU	Protocol Data Unit
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
US	Ultrasound
VM	Value Multiplicity
VR	Value Representation

2. NETWORKING

2.1 IMPLEMENTATION MODEL

AE implemented in DICOM Interface for ImagePilot allows receiving and requesting Association to/from external AE using DICOM Storage SCP/SCU Service Class.

2.1.1 Application Data Flow
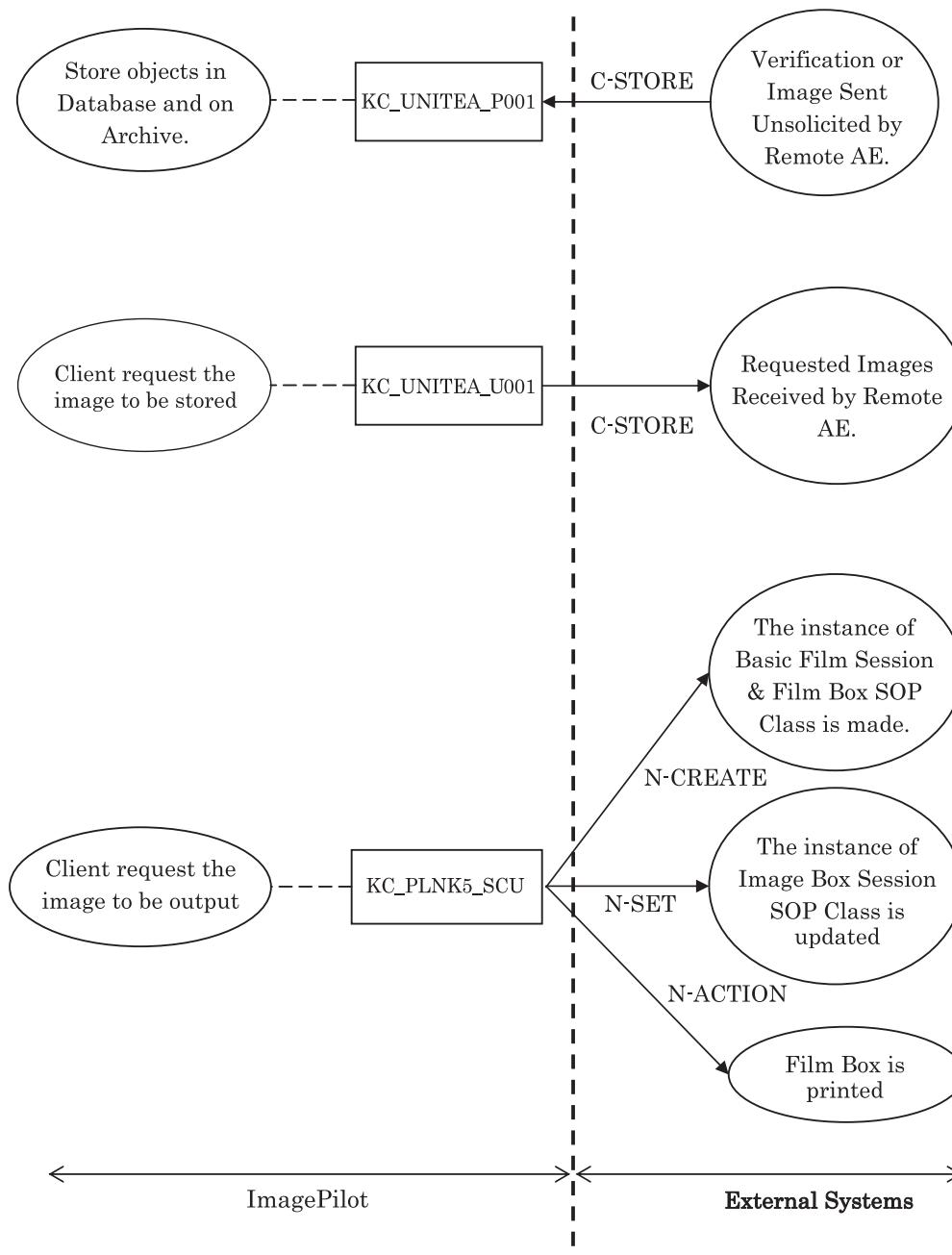
2.1.2 Function Definition of AEs

2.1.2.1 Function Definition of STORAGE-SCP Application Entity

KC_UNITEA_P001(:Default AE Title for STORAGE-SCP) runs as background process and becomes ready to receive signal as soon as the system is started up.

KC_UNITEA_P001 operates as DICOM Storage Service Class SCP. KC_UNITEA_P001 starts reception against C-STORE-RQ from external AE after accepting Association Establishment Request.

Completion of image transfer from external AE is defined as when the Association is released.

External AE from which the Association Request should be received and accepted is set in configuration.

2.1.2.2 Function Definition of QUERY/RETRIEVE-SCP Application Entity

KC_UNITEA_U001(:Default AE Title for STORAGE-SCU) runs as communication process and starts sending the image using STORAGE-SCU Service after the Association Request to external AE is accepted.

External AE that should send Association Request is set in configuration.

2.1.2.3 Function Definition of PRINT MANAGE-SCP Application Entity

KC_PLNK5_SCU(:Default AE Title for PRINT MANAGE-SCU) runs as communication process and starts hard copy transmission using N-CREATE-RQ after the Association Request to external AE is accepted.

External AE that should send Association Request is set in configuration.

2.1.3 Sequencing of Real-World Activities

Those AEs do not support Sequencing of Real-World Activities.

DICOM Conformance Statement

2.2 AE SPECIFICATIONS

2.2.1 STORAGE-SCP Application Entity

KC_UNITEA_P001 has been set as default for STORAGE-SCP AE Title in ImagePilot.

2.2.1.1 SOP Class

KC_UNITEA_P001 supports following DICOM V3.0 SOP Classes as an SCP.

SOP Class name	SOP Class UID	SCU	SCP
CR (Computed Radiography) Image	1.2.840.10008.5.1.4.1.1.1	NO	YES
CT Image Information Object Storage	1.2.840.10008.5.1.4.1.1.2	NO	YES
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	NO	YES
MR Image Information Object Storage	1.2.840.10008.5.1.4.1.1.4	NO	YES
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	NO	YES
SC (Secondary Capture) Image Storage	1.2.840.10008.5.1.4.1.1.7	NO	YES
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	NO	YES
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	NO	YES
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	NO	YES
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	NO	YES
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	NO	YES

2.2.1.2 Association Policies

2.2.1.2.1 General

KC_UNITEA_P001 starts receiving the image data after Association is established. AE Title and Port No. from which the Association is accepted are set in configuration.

Application Context Name supports DICOM V3.0 SOP Class listed below.

Application Context Name	1.2.840.10008.3.1.1.1

2.2.1.2.2 Number of Associations

KC_UNITEA_P001 is capable of accepting Associations from maximum 5 external AEs including Associations for different services at the same time. Parallel processing will be implemented for each AE whose Association has been established.

Maximum number of simultaneous Associations	5

2.2.1.2.3 Asynchronous Nature

Asynchronous processing is not supported.

Maximum number of simultaneous Associations	1 (Not Configurable)

2.2.1.2.4 Implementation Identifying Information

Implementation Class UID	Refer to description for Instance UID below
Implementation Version Name	KC_UNITEA_X.XX X.XX represents software version.

SOP Instance UID is defined as follows.
- 1.2.392.200036.9107.[DivCode].[Device].[Serial No.].[yyyymmdd].[hhmmss].[Unique No.]

Study Instance UID is defined as follows.
- 1.2.392.200036.9107.[DivCode].[11+Study No.]

Series Instance UID is defined as follows.
- 1.2.392.200036.9107.[DivCode].[Device].[Serial No.].[Study No.].[12+Series No.]

Notes) [DivCode]   : Section code 500

    [Device]   : Device type of source 220

    [Serial No.]   : Serial No. of the Device is specified.

    [yyyymmdd]   : Date is specified.

    [hhmmss]   : Time is specified.

    [Study No.]   : Study ID

    [Series No.]   : Series Number

    [Unique No.]   : Unique No. internally issued by the Device is specified.

2.2.1.3 Association Initiation Policy

KC_UNITEA_P001 does not request Association.

2.2.1.4 Association Acceptance Policy

2.2.1.4.1 Activity-Storage Image Requested by an External Peer AE

2.2.1.4.1.1 Description and Sequencing of Activity

KC_UNITEA_P001 becomes stand-by as soon as the system is started up so that it can receive request for Association from external AE. KC_UNITEA_P001 starts receiving images only after accepting the Association.

KC_UNITEA_P001 shall release the Association when the image transfer is completed. Registration of the image shall not be made if a request for release is not received.
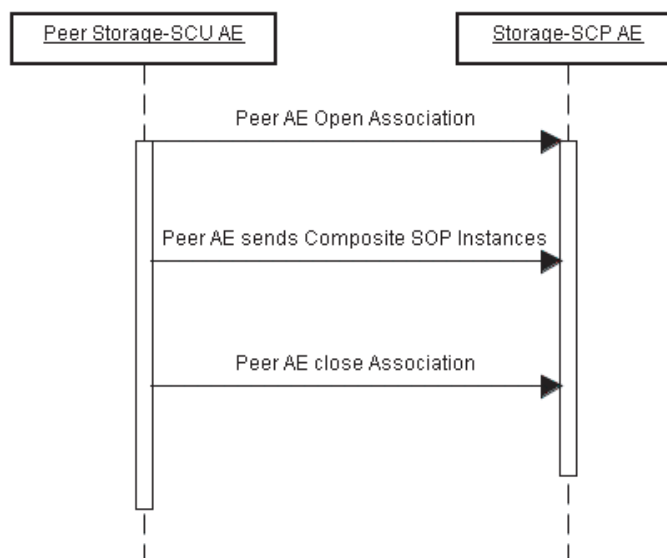
Sequence of Image Storage requested from external AE in the above is described below.

1. External AE sends a request for Association to KC_UNITEA_P001.
2. External AE sends images to KC_UNITEA_P001.
3. External AE sends a request for release to KC_UNITEA_P001.

2.2.1.4.1.2 Accepted Presentation Contexts

KC_UNITEA_P001 is capable of accepting Presentation Contexts listed below.

Abstract Syntax			
Name	UID	Role	Extended Negotiation
CR Image Storage Service class	1.2.840.10008.5.1.4.1.1.1	SCP	None
CT Image Information Object Storage	1.2.840.10008.5.1.4.1.1.2	SCP	None
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	SCP	None
MR Image Information Object Storage	1.2.840.10008.5.1.4.1.1.4	SCP	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	SCP	None
SC (Secondary Capture) Image Storage	1.2.840.10008.5.1.4.1.1.7	SCP	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	SCP	None

Abstract Syntax			
Name	UID	Role	Extended Negotiation
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	SCP	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	SCP	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	SCP	None

KC_UNITEA_U001 supports following Transfer Syntax for Abstract Syntax mentioned above.

Transfer Syntax	
Name List	UID List
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 Baseline (Process1)	1.2.840.10008.1.2.4.50
JPEG Extended (Process2 & 4)	1.2.840.10008.1.2.4.51
JPEG Lossless	1.2.840.10008.1.2.4.70

2.2.1.5 STORAGE-SCU Application Entity

KC_UNITEA_U001 has been set as default for STORAGE-SCU AE Title in ImagePilot.

2.2.1.5.1 SOP Class

KC_UNITEA_U001 supports following DICOM V3.0 SOP Classes as an SCP.

SOP Class name	SOP Class UID	SCU	SCP
CR (Computed Radiography) Image	1.2.840.10008.5.1.4.1.1.1	YES	NO
CT Image Information Object Storage	1.2.840.10008.5.1.4.1.1.2	YES	NO
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	YES	NO
MR Image Information Object Storage	1.2.840.10008.5.1.4.1.1.4	YES	NO
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	YES	NO
SC (Secondary Capture) Image Storage	1.2.840.10008.5.1.4.1.1.7	YES	NO
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	YES	NO
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	YES	NO
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	YES	NO
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	YES	NO
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	YES	NO

2.2.1.6 Association Establishment Policies

2.2.1.6.1 General

KC_UNITEA_U001 starts sending the image data after Association is established. AE Title and Port No. from which the Association is accepted are set in configuration.

KC_UNITEA_U001 does not accept Association Request from the external AEs.

Application Context Name supports DICOM V3.0 SOP Class listed below.

Application Context Name	1.2.840.10008.3.1.1.1

2.2.1.6.2 Number of Associations

KC_UNITEA_U001 is capable of sending Association Requests to maximum 5 external AEs including Associations for different services at the same time. Parallel processing will be implemented for each AE whose Association has been established.

Maximum number of simultaneous Associations	5

2.2.1.6.3 Asynchronous Nature

Asynchronous processing is not supported.

Maximum number of simultaneous Associations	1 (Not Configurable)

2.2.1.6.4 Implementation Identifying Information

Implementation Class UID	Refer to description for Instance UID below
Implementation Version Name	KC_UNITEA_X.XX X.XX represents software version.

SOP Instance UID is defined as follows.
- 1.2.392.200036.9107.[DivCode].[Device].[Serial No.].[yyyymmdd].[hhmmss].[Unique No.]

Study Instance UID is defined as follows.
- 1.2.392.200036.9107.[DivCode].[11+Study No.]

Series Instance UID is defined as follows.
- 1.2.392.200036.9107.[DivCode].[Device].[Serial No.].[Study No.].[12+Series No.]

Notes) [DivCode]   : Section code 500

     [Device]   : Device type of source 220

     [Serial No.]   : Serial No. of the Device is specified.

     [yyyymmdd]   : Date is specified.

     [hhmmss]   : Time is specified.

     [Study No.]   : Study ID

     [Series No.]   : Series Number

     [Unique No.]   : Unique No. internally issued by the Device is specified.

2.2.1.7 Association Initiation Policy

2.2.1.7.1 Activity-Send Image Requested by an External Peer AE

2.2.1.7.1.1 Description and Sequencing of Activity

STORAGE-SCU of ImagePilot will be started up when the image is sent to the external AEs.

STORAGE-SCU Service requests Association to external AEs, and sends the image after the request is accepted. Release will be made after the image transfer is completed.

```
Peer Sorage                                                        Storage-
SCP AE                                                             SCU AE
   │                                                                 ┌─┐
   │                    Open Association                             │ │
  ┌┴┐◄──────────────────────────────────────────────────────────────│ │
  └┬┘                                                                │ │
   │               Image Sent Peer AE in Response                    │ │
  ┌┴┐◄──────────────────────────────────────────────────────────────│ │
  └┬┘                                                                │ │
   │                    Close Association                            │ │
  ┌┴┐◄──────────────────────────────────────────────────────────────│ │
  └┬┘                                                                └─┘
   │                                                                 │
```
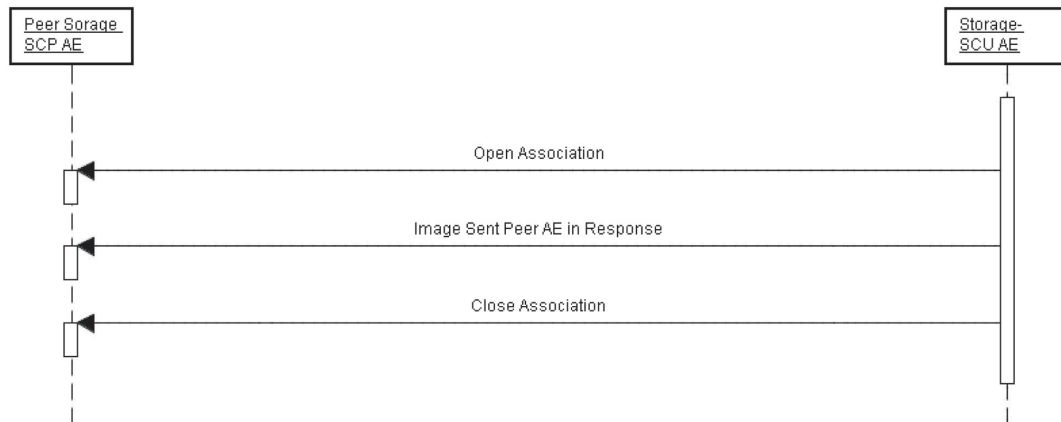
Sequence of Image Transfer Request to the external AE in the above is described below.

1. KC_UNITEA_U001 sends Association Request to external AE.
2. KC_UNITEA_U001 sends the image requested by C-STORE Command of STORAGE SOP Class.
3. KC_UNITEA_U001 sends Release Request to external AE.

2.2.1.7.1.2 Proposed Presentation Contexts

KC_UNITEA_U001 proposes following Presentation Contexts as necessary.

Abstract Syntax			
Name	UID	Role	Extended Negotiation
CR Image Storage Service class	1.2.840.10008.5.1.4.1.1.1	SCU	None
CT Image Information Object Storage	1.2.840.10008.5.1.4.1.1.2	SCU	None
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	SCU	None
MR Image Information Object Storage	1.2.840.10008.5.1.4.1.1.4	SCU	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	SCU	None
SC (Secondary Capture) Image Storage	1.2.840.10008.5.1.4.1.1.7	SCU	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	SCU	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	SCU	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	SCU	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	SCU	None

KC_UNITEA_U001 supports following Transfer Syntax for Abstract Syntax mentioned above.

Transfer Syntax	
Name List	UID List
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 Baseline (Process1)	1.2.840.10008.1.2.4.50
JPEG Extended (Process2 & 4)	1.2.840.10008.1.2.4.51
JPEG Lossless	1.2.840.10008.1.2.4.70

2.2.1.8 Association Acceptance Policy

STORAGE-SCU Service does not accept Association Request.

2.2.1.9 CR Image Storage SOP Class

This model conforms with the CR Image SOP Class.

The KC_UNITEA_U001 uses C-STORE to store image data on an image storage device (SCP).

Behavior: For SOP instances matching the CR Image IOD request, the KC_UNITEA_U001executes the C-STORE DIMSE service.

The KC_UNITEA_U001 recognizes the C-STORE response status and takes appropriate action depending on whether the service terminated normally or not.

CR Image IOD Modules

IE	Module	Usage
Patient	Patient	M
	Clinical Trial Subject	U
Study	General Study	M
	Patient Study	U
	Clinical Trial Study	U
Series	General Series	M
	CR Series	M
	Clinical Trial Series	U
Equipment	General Equipment	M
Image	General Image	M
	Image Pixel	M
	Contrast/bolus	C
	Display Shutter	U
	Device	U
	CR Image	M
	Overlay Plane	U
	Modality LUT	U
	VOI LUT	U
	SOP Common	M

Patient				
Tag	Name	VR	VM	Type
(0010,0010)	Patient's Name	PN	1	2
(0010,0020)	Patient ID	LO	1	2
(0010,0030)	Patient's Birth Date	DA	1	2
(0010,0040)	Patient's Sex	CS	1	2
(0010,0032)	Patient's Birth Time	TM	1	3
(0010,1000)	Other Patient IDs	LO	1	3
(0010,1001)	Other Patient Names	PN	1	3
(0010,4000)	Patient Comments	LT	1	3

General Study				
Tag	Name	VR	VM	Type
(0020,000D)	Study Instance UID	UI	1	1
(0008,0020)	Study Date	DA	1	2
(0008,0030)	Study Time	TM	1	2
(0008,0090)	Referring Physician's Name	PN	1	2
(0020,0010)	Study ID	SH	1	2
(0008,0050)	Accession Number	SH	1	2
(0008,1030)	Study Description	LO	1	3

Patient Study				
Tag	Name	VR	VM	Type
(0010,1010)	Patient's Age	AS	1	3
(0010,1020)	Patient's Size	DS	1	3
(0010,1030)	Patient's Weight	DS	1	3

General Series				
Tag	Name	VR	VM	Type
(0008,0060)	Modality	CS	1	1
(0020,000E)	Series Instance UID	UI	1	1
(0020,0011)	Series Number	IS	1	2
(0020,0060)	Laterality	CS	1	2C
(0008,0021)	Series Date	DA	1	3
(0008,0031)	Series Time	TM	1	3
(0008,1050)	Performing Physicians' Name	PN	1	3
(0008,103E)	Series Description	LO	1	3
(0008,1070)	Operators' Name	PN	1	3
(0018,0015)	Body Part Examined	CS	1	3
(0018,5100)	Patient Position	CS	1	3
(0028,0108)	Smallest Pixel Value in Series	US	1	3
(0028,0109)	Largest Pixel Value in Series	US	1	3

CR Series				
Tag	Name	VR	VM	Type
(0018,0015)	Body Part Examined	CS	1	2
(0018,5101)	View Position	CS	1	2

General Equipment				
Tag	Name	VR	VM	Type
(0008,0070)	Manufacturer	LO	1	2
(0008,0080)	Institution Name	LO	1	3
(0008,1010)	Station Name	SH	1	3
(0008,1040)	Institutional Department Name	LO	1	3
(0008,1090)	Manufacturer's Model Name	LO	1	3

General Image				
Tag	Name	VR	VM	Type
(0020,0013)	Instance Number	IS	1	2
(0020,0020)	Patient Orientation	CS	2	2C
(0008,0023)	Content Date	DA	1	2C
(0008,0033)	Content Time	TM	1	2C
(0008,0008)	Image Type	CS	1	3
(0020,0012)	Acquisition Number	IS	1	3
(0008,0022)	Acquisition Date	DA	1	3
(0008,0032)	Acquisition Time	TM	1	3
(0008,002A)	Acquisition DateTime	DT	1	3
(0020,4000)	Image Comments	LT	1	3

Image Pixel				
Tag	Name	VR	VM	Type
(0028,0002)	Samples per Pixel	US	1	1
(0028,0004)	Photometric Interpretation	CS	1	1
(0028,0010)	Rows	US	1	1
(0028,0011)	Columns	US	1	1
(0028,0100)	Bits Allocated	US	1	1
(0028,0101)	Bits Stored	US	1	1
(0028,0102)	High Bit	US	1	1

Image Pixel				
(0028,0103)	Pixel Representation	US	1	1
(7FE0,0010)	Pixel Data	OW	1	1
(0028,0006)	Planar Configuration	US	1	1C

CR Image				
Tag	Name	VR	VM	Type
(0028,0004)	Photometric Interpretation	CS	1	1
(0018,0060)	KVP	DS	1	3
(0018,1111)	Distance Source to Patient	DS	1	3
(0018,1150)	Exposure Time	IS	1	3
(0018,1151)	X-Ray Tube Current	IS	1	3
(0018,1152)	Exposure	IS	1	3
(0018,1164)	Imager Pixel Spacing	DS	2	3

Modality LUT				
Tag	Name	VR	VM	Type
(0028,1052)	Rescale Intercept	DS	1	1C
(0028,1053)	Rescale Slope	DS	1	1C

VOI LUT				
Tag	Name	VR	VM	Type
(0028,0150)	Window Center	DS	1	1C
(0028,1051)	Window Width	DS	1	1C

SOP Common				
Tag	Name	VR	VM	Type
(0008,0016)	SOP Class UID	UI	1	1
(0008,0018)	SOP Instance UID	UI	1	1
(0008,0005)	Specific Character Set	CS	1-3	1C
(0008,0012)	Instance Creation Date	DA	1	3
(0008,0013)	Instance Creation Time	TM	1	3
(0020,0013)	Instance Number	IS	1	3

Other				
Tag	Name	VR	VM	Type
(0008,0064)	Conversion Type	CS	1	
(0008,0100)	Code Value	SH	1	
(0008,0102)	Coding Scheme Designator	SH	1	
(0008,0104)	Code Meaning	LO	1	
(0010,1040)	Patient's Address	LO	1	
(0010,2154)	Patient's Telephone Numbers	SH	1	
(0020,0170)	Other Study Numbers	IS	1	
(0032,1032)	Requesting Physician	PN	1	

2.2.2 Print MANAGE-SCU Application Entit

KC_PLNK5_SCU has been set as default for PRINT MANAGE-SCU AE Title in ImagePilot.

2.2.2.1 SOP Class

ImagePilot supports following DICOM V3.0 SOP Classes in PRINT MANAGE-SCU Service.

SOP Class name	SOP Class UID	SCU	SCP
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	YES	NO
Presentation LUT	1.2.840.10008.5.1.1.23	YES	NO

2.2.2.2 Association Establishment Policies

2.2.2.2.1 General

KC_PLNK5_SCU starts sending the image data after Association is established. AE Title and Port No. from which the Association is accepted are set in configuration.

KC_PLNK5_SCU does not accept Association Request from the external AEs.

Application Context Name supports DICOM V3.0 SOP Class listed below.

Application Context Name	1.2.840.10008.3.1.1.1

2.2.2.2.2 Number of Associations

KC_PLNK5_SCU is capable of sending Association Requests for maximum 1 external AE including Associations for different services at the same time. Parallel processing will be implemented for each AE whose Association has been established.

Maximum number of simultaneous Associations	1

2.2.2.2.3 Asynchronous Nature

Asynchronous processing is not supported.

Maximum number of simultaneous Associations	1 (Not Configurable)

2.2.2.2.4 Implementation Identifying Information

Implementation Class UID	Refer to description for Instance UID below
Implementation Version Name	KC_UNITEA_X.XX X.XX represents software version.

SOP Instance UID is defined as follows.
- 1.2.392.200036.9107.[DivCode].[Device].[Serial No.].[yyyymmdd].[hhmmss].[Unique No.]

Study Instance UID is defined as follows.
- 1.2.392.200036.9107.[DivCode].[11+Study No.]

Series Instance UID is defined as follows.
- 1.2.392.200036.9107.[DivCode].[Device].[Serial No.].[Study No.].[12+Series No.]

Notes) [DivCode]   : Section code 500

      [Device]   : Device type of source 220

      [Serial No.]   : Serial No. of the Device is specified.

      [yyyymmdd]   : Date is specified.

      [hhmmss]   : Time is specified.

      [Study No.]   : Study ID

      [Series No.]   : Series Number

      [Unique No.]   : Unique No. internally issued by the Device is specified.

2.2.2.3 Association Initiation Policy

2.2.2.3.1 Activity-Print Image Requested to an External Peer AE

2.2.2.3.1.1 Description and Sequencing of Activity

KC_PLNK5_SCU sends Association Request to Print Service Request origin, and sends Print Service Request after Association Request is accepted.
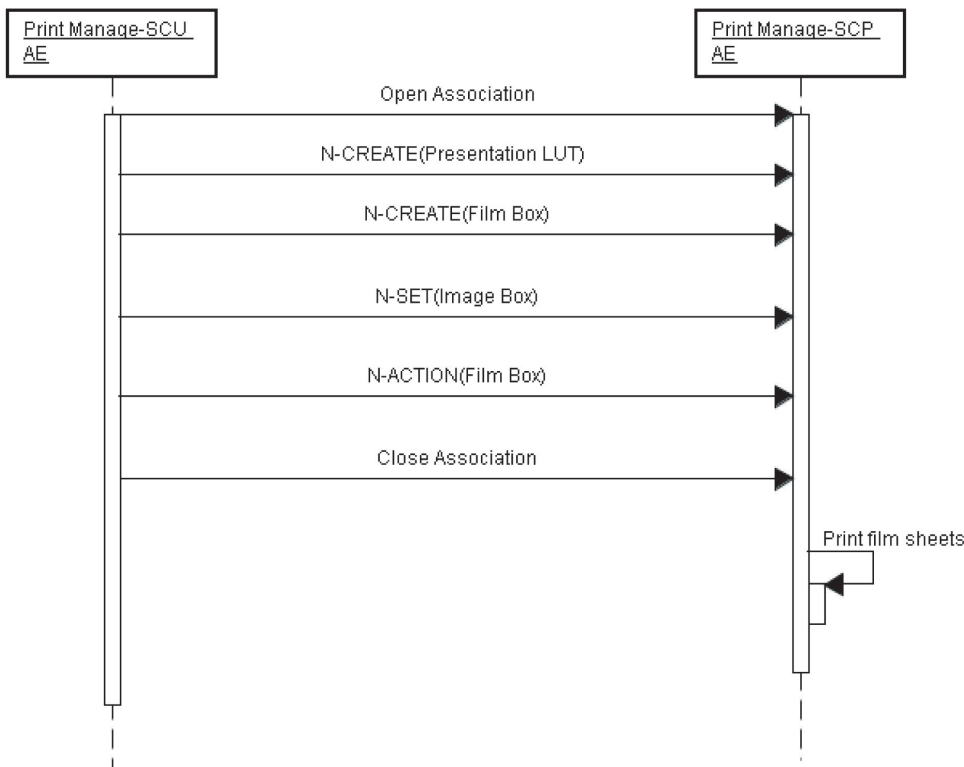
Sequence of Print Service requested from external AE in the above is described below.

1. KC_PLNK5_SCU sends Association Request to external AE.

2. Creates Film Session using N-CREATE command of Film Session SOP Class.

3. Creates Presentation LUT using N-CREATE command of Presentation LUT SOP Class (assuming the Printer supports this command)

4. Creates File Box associated with Film Session using N-CREATE command of Film Box SOP Class.

5. Sends a sheet containing the data to be output from the Printer using N-SET command of Image Box SOP Class. If Presentation LUT is not supported, processing shall be continued using LUT that has been already received.

6. Sends a request for printing Film Box to the Printer using N-ACTION command of Film Box SOP Class.

7. Printer outputs the requested sheet.

8. KC_PLNK5_SCU sends Release Request to external AE.

2.2.2.3.1.2 Proposed Presentation Contexts

ImagePilot sends Association Request using Presentation Contexts listed below in PRINT MANAGE-SCU.

Abstract Syntax			
Name	UID	Role	Extended Negotiation
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	SCU	None
Presentation LUT	1.2.840.10008.5.1.1.23	SCU	None

ImagePilot supports following Transfer Syntax for Abstract Syntax mentioned above.

Transfer Syntax	
Name List	UID List
Implicit VR Little Endian	1.2.840.10008.1.2

2.2.2.3.1.3 SOP Specific Conformance for the Printer SOP Class

KC_PLNK5_SCU supports following DIMSE.

- N-GET

Details of DIMSE is described in the following paragraph.

2.2.2.3.1.3.1 Printer SOP Class Operations (N-GET)

SCU is capable of using N-GET to send Request for Print SOP Instance to SCP.

<< Printer SOP Class>>

N-GET successful	Successful Printlink5-IN(SCP) searched SOP Instance
N-GET failed	Failure Printlink5-IN(SCP) did not search SOP Instance

Printlink5-IN (SCP) returns either of the following status codes to HOST(SCP).

<< Status Codes common to Print Manage Service Class>>

0000H(successful)	U/M : Imager status, imager status information.
	U/U : Manufacturer, product model name, installation serial No., software version, imager name.

<< Specific Status Code>>

No specific status code

2.2.2.3.1.4 SOP Specific Conformance for the Film Session SOP Class

KC_PLNK5_SCU supports following DIMSE.

- N-CREATE

Details of DIMSE is described in the following paragraph.

2.2.2.3.1.4.1 Film Session SOP Class Operations (N-CREATE)

Attributes of N-CREATE are listed below.

Tag	Name	VR	VM	Permitted Value
(2000, 0010)	Number Of Copies	IS	1	Print count. 1 ~ 99
(2000, 0020)	Print Priority	CS	1	Priority in print. LOW MED HIGH
(2000, 0030)	Medium Type	CS	1	Type of media. CLEAR FILM = Clear base BLUE FILM = Blue base DR BLUE FILM = DR blue base
(2000, 0040)	Film Destination	CS	1	Film output destination. MAGAZINE PROCESSOR BIN_1 ~ BIN_6

Tag	Name	VR	VM	Permitted Value
(2000, 0060)	Memory Allocation	LO	1	Memory allocation. Set the necessary memory contents. Value is displayed in KB.

Tags other than the above are not checked.

Header information that is not maintained yet will be maintained as necessary.

2.2.2.3.1.5 SOP Specific Conformance for the Presentation LUT SOP class

KC_PLNK5_SCU supports following DIMSE.

- N-CREATE

Details of DIMSE is described in the following paragraph.

2.2.2.3.1.5.1 Presentation LUT SOP Class Operations (N-CREATE)

Attributes that are sent by N-CREATE are listed below.

Tag	Name	VR	VM	Permitted Value
(2050, 0010)	Presentation LUT Sequence	SQ	1	Presentation LUT Sequence
(0028, 3002)	LUT Descriptor	US\ US	1	LUT descriptor
(0028, 3003)	Explanation	LO	1	LUT explanation
(0028, 3006)	LUT Data	US or SS	1-n	LUT data
(2110, 0030)	Presentation LUT Shap	CS	1	Presentation LUT shape IDENTITY/LIN OD

2.2.2.3.1.6 SOP Specific Conformance for the Film Box SOP class

KC_PLNK5_SCU supports following DIMSE.

- N-CREATE

- N-ACTRION

Details of DIMSE is described in the following paragraph.

2.2.2.3.1.6.1 Film Box SOP Class Operations (N-CREATE)

Attribute that is sent using N-CREATE is listed below.

Tag	Name	VR	VM	Permitted Value
(2010,0010)	Image Display Format	ST	1	STANDARD\1,1~STANDARD\5.4
(2010,0040)	Film Orientation	CS	1	Film orientation. PORTRAIT LANDSCAPE
(2010,0050)	Film Size ID	CS	1	Film size (imager-dependent) 8INX10IN 10INX12IN 11INX14IN 14INX14IN 14INX17IN
(2010,0060)	Magnification Type	CS	1	Magnification type. REPLICATE = 0-dimensional interpolation CUBIC = 3-dimensional B-Spline interpolation.
(2010,0080)	Smoothing Type	CS	1	Smoothing type: $1 \sim 7$ Valid only for the magnification type (2010, 0060) = CUBIC.
(2010,0100)	Borders	CS	1	Border density: BLACK/ WHITE
(2010,0120)	Min Density	US	1	$10 \sim 459$ (imager-dependent)
(2010,0130)	Max Density	US	1	$11 \sim 460$ (imager-dependent)
(2010,0140)	Trim	US	1	Trimming frame YES NO
(2010,0150)	Configuration Information	ST	1	Imager LUT description is as follows; KC_LUT=$1 \sim 7$
(2010,015E)	Illuminatio	US	1	Illumination
(2010,0160)	Reflected Ambient Light	US	1	Reflected ambient light

Tags other than the above are not checked.

Header information that is not maintained yet will be maintained as necessary.

2.2.2.3.1.6.2 Film Box SOP Class Operations (N-ACTION)

N-ACTION requests SCP to print the contents of Film Box.
However, it does not evaluate the contents returned as the response from N-ACTION.

2.2.2.3.1.7 SOP Specific Conformance for the Image Box SOP class

KC_PLNK5_SCU supports following DIMSE.

- N-SET

Details of DIMSE is described in the following paragraph.

2.2.2.3.1.7.1 Image Box SCP Class Operations (N-SET)

Attributes of N-SET are listed below.

Tag	Name	VR	VM	Permitted Value
(0028, 0002)	Samples per Pixel	US	1	Samples per pixel.
(0028, 0004)	Photometric Interpretation	CS	1	Photometric interpretation. Minimum VOI pixel value= White MinimumVOI pixel value = Black
(0028, 0010)	Rows	US	1	Image pixels in Y-axis direction.
(0028, 0011)	Columns	US	1	Image pixels in X-axis direction.
(0028, 0034)	Pixel Aspect Ratio	IS	2	Pixel aspect ratio.
(0028, 0100)	Bits Allocated	US	1	Bits allocated to pixel. Vacant bits included. 0008:8 (8 bits) 000A:16 (12 bits) Returns an error for those other than the above.
(0028, 0101)	Bits Stored	US	1	Bits per pixel. 0008:8 bits 000C:12 bits
(0028, 0102)	High Bit	US	1	High bit. MSB (Most Significant Bit) of pixel data. 0007: (Bits Stored = 8) 000B: (Bits Stored = 12
(0028, 0103)	Pixel Representation	US	1	Presentation of pixel data. 0000 = integer without sign
(2020, 0010)	Image Position	US	1	Image position. Position of images comprising the page.
(2020, 0020)	Polarity	CS	1	Polarity NORMAL REVERSE
(2020, 0030)	Requested Image Size	DS	1	Requested image size (imager-dependent)
(2020, 0040)	Requested Decimate/Crop Behavior	CS	1	Requested behavior (imager-dependent)
(7FE0, 0010)	Pixel Data	OW OB	1	Pixel data.

Tags other than the above are not checked.

Header information that is not maintained yet will be maintained as necessary.

2.2.2.4 Association Acceptance Policy

KC_PLNK5_SCU does not accept Association Request.

2.3 NETWORKING INTERFACE

2.3.1 Supported Communications Stacks (parts8, 9)

Provides higher-level protocols that are defined by DICOM PS3.8 for DICOM TCP/IP.

2.3.2 TCP/IP Stacks

2.3.2.1 Physical Network Interface

ImagePilot supports following Network Interface configuration.

Recommended is Ethernet 1000Base-TX. 100Base-TX can be an alternative as an option.

1000Base-TX
100Base-TX

2.4 CONFIGURATION

2.4.1 AE Title/Presentation Address Mapping

2.4.1.1 Local AE Titles

All Application Entities for DICOM Service in ImagePilot are set in configuration file.

AE setting shall be made in configuration by the service engineer.

Making the setting in configuration file allows the same AE Title to be applied to each service within the local network.

2.4.2 Parameters

Parameter	Default Value	Range
General Parameters		
Max PDU Size (Kbytes)	64	1 ~ 64Kbytes
Reception Time-Out for General Communication (ms)	180000	0 ~ 2147483648
Auto Release Time (sec)	600000	0 ~ 2147483648
STORAGE-SCU AE Parameters		
Transfer Syntax	0	0 : Implicit VR little endian 1 : Explicit VR little endian 2 : Explicit VR big endian 3 : Reversible JPEG 4 : Irreversible JPEG8 bits 5 : Irreversible JPEG12 bits 6 : JPEG2000-compatible, reversible JPEG 7 : JPEG2000-compatible, irreversible JPEG
Print Manage-SCP AE Parameters		
Reception Time-Out for General Communication (ms)	180000	
Print Status Notification ON/OFF	0	0 : OFF, 1: ON

Parameter	Default Value	Range
Presentation LUT AV/NA	0	0 : Available, 1 : Not available
Max Copies	99	Printer max copies
Memory Allocation	512	Printer setting
Requested Image Size AV/NA	0	0 : Available, 1 : Not available
Retry Process	-	-

3. SUPPORT OF CHARACTER SETS

Following expanded character set is supported.

Default Single-byte Character Sets
- ISO-IR6   (ISO 646) default
- ISO-IR100 (ISO 8859-1)

Default Multi-byte Character Sets
- ISO-IR13   (JIS X 0201)
- ISO-IR87   (JIS X 0208)

4. SECURITY

ImagePilot does not support special security measures presuming the system is protected by the institute's security measures.

4.1 ASSOCIATION LEVEL SECURITY

In the process of each DICOM Service provided by ImagePilot, checks on Calling AE Title, Called AE Title and Application Contexts are made depending on its contents. Doing so helps protect from illegal access from AE that is not set in configuration.

KONICA MINOLTA

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