DICOM Conformance Statement

Philips IntelliSite Pathology Solution R5.1

Issued by:

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1. DICOM Conformance Statement Overview

This document is the DICOM Conformance Statement for Philips IntelliSite Pathology Solution 5.1 (PIPS). Philips Digital Pathology Solution provides a total system solution for digitizing the pathology departments to operate more effectively and efficiently. Rather than addressing an isolated issue in the workflow, Philips intends to offer a solution that improves the pathology workflow as a whole. In order to deliver the PIPS solution, the following underlying sub-systems are developed:

- Scanner
  - o Philips Ultra-Fast Scanner (UFS)
  - o Pathology Scanner SG20
  - o Pathology Scanner SG60
  - o Pathology Scanner SG300
- Philips Image Management System (IMS)
- Display

The IMS sub-system supports the storage of images on a remote DICOM System (PACS).

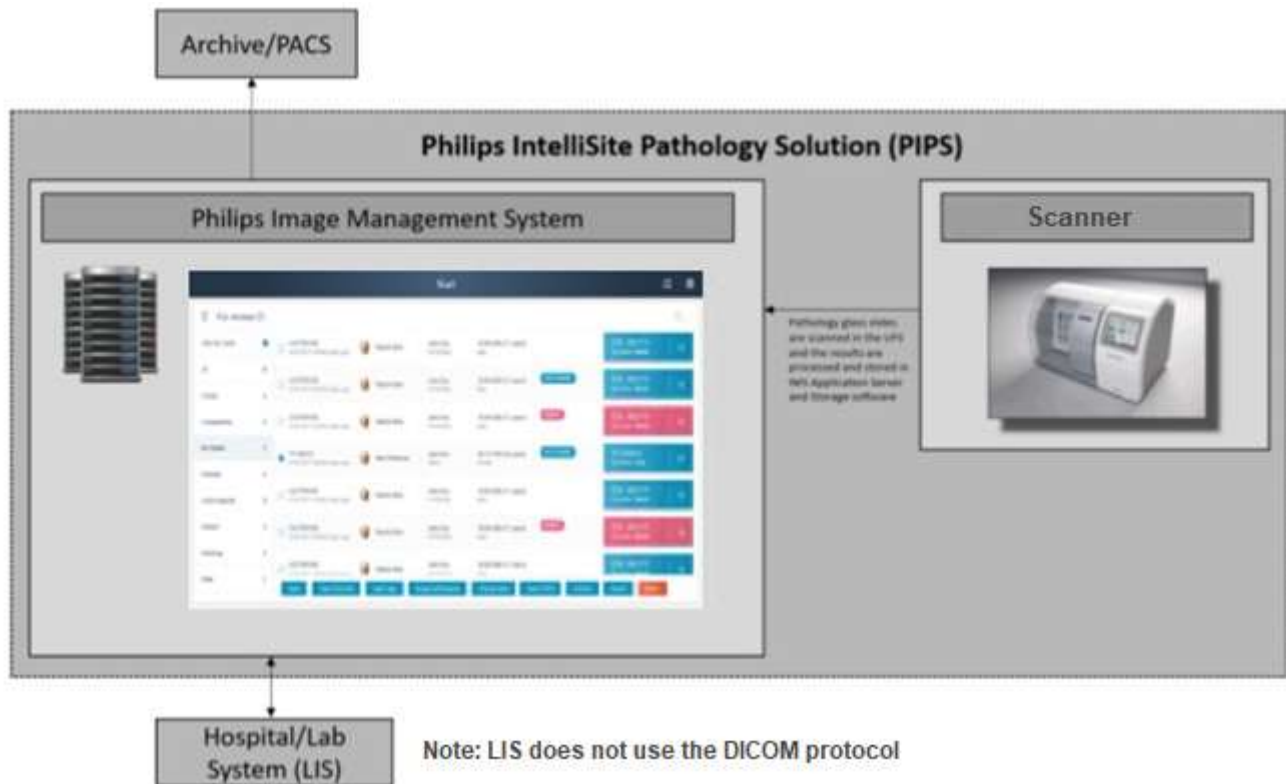The figure below shows the position of the PIPS in a hospital environment.

Figure 1: PIPS System in a DICOM network overview

Supported Networking DICOM Services can be found below in Table 1.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)	Display
Name	**UID**			
Other				
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6	Yes	No	Yes

2. Table of Contents

3. Introduction

The introduction specifies product and relevant disclaimers as well as any general information that the vendor feels is appropriate.

3.1. Revision History

The revision history provides dates and differences of the different releases.

Table 2: Revision History

Document Version	Date of Issue	Description of change
01	12-DEC-2020	First release of Philips IntelliSite Pathology Solution 5.1

3.2. Audience

This Conformance Statement is intended for:
- (Potential) customers
- System integrators of medical equipment
- Marketing staff interested in system functionality
- Software designers implementing DICOM interfaces

It is assumed that the reader is familiar with the DICOM standard.

3.3. Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2.
This DICOM Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**
  Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment.
  It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.

- **Validation**
  Philips equipment has been carefully tested to ensure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
  Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**
  The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery. The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

3.4. Definitions, Terms and Abbreviations

Table 3: Definitions, Terms and Abbreviations

Abbreviation/Term	Explanation
AE	Application Entity
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DPS	Digital Pathology Solutions
GUI	Graphic User Interface
HIS	Hospital Information System
IMS	Image Management System
IOD	Information Object Definition
LIS	Laboratory information System
PDU	Protocol Data Unit
PIPS	Philips IntelliSite Pathology Solution
RWA	Real-World Activity
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UFS	Philips Ultra-Fast Scanner
UID	Unique Identifier

3.5. References

[DICOM] Digital Imaging and Communications in Medicine, Parts 1 - 22 (NEMA PS 3.1- PS 3.22),
   National Electrical Manufacturers Association
   1300 North 17th Street
   Suite 900
   Arlington, Virginia 22209
   Internet: https://www.dicomstandard.org/current

   Note that at any point in time the official standard consists of the most recent yearly edition of the base standard (currently 2020) plus all the supplements and correction items that have been approved as Final Text.

4. Networking

This section contains the networking related services (vs. the media related ones).

4.1.   Implementation model

The implementation model consists of three sections:

- The application data flow diagram, specifying the relationship between the Application Entities and the "external world" or Real-World Activities,
- A functional description of each Application Entity, and
- The sequencing constraints among them.

4.1.1.   Application Data Flow
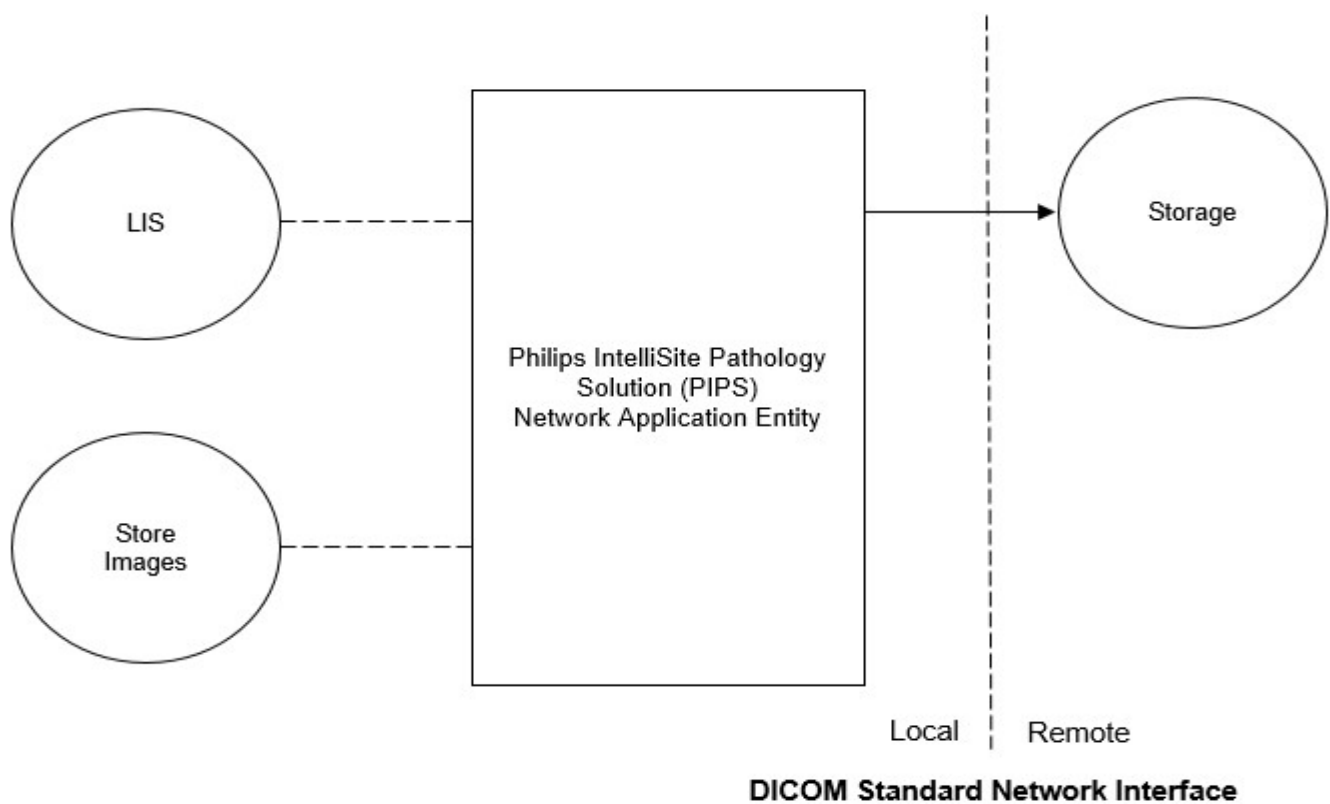
Figure 2: PIPS System AE Data Flow Diagram

4.1.2. Functional Definition of AE's

This section contains a functional definition for each individual local Application Entity.

4.1.2.1.   Functional Definition of Storage AE

The Philips IntelliSite Pathology Solution AE is the one and only application entity within the DPS solution. PIPS incorporates the following functionality:

- The Philips IntelliSite Pathology Solution AE can store images by using the Storage service as SCU (Store Images).

4.1.3. Sequencing of Real World Activities

The figure below shows a typical sequence of an export to archive / PACS.
The PIPS will retrieve (proprietary format and not DICOM interaction) the cases from the LIS.
The user selects a case in the PIPS worklist and initiates the export to PACS / Archive action.
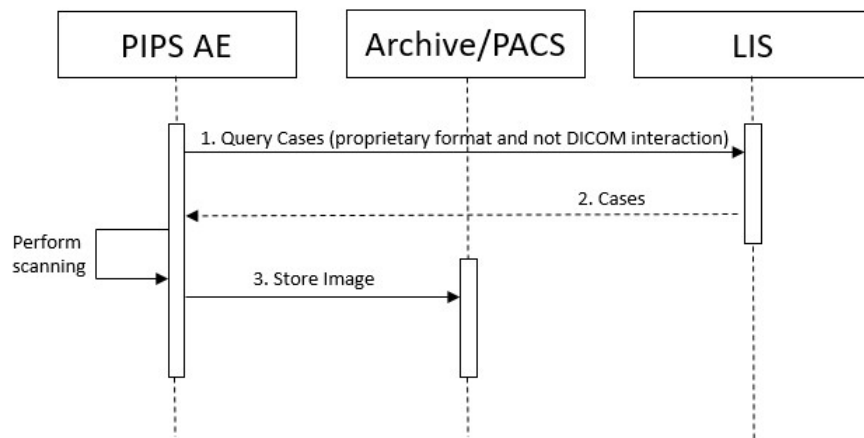
Figure 3: Sequencing of Image Store

4.2.   AE Specifications

This section in the DICOM Conformance Statement describes the Application Entity specifications.

4.2.1. Storage AE

Detail of this specific Application Entity is specified in this section.

4.2.1.1.   SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 4: SOP Classes for storage AE

SOP Class Name	SOP Class UID	SCU	SCP
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6	Yes	No

4.2.1.2.   Association Policies

Each AE specification contains a description of the general association establishment and acceptance policies of the AE.

4.2.1.2.1. General

The DICOM standard application context is specified below.

Table 5: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2. Number of Associations

The number of simultaneous associations that an Application Entity may support as an Initiator or Acceptor is specified here.

Table 6: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	1

4.2.1.2.3. Asynchronous Nature

The implementation supports negotiation of multiple outstanding transactions, along with the maximum number of outstanding transactions supported.

Table 7: Asynchronous nature as an Association Initiator for this AE

Description	Value
Maximum number of outstanding asynchronous transactions	1

4.2.1.2.4. Implementation Identifying Information

The values supplied for Implementation Class UID and version name are documented here.

Table 8: DICOM Implementation Class and Version for storage AE

Implementation Class UID	1.3.46.670589.54.2.17.4
Implementation Version Name	17.4.0.0

4.2.1.2.5. Communication Failure Handling

The behavior of the AE during communication failure is summarized in the next table.

Table 9: Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the command is marked as failed. The reason is logged and reported to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.2.1.3. Association Initiation Policy

The Application Entity will respond to a received Association rejection as shown in the table 10.

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Table 10: DICOM Association Rejection Handling

Result	Source	Reason/Diagnosis	Behavior
1 – rejected-permanent	1 – DICOM UL service-user	1 – no-reason-given	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.
		2 – application-context-name-not-supported	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
		3 – calling-AE-title-not-recognized	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
		7 – called-AE-title-not-recognized	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
		2 – protocol-version-not-supported	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
		2 – local-limit-exceeded	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
2 – rejected-transient	1 – DICOM UL service-user	1 – no-reason-given	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
		2 – application-context-name-not-supported	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
		3 – calling-AE-title-not-recognized	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
		7 – called-AE-title-not-recognized	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
		2 – protocol-version-not-supported	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
		2 – local-limit-exceeded	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging

Table 11: Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
	1 - unrecognized-PDU	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
	2 - unexpected-PDU	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
	4 - unrecognized-PDU-parameter	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
	5 - unexpected-PDU-parameter	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging
	6 - invalid-PDU-parameter-value	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging

4.2.1.3.1. (Real-World) Activity – Image Export

4.2.1.3.1.1. Description and Sequencing of Activities
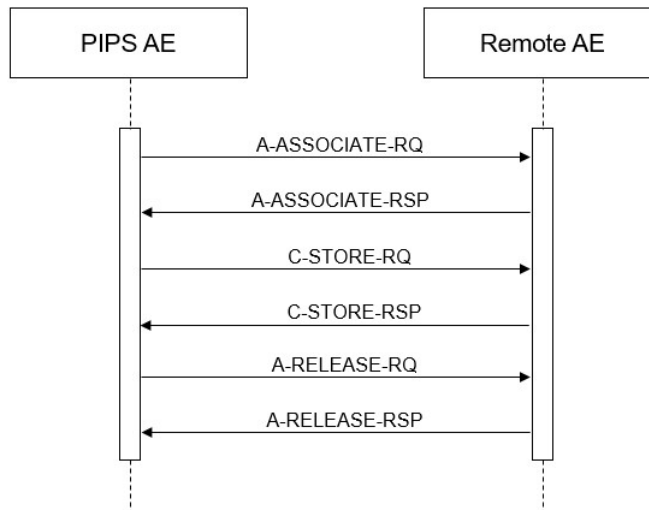
Figure 4: (Real World) Activity - Image Export

PIPS stores images without Storage Commitment. The image export can be initiated manually in the viewer, after clicking the store button the PIPS AE will store the selected images at the selected Storage SCP.

The PIPS AE will request an association with the remote Storage SCP for the applicable Storage SOP classes. After accepting the association the PIPS AE will send the store request, wait for response, and the release the association. The store response status may be inspected on the UI.

Depending on the status of the store, the PIPS AE may queue store requests for retries. The queued store requests can be canceled from the UI (task manager).

4.2.1.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 12: Proposed Presentation Contexts for (Real-World) Activity – Image Export

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6	JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

By default the Transfer Syntax is JPEG 2000 Image Compress (Lossless). If not supported the Explicit VR Little Endian and Implicit VR Little Endian will be used.

4.2.1.3.1.3. SOP Specific Conformance for Storage SOP Classes

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.1.3.1. Dataset Specific Conformance for C-STORE-RQ

Table 13: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successfully stored	Export is successful. The Export job will have the Completed status in the Task List.
Failure	A7xx	Refused: Out of resources	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.
	A9xx	Error: Data Set does not match SOP Class	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.
	Cxxx	Error: cannot understand	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.
	0210	Duplicate Invocation	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.
	0117	Invalid Object Instance	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.
	0212	Mistyped Argument	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.
Warning	B000	Coercion of Data Elements	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.
	B007	Data Set does not match SOP Class	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.
	B006	Elements Discarded	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.
	0107	Attribute List Error	Export job failed, which is reflected in the Task List. The reason for failure is logged in the IMS Server logging.

Table 14: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user.
Association aborted	The command is marked as failed. The reason is logged and reported to the user.

4.2.1.4. Association Acceptance Policy

Not applicable to the SCU behavior.

4.3.   Network Interfaces

4.3.1. Physical Network Interfaces

The System provides only DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the standard.
TCP/IP IPv4 is the only protocol stack supported.
Supported physical medium include:
IEEE 802.3-1995, 10BASE-T
IEEE 802.3-1995, 100BASE-TX (Fast Ethernet)
IEEE 802.3, 1000BASE-X (Fiber Optic Gigabit Ethernet).

The TCP/IP Stack as supported by the underlying Operating System.
The API is the WinSock 2 interface as supported by the underlying Operating System.

4.3.2. Additional Protocols

No additional protocols are used.

4.4.   Configuration

Any implementation's DICOM conformance may be dependent upon configuration, which takes place at the time of installation. Issues concerning configuration are addressed in this section.

4.4.1. AE Title/Presentation Address Mapping

An important installation issue is the translation from AE title to presentation address. How this is to be performed is described here.

4.4.1.1.   Local AE Titles

The local AE title mapping and configuration are specified as:

Table 15: AE Title configuration table

Application Entity	Default AE Title	Default TCP/IP Port
PIPS AE	PIPS	250

4.4.1.2.   Remote AE Title/Presentation Address Mapping

The following AE specific information must be available to configure a remote AE:
 - AE title.
 - Hostname or IP address.
 - Port number.

4.4.2. Parameters

The specification of important operational parameters, their default value and range (if configurable) are specified here.

Table 16: Configuration Parameters Table

Parameter	Configurable	Default Value
General Parameter		
Time-out waiting for acceptance or rejection Response to an Association Open Request (Application Level timeout)	YES	
General Dimse level time-out values (Verification, Storage, Storage Commitment)	NO	
Time-out for response to TCP/IP connect request. (Low-level timeout)	OS	
Time-out waiting for acceptance of a TCP/IP message over the network (Low-level timeout)	OS	
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	OS	
Any changes to default TCP/IP settings, such as configurable stack parameters.	OS	
AE Specific Parameters		
Size constraint in maximum object size	NO	
Maximum PDU size the AE can receive	NO	
Maximum PDU size the AE can send	NO	786464
AE specific DIMSE level time-out values	YES	

5. Media Interchange

Not applicable

6. Support of Character sets

Any support for character sets in Network and Media services is described here.

Table 17: Supported DICOM Character Sets

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Latin alphabet No. 1	ISO 2022 IR 100	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 100	G1	Supplementary set of ISO 8859

7. Security

Philips IntelliSite Pathology Solution 5.1 allows the use of a conventional (non-secure) DICOM communication.

7.1. Security Profiles

Not applicable

7.2. Association Level Security

The Philips IntelliSite Pathology Solution 5.1 shall reject association requests from applications that do not address its PIPS AE.

7.3. Application Level Security

Not applicable

8. Annexes of application "PIPS System Network AE"

8.1. IOD Contents

8.1.1. Created SOP Instance

This section specifies each IOD created by this application.

This section specifies each IOD created (including private IOD's). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

ALWAYS	The module is always present
CONDITIONAL	The module is used under specified condition

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

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

8.1.1.1. List of created SOP Classes

Table 18: List of created SOP Classes

SOP Class Name	SOP Class UID
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6

8.1.1.2. VL Whole Slide Microscopy Image Storage SOP Class

Table 19: IOD of Created VL Whole Slide Microscopy 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
	Whole Slide Microscopy Series	ALWAYS
Frame of Reference	Frame of Reference	ALWAYS
Equipment	General Equipment Module	ALWAYS
	Enhanced General Equipment	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Acquisition Context	ALWAYS
	Multi-frame Functional Groups	ALWAYS
	Multi-frame Dimension	ALWAYS
	Specimen	ALWAYS
	VL Whole Slide Microscopy Image	ALWAYS
	Optical Path	ALWAYS
	SOP Common Module	ALWAYS

Table 20: 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	F, M, O	VNAP	AUTO	-

Table 21: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	<yyyymmdd>
Study Time	0008,0030	TM		VNAP	AUTO	
Accession Number	0008,0050	SH		VNAP	AUTO	
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 22: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	SM	ALWAYS	FIXED	-
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-
Series Number	0020,0011	IS		ALWAYS	AUTO	-

Table 23: Whole Slide Microscopy Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	SM	ALWAYS	FIXED	-

Table 24: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	CS		ALWAYS	AUTO	-
Position Reference Indicator	0020,1040		SLIDE_CORNER	ALWAYS	FIXED	

Table 25: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		ALWAYS	AUTO	Value defined by the scanner
Institution Name	0008,0080	LO		VNAP	AUTO	
Institution Address	0008,0080	ST		VNAP	AUTO	
Institutional Department Name	0008,0081	LO		VNAP	AUTO	
Manufacturer's Model Name	0008,1090	LO		VNAP	AUTO	Value defined by the scanner
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	Value defined by the scanner
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	Value defined by the scanner
Date of Last Calibration	0018,1200	DA		VNAP	AUTO	
Time of Last Calibration	0018,1201	TM		VNAP	AUTO	

Table 26: Enhanced General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		ALWAYS	AUTO	Value defined by the scanner
Manufacturer's Model Name	0008,1090	LO		VNAP	AUTO	Value defined by the scanner
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	Value defined by the scanner
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	Value defined by the scanner

Table 27: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Patient Orientation	0020,0020	CS		VNAP	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	Format: <yyyymmdd>
Content Time	0008,0033	TM		ALWAYS	AUTO	
Image Type	0008,0008	CS		ALWAYS	AUTO	-
Acquisition DateTime	0008,002A	DT		ALWAYS	AUTO	-
Burned In Annotation	0028,0301	CS	NO	ALWAYS	FIXED	
Lossy Image Compression	0028,2110	CS	01	ALWAYS	AUTO	
Lossy Image Compression Ratio	0028,2112	DS		ALWAYS	AUTO	Value defined by the scanner
Lossy Image Compression Method	0028,2114	CS	PHILIPS_DP_1_0	ALWAYS	AUTO	

Table 28: General Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Derivation Description	0008,2111	ST		ALWAYS	AUTO	

Table 29: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	RGB	ALWAYS	AUTO	
Planar Configuration	0028,0006	US	0	ALWAYS	FIXED	
Rows	0028,0010	US	512	ALWAYS	AUTO	
Columns	0028,0011	US	512	ALWAYS	AUTO	
Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	
Bits Stored	0028,0101	US	8	ALWAYS	AUTO	
High Bit	0028,0102	US	7	ALWAYS	FIXED	
Pixel Representation	0028,0103	US	0	ALWAYS	FIXED	
Pixel Data	7FE0,0010	OB				

Table 30: Acquisition context Module

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

Table 31: Multi-Frame Functional group Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	Format: <yyyymmdd>

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Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS	1	ALWAYS	AUTO	
Number of Frames	0028,0008	IS		ALWAYS	AUTO	-
Shared Functional Groups Sequence	5200,9229	SQ		ALWAYS	AUTO	
>Optical Path Identification Sequence	0048,0207	SQ		ALWAYS	AUTO	
>>Optical Path Identifier	0048,0106	SH		ALWAYS	AUTO	
Per-frame Functional Groups Sequence	5200,9230	SQ		ALWAYS	AUTO	
>Frame Content Sequence	0020,9111	SQ		ALWAYS	AUTO	
>>Dimension Index Values	0020,9157	UL		ALWAYS	AUTO	
> Pixel Measures Sequence	0028,9110	SQ		ALWAYS	AUTO	
>> Slice Thickness	0018,0050	DS		ALWAYS	AUTO	
>> Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	
> Plane Position (Slide) Sequence	0048,021A	SQ		ALWAYS	AUTO	
>> X Offset in Slide Coordinate System	0040,072A	DS		ALWAYS	AUTO	
>> Y Offset in Slide Coordinate System	0040,073A	DS		ALWAYS	AUTO	
>> Z Offset in Slide Coordinate System	0040,074A	DS		ALWAYS	AUTO	
>> Column Position In Total Pixel Matrix	0048,021E	SL		ALWAYS	AUTO	
Row Position In Total Pixel Matrix	0048,021F	SL		ALWAYS	AUTO	

Table 32: Multi-Frame Dimension Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Dimension Organization Sequence	0020,9221	SQ		VNAP	AUTO	
>Dimension Organization UID	0020,9164	UI		ALWAYS	AUTO	
Dimension Index Sequence	0020,9222	SQ		ALWAYS	AUTO	
>Dimension Index Pointer	0020,9165	AT	00209157	ALWAYS	AUTO	
Dimension Description Label	0020,9421	LO	"Plane Position (Slide) Sequence "	ALWAYS	Fixed	

Table 33: Specimen Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Container Identifier	0040,0512	LO		ALWAYS	AUTO	
Container Type Code Sequence	0040,0518	SQ		ALWAYS	AUTO	
>Code Value	0008,0100	SH	A-0101B	ALWAYS	FIXED	
> Coding Scheme Designator	0008,0102	SH	SRT	ALWAYS	FIXED	
>Code Meaning	0008,0104	LO	Microscope slide	ALWAYS	FIXED	
Specimen Description Sequence	0040,0560	SQ		ALWAYS	AUTO	
> Specimen UID	0040,0554	UI		ALWAYS	AUTO	

| > Specimen Preparation Sequence | 0040,0610 | SQ | | ALWAYS | EMPTY | |
| Issuer of the Container Identifier Sequence | 0040,0513 | SQ | | VNAP | AUTO | |

Table 34: VL Whole Slide Microscopy Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	AUTO	
Acquisition DateTime	0008,002A	DT		ALWAYS	AUTO	
Volumetric Properties	0008,9206	CS	1	ALWAYS	FIXED	
Acquisition Duration	0018,9073	FD		ALWAYS	AUTO	
Samples Per Pixel	0028,0002	US	3	ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Planar Configuration	0028,0006	IS	0	ALWAYS	FIXED	
Number of Frames	0028,0008	IS		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	
Bits Stored	0028,0101	US	8	ALWAYS	AUTO	
High Bit	0028,0102	US	7	ALWAYS	FIXED	
Pixel Representation	0028,0103	US		ALWAYS	FIXED	
Burned In Annotation	0028,0301	CS	NO	ALWAYS	FIXED	
Lossy Image Compression	0028,2110	CS		ALWAYS	AUTO	
Lossy Image Compression Ratio	0028,2112	DS		ALWAYS	AUTO	
Lossy Image Compression Method	0028,2114	CS		ALWAYS	AUTO	
Imaged Volume Width	0048,0001	FL		ALWAYS	AUTO	
Imaged Volume Height	0048,0002	FL		ALWAYS	AUTO	
Imaged Volume Depth	0048,0003	FL		ALWAYS	AUTO	
Total Pixel Matrix Columns	0048,0006	UL		ALWAYS	AUTO	
Total Pixel Matrix Rows	0048,0007	UL		ALWAYS	AUTO	
Total Pixel Matrix Origin Sequence	0048,0008	SQ		ALWAYS	AUTO	
>X Offset in Slide Coordinate System	0040,072A	DS		ALWAYS	AUTO	
>Y Offset in Slide Coordinate System	0040,073A	DS		ALWAYS	AUTO	
Specimen Label in Image	0048,0010	CS	NO	ALWAYS	FIXED	
Focus Method	0048,0011	CS	MANUAL	ALWAYS	FIXED	
Extended Depth of Field	0048,0012	CS	NO	ALWAYS	FIXED	
Image Orientation (Slide)	0048,0102	DS		ALWAYS	AUTO	

Table 35: Optical Path Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Optical Path Sequence	0048,0105	SQ		ALWAYS	AUTO	
>Illumination Type Code Sequence	0022,0016	SQ		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	FIXED	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	FIXED	
>>Code Meaning	0008,0104	LO		ALWAYS	FIXED	
>Optical Path Identifier	0048,0106	SH				

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Table 36: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	Format: <yyyymmdd>
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	Format: <hhmmss>
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.77.1.6	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Note: IMS supports import of other file formats. Only created instances get Philips manufacturer value and not the imported ones.

8.1.2. Usage of Attributes from Received IOD

Not applicable.

8.1.3. Coerced/Modified fields

Not Applicable.

8.2. Data Dictionary of Private Attributes

Not Applicable.