DICOM Conformance Statement

Philips Flash Ultrasound System 5100 Point of Care

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1. DICOM Conformance Statement Overview

Philips Flash Ultrasound System 5100 Point of Care is interoperable with systems providing a DICOM interface. The system creates the DICOM Ultrasound Image, Comprehensive SR and derived objects. (Please refer to Chapter 8 for more details). The local storage has a limited capacity and is not intended for long term archiving purposes. The generated objects can be sent to the remote node.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)	Display
Name	**UID**			
Other				
Verification SOP Class	1.2.840.10008.1.1	Yes	No	N/A
Transfer				
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Yes	No	Yes
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Yes	No	Yes
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33	Yes	No	No
Multi-frame True Color Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.4	Yes	No	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	No	Yes
Workflow Management				
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No	N/A
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No	N/A
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No	N/A
Print Management				
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No	N/A
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No	N/A
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No	N/A
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No	N/A
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No	N/A
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No	N/A
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No	N/A
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No	N/A
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No	N/A
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No	N/A

A table of Supported Media Storage Application Profiles (with roles) is provided.

Table 2: Media Services

Media Storage Application Profile	File-set Creator (FSC)	File-set Updater (FSU)	File-set Reader (FSR)
USB			
General Purpose USB Media Interchange with JPEG	Yes	Yes	Yes

2. 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 3: Revision History

Document Version	Date of Issue	Description of change
01	19-Sep-2023	First release for Ultrasound Blaze R1.0
02	18-Dec-2024	Updated document with below changes 1) the Product Name was changed to Flash Point of Care Ultrasound System 5100 Series 1.0.x from Ultrasound Blaze R1.0 2) Added below two IOD content in Section 8. a. Multi-frame True Color Secondary Capture Image Storage SOP Class b. Secondary Capture Image Storage SOP Class
03	10-Mar-2025	Updated the product name from “Flash Point of Care Ultrasound System 5100 Series 1.0.x” to “Philips Flash Ultrasound System 5100 Point of Care”

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 4: Definitions, Terms and Abbreviations

Abbreviation/Term	Explanation
AE	Application Entity
ANSI	American National Standard Institute
AP	Application Profile
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DIMSE-Composite
DIMSE-N	DIMSE-Normalized
ELE	DICOM Explicit VR Little Endian
FSC	File-set Creator
FSR	File-set Reader
FSU	File-set Updater
GUI	Graphic User Interface
HIS	Hospital Information System
HL7	Health Level Seven
ILE	DICOM Implicit VR Little Endian
IOD	Information Object Definition
MPPS	Modality Performed Procedure Step
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
RIS	Radiology Information System
RWA	Real-World Activity
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

Abbreviation/Term	Explanation
US	Ultrasound
USMF	Ultrasound Multi-frame
SR	Structured Report
WLM	Worklist Management

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

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

The Philips Flash Ultrasound System 5100 Point of Care implements one network application entity: AE Title (Configurable).

The following figure shows the networking application data flow as a functional overview of the application entity. On the left the local Real-World Activities are presented, whereas on the right the remote Real-World Activities are presented

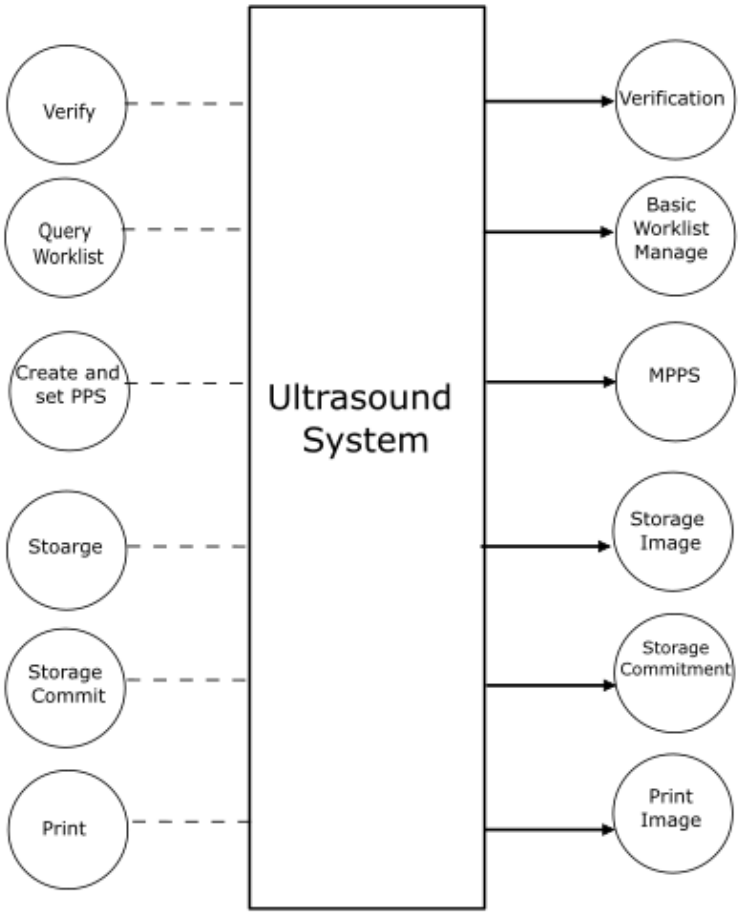

Figure 1: Application Data Flow Diagram

The Philips Flash Ultrasound System 5100 Point of Care incorporates the following functionality:
- Export (and commit) images from the local database to a network DICOM node.

- Modality Work List (MWL)
- Send Modality Performed Procedure Step (MPPS) messages to a network DICOM node
- Print

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 Philips Flash Ultrasound System 5100 Point of Care Network AE

Philips Flash Ultrasound System 5100 Point of Care incorporates the following functionality:

- The Philips Flash Ultrasound System 5100 Point of Care Network AE can verify application-level communication by using the Verification service both as SCU and SCP (Verify).
- The Philips Flash Ultrasound System 5100 Point of Care Network AE can store images by using the Storage service as SCU.
- The Philips Flash Ultrasound System 5100 Point of Care Network AE can commit images by using the Storage Commitment service as SCU (Commit Image).
- The Philips Flash Ultrasound System 5100 Point of Care Network AE uses the Basic Worklist Management service as SCU.
- The Philips Flash Ultrasound System 5100 Point of Care Network AE can send MPPS N-Create and N-Set messages at the opening and closing of a study once configured.
- The Philips Flash Ultrasound System 5100 Point of Care Network AE can print as SCU.

4.1.3. Sequencing of Real World Activities

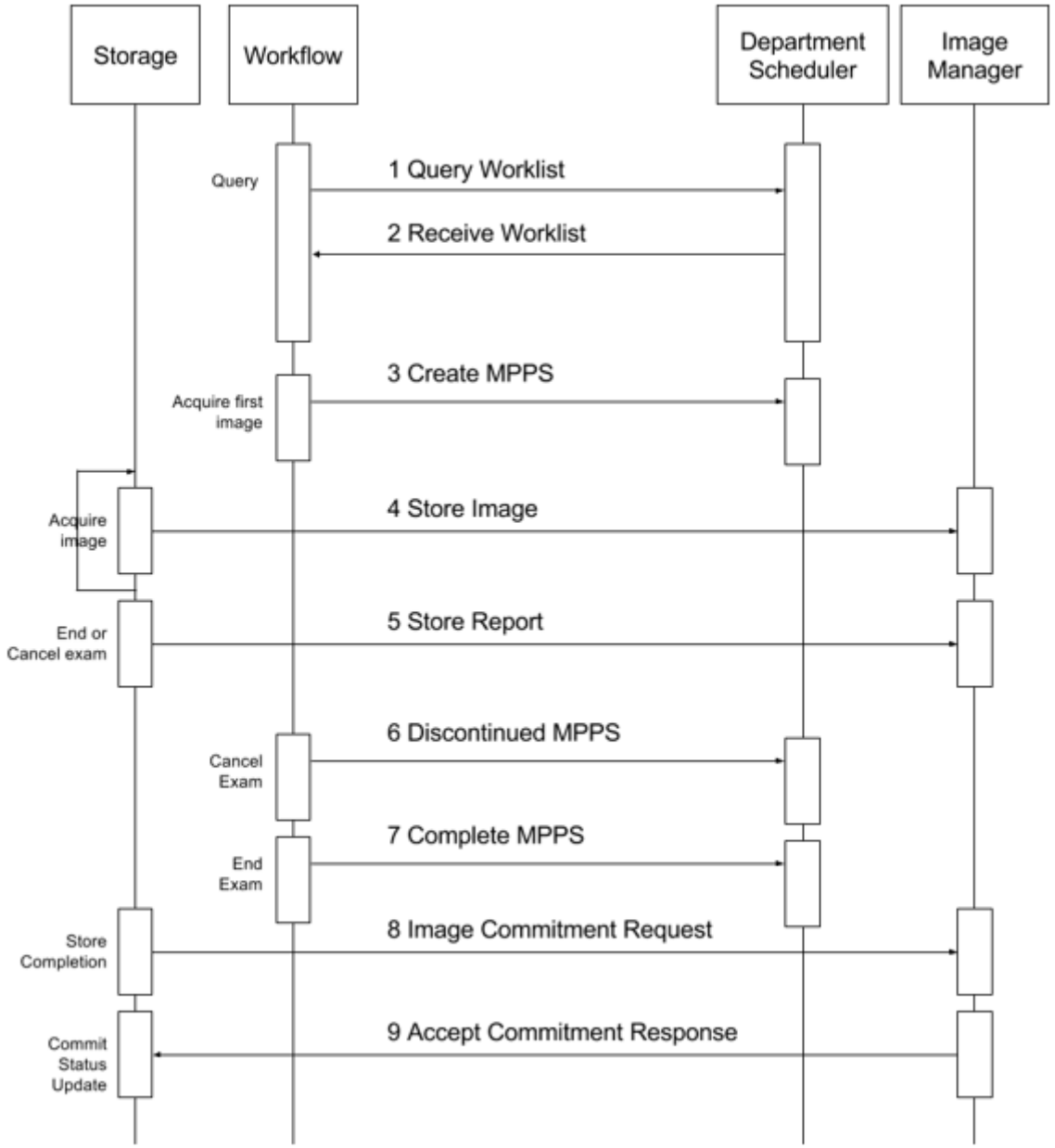

Figure 2: Sequencing of Storage Commitment

4.2. AE Specifications

This section in the DICOM Conformance Statement is a set of Application Entity specifications. There are as many of these subsections as there are different AE's in the implementation.

4.2.1. Philips Flash Ultrasound System 5100 Point of Care Network 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 5: SOP Classes for Philips Flash Ultrasound System 5100 Point of Care Network AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	No
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33	Yes	No
Multi-frame True Color Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.4	Yes	No
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	No

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

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 6: 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 7: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	Limited by system resources

Table 8: Number of associations as an Association Acceptor for this AE

Description	Value
Maximum number of simultaneous associations	Limited by system resources (Default value 50)

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 9: Asynchronous nature as an Association Initiator for this AE

Description	Value
Maximum number of outstanding asynchronous transactions	1*

*The Philips Flash Ultrasound System 5100 Point of Care Network AE does not support asynchronous operations and will not perform asynchronous window negotiation. The only exception is Storage Commitment.

4.2.1.2.4 Implementation Identifying Information

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

Table 10: DICOM Implementation Class and Version for Philips Flash Ultrasound System 5100 Point of Care Network AE

Implementation Class UID	1.3.46.670589.14
Implementation Version Name	5100POC_1.0.x
where “x” represents minor release version	

4.2.1.3. Association Initiation Policy

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

Table 11: Association Rejection response

Result	Source	Reason/Diagnosis	Behavior
1 - rejected-permanent	1 - DICOM UL service-user	1 - no-reason-given	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent,1: REJECT_SOURCE_dul_user,1: REJECT_REASON_no_reason_given)
		2 - application-context-name-not supported	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 1: REJECT_SOURCE_dul_user, 2: REJECT_REASON_application_context_not_support)
		3 - calling-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 1: REJECT_SOURCE_dul_user, 3: REJECT_REASON_calling_aetitle_not_recognized)
		7 - called-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 1: REJECT_SOURCE_dul_user, 7: REJECT_REASON_called_aetitle_not_recognized)
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	Association is not established. The following error is logged. Error: UserRecoverable: impl.dicom.access.PEER: Associationrejected by peer (1: REJECT_RESULT_permanent, 2: REJECT_SOURCE_dul_provider (acse), 1: REJECT_REASON_no_reason_given)
		2 - protocol-version-not-supported	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 2: REJECT_SOURCE_dul_provider (acse), 2: REJECT_REASON_application_context_not_support)
	3 - DICOM UL service-provider (Presentation	1 - temporary-congestion	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 3: REJECT_SOURCE_dul_provider (presentation), 1: REJECT_REASON_no_reason_given)

Result	Source	Reason/Diagnosis	Behavior
	related function)	2 - local-limit-exceeded	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 3: REJECT_SOURCE_dul_provider (presentation), 2: REJECT_REASON_application_context_not_support)
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 1: REJECT_REASON_no_reason_given)
		2 - application-context-name-not-supported	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 2: REJECT_REASON_application_context_not_support)
		3 - calling-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 3: REJECT_REASON_calling_aetitle_not_recognized)
		7 - called-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 7: REJECT_REASON_called_aetitle_not_recognized)
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 2: REJECT_SOURCE_dul_provider (acse), 1: REJECT_REASON_no_reason_given)
		2 - protocol-version-not-supported	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 2: REJECT_SOURCE_dul_provider (acse), 2: REJECT_REASON_application_context_not_support)
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 3: REJECT_SOURCE_dul_provider (presentation), 1: REJECT_REASON_no_reason_given)
		2 - local-limit-exceeded	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 3: REJECT_SOURCE_dul_provider (presentation), 2: REJECT_REASON_application_context_not_support)

The behavior of the AE on receiving an Association abort is summarized in the next table.

Table 12: Association Abort Handling

Source	Reason/Diagnosis	Behavior when received	Sent when
0 - DICOM UL service-user (initiated abort)	0- reason-not-specified	When received, the Philips Flash Ultrasound System 5100 Point of Care terminates the connection with the following log: Association ABORTED by peer (0: ABORT_SOURCE_dul_user, 0: ABORT_REASON_not_specified).	• N-EVENT-REPORT received with status FAILURE. • Abort is issued to an executing job that utilizes this network connection (ExportNetwork/ ArchiveNetwork/DICOMCopy/DICOMMove) • Any other problem than ones specified for Philips Flash

Source	Reason/Diagnosis	Behavior when received	Sent when
			Ultrasound System 5100 Point of Care Network AE SCU in the rows below. (Examples: Problem while decoding the DICOM stream, SCU was unable to send the Response to SCP, Error writing to SCU stream).
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	When received, the Philips Flash Ultrasound System 5100 Point of Care Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 0: ABORT_REASON_not_specified)	• There are problems in SCU/SCP role negotiation. • Any other problem than ones specified for Philips Flash Ultrasound System 5100 Point of Care Network AE SCU in the rows below. (Example: Problem while decoding the DICOM stream).
	1 - unrecognized-PDU	When received, the Philips Flash Ultrasound System 5100 Point of Care Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 1: ABORT_REASON_unrecognized_pdu).	An unrecognized PDU type is received[4].
	2 - unexpected-PDU	When received, the Philips Flash Ultrasound System 5100 Point of Care Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 2: ABORT_REASON_unexpected_pdu).	The received PDU type is not expected in the current state of connection[5].
	4 - unrecognized-PDU-parameter	When received, the Philips Flash Ultrasound System 5100 Point of Care Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 4: ABORT_REASON_unrecognized_pdu_parameter).	An unrecognized Associate PDU item is received[1].
	5 - unexpected-PDU-parameter	When received, the Philips Flash Ultrasound System 5100 Point of Care Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 5: ABORT_REASON_unexpected_pdu_parameter).	• One of the Associate PDU items is received more than once[2]. • One of the Associate PDU items is received unexpectedly[2].

Source	Reason/Diagnosis	Behavior when received	Sent when
	6 - invalid-PDU-parameter-value	When received, the Philips Flash Ultrasound System 5100 Point of Care Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 6: ABORT_REASON_invalid_pdu_parameter).	• One of the Associate PDU items is received more than once[3]. • One of the Associate PDU items is not received[3]. • There is mismatch in the application context names between the SCU and the SCP. • Illegal Asynchronous Operations Window invoke value is received. • Illegal Asynchronous Operations Window perform value is received. • Unknown presentation context id is received. • Unknown abstract syntax is received. • The length or the format of a received PDU item is invalid.

Notes:

1. Associate PDU items that are recognized:
   - 0x10 APPLICATION CONTEXT
   - 0x20 PRESENTATION CONTEXT (RQ)
   - 0x21 PRESENTATION CONTEXT (AC)
   - 0x30 ABSTRACT SYNTAX
   - 0x40 TRANSFER SYNTAX
   - 0x50 USER INFO
   - 0x51 MAXIMUM LENGTH
   - 0x52 IMPLEMENTATION CLASS UID
   - 0x53 ASYNCHRONOUS OPERATIONS WINDOW
   - 0x54 SCP/SCU ROLE SELECTION
   - 0x55 IMPLEMENTATION VERSION NAME
   - 0x56 SOP CLASS EXTENDED NEGOTIATION

2. Associate PDU items for Unexpected-PDU ParameterReceived more than once:
   - 0x10 APPLICATION CONTEXT (SCU, SCP)
   - 0x30 ABSTRACT SYNTAX (SCU, SCP)
   - 0x40 TRANSFER SYNTAX (SCU)

Received unexpectedly:
   - 0x20 PRESENTATION CONTEXT (RQ) (SCU)

3. Associate PDU items for Invalid-PDU parameter value:
Received more than once (SCU, SCP):
   - 0x50 USER INFO
   - 0x51 MAXIMUM LENGTH
   - 0x52 IMPLEMENTATION CLASS UID
   - 0x53 ASYNCHRONOUS OPERATIONS WINDOW
   - 0x55 IMPLEMENTATION VERSION NAME

Received illegally:

- 0x21 PRESENTATION CONTEXT (AC) (SCP)

PDU items not received:

- 0x10 APPLICATION CONTEXT (SCU, SCP)
- 0x20 PRESENTATION CONTEXT (RQ) (SCP)
- 0x21 PRESENTATION CONTEXT (AC) (SCU)
- 0x50 USER INFO (SCU, SCP)
- 0x30 ABSTRACT SYNTAX (SCU)
- 0x40 TRANSFER SYNTAX (SCU)
- 0x51 MAXIMUM LENGTH (SCU, SCP)
- 0x52 IMPLEMENTATION CLASS UID (SCU)

4. PDU types that are recognized:
   - 0x01 A-ASSOCIATE-RQ
   - 0x02 A-ASSOCIATE-AC
   - 0x03 A-ASSOCIATE-RJ
   - 0x04 P-DATA-TF
   - 0x05 A-RELEASE-RQ
   - 0x06 A-RELEASE-RP
   - 0x07 A-ABORT

5. Expected PDU's for following states:

STATE_IDLE:

- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP

STATE_ASSOCIATED:

- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x06 A-RELEASE-RP

STATE_ASSOCIATING (SCU):

- 0x01 A-ASSOCIATE-RQ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP

STATE_RELEASING:

- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ

STATE_WAIT_FOR_ASSOCIATE (SCP):

- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x04 P-DATA-TF

- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP
- 0x07 A-ABORT

STATE_WAIT_FOR_FINISH:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP

STATE_WAIT_FOR_DISCONNECT:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ

4.2.1.3.1 (Real-World) Activity – Verification as SCU

4.2.1.3.1.1 Description and Sequencing of Activities

The Philips Flash Ultrasound System 5100 Point of Care Network AE implements the Verification service class / Verification SOP class to verify application-level communication.

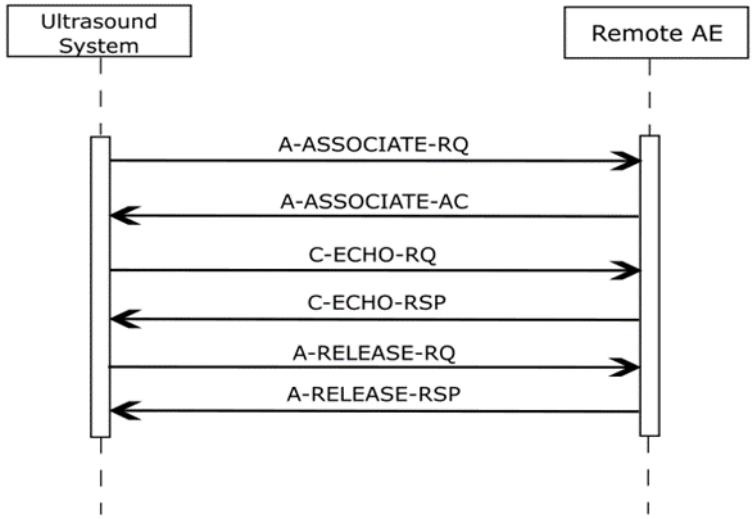

Figure 3: Data Flow Diagram – Verification as SCU

4.2.1.3.1.2 Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 13: Proposed Presentation Contexts for (Real-World) Activity – Verification as SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.1.3.1.3 SOP Specific Conformance for Verification SOP Class

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

The Philips Flash Ultrasound System 5100 Point of Care Network AE provides standard conformance to the DICOM Verification service class.

4.2.1.3.1.3.1 Dataset Specific Conformance for Verification C-ECHO SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 14: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation	The SCP has successfully returned a verification response

4.2.1.3.2 (Real-World) Activity – Modality worklist as SCU

4.2.1.3.2.1 Description and Sequencing of Activities

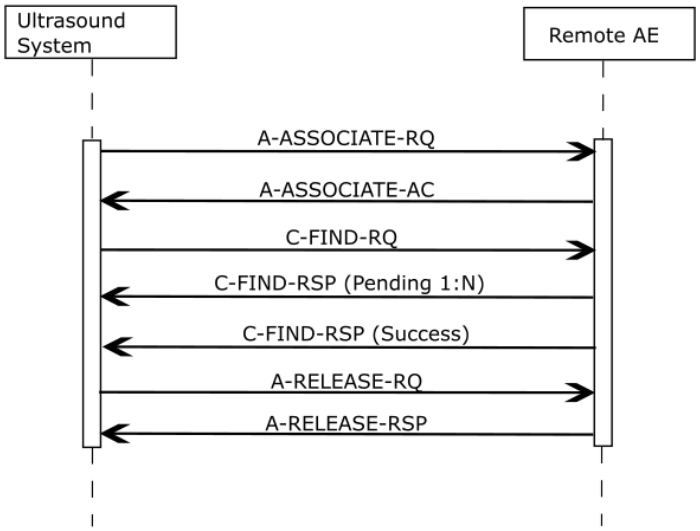

Figure 4: (Real World) Activity - Modality work list as SCU

Note:

- The system accepts any number of C-FIND responses, however SUT is capable of displaying 4700 responses on the UI.
- When C-FIND responses with missing mandatory attributes are received, Error is displayed on selecting that particular study [Refer Table 17].

- When C-FIND responses with empty values for mandatory attributes are received handled as mentioned below:
  - Empty value for patient ID or patient name-on selecting that study, error is displayed.
  - Empty value for Station AE-Station AE is automatically assigned by SUT
- When responses with extra keys are received (like Study Date & Study Time), SUT process the response successfully.

4.2.1.3.2.2 Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 15: Proposed Presentation Contexts for (Real-World) Activity – Modality worklist As SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.1.3.2.3 SOP Specific Conformance for Modality Worklist Information Model - FIND SOP Class

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

4.2.1.3.2.3.1 Dataset Specific Conformance for Modality Worklist Information Model - FIND SOP Class C-FIND-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
The table below should be read as follows:

Attribute Name: Attributes supported to build a Modality Worklist Request Identifier.
Tag: DICOM tag for this attribute.
VR: DICOM VR for this attribute.
M: Matching Keys for (automatic) Worklist Update.
R: Return Keys. An “X” will indicate that this attribute as Return Key with zero length for Universal Matching.
Q: Interactive Query Key. An “X” will indicate that this attribute as matching key can be used.
D: Displayed Keys. An “X” indicates that this Worklist attribute is displayed to the user during a patient registration dialog.
IOD: An “X” indicates that this Worklist attribute is included into all object Instances created during performance of the related Procedure Step.

Types of matching supported:
Single Value Matching
List of UID Matching
Wild Card Matching
Range Matching
Sequence Matching
Universal Matching

Table 16: Worklist Request Identifier

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
SOP Common Module									
Specific Character Set	0008,0005	CS		X					Default Value: ISO_IR 192
Patient Identification Module									
Other Patient Ids	0010,1000	LO		X					
Patient ID	0010,0020	LO	X	X	X	X	X	Single Value, Wildcard, Universal	
Patient's Name	0010,0010	PN		X	X	X	X	Single Value, Wildcard, Universal	
Patient Demographic Module									
Ethnic Group	0010,2160	SH		X					
Patient Comments	0010,4000	LT		X					
Patient's Birth Date	0010,0030	DA		X		X	X	Universal	
Patient's Sex	0010,0040	CS		X		X	X	Universal	
Patient's Size	0010,1020	DS		X					
Patient's Weight	0010,1030	DS		X				Universal	
Patient Medical Module									
Additional Patient History	0010,21B0	LT		X			X		
Medical Alerts	0010,2000	LO		X					
Pregnancy Status	0010,21C0	US		X					
Last Menstrual Date	0010,21D0	DA		X					
Visit Identification Module									
Admission ID	0038,0010	LO		X					
Issuer of Admission ID Sequence	0038,0014	SQ		X					
Visit Status Module									
Current Patient Location	0038,0300	LO		X					
Scheduled Procedure Step Module									
Scheduled Procedure Step Sequence	0040,0100	SQ		X					
>Modality	0008,0060	CS	X		X		X	Single Value	
>Scheduled Performing Physician's Name	0040,0006	PN		X		X			
>Scheduled Procedure Step Description	0040,0007	LO		X					
>Scheduled Procedure Step Start Date	0040,0002	DA	X	X	X	X		Range, Single Value	
>Scheduled Procedure Step Start Time	0040,0003	TM		X					

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
> Scheduled Procedure Step Location	0040,0011	SH		X					
>Comments on the Scheduled Procedure Step	0040,0400	LT		X					
>Scheduled Station AE Title	0040,0001	AE						Single Value	
>Scheduled Station Name	0040,0010	SH		X					
>Scheduled Protocol Code Sequence	0040,0008	SQ		X			X		
>>Code Meaning	0008,0104	LO		X			X		
>>Code Value	0008,0100	SH		X			X		
>>Coding Scheme Designator	0008,0102	SH		X			X		
>>Coding scheme verion	0008,0103	SH		X			X		
Requested Procedure Module									
Names of Intended Recipients of Results	0040,1010	PN		X					
Requested Procedure Comments	0040,1400	LT		X					
Requested Procedure Description	0032,1060	LO		X					
Requested Procedure ID	0040,1001	SH		X	X		X	Universal	
Reason for the Requested Procedure	0040,1002	LO		X					
Study Instance UID	0020,000D	UI		X			X		
Referenced Study Sequence	0008,1110	SQ		X			X		
Requested Procedure Code Sequence	0032,1064	SQ		X					
>Code Meaning	0008,0104	LO		X					
>Code Value	0008,0100	SH		X					
> Coding Scheme Version	0008,0103	SH		X					
Imaging Service Request Module									
Accession Number	0008,0050	SH		X	X	X	X	Universal	
Issuer of Accession Number Sequence	0008,0051	SQ		X					
Imaging Service Request Comments	0040,2400	LT		X					
Referring Physician's Name	0008,0090	PN		X		X	X	Universal	
Requesting Physician	0032,1032	PN		X		X			
Requesting Service	0032,1033	LO		X					

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Physician(s) of Record	0008,1048	PN		X					

When MWL operation is failed then system stops further querying and shows Worklist Query Error on UI.

Table 17: C-FIND-RQ Status Response

Service Status	Code	Further Meaning	Behavior
Success	0000	Matching is complete	The Worklist is updated.
Failure	A700	Refused – Out of resources	The association is released. The reason is logged.
	A900	Failed – Identifier does not match SOP class	The association is released. The reason is logged.
	0122	Failed - Refused: SOP Class Not Supported	The association is released. The reason is logged.
	Cxxx	Failed – Unable to process	The association is released. The reason is logged.
Pending	FF00	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	The Query Worklist job continues.
	FF01	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	The Query Worklist job continues.

4.2.1.3.3 (Real-World) Activity – Modality Performed Procedure Step as SCU

4.2.1.3.3.1 Description and Sequencing of Activities

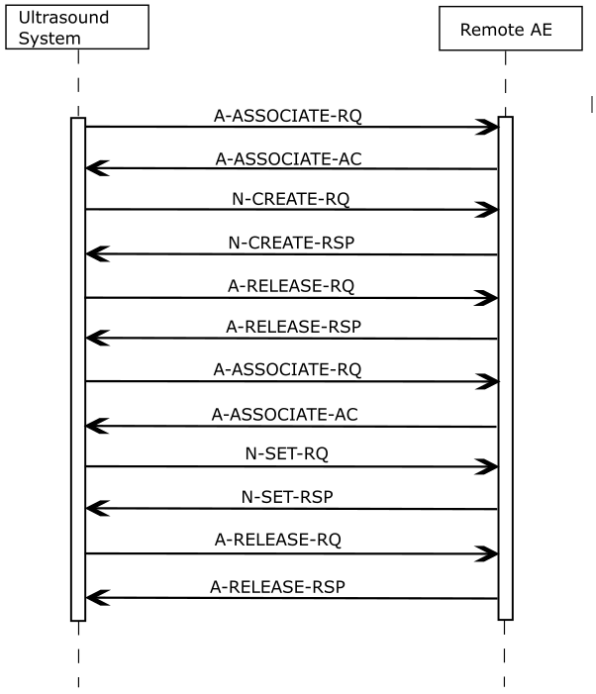

Figure 5: Data Flow Diagram - Modality Performed Procedure Step as SCU

4.2.1.3.3.2 Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 18: Proposed Presentation Contexts for (Real-World) Activity – Modality Performed Procedure Step As SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.1.3.3.3 SOP Specific Conformance for Modality Performed Procedure Step SOP Class

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

4.2.1.3.3.3.1 Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 19: Modality Performed Procedure Step for N-CREATE -RQ

Attribute Name	Tag	Comment
Image Acquisition Results Module		
Modality	(0008,0060)	
Study ID	(0020,0010)	
Performed Protocol Code Sequence	(0040,0260)	
Performed Series Sequence	(0040,0340)	
>Retrieve AETitle	(0008,0054)	
>Series Description	(0008,103E)	
>Performing Physicians Name	(0008,1050)	
>Operators Name	(0008,1070)	
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Class UID	(0008,1150)	
>>Referenced SOP Instance UID	(0008,1155)	
>Protocol Name	(0018,1030)	
>Series Instance UID	(0020,000E)	
>Referenced Non Image Composite SOP Instance Sequence	(0040,0220)	Present only if SR Object is created
Performed Procedure Step Information Module		
Procedure Code Sequence	(0008,1032)	
Performed Station AETitle	(0040,0241)	
Performed Station Name	(0040,0242)	
Performed Location	(0040,0243)	
Performed Procedure Step Start Date	(0040,0244)	
Performed Procedure Step Start Time	(0040,0245)	
Performed Procedure Step End Date	(0040,0250)	
Performed Procedure Step End Time	(0040,0251)	
Performed Procedure Step Status	(0040,0252)	
Performed Procedure Step ID	(0040,0253)	
Performed Procedure Step Description	(0040,0254)	

Attribute Name	Tag	Comment
Image Acquisition Results Module		
Performed Procedure Type Description	(0040,0255)	
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)	
Performed Procedure Step Relationship Module		
Referenced Patient Sequence	(0008,1120)	
Patient's Name	(0010,0010)	
Patient ID	(0010,0020)	
Patient's Birth Date	(0010,0030)	
Patient's Sex	(0010,0040)	
Scheduled Step Attributes Sequence	(0040,0270)	
>Accession Number	(0008,0050)	
>Referenced Study Sequence	(0008,1110)	
>Study Instance UID	(0020,000D)	
>Requested Procedure Description	(0032,1060)	
>Scheduled Procedure Step Description	(0040,0007)	
>Scheduled Protocol Code Sequence	(0040,0008)	
>Scheduled Procedure Step ID	(0040,0009)	
>Requested Procedure ID	(0040,1001)	

Possible status responses from N-CREATE-RQ actions are shown in next Table.

Table 20: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation, The SCP has completed the operation successfully.	The association will be released.
Failure	0105	No Such Attribute	The request for MPPS is marked as failed.
	0110	Processing Failure	
	0111	Duplicate SOP Instance	
	0116	Attribute Value Out Of Range	
	0117	Invalid Object Instance	
	0118	No Such SOP Class	
	0120	Missing Attribute	
	0121	Missing Attribute Value	
	0124	Refused: Not Authorized	
	0210	Duplicate Invocation	
	0106	Invalid Attribute Value	
	0107	Attribute List Error	
	0211	Unrecognized Operation	
	0212	Mistyped Argument	
	0213	Resource Limitation	
	0112	No Such Object Instance	
	0122	Referenced SOP Class Not Supported	
	0131	Duplicate Transaction UID	

4.2.1.3.3.3.2 Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 21: Modality Performed Procedure Step for N-SET -RQ

Attribute Name	Tag	Comment
Performed Procedure Step Information Module		
Performed Procedure Step End Date	(0040,0250)	
Performed Procedure Step End Time	(0040,0251)	
Performed Procedure Step Status	(0040,0252)	
Performed Procedure Type Description	(0040,0255)	
Institutional Department Name	(0008,1040)	
Institutional Department Type Code Sequence	(0008,1041)	
Physician(s) of Record	(0008,1048)	
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)	
Image Acquisition Results Module		
Performed Series Sequence	(0040,0340)	
>Retrieve AETitle	(0008,0054)	
>Series Description	(0008,103E)	
>Performing Physicians Name	(0008,1050)	
>Operators Name	(0008,1070)	
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Class UID	(0008,1150)	
>>Referenced SOP Instance UID	(0008,1155)	
>Protocol Name	(0018,1030)	
>Series Instance UID	(0020,000E)	
>Referenced Non Image Composite SOP Instance Sequence	(0040,0220)	

Possible status responses from N-SET-RQ actions are shown in next Table.

Table 22: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation, The SCP has completed the operation successfully.	The association will be released.
Failure	0105	No Such Attribute	The request for MPPS is marked as failed.
	0110	Processing Failure	
	0111	Duplicate SOP Instance	
	0116	Attribute Value Out Of Range	
	0117	Invalid Object Instance	
	0118	No Such SOP Class	
	0120	Missing Attribute	
	0121	Missing Attribute Value	
	0124	Refused: Not Authorized	
	0210	Duplicate Invocation	
	0106	Invalid Attribute Value	
	0107	Attribute List Error	

Service Status	Error Code	Further Meaning	Behavior
	0211	Unrecognized Operation	
	0212	Mistyped Argument	
	0213	Resource Limitation	
	0213	Resource Limitation	

4.2.1.3.4 (Real-World) Activity – Image Export

4.2.1.3.4.1 Description and Sequencing of Activities

The Philips Flash Ultrasound System 5100 Point of Care implements the Storage service class as part of the Philips Flash Ultrasound System 5100 Point of Care to store selected images at an archive or other storage SCP. All actual selected images are exported using one and the same association.

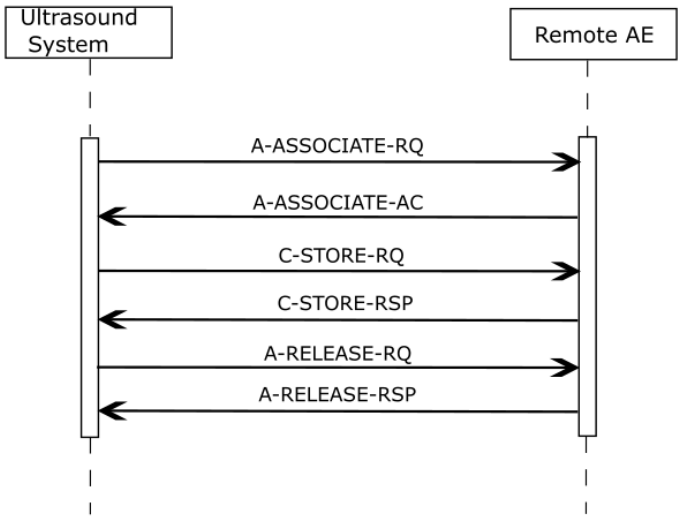

Figure 6: Data Flow Diagram – Store Image – Storage as SCU

4.2.1.3.4.2 Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 23: 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		
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG_LOSSLESS	1.2.840.10008.1.2.4.70		
		JPEG_BASELINE_LOSSY	1.2.840.10008.1.2.4.50		
		RLE	1.2.840.10008.1.2.5		
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG_LOSSLESS	1.2.840.10008.1.2.4.70		

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
		JPEG_BASELINE_LOSSY	1.2.840.10008.1.2.4.50		
		RLE	1.2.840.10008.1.2.5		
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Multi-frame True Color Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG_LOSSLESS	1.2.840.10008.1.2.4.70		
		JPEG_BASELINE_LOSSY	1.2.840.10008.1.2.4.50		
		RLE	1.2.840.10008.1.2.5		
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG_LOSSLESS	1.2.840.10008.1.2.4.70		
		JPEG_BASELINE_LOSSY	1.2.840.10008.1.2.4.50		
		RLE	1.2.840.10008.1.2.5		

4.2.1.3.4.2.1 Dataset Specific Conformance for C-STORE-RQ

Detail regarding the Dataset Specific response behavior will be reported in this section.
This includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 24: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful stored	Progress of the export job is updated and connection is retained for the next store. If the store of all the SOP instances is completed then the connection is released.
Failure	A7xx	Refused: Out of Resources	Error is logged and the export job fails. Connection is released.
	A9xx	Error: Data Set does not match SOP Class	Error is logged and the export job fails. Connection is released.
	Cxxx	Error: cannot understand	Error is logged and the export job fails. Connection is released.
	0210	Duplicate Invocation	Error is logged and the export job fails. Connection is released.
	0117	Invalid Object Instance	Error is logged and the export job fails. Connection is released.
	0212	Mistyped Argument	Error is logged and the export job fails. Connection is released.
Warning	B000	Coercion of Data Elements	Warning is logged and the export job continues. Connection is not released.
	B007	Data Set does not match SOP Class	Warning is logged and the export job continues. Connection is not released.
	B006	Elements Discarded	Warning is logged and the export job continues. Connection is not released.

Service Status	Error Code	Further Meaning	Behavior
	0107	Attribute List Error	Warning is logged and the export job continues. Connection is not released.

4.2.1.3.5 (Real-World) Activity – Storage Commitment Push Model As SCU

4.2.1.3.5.1 Description and Sequencing of Activities

Philips Flash Ultrasound System 5100 Point of Care Storage Commitment as a SCU service. It accepts storage commitment notification (N-EVENT-REPORT) from systems that send them.

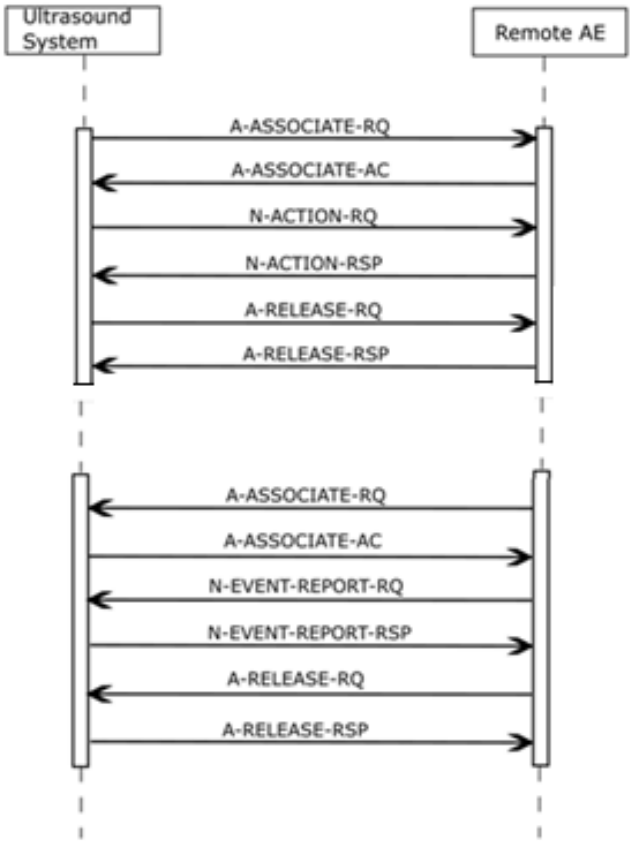

Figure 7: Data Flow Diagram – Commit Image (Asynchronous)

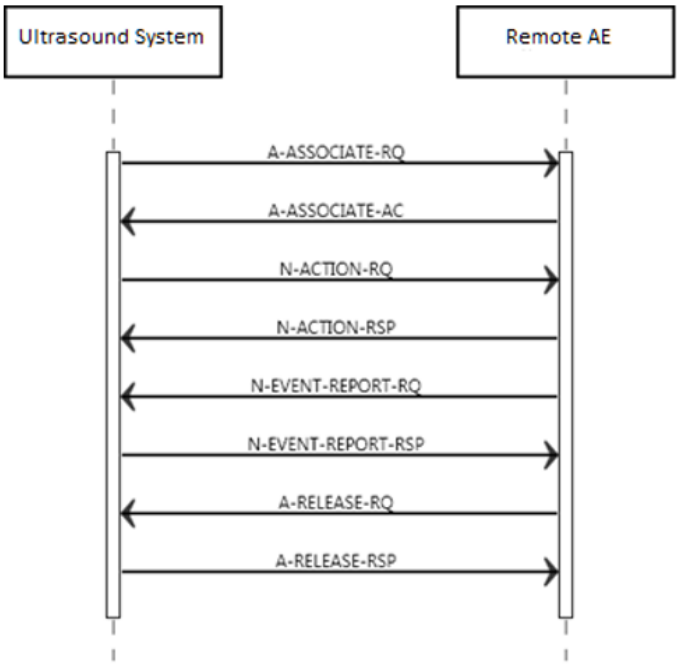

Figure 8: Data Flow Diagram – Commit Image (Synchronous)

4.2.1.3.5.2 Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 25: Proposed Presentation Contexts for (Real-World) Activity – Storage Commitment Push Model AS SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.1.3.5.3 SOP Specific Conformance for Storage Commitment Push Model SOP Class

Philips Flash Ultrasound System 5100 Point of Care provides standard conformance to Storage Commitment Service Class using Push Model as SCU.

Multiple N-ACTION-RQ can be performed over a single association. Multiple N-EVENT-REPORT-RQ can be accepted over a single association. After all N-ACTION-RQ that are waiting in the stack are issued, association will be closed with the timeout which is configurable.

A remote system reports about storage commitment completion using an N-EVENT-REPORT-RQ command. The system accepts the N-EVENT-REPORT-RQ commands over a separate association initiated by the remote system, using reverse role negotiation for the asynchronous behavior after the earlier connection was timed out.

Storage Commitment for individual images are grouped into large "chunks" and issued as a single Storage Commitment request.

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior. Philips Flash Ultrasound System 5100 Point of Care provides standard conformance to the DICOM Storage Commitment service class.

Storage commitment request is marked as failure when:

1. Timeout occurs while waiting for N-EVENT-REPORT.
2. Storage Commitment fail for any one or few of the objects.
3. Storage Commitment missing for any one or few of the objects.

4.2.1.3.5.3.1 Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-EVENT-REPORT-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 26: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful storage commitment	Successful completion of the request.
Failure	0119	Class Instance Conflict	The request for storage commitment is marked as failed.
	0213	Resource Limitation	
	0110	Processing Failure	
	0112	No Such Object Instance	
	0122	Referenced SOP Class Not Supported	
	0131	Duplicate Transaction UID	

4.2.1.3.5.3.2 Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 27: Storage Commitment Attribute for N-ACTION-RQ

Attribute Name	Tag	Comment
Storage Commitment Module		
Transaction UID	0008,1195	
Referenced SOP Sequence	0008,1199	
>Referenced SOP Class UID	0008,1150	
>Referenced SOP Instance UID	0008,1155	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 28: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful	Successful completion of the request.
Failure	0119	Class Instance Conflict	The request for storage commitment is marked as failed.
	0213	Resource Limitation	
	0110	Processing Failure	
	0112	No Such SOP Instance	

Service Status	Error Code	Further Meaning	Behavior
	0114	No Such Argument	
	0118	No Such SOP Class	
	0210	Duplicate Invocation	
	0211	Unrecognized Operation	
	0124	Not Authorized	
	0115	Invalid Argument Value	
	0117	Invalid Object Instance	
	0212	Mistyped Argument	
	0123	No Such Action	

4.2.2. System Print

This chapter describes the Print AE in detail.

4.2.2.1. SOP Classes

This Application Entity provides Standard Conformance to the SOP Classes shown in next table.

Table 29: SOP Classes for System Print

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	UID		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Yes	No

4.2.2.2. Association Policies

This chapter describes the establishment of an association and the acceptance policies of the Print AE.

4.2.2.2.1 General

The following DICOM standard application context is specified.

Table 30: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.2.2.2.2 Number of Associations

The number of simultaneous associations that the Print AE supports is specified in next table. The Print AE does not accept any incoming associations.

Table 31: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	1

4.2.2.2.3 Asynchronous Nature

The Philips Flash Ultrasound System 5100 Point of Care system does not support asynchronous print operations and will not perform asynchronous window negotiation.

4.2.2.2.4 Implementation Identifying Information

The following values are used for Implementation Class UID and Implementation Version Name.

Table 32: DICOM Implementation Class and Version for System Print

Implementation Class UID	1.3.46.670589.54.2.23.6
Implementation Version Name	23.6.0.x
* where “x” represents minor release version	

4.2.2.2.5 Communication Failure Handling

The possible DICOM Association failures are summarized in next table.

Table 33: Communication Failure Behavior

Exception	Behavior
Association Aborted.	The Print Image job is marked as Failed. The reason is logged and reported to the user.

4.2.2.3. Association Initiation Policy

4.2.2.3.1 (Real-World) Activity – Print Management as SCU

4.2.2.3.1.1 Description and Sequencing of Activities

The operator can select images and request them to be printed on a printer (out of choice list of configured printers). Each request is forwarded to the job queue and processed as individual request to Print Images. The print job consists of data describing the images and graphics to be printed as well as the requested layout and other parameters. One print job on Philips Flash Ultrasound System 5100 Point of Care may result in a number of film sessions with the printer equal to the number of printed film sheets. Each film sheet within the print job is internally processed, converted to a STANDARD/1, 1 page and then an association towards the remote Print Server is established and the page image is sent to that Print Server. Once the transmission of the film sheet is completed, the association is closed. A sequence of interactions between the Philips Flash Ultrasound System 5100 Point of Care and a remote AE to print one film sheet is presented in figure 9.

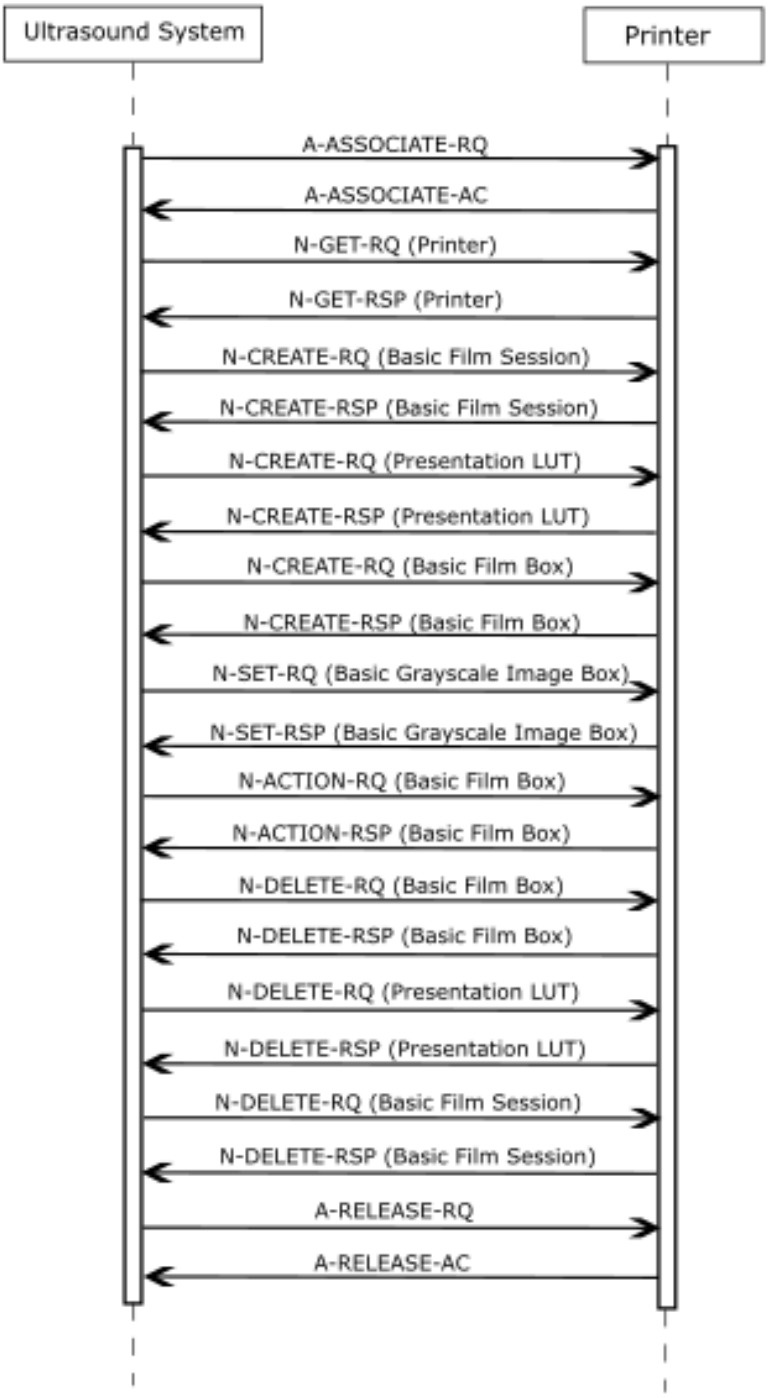

Figure 9: Sequencing of RWA Print Images

The following implementation remarks are important to achieve successful printing:

- Each film session will be in a single association with one or more film boxes and one or more film sheets
- The number of images per Film Box is one. The images to be printed on one film are rendered by the Philips Flash Ultrasound System 5100 Point of Care into one logical image.
- The Philips Flash Ultrasound System 5100 Point of Care will request for releasing the association when the print command is given (i.e. the N-ACTION Request). The association is not kept open for receiving N-EVENT-REPORTs of the Printer SOP Class.

Table 34: The Applied Order of Print Service Elements

Service Element of SOP Class	Description
N-GET of the Printer SOP Class	Purpose is to retrieve printer information.
N-CREATE of the Basic Film Session SOP Class	Specifies the DICOM Printer about some general presentation parameters, applicable for all films in the Film Session. Applied attributes are: Number of Copies, Print Priority, Medium Type, Film Destination
N-CREATE of the Basic Film Box SOP Class	Specifies the DICOM Printer about some general presentation parameters, applicable for all images in the Film Box. Applied attributes are: Film Orientation, Film Size ID, Magnification Type, Max. Density, Configuration Information, Trim.
N-CREATE of the Printer SOP Class	Specifies the DICOM Printer about Presentation LUT SOP Class.
N-SET of the Basic Grayscale Image Box SOP Class	Images to be printed. Applied attributes are: Polarity
N-ACTION of the Basic Film Box SOP Class	Triggers the DICOM Printer to print. This actual print action is done at film box level. No attributes are present.
N-DELETE of the Basic Film Session SOP Class	Triggers deletion of the complete Basic Film Session SOP Instance hierarchy. As a result, all references to Image SOP Instances within the film session are deleted.
N-DELETE of the Basic Film Box SOP Class	Triggers deletion of the last created Basic Film Box SOP Instance hierarchy. As a result all the information describing the last film is deleted
N-DELETE of the Printer SOP Class	Triggers deletion of the last Presentation LUT SOP Instance.

4.2.2.3.1.2 Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 35: Proposed Presentation Contexts for (Real-World) Activity – Print Management As SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9			SCU	None
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18			SCU	None
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
>Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

4.2.2.3.1.3 SOP Specific Conformance for Basic Film Session SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section specifies each IOD created (including private IOD's).
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

4.2.2.3.1.3.1 Dataset Specific Conformance for Basic Film Session SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 36: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Copies	2000,0010	IS	1-100	ALWAYS	USER	
Print Priority	2000,0020	CS	MED	ALWAYS	AUTO	
Medium Type	2000,0030	CS	PAPER,CLEAR FILM, BLUE FILM	ALWAYS	USER	
Film Destination	2000,0040	CS	PROCESSOR	ALWAYS	AUTO	Default value from Printer ex: PROCESSOR

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 37: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes. Status of the job is marked as 'Completed' in the Job viewer.

Service Status	Error Code	Further Meaning	Behavior
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	B600	Memory allocation not supported.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	0107	Attribute list error	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116	Attribute Value out of range	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B601	Film session printing (collation) is not supported	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B602	Film Session SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B604	Image size is larger than image box size, the image has been demagnified.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B605	Requested Min Density or Max Density outside of printer's operating range	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	Image size is larger than the Image Box size. The Image has been cropped to fit.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.3.2 Dataset Specific Conformance for Basic Film Session SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 38: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues.
Failure	0112	No such SOP instance	The print job continues and completes. Status of the job is marked as 'Completed' in the Job viewer.
Failure	xxxx	any failure	The print job fails, the error is logged and the association is released.
Warning	xxxx	any warning	The print job fails, the warning is logged and the association is released.

4.2.2.3.1.4 SOP Specific Conformance for Presentation LUT SOP Class

4.2.2.3.1.4.1 Dataset Specific Conformance for Presentation LUT SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 39: Presentation LUT Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation LUT Shape	2050,0020	CS	IDENTITY	ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

4.2.2.3.1.4.2 Dataset Specific Conformance for Presentation LUT SOP Class N-DELETE-SCU

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 40: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues.
Failure	xxxx	any failure	The print job fails, the error is logged and the association is released.
Warning	xxxx	any warning	The print job fails, the warning is logged and the association is released.

4.2.2.3.1.5 SOP Specific Conformance for Basic Film Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

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

4.2.2.3.1.5.1 Dataset Specific Conformance for Basic Film Box SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 41: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Display Format	2010,0010	ST	STANDARD\1,1	ALWAYS	AUTO	
Film Orientation	2010,0040	CS	PORTRAIT, LANDSCAPE	ALWAYS	USER	
Film Size ID	2010,0050	CS	10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, 8INX10IN, A3, A4	ALWAYS	USER	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Magnification Type	2010,0060	CS	REPLICATE, BILINEAR, CUBIC, NONE	OPTIONAL	AUTO	
Max Density	2010,0130	US	300	OPTIONAL	AUTO	
Trim	2010,0140	CS	NO, YES	ALWAYS	IMPLICIT/ CONFIG	
Configuration Information	2010,0150	ST	LUT=0,9	OPTIONAL	AUTO	
Illumination	2010,015E	US		OPTIONAL	AUTO	
Reflected Ambient Light	2010,0160	US		OPTIONAL	AUTO	
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Referenced Presentation LUT Sequence	2050,0500	SQ		ALWAYS	AUTO	
> Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 42: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes. Status of the job is marked as ‘Completed’ in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as ‘Permanently Failed’ in the Job viewer with detail.
Warning	B600	Memory allocation not supported.	The print job is terminated and the warning is logged. Status is marked as ‘Permanently Failed’ in the Job viewer with detail.
	0107	Attribute list error	The print job continues and the warning is logged. Status is marked as ‘Completed’ in the Job viewer.
	0116	Attributes out of range	The print job continues and the warning is logged. Status is marked as ‘Completed’ in the Job viewer.
	B603	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	The print job is terminated and the warning is logged. Status is marked as ‘Permanently Failed’ in the Job viewer with detail.
	B604	Image size is larger than image box size, the image has been demagnified.	The print job is terminated and the warning is logged. Status is marked as ‘Permanently Failed’ in the Job viewer with detail.

Service Status	Error Code	Further Meaning	Behavior
	B605	Requested Min Density or Max Density outside of printer's operating range	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	Image size is larger than the Image Box size. The Image has been cropped to fit.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	Image size or Combined Print Image size is larger than the Image Box size.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.5.2 Dataset Specific Conformance for Basic Film Box SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 43: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created.	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	0107	Attribute list error	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116	Attributes out of range	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B600	Memory allocation not supported.	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B603	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B604	Image Size is larger than Image Box Size - The Image has been de-magnified	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	Image Size is larger than Image Box Size - The Image has been cropped to fit	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.5.3 Dataset Specific Conformance for Basic Film Box SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 44: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues.
Failure	xxxx	(any failure)	The print job fails, the error is logged and the association is released.
Warning	xxxx	(any warning)	The print job fails, the warning is logged and the association is released.

4.2.2.3.1.6 SOP Specific Conformance for Basic Grayscale Image Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

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

4.2.2.3.1.6.1 Dataset Specific Conformance for Basic Grayscale Image Box SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 45: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Box Position	2020,0010	US	1	ALWAYS	AUTO	
Polarity	2020,0020	CS	NORMAL	ALWAYS	AUTO	
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	
>Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	
>Rows	0028,0010	US		ALWAYS	IMPLICIT	
>Columns	0028,0011	US		ALWAYS	IMPLICIT	
>Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	
>Bits Stored	0028,0101	US	12	ALWAYS	IMPLICIT	
>High Bit	0028,0102	US	11	ALWAYS	AUTO	
>Pixel Representation	0028,0103	US		ALWAYS	AUTO	
>Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 46: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes. Status is marked as ‘Completed’ in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as ‘Permanently Failed’ in the Job viewer with detail.

Service Status	Error Code	Further Meaning	Behavior
Warning	B600	Memory allocation not supported.	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0107	Attribute list error	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116	Attributes out of range	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B604	Image size larger than image box size, the image has been demagnified	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B605	Requested Min Density or Max Density outside of printer's operating range	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	Image size is larger than the Image Box size	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	Image size or Combined Print Image size is larger than the Image Box size	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.7 SOP Specific Conformance for Basic Film Session SOP Class of the Basic Color Print Management Meta SOP Class

4.2.2.3.1.7.1 Dataset Specific Conformance for Basic Film Session SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 47: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Copies	2000,0010	IS	1-100	ALWAYS	USER	
Print Priority	2000,0020	CS	MED	ALWAYS	AUTO	
Medium Type	2000,0030	CS	PAPER,CLEAR FILM, BLUE FILM	ALWAYS	USER	
Film Destination	2000,0040	CS	PROCESSOR	ALWAYS	AUTO	Default value from Printer ex: PROCESSOR

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 48: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.

Service Status	Error Code	Further Meaning	Behavior
Warning	B600	Memory allocation not supported.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail..
	0107	Attribute list error	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116	Attribute Value out of range	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B601	Film session printing (collation) is not supported	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B602	Film Session SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B604	Image size is larger than image box size, the image has been demagnified.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B605	Requested Min Density or Max Density outside of printer's operating range	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	Image size is larger than the Image Box size. The Image has been cropped to fit.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.8 SOP Specific Conformance for Basic Film Box SOP Class of the Basic Color Print Management Meta SOP Class

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

4.2.2.3.1.8.1 Dataset Specific Conformance for Basic Film Box SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 49: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Display Format	2010,0010	ST	STANDARD\1,1	ALWAYS	AUTO	
Film Orientation	2010,0040	CS	PORTRAIT, LANDSCAPE	ALWAYS	USER	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Film Size ID	2010,0050	CS	10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, 8INX10IN, A3, A4	ALWAYS	USER	
Magnification Type	2010,0060	CS	REPLICATE, BILINEAR, CUBIC, NONE	OPTIONAL	AUTO	Value from the printer template configuration
Max Density	2010,0130	US	300	OPTIONAL	AUTO	
Trim	2010,0140	CS	NO, YES	ALWAYS	IMPLICIT/ CONFIG	
Configuration Information	2010,0150	ST	LUT=0,9	OPTIONAL	AUTO	
Illumination	2010,015E	US		OPTIONAL	AUTO	
Reflected Ambient Light	2010,0160	US		OPTIONAL	AUTO	
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Referenced Presentation LUT Sequence	2050,0500	SQ		ALWAYS	AUTO	
> Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 50: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes. Status of the job is marked as ‘Completed’ in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as ‘Permanently Failed’ in the Job viewer with detail.
Warning	B600	Memory allocation not supported.	The print job is terminated and the warning is logged. Status is marked as ‘Permanently Failed’ in the Job viewer with detail.
	0107	Attribute list error	The print job continues and the warning is logged. Status is marked as ‘Completed’ in the Job viewer.

Service Status	Error Code	Further Meaning	Behavior
	0116	Attributes out of range	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B603	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B604	Image size is larger than image box size, the image has been demagnified.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B605	Requested Min Density or Max Density outside of printer's operating range	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	Image size is larger than the Image Box size. The Image has been cropped to fit.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	Image size or Combined Print Image size is larger than the Image Box size.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.8.2 Dataset Specific Conformance for Basic Film Box SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 51: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created.	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	0107	Attribute list error	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	0116	Attributes out of range	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.
	B600	Memory allocation not supported.	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B603	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.

Service Status	Error Code	Further Meaning	Behavior
	B604	Image Size is larger than Image Box Size - The Image has been de-magnified	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B609	Image Size is larger than Image Box Size - The Image has been cropped to fit	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

4.2.2.3.1.9 SOP Specific Conformance for Basic Color Image Box SOP Class of the Basic Color Print Management Meta SOP Class

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

4.2.2.3.1.9.1 Dataset Specific Conformance for Basic Color Image Box SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 52: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Box Position	2020,0010	US		ALWAYS	AUTO	
Polarity	2020,0020	CS	NORMAL	ANAP	CONFIG	
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	
>Samples per Pixel	0028,0002	US	3	ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS	RGB	ALWAYS	IMPLICIT	
>Rows	0028,0010	US		ALWAYS	IMPLICIT	
>Columns	0028,0011	US		ALWAYS	IMPLICIT	
>Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	
>Bits Stored	0028,0101	US	8	ALWAYS	IMPLICIT	
>High Bit	0028,0102	US	7	ALWAYS	AUTO	
>Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
>Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	
>Planner Configuration	0028,0006	US		ANAP	CONFIG	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 53: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues and completes. Status is marked as 'Completed' in the Job viewer.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released. Status is marked as 'Permanently Failed' in the Job viewer with detail.
Warning	B604	Image size is larger than image box size, the image has been demagnified.	The print job continues and the warning is logged. Status is marked as 'Completed' in the Job viewer.

Service Status	Error Code	Further Meaning	Behavior
	B609	Image size is larger than the image box size. The image has been cropped to fit.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	B60A	Image size or combined print image size is larger than the image box size. Image or combined print image has been decimated to fit.	The print job is terminated and the warning is logged. Status is marked as 'Permanently Failed' in the Job viewer with detail.
	xxxx	(any other warning)	Print job is terminated, the warning is logged, and the association is released.

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 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 API is the WinSock 2 interface as supported by the underlying Operating System.

4.3.2. Additional Protocols

Not applicable. Additional Network protocols are not implemented by the system.

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 Philips Support Connect (PSC) Interface only allows one AE to be configured.

The following AE specific information must be available to configure a local AE:
- AE title.
- Hostname or IP address (or both). If the AE should only be associated with a specific network adapter, don't specify the host name and use the IP address of this network adapter.
- Port number

4.4.1.2. Remote AE Title/Presentation Address Mapping

One or more remote AE's may be configured.

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

- Port number.

4.4.2. Parameters

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

Table 54: 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)	No	60 [s] (set 0 for no time-out)
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	-
Local AE Specific Parameters		
Size constraint in maximum object size	No	-
Maximum PDU size the AE can send and receive	No	Configurable (default value : 32768)
Network Timeout (seconds)	YES	600 Sec
AE specific DIMSE level time-out values	No	300 [s] (set 0 for no time-out)
Number of simultaneous associations by service and/or SOP class	No	1 per service/SOP class
SOP Class support	No	All supported SOP classes
Transfer Syntax support	No	ELE - 1.2.840.10008.1.2.1
		ILE - 1.2.840.10008.1.2
		JPEG Lossless - 1.2.840.10008.1.2.4.70
		JPEG Baseline Lossy - 1.2.840.10008.1.2.4.50
		RLE - 1.2.840.10008.1.2.5
Remote Configurable Parameters		
Association (Artim) time-out	Yes	60 Sec
Storage Commit Mode	Yes	Asynchronous/Synchronous
Number of simultaneous associations by service and/or SOP class	No	1 per service/SOP class
SOP Class support	No	All supported SOP classes
Transfer Syntax support	No	ELE - 1.2.840.10008.1.2.1
		ILE - 1.2.840.10008.1.2
		JPEG Lossless - 1.2.840.10008.1.2.4.70

Parameter	Configurable	Default Value
		JPEG Baseline Lossy-1.2.840.10008.1.2.4.50
		RLE - 1.2.840.10008.1.2.5

5. Media Interchange

5.1. Implementation model

The implementation model identifies the DICOM Application Entities for Media in specific implementation and relates the Application Entities to Real-World Activities.

5.1.1. Application Data Flow Diagram

The Philips Flash Ultrasound System 5100 Point of Care implements one media application entity: AE Title (Configurable).

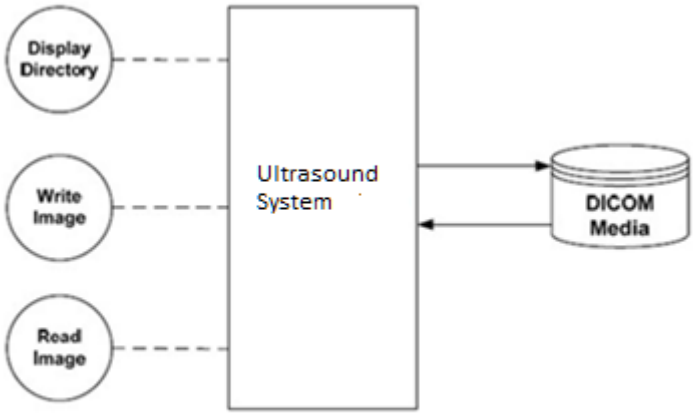

Figure 10: Application Data Flow Diagram

5.1.2. Functional Definitions of AE's

The Philips Flash Ultrasound System 5100 Point of Care implements the following functions for DICOM media.

- Write a DICOM file-set onto the medium.
- Create a DICOMDIR file.
- Read the DICOMDIR file from the medium.

5.1.3. Sequencing of Real World Activities

Whenever media has to be written the Media AE first tries to read the DICOMDIR. Then the Media AE will write the images of the selected Examinations and the updated DICOMDIR to the DICOM media.

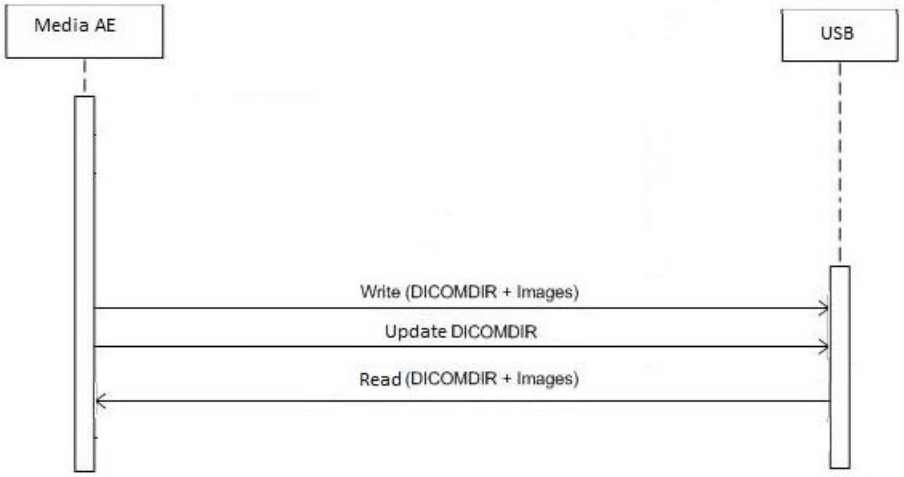

Figure 11: Sequencing of RWA Write Image

5.2. AE Specifications

This section in the DICOM Conformance Statement specifies a set of Media Application Entities.

5.2.1. Philips Flash Ultrasound System 5100 Point of Care Media AE Media - Specification

This section contains general policies that apply to all of the Application Entities described in subsequent section.

The Philips Flash Ultrasound System 5100 Point of Care provides standard conformance to the DICOM interchange option of the media storage service class, and follows the specifications as defined in the DICOM standard – Media Storage and File Format for Data Interchange (PS 3.10) and Media Storage Application Profiles (PS 3.11).

Media Storage Application Profiles STD-GEN-USB-JPEG ([DICOM] PS 3.11) for reading and writing. For one or more Application Profiles, the following table shows the Real-World Activities and the roles of each of these Real-World Activities.

Note:
Read File-set = Read Image
Create File-set = Write Image
Update File-set = Write Image

Table 55: AE Philips Flash Ultrasound System 5100 Point of Care Media AE related Application Profiles, RWA activities and roles

Supported Application Profile	Identifier	Real-World Activities	Roles
General Purpose USB Media Interchange with JPEG	STD-GEN-USB-JPEG	Create File-set	FSC
		Update File-set	FSU
		Read File-set	FSR

5.2.1.1. File Meta Information for the Philips Flash Ultrasound System 5100 Point of Care Media AE

Table 56: File Meta Information for the Philips Flash Ultrasound System 5100 Point of Care Media AE

Implementation Class UID	1.3.46.670589.54.2.23.6

Implementation Version Name	23.6.0.x
*where “x” represents minor release version	

5.2.1.2. Real-World Activities

The AE specification contains a description of the Real-World Activities, which invoke the particular AE.

5.2.1.2.1 RWA - Read File-set

This Media Application Entity has a File-set Reader functionality which is described here.

Display Directory

The Philips Flash Ultrasound System 5100 Point of Care will act as a FSR when reading the directory of the medium. This allows the System Integrator to see the results in an overview of the patients, studies, series and images.

Read Images

The Philips Flash Ultrasound System 5100 Point of Care will act as a FSR when reading all/selected images from DICOM media.

5.2.1.2.1.1 Media Storage Application Profile

Refer to the table in section 5.2.1.

5.2.1.2.1.1.1 Options

Not applicable. System has not implemented RWA – Read File Set options..

5.2.1.2.2 RWA - Create File-set

This Media Application Entity has a File-set Creator functionality which is described here.

When an image transfer to USB is initiated then the Media AE acts as an FSC using the interchange option to export SOP Instances from the local database to a USB medium.

5.2.1.2.2.1 Media Storage Application Profile

Refer to the table in section 5.2.1.

5.2.1.2.2.1.1 Options

The options used in the Application Profile are specified in detail in this section.
The DICOMDIR file will be created on the USB medium when new images are written, the System can write created image to media of the following listed SOP Classes.

Table 57: AE related storage SOP Classes for Media

SOP Class Name	SOP Class UID
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1
Multi-frame True Color Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.4
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33

The System can write created image to media with the following listed Transfer Syntax.

Table 58: AE related storage SOP Classes for Media

Transfer Syntax	UID List
Explicit VR Little Endian	1.2.840.10008.1.2.1

The system can write created image to media with the following listed Media Storage SOP Class.

Table 59: AE Media Store SOP Class

Media Storage SOP Class Name	Media Storage SOP Class UID
Media Storage Directory Storage	1.2.840.10008.1.3.10

Table 60: Supported attributes in the DICOMDIR

DICOM Tag	Description
0002, 0000	File Meta Information Group Length
0002, 0001	File Meta Information Version
0002, 0002	Media Storage SOP Class UID
0002, 0003	Media Storage SOP Instance UID
0002, 0010	Transfer Syntax UID
0002, 0012	Implementation Class UID
0002, 0013	Implementation Version Name
0002,0016	Source Application Entity Title
File Set and Directory Information	
0004, 1130	File Set ID
0004, 1200	Offset Of The First Directory Record Of The Root Directory Entity
0004, 1202	Offset Of The Last Directory Record Of The Root Directory Entity
0004, 1212	File Set Consistency Flag
0004, 1220	Directory Record Sequence
Patient Level	
0004, 1400	Offset Of The Next Directory Record
0004, 1410	Record In Use Flag
0004, 1420	Offset Of Referenced Lower Level Directory Entity
0004, 1430	Directory Record Type
0008,0005	Specific Character Set
0010, 0010	Patients Name
0010, 0020	Patient ID
0010,0030	Patient's Birth Date
0010,0040	Patient's Sex
Study Level	
0004, 1400	Offset Of The Next Directory Record
0004, 1410	Record In Use Flag
0004, 1420	Offset Of Referenced Lower Level Directory Entity
0004, 1430	Directory Record Type
0008,0005	Specific Character Set
0008, 0020	Study Date
0008, 0030	Study Time
0008, 0050	Accession Number

DICOM Tag	Description
0008,0080	Institution Name
0008,0090	Referring Physician's Name
0008, 1030	Study Description
0008,1050	Performing Physician's Name
0008,1090	Manufacturer's Model Name
0010,1020	Patient's Size
0010,1030	Patient's Weight
0020, 000d	Study Instance UID
0020, 0010	Study ID
Series Level	
0004, 1400	Offset Of The Next Directory Record
0004, 1410	Record In Use Flag
0004, 1420	Offset Of Referenced Lower Level Directory Entity
0004, 1430	Directory Record Type
0008,0005	Specific Character Set
0008, 0060	Modality
0008,0070	Manufacturer
0020,000D	Study Instance UID
0020, 000E	Series Instance UID
0020, 0011	Series Number
Image Level	
0004, 1400	Offset Of The Next Directory Record
0004, 1410	Record In Use Flag
0004, 1420	Offset Of Referenced Lower Level Directory Entity
0004, 1430	Directory Record Type
0004, 1500	Referenced File ID
0004, 1510	Referenced SOP Class UID In File
0004, 1511	Referenced SOP Instance UID In File
0004, 1512	Referenced Transfer Syntax UID In File
0008,0005	Specific Character Set
0008, 0008	Image Type
0008,0012	Instance Creation Date
0008,0013	Instance Creation Time
0008, 0016	SOP Class UID
0008, 0018	SOP Instance UID
0020,000D	Study Instance UID
0020, 000E	Series Instance UID
0020, 0013	Instance Number
0028,0002	Samples per Pixel
0028,0004	Photometric Interpretation
0028,0008	Number of Frames
0028,0009	Frame Increment Pointer
0028, 0010	Rows
0028, 0011	Columns

DICOM Tag	Description
0028,0100	Bits Allocated
0028,0101	Bits Stored
0028,0102	High Bit
0028,0103	Pixel Representation
SR Document	
0004, 1400	Offset Of The Next Directory Record
0004, 1410	Record In Use Flag
0004, 1420	Offset Of Referenced Lower Level Directory Entity
0004, 1430	Directory Record Type
0004, 1500	Referenced File ID
0004, 1510	Referenced SOP Class UID In File
0004, 1511	Referenced SOP Instance UID In File
0004, 1512	Referenced Transfer Syntax UID In File
0008, 0016	SOP Class UID
0008, 0018	SOP Instance UID
0008,0023	Content Date
0008,0033	Content Time
0020, 0013	Instance Number

5.2.1.2.3 RWA - Update File-set

This Media Application Entity has a File-set Updater functionality which is described here.

File-set Updater (FSU) exercises this role by means of M-READ, M-WRITE, and M-DELETE Operations. It reads, but shall not modify, the content of any of the DICOM files in a File-set except for the DICOMDIR File. It will delete existing Files in a File-set by means of an M-DELETE and replace it with updated DICOMDIR File.

5.2.1.2.3.1 Media Storage Application Profile

Refer to the table in section 5.2.1.

5.2.1.2.3.1.1 Options

Not applicable. System has not implemented RWA – Update File Set options.

5.3. Augmented and Private Application Profiles

Not applicable. System has not implemented Augmented and Private Application Profiles.

5.4. Media Configuration

Not Applicable. System has not implemented additional Media Configuration Profiles.

6. Support of Character Sets

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

Table 61: Supported DICOM Character Sets

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Unicode in UTF-8	ISO_IR 192	-	-	-	-
Latin alphabet No. 1	ISO 2022 IR 100	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/01	ISO-IR 100	G1	Supplementary set of ISO 8859
Japanese	ISO 2022 IR 13	ESC 02/08 04/10	ISO-IR 14	G0	JIS X 0201: Romaji
		ESC 02/09 04/09	ISO-IR 13	G1	JIS X 0201: Katakana
	ISO 2022 IR 87	ESC 02/04 04/02	ISO-IR 87	GL	JIS X 0208: Kanji
Cyrillic	ISO 2022 IR 144	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/12	ISO-IR 144	G1	Supplementary set of ISO 8859
Latin alphabet No. 1	ISO_IR 100	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 100	G1	Supplementary set of ISO 8859
Japanese	ISO_IR 13	-	ISO-IR 14	G0	JIS X 0201: Romaji
		-	ISO-IR 13	G1	JIS X 0201: Katakana
Cyrillic	ISO_IR 144	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 144	G1	Supplementary set of ISO 8859
Chinese	GB18030	-	GB18030	-	-

When an unsupported character set is received it shall be displayed as “?”.

7. Security

7.1. Security Profiles

The Philips Flash Ultrasound System 5100 Point of Care supports security measures that will be used for secure authentication of a node and for the generation of audit records.

7.1.1. Security use Profiles

Not applicable. System has not implemented Security Use Profiles.

7.1.2. Security Transport Connection Profiles

The Philips Flash Ultrasound System 5100 Point of Care conforms to the TLS protocol v1.2 of Secure Transport Connection Profile and is compliant to Non-Downgrading BCP 195 TLS Secure Transport Connection Profile.

The Philips Flash Ultrasound System 5100 Point of Care provides a service accessible tool to manage private keys and certificates of the local and remote DICOM nodes.

Secure communication is a “mode of operation” of Philips Flash Ultrasound System 5100 Point of Care supported by the implementation of the DICOM TLS 1.2 Secure Transport Connection Profile. This functionality will be used by the nodes that can authenticate each other before they exchange DICOM information. For secure communication the TLS protocol v1.2 is used which provides message authentication, integrity, and confidentiality.

Philips Flash Ultrasound System 5100 Point of Care may communicate using the following Cipher Suites:

- TLS_RSA_WITH_3DES_EDE_CBC_SHA.
- TLS_RSA_WITH_AES_128_CBC_SHA.
- TLS_DHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
- TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384
- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
- TLS_RSA_WITH_AES_128_CBC_SHA256
- TLS_RSA_WITH_AES_128_GCM_SHA256
- TLS_RSA_WITH_AES_256_CBC_SHA256
- TLS_RSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256

Certificates

If two systems communicate with each other, one system will be listening on a port (server node) while the other system sets up a connection (client node). The certificate this server node will send to the other client node is the server certificate. The client node initiates the communication and the certificate that the client node is sending to the server is the client certificate. The following TLS Certification checks will be done (TLS Handshake). The machine (either server or client) that will send its certificate will choose the certificate according to Common Name (CN) value in the Subject-field. This name is case-sensitive. All present certificates should have unique CN values.

The client verifies:

- that the server certificate is a valid X.509 certificate;
- that the server certificate either is signed by a CA or is self-signed;
- that the server certificate is in the list of trusted certificates;
- that the server certificate is valid (present time is between "Valid from" and "Valid to" fields of the X.509 certificate);
- that the server certificate has the correct purpose (at least Server Authenticate purpose).

The System is responsible for:
- revocation of certificates;
- limiting the connection to a limited set of IP-addresses.

Additional information: The value in the Subject-field is determined in the certificate request. The CA will sign the request in case it accepts the values that are present in the request. The CN value can be: IP-number, hostname or hostname.domain. The value in the CN-field must be equal to the value that is used in making a connection to the server. In case the name is specified as hostname. Domain that same value should be specified during connect. In the ideal situation the name-IP-address translation will be dealt with by the DNS in the hospital.
This check is case-insensitive.

7.1.3. Digital Signature Profiles

Not applicable. System has not implemented Digital Signature Profiles.

7.1.4. Media Storage Security Profiles

Not applicable. System has not implemented Media Storage Security Profiles.

7.1.5. Attribute Confidentiality Profiles

The System conforms to the Basic Attribute Level Confidentiality Profile as a de-identifier. This functionality is targeted towards creating a special purpose, de-identified version of an already existing Data set.
Table presents all attributes belonging to below mentioned IOD can be de-identified by the PII. Each Attribute to be protected has its value replaced by no value or some auto generated which does not allow identification of the patient.

Table 62: De-identified Attributes

Attribute Name	Tag	Philips Flash Ultrasound System 5100 Point of Care De-Identification support	Remarks
Patient's Birth Date	(0010,0030)	Z	No remark
Patient's Name	(0010,0010)	Z	No remark
Patient's Sex	(0010,0040)	Z	No remark
Patient ID	(0010,0020)	Z	No remark
Referring Physician's Name	(0008,0090)	Z	No remark
Study Date	(0008,0020)	Z	No remark
Study ID	(0020,0010)	Z	No remark
Study Time	(0008,0030)	Z	No remark
Accession Number	(0008,0050)	X	No remark
Patient's Size	(0010,1020)	X	No remark
Patient's Weight	(0010,1030)	X	No remark
Performed Procedure Step ID	(0040,0253)	X	No remark
Performed Procedure Step Start Date	(0040,0244)	X	No remark
Performed Procedure Step Start Time	(0040,0245)	X	No remark

Attribute Name	Tag	Philips Flash Ultrasound System 5100 Point of Care De-Identification support	Remarks
Performing Physician's Name	(0008,1050)	X	No remark
Referenced Performed Procedure Step Sequence	(0008,1111)	X	No remark
>Referenced SOP Class UID	>(0008,1150)	X	No remark
>Referenced SOP Instance UID	(0008,1155)	X	No remark
Instance Creation Date	(0008,0012)	Z	No remark
Instance Creation Time	(0008,0013)	Z	No remark
Requested Procedure ID	(0040,1001)	X	No remark
Scheduled Procedure Step Description	(0040,0007)	X	No remark
Scheduled Procedure Step Start Date	(0040,0002)	X	No remark
Scheduled Procedure Step Start Time	(0040,0003)	X	No remark
Study Description	(0008,1030)	X	No remark
Admission ID	(0038,0010)	X	No remark
Issuer of Admission ID Sequence	(0038,0014)	X	No remark
>Local Namespace Entity ID	(0040,0031)	X	No remark
>Universal Entity ID	(0040,0032)	X	No remark
>Universal Entity ID Type	(0040,0033)	X	No remark
Series Instance UID	(0020,000E)	U	No remark
SOP Instance UID	(0008,0018)	U	No remark
Study Instance UID	(0020,000D)	U	No remark
Institution Code Sequence	(0008,0082)	X	No remark
Requested Procedure Description	(0032,1060)	X	No remark
DateTime	(0040,A120)	Z	No remark
Station Name	(0008,1010)	X	No remark
Institution Name	(0008,0080)	X	No remark

The following action codes are used in the table:

- Z - replace with a zero length value, or a non-zero length value that may be a dummy value and consistent with the VR
- X - remove
- U - replace with a non-zero length UID that is internally consistent within a set of Instances

7.1.6. Network Address Management Profiles

Not applicable. System has not implemented Network Address Management Profiles.

7.1.7. Time Synchronization Profiles

Philips Flash Ultrasound System 5100 Point of Care conforms to the Basic Time Synchronization Profile as NTP Client. The NTP Timeserver with which the client synchronizes its time is configured via Service. The NTP Timeserver is an element of Hospital Infrastructure.

7.1.8. Application Configuration Management Profiles

Not applicable. System has not implemented Application Configuration Management Profiles.

7.1.9. Audit Trail Profiles

The system supports below Audit events.

Table 63: List of supported events

Audit Event Trigger	Description	Message DICOM PS 3.15 A.5.3
Actor-start-stop	When application has started or is closed.	Application Activity
Begin-storing-instances	Begin storing SOP Instances for a study to an external repository.	Begin Transferring DICOM Instances
Instances-Stored	Storage of SOP instances to a remote repository has been completed.	DICOM Instances Transferred
Node-Authentication-failure	A secure node authentication failure has occurred during TLS negotiation, e.g., invalid certificate.	Security Alert
PHI-export	Any export of PHI to media.	Export
Security Alert	When software, security or networking configuration of the system is changed via the field service functionality.	Security Alert
Instances-deleted	SOP Instances are deleted from a specific study. One event covers all instances deleted for the particular study.	DICOM Instances Accessed" or "DICOM Study Deleted
Study-used	SOP Instances from a specific study are created or accessed. One event covers all instances used for the particular study.	DICOM Instances Accessed
Patient Created, Modified or Updated	This message describes the event of a patient record being created, modified, accessed, or deleted.	Patient Record
Viewing Local Audit Log	This message describes the event of a person or process reading a log of audit trail information.	Audit Log Used
User Logon or Logoff	This message describes the event that a user has attempted to log on or log off. This report can be made regardless of whether the attempt was successful or not.	User Authentication

7.2. Association Level Security

Philips Flash Ultrasound System 5100 Point of Care accepts associations only from known applications or an application whose "calling AE Title" is defined in its configuration file. Philips Flash Ultrasound System 5100 Point of Care will reject association requests from unknown applications, i.e. applications that offer an unknown "calling AE title". An application entity (AE) is known if – and only if – it is defined during configuration of Philips Flash Ultrasound System 5100 Point of Care, which is done via the configuration application.

7.3. Application Level Security

Philips Flash Ultrasound System 5100 Point of Care allows the use of either conventional (non-secure) communication or secure communication based on the Transport Layer Security (TLS 1.2 and higher) protocol. If configured Philips Flash Ultrasound System 5100 Point of Care supports security measures for:

- Secure authentication of a node;
- Integrity and confidentiality of transmitted data;
- Generation of audit trail records;

- Access control and user authentication.

7.3.1. Basic Application Level Confidentiality Profile

User authentication for login/logout to application is applicable.

8. Annexes of Application " Philips Flash Ultrasound System 5100 Point of Care"

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

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

8.1.1.1. List of created SOP Classes

Table 64: List of created SOP Classes

SOP Class Name	SOP Class UID
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33
Multi-frame True Color Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.4
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7

8.1.1.1.1 Ultrasound Image Storage SOP Class

Table 65: SOP Class Modules

Information Entity	Module	Presence
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	US Region Calibration Module	ALWAYS
	US Image Module	ALWAYS
	SOP Common Module	ALWAYS

Table 66: Patient Module

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

Table 67: 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	USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	
Study Description	0008,1030	LO		ANAP	COPY	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Physician(s) of Record	0008,1048	PN		ANAP	AUTO	

Table 68: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Size	0010,1020	DS		VNAP	USER	
Patient's Weight	0010,1030	DS		VNAP	USER	
Admission ID	0038,0010	LO		ANAP	USER	
Issuer of Admission ID Sequence	0038,0014	SQ		VNAP	USER	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
> Local Namespace Entity ID	0040,0031	UT		ANAP	USER	
>Universal Entity ID	0040,0032	UT		ANAP	USER	
>Universal Entity ID Type	0040,0033	CS		ANAP	USER	
Additional Patient History	0010,21B0	LT		ANAP	USER	

Table 69: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	US	ALWAYS	AUTO	
Performing Physicians' Name	0008,1050	PN		ANAP	USER	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	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	
Request Attributes Sequence	0040,0275	SQ		ALWAYS	AUTO	
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	
>Requested Procedure ID	0040,1001	SH		ANAP	MWL	

Table 70: 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		ANAP	AUTO	
Station Name	0008,1010	SH		ANAP	AUTO	
Manufacturer's Model Name	0008,1090	LO	5100 POC	ALWAYS	AUTO	
Software Version(s)	0018,1020	LO	5100 POC_1.0.x.y	ANAP	AUTO	Where x.y are the build details of the application

Table 71: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ANAP	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 72: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAY	AUTO	

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

Table 73: US Region Calibration Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Sequence of Ultrasound Regions	0018,6011	SQ		ALWAYS	AUTO	
>Region Spatial Format	0018,6012	US		ALWAYS	AUTO	
>Region Data Type	0018,6014	US		ALWAYS	AUTO	
>Region Flags	0018,6016	UL		ALWAYS	AUTO	
>Region Location Min X0	0018,6018	UL		ALWAYS	AUTO	
>Region Location Min Y0	0018,601A	UL		ALWAYS	AUTO	
>Region Location Max X1	0018,601C	UL		ALWAYS	AUTO	
>Region Location Max Y1	0018,601E	UL		ALWAYS	AUTO	
>Reference Pixel X0	0018,6020	SL		ALWAYS	AUTO	
>Reference Pixel Y0	0018,6022	SL		ALWAYS	AUTO	
>Physical Units X Direction	0018,6024	US		ALWAYS	AUTO	
>Physical Units Y Direction	0018,6026	US		ALWAYS	AUTO	
>Physical Delta X	0018,602C	FD		ALWAYS	AUTO	
>Physical Delta Y	0018,602E	FD		ALWAYS	AUTO	

Table 74: US Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		VNAP	CONFIG	
Stage Name	0008,2120	SH		ANAP	AUTO	
View Name	0008,2127	SH		ANAP	AUTO	
Transducer Identification Sequence	0018,5011	SQ		ANAP	AUTO	
>Device Serial Number	0018,1000	LO		VNAP	AUTO	
>Software Versions	0018,1020	LO	5100 POC_1.0.x.y	VNAP	AUTO	Where x.y is the build details of the application
>Device Alternate Identifier	3010,001B	UC		VNAP	AUTO	
> Device Alternate Identifier Type	3010,001C	CS		ALWAYS	AUTO	
> Device Alternate Identifier Format	3010,001D	LT		ALWAYS	AUTO	
> Device Label	3010,002D	LO		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Device Type Code Sequence	3010,002E	SQ		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>> Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	
>> Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Manufacturer's Device Identifier	3010,0043	ST	5100 POC	ALWAYS	AUTO	
Samples Per Pixel	0028,0002	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Planar Configuration	0028,0006	US		ANAP	AUTO	
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Processing Function	0018,5020	LO		ALWAYS	AUTO	

Table 75: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.6.1	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.1.1.2 Ultrasound Multi-Frame Image Storage SOP Class

Table 76: IOD of Created Ultrasound Multi-frame Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient 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
	US Region Calibration Module	ALWAYS
	US Image Module	ALWAYS
	SOP Common Module	ALWAYS

Table 77: Patient Module

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

Table 78: 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	USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	
Study Description	0008,1030	LO		ANAP	COPY	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Physician(s) of Record	0008,1048	PN		ANAP	AUTO	

Table 79: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Size	0010,1020	DS		ANAP	COPY	
Patient's Weight	0010,1030	DS		ANAP	COPY	
Issuer of Admission ID Sequence	0038,0014	SQ		VNAP	USER	
> Local Namespace Entity ID	0040,0031	UT		ANAP	USER	
>Universal Entity ID	0040,0032	UT		ANAP	USER	
>Universal Entity ID Type	0040,0033	CS		ANAP	USER	
Additional Patient History	0010,21B0	LT		ANAP	USER	
Admission ID	0038,0010	LO		ANAP	USER	

Table 80: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	US	ALWAYS	AUTO	
Performing Physicians' Name	0008,1050	PN		ANAP	USER	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAPCV	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	

Series Number	0020,0011	IS		ALWAYS	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO	
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	
Request Attributes Sequence	0040,0275	SQ		ALWAYS	AUTO	
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	
>Requested Procedure ID	0040,1001	SH		ANAP	MWL	

Table 81: 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		ANAP	AUTO	
Station Name	0008,1010	SH		ANAP	AUTO	
Manufacturer's Model Name	0008,1090	LO	5100 POC	ALWAYS	AUTO	
Software Version(s)	0018,1020	LO	5100 POC_1.0.x.y	ANAP	AUTO	Where x.y is the build details of the application

Table 82: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		VNAP	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 83: Image Pixel Module

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

Table 84: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time Vector	0018,1065	DS		ALWAYS	AUTO	

Table 85: Multi-Frame Module

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

Table 86: US Region Calibration Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Sequence of Ultrasound Regions	0018,6011	SQ		ALWAYS	AUTO	
>Region Spatial Format	0018,6012	US		ALWAYS	AUTO	
>Region Data Type	0018,6014	US		ALWAYS	AUTO	
>Region Flags	0018,6016	UL		ALWAYS	AUTO	
>Region Location Min X0	0018,6018	UL		ALWAYS	AUTO	
>Region Location Min Y0	0018,601A	UL		ALWAYS	AUTO	
>Region Location Max X1	0018,601C	UL		ALWAYS	AUTO	
>Region Location Max Y1	0018,601E	UL		ALWAYS	AUTO	
>Reference Pixel X0	0018,6020	SL		ALWAYS	AUTO	
>Reference Pixel Y0	0018,6022	SL		ALWAYS	AUTO	
>Physical Units X Direction	0018,6024	US		ALWAYS	AUTO	
>Physical Units Y Direction	0018,6026	US		ALWAYS	AUTO	
>Physical Delta X	0018,602C	FD		ALWAYS	AUTO	
>Physical Delta Y	0018,602E	FD		ALWAYS	AUTO	

Table 87: US Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: DERIVED, Value 2: SECONDARY	ALWAYS	AUTO	
Stage Name	0008,2120	SH		ANAPCV	AUTO	
View Name	0008,2127	SH		ANAPCV	AUTO	
Transducer Identification Sequence	0018,5011	SQ		ANAPCV	AUTO	
>Device Serial Number	0018,1000	LO		VNAP	AUTO	
>Software Versions	0018,1020	LO	5100 POC_1.0.x.y	VNAP	AUTO	Where x.y is the build details of the application
>Device Alternate Identifier	3010,001B	UC		VNAP	AUTO	
> Device Alternate Identifier Type	3010,001C	CS		ALWAYS	AUTO	
> Device Alternate Identifier Format	3010,001D	LT		ALWAYS	AUTO	
> Device Label	3010,002D	LO		ALWAYS	AUTO	
>Device Type Code Sequence	3010,002E	SQ		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>> Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	
>> Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Manufacturer's Device Identifier	3010,0043	ST	5100 POC	ALWAYS	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Planar Configuration	0028,0006	US		ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT	0x00181065	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	AUTO	
Pixel Representation	0028,0103	US	0x0000	ALWAYS	AUTO	
Processing Function	0018,5020	LO		ALWAYS	AUTO	

Table 88: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	Required if expanded/replacement character set used
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.3.1	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.1.1.3 Multi-Frame True Color Secondary Capture Image Storage IOD

Table 89: IOD of Created Multi-Frame Color Secondary Capture Image Storage SOP Instance

Information Entity	Module	Presence of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	General Reference Module	ALWAYS
	Image Pixel Module	ALWAYS
	Cine Module	CONDITIONAL
	Multi-frame Module	ALWAYS

Information Entity	Module	Presence of Module
	Multi-frame Functional Groups Module	ALWAYS
	SC Image Module	ALWAYS
	SC Multi-frame Image Module	ALWAYS
	SC Multi-frame Vector Module	CONDITIONAL
	SOP Common Module	ALWAYS

Table 90: Patient Module

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

Table 91: 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	USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Description	0008,1030	LO		ANAP	COPY	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Physician(s) of Record	0008,1048	PN		ANAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	

Table 92: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Size	0010,1020	DS		VNAP	USER	
Patient's Weight	0010,1030	DS		VNAP	USER	
Additional Patient History	0010,21B0	LT		ANAP	USER	
Admission ID	0038,0010	LO		ANAP	USER	
Issuer of Admission ID Sequence	0038,0014	SQ		VNAP	USER	
> Local Namespace Entity ID	0040,0031	UT		ANAP	USER	
>Universal Entity ID	0040,0032	UT		ANAP	USER	
>Universal Entity ID Type	0040,0033	CS		ANAP	USER	

Table 93: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	OT	ALWAYS	AUTO	
Performing Physicians' Name	0008,1050	PN		ANAP	USER	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	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	
Request Attributes Sequence	0040,0275	SQ		ALWAYS	AUTO	
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	
>Requested Procedure ID	0040,1001	SH		ANAP	MWL	

Table 94: 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		ANAP	AUTO	
Station Name	0008,1010	SH		ANAP	AUTO	
Manufacturer's Model Name	0008,1090	LO	5100 POC	ALWAYS	AUTO	
Software Version(s)	0018,1020	LO	5100 POC_1.0.x.y	ANAP	AUTO	Where x.y are the build details of the application

Table 95: SC Equipment Module

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

Table 96: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		VNAP	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	
Patient Orientation	0020,0020	CS		ANAP	USER	
Burned In Annotation	0028,0301	CS		ANAP	USER	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Lossy Image Compression	0028,2110	CS		ANAP	AUTO	
Lossy Image Compression Ratio	0028,2112	DS		ANAP	AUTO	
Lossy Image Compression Method	0028,2114	CS		ANAP	AUTO	

Table 97: General Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Source Image Sequence	0008,2112	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		VNAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 98: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAY	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAY	AUTO	
Planar Configuration	0028,0006	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Aspect Ratio	0028,0034	IS		ANAP	AUTO	
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OB		ANAP	AUTO	

Table 99: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time Vector	0018,1065	DS		ALWAYS	AUTO	

Table 100: Multi Frame Module

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

Table 101: Multi-frame Functional Groups 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	
Instance Number	0020,0013	IS		VNAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS	AUTO	
Shared Functional Groups Sequence	5200,9229	SQ		VNAP	AUTO	
Per-frame Functional Groups Sequence	5200,9230	SQ		ANAP	AUTO	

Table 102: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ANAP	AUTO	
Time of Secondary Capture	0018,1014	TM		ANAP	AUTO	

Table 103: SC Multi Frame Module

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

Table 104: SC Multi Frame Vector Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time Vector	0018,1065	DS		ANAP	AUTO	

Table 105: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7.4	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.1.1.4 Secondary Capture Image Storage IOD

Table 106: IOD of Created Secondary Capture Image Storage SOP Instance

Information Entity	Module	Presence of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	SC Equipment Module	ALWAYS

Information Entity	Module	Presence of Module
Image	General Image Module	ALWAYS
	General Reference Module Module	ALWAYS
	Image Pixel Module	ALWAYS
	SC Image Module	ALWAYS
	SOP Common Module	ALWAYS

Table 107: Patient Module

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

Table 108: 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	USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Description	0008,1030	LO		ANAP	COPY	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Physician(s) of Record	0008,1048	PN		ANAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	

Table 109: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Size	0010,1020	DS		VNAP	USER	
Patient's Weight	0010,1030	DS		VNAP	USER	
Additional Patient History	0010,21B0	LT		ANAP	USER	
Admission ID	0038,0010	LO		ANAP	USER	
Issuer of Admission ID Sequence	0038,0014	SQ		VNAP	USER	
> Local Namespace Entity ID	0040,0031	UT		ANAP	USER	
>Universal Entity ID	0040,0032	UT		ANAP	USER	
>Universal Entity ID Type	0040,0033	CS		ANAP	USER	

Table 110: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	OT	ALWAYS	AUTO	
Performing Physicians' Name	0008,1050	PN		ANAP	USER	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	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	
Request Attributes Sequence	0040,0275	SQ		ALWAYS	AUTO	
>Requested Procedure Description	0032,1060	LO		ANAP	MWL	
>Requested Procedure ID	0040,1001	SH		ANAP	MWL	

Table 111: 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		ANAP	AUTO	
Station Name	0008,1010	SH		ANAP	AUTO	
Manufacturer's Model Name	0008,1090	LO	5100 POC	ALWAYS	AUTO	
Software Version(s)	0018,1020	LO	5100 POC_1.0.x.y	ANAP	AUTO	Where x.y are the build details of the application

Table 112: SC Equipment Module

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

Table 113: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		VNAP	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	
Patient Orientation	0020,0020	CS		ANAP	USER	
Burned In Annotation	0028,0301	CS		ANAP	USER	

Table 114: General Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Source Image Sequence	0008,2112	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		VNAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 115: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAY	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAY	AUTO	
Planar Configuration	0028,0006	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Aspect Ratio	0028,0034	IS		ANAP	AUTO	
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OB		ANAP	AUTO	

Table 116: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ANAP	AUTO	
Time of Secondary Capture	0018,1014	TM		ANAP	AUTO	

Table 117: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.1.1.5 Comprehensive SR SOP Class

Table 118: IOD of Created Comprehensive SR SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	CONDITIONAL
Series	SR Document Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS

Information Entity	Module	Presence Of Module
Document	SR Document General Module	ALWAYS
Document	SR Document Content Module	ALWAYS
Document	SOP Common Module	ALWAYS

Table 119: Patient Module

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

Table 120: 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	USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	AUTO	
Study Description	0008,1030	LO		ANAP	COPY	
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Physician(s) of Record	0008,1048	PN		ANAP	AUTO	

Table 121: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Size	0010,1020	DS		ANAP	COPY	
Patient's Weight	0010,1030	DS		ANAP	COPY	
Issuer of Admission ID Sequence	0038,0014	SQ		VNAP	USER	
> Local Namespace Entity ID	0040,0031	UT		ANAP	USER	
>Universal Entity ID	0040,0032	UT		ANAP	USER	
>Universal Entity ID Type	0040,0033	CS		ANAP	USER	
Additional Patient History	0010,21B0	LT		ANAP	USER	
Admission ID	0038,0010	LO		ANAP	USER	

Table 122: SR Document Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	SR	ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Reference SOP class UID	0008,1150	UI		ALWAYS	AUTO	
>Reference SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Protocol Name	0018,1030	LO		ANAP	AUTO	

Table 123: 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		ANAP	AUTO	
Station Name	0008,1010	SH		ANAP	AUTO	
Manufacturer's Model Name	0008,1090	LO	5100 POC	ALWAYS	AUTO	
Software Version(s)	0018,1020	LO	5100 POC_1.0.x.y	ANAP	AUTO	Where x.y are the build details of the application

Table 124: SR Document General 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	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Performed Procedure Code Sequence	0040,A372	SQ		ALWAYS	AUTO	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
Completion Flag	0040,A491	CS	PARTIAL	ALWAYS	AUTO	
Verification Flag	0040,A493	CS	UNVERIFIED	ALWAYS	AUTO	

Table 125: SR Document Content Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Value Type	0040,A040	CS	CONTAINER	ALWAYS	AUTO	
Concept Name Code Sequence	0040,A043	SQ		ALWAYS	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Continuity Of Content	0040,A050	CS		ALWAYS	AUTO	
Content Template Sequence	0040,A504	SQ		ANAP	AUTO	
>Mapping Resource	0008,0105	CS		ALWAYS	AUTO	
>Template Identifier	0040,DB00	CS		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Sequence	0040,A730	SQ		ANAP	AUTO	
>Relationship Type	0040,A010	CS	CONTAINS	ALWAYS	AUTO	
>Value Type	0040,A040	CS		ALWAYS	AUTO	
>Concept Name Code Sequence	0040,A043	SQ		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Measured Value Sequence	0040,A300	SQ		ANAP	AUTO	
>>Measurement Units Code Sequence	0040,08EA	SQ		ANAP	AUTO	
>>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>>Numeric Value	0040,A30A	DS		ANAP	AUTO	
>>Concept Code Sequence	0040,A168	SQ		ANAP	AUTO	
>>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	

Table 126: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.88.33	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.2. Usage of Attributes from Received IOD

Not Applicable as the System has not implemeted image import functionality.

8.1.3. Attribute Mapping

Table 127: Attribute mapping during Modality Workflow

Name	WLM Tag	MPPS CREATE Tag	MPPS SET Tag	Image IOD Tag
Accession Number	0008,0050	0008,0050	-	0008,0050
Modality	-	0008,0060	-	0008,0060
Referring Physician's Name	0008,0090	-	-	0008,0090
Referenced Study Sequence	0008,1110	0008,1110	-	0008,1110
Referenced Image Sequence	-	-	0008,1140	-
> Referenced SOP Class UID SOP Class UID	-	-	0008,1150	0008,0016
> Referenced SOP Instance UID SOP Instance UID	-	-	0008,1155	0008,0018

Name	WLM Tag	MPPS CREATE Tag	MPPS SET Tag	Image IOD Tag
Patient's Name	0010,0010	0010,0010	-	0010,0010
Patient ID	0010,0020	0010,0020	-	0010,0020
Patient's Birth Date	0010,0030	0010,0030	-	0010,0030
Patient's Sex	0010,0040	0010,0040	-	0010,0040
Additional Patient History	0010,21B0	-	-	0010,21B0
Protocol Name	-	-	0018,1030	0018,1030
Study Instance UID	0020,000D	0020,000D	-	0020,000D
Series Instance UID			0020,000E	0020,000E
Study ID	-	0020,0010	-	0020,0010
Requested Procedure Description	0032,1060	0032,1060	-	-
Performed Procedure Step Start Date	-	0040,0244	-	0040,0244
Performed Procedure Step Start Time	-	0040,0245	-	0040,0245
Performed Procedure Step ID	-	0040,0253	-	0040,0253
Requested Procedure ID	0040,1001	0040,1001	-	0040,1001

8.1.4. Coerced/Modified fields

Not Applicable. System hs not implemented coercion/modification of image fields.

8.2. Data Dictionary of Private Attributes

Philips Flash Ultrasound System 5100 Point of Care has implemented Private attributes.Refer to section 8.5.1.

8.3. Coded Terminology and Templates

Philips Flash Ultrasound System 5100 Point of Care has implemented specific support for coded terminology and templates. Refer to section 8.3.2.1.

8.3.1. Context Groups

Not Applicable. System has not implemented the Context group modules.

8.3.2. Template Specifications

Philips Flash Ultrasound System 5100 Point of Care can optionally create and store, upon completion of the study, a DICOM Comprehensive SR object.

8.3.2.1. Comprehensive SR IOD Templates

The templates that comprise the Comprehensive SR are interconnected as indicated in the below figure:

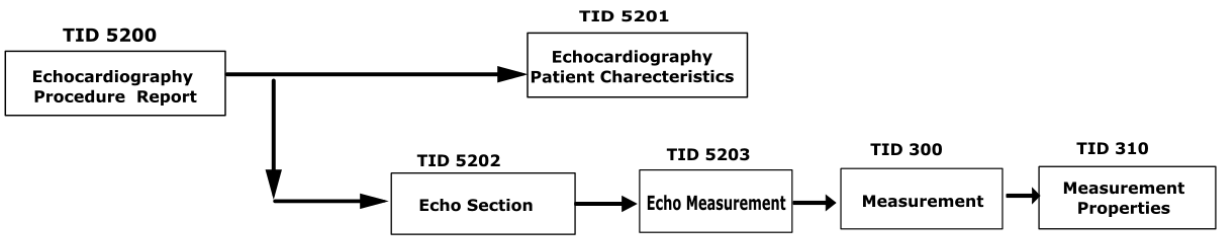

Figure 12: Comprehensive SR IOD Template Structure

This section describes the content of all the templates used in the Comprehensive SR IOD Template.

Table 128: Used Templates for Comprehensive SR Reporting

Template Name	Template ID
Echocardiography Procedure Report	TID 5200
Echocardiography Patient Characteristics	TID 5201
Echo Section	TID 5202
Echo Measurement	TID 5203
Measurement	TID 300
Measurement Properties	TID 310

8.3.2.1.1 TID 5200 Echocardiography Procedure Report

Table 129: Echocardiography Procedure Report

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
		EV (125200, DCM, “Adult Echocardiography Procedure Report")	CONTAINER	1	ALWAYS	
>	CONTAINS	DTID 5201 “Echocardiography Patient Characteristics”	INCLUDE	1	ALWAYS	
>	CONTAINS	DTID 5202 “Echo section”	INCLUDE	1	ALWAYS	

8.3.2.1.2 TID 5201 Echocardiography Patient Characteristics

Table 130: Echocardiography Patient Characteristics

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
		EV (121118, DCM, “Patient Characteristics”)	CONTAINER	1	ALWAYS	
>	CONTAINS	EV (121033, DCM, “Subject Age”)	NUM	1	ALWAYS	
>	CONTAINS	EV (121032, DCM, “Subject Sex”)	CODE	1	ALWAYS	
>	CONTAINS	EV (8277-6, LN, “Body Surface Area”)	NUM	1	ALWAYS	
>>	INFERRED FROM	EV (8278-4, LN, Body Surface Area Formula”)	CODE	1	ALWAYS	

8.3.2.1.3 TID 5202 Echo Section

Table 131: Echo Section

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
		EV (59776-5, LN, “Findings”)	CONTAINER	1	ALWAYS	
>	HAS CONCEPT MOD	EV (363698007, SCT, “Finding Site”)	CODE	1	ALWAYS	$SectionSubject = EV (87878005, SCT, "Left Ventricle")
>	CONTAINS	DT (125007, DCM, “Measurement Group”)	CONTAINER	1-n	ALWAYS	
>>	CONTAINS	DTID 5203 “Echo Measurement”	INCLUDE	1-n	ALWAYS	$Measurement = $MeasType

8.3.2.1.4 TID 5203 Echo Measurement

Table 132: Echo Measurement

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
	INCLUDE	DTID 300 “Measurement”	NUM	1	ALWAYS	
>	HAS ACQ CONTEXT	EV (399264008, SCT, "Image Mode")	CODE	1	CONDTIONAL	

8.3.2.1.5 TID 300 Measurement

Table 133: Measurement

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
		$Measurement	NUM	1	ALWAYS	UNITS = $Units
>	HAS CONCEPT MOD	EV (370129005, SCT, "Measurement Method")	CODE	1	CONDTIONAL	$Method
>	HAS CONCEPT MOD	EV (121401, DCM, "Derivation")	CODE	1	CONDTIONAL	$Derivation
>	HAS PROPERTIES	DTID 310 “Measurement Properties”	INCLUDE	1	CONDTIONAL	

8.3.2.1.6 TID 310 Measurement Properties

Table 134: Measurement Properties

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
		EV (121404, DCM, "Selection Status")	CODE	1	CONDTIONAL	$Method

8.3.3. Private code definitions

Not Applicable. System has not implemented private code definitions.

8.4. Grayscale Image consistency

Philips Flash Ultrasound System 5100 Point of Care does not implement any specific support for grayscale image 0consistency.

8.5. Standard Extended/Specialized/Private SOPs

Table 135: List of Extended/Specialized/Private created SOP Instance

SOP Class Name	SOP Class UID
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33
Multi-frame True Color Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.4
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7

8.5.1. Standard Extended/Specialized/Private SOP Instance

The Storage SOP classes are extended to create a standard extended SOP class by addition of standard and private attributes to the created SOP Instances.

8.5.1.1. Ultrasound Image Storage SOP Class

Table 136: Addition of standard and private attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ANAP	AUTO	
DateTime	0040,A120	DT		ANAP	AUTO	
Institution Code Sequence	0008,0082	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ANAP	AUTO	
>Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ANAP	AUTO	
Other Patient IDs	0010,1000	LO		ANAP	AUTO	
Scheduled Procedure Step Start Date	0040,0002	DA		ANAP	AUTO	
Scheduled Procedure Step Start Time	0040,0003	TM		ANAP	AUTO	
Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO	
Private Creator Group	07A1,0010	LO		ANAP	AUTO	
Private Attribute	07A1,1014	CS		ANAP	AUTO	
Private Creator Group	1001,0010	LO	Philips Imaging DD 001	ANAP	AUTO	
Private Attribute	1001,101D	SH		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Private Creator Group	2001,0010	LO	Philips Imaging DD 002	ANAP	AUTO	
Private Attribute	2001,10B9	LO		ANAP	AUTO	
Private Creator Group	200D,0010	LO	Philips US Imaging DD 111	ANAP	AUTO	
Private Attribute	200D,1001	LO		ANAP	AUTO	
Private Attribute	200D,1002	US		ANAP	AUTO	
Private Creator Group	800D,0010	LO	Philips US Imaging DD 111	ANAP	AUTO	
Private Attribute	800D,1000	OB		ANAP	AUTO	
Private Attribute	800D,1001	OB		ANAP	AUTO	
Private Attribute	800D,1004	LO		ANAP	AUTO	
Private Attribute	800D,1005	US		ANAP	AUTO	
Private Attribute	800D,1006	UI		ANAP	AUTO	

8.5.1.2. Ultrasound Multi-Frame Image Storage SOP Class

Table 137: Addition of standard and private attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
DateTime	0040,A120	DT		ANAP	AUTO	
Institution Code Sequence	0008,0082	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ANAP	AUTO	
>Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ANAP	AUTO	
Other Patient IDs	0010,1000	LO		ANAP	AUTO	
Scheduled Procedure Step Start Date	0040,0002	DA		ANAP	AUTO	
Scheduled Procedure Step Start Time	0040,0003	TM		ANAP	AUTO	
Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO	
Private Creator Group	07A1,0010	LO		ANAP	AUTO	
Private Attribute	07A1,1014	CS		ANAP	AUTO	
Private Creator Group	1001,0010	LO	Philips Imaging DD 001	ANAP	AUTO	
Private Attribute	1001,101D	SH		ANAP	AUTO	
Private Creator Group	2001,0010	LO	Philips Imaging DD 002	ANAP	AUTO	
Private Attribute	2001,10B9	LO		ANAP	AUTO	
Private Creator Group	200D,0010	LO	Philips US Imaging DD 111	ANAP	AUTO	
Private Attribute	200D,1001	LO		ANAP	AUTO	
Private Attribute	200D,1002	US		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Private Creator Group	800D,0010	LO	Philips US Imaging DD 111	ANAP	AUTO	
Private Attribute	800D,1000	OB		ANAP	AUTO	
Private Attribute	800D,1001	OB		ANAP	AUTO	
Private Attribute	800D,1004	UT		ANAP	AUTO	
Private Attribute	800D,1005	US		ANAP	AUTO	
Private Attribute	800D,1006	UI		ANAP	AUTO	

8.5.1.3. Multi-Frame True Color Secondary Capture Image Storage SOP Class

Table 138: Addition of standard and private attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
DateTime	0040,A120	DT		ANAP	AUTO	
Institution Code Sequence	0008,0082	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ANAP	AUTO	
>Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ANAP	AUTO	
Other Patient IDs	0010,1000	LO		ANAP	AUTO	
Scheduled Procedure Step Start Date	0040,0002	DA		ANAP	AUTO	
Scheduled Procedure Step Start Time	0040,0003	TM		ANAP	AUTO	
Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO	
Private Creator Group	01E1,0010	LO		ANAP	AUTO	
Private Attribute	01E1,1040	UI		ANAP	AUTO	
Private Creator Group	07A1,0010	LO		ANAP	AUTO	
Private Attribute	07A1,1014	CS		ANAP	AUTO	
Private Creator Group	1001,0010	LO	Philips Imaging DD 001	ANAP	AUTO	
Private Attribute	1001,101D	SH		ANAP	AUTO	
Private Creator Group	2001,0010	LO	Philips Imaging DD 002	ANAP	AUTO	
Private Attribute	2001,10B7	CS		ANAP	AUTO	
Private Attribute	2001,10B8	ST		ANAP	AUTO	
Private Attribute	2001,10B9	LO		ANAP	AUTO	
Private Creator Group	200D,0010	LO	Philips US Imaging DD 111	ANAP	AUTO	
Private Attribute	200D,1000	US		ANAP	AUTO	
Private Attribute	200D,1001	LO		ANAP	AUTO	
Private Attribute	200D,1002	US		ANAP	AUTO	
Private Attribute	200D,1004	UT		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Private Attribute	200D,1005	UT		ANAP	AUTO	
Private Attribute	200D,1006	UT		ANAP	AUTO	
Private Creator Group	5005,0010	LO		ANAP	AUTO	
Private Creator Group	800D,0010	LO	Philips US Imaging DD 111	ANAP	AUTO	
Private Attribute	800D,1000	OB		ANAP	AUTO	
Private Attribute	800D,1001	OB		ANAP	AUTO	
Private Attribute	800D,1003	CS		ANAP	AUTO	
Private Attribute	800D,1004	LO		ANAP	AUTO	
Private Attribute	800D,1005	US		ANAP	AUTO	
Private Attribute	800D,1006	UI		ANAP	AUTO	

8.5.1.4. Secondary Capture Image Storage SOP Class

Table 139: Addition of standard and private attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ANAP	AUTO	
DateTime	0040,A120	DT		ANAP	AUTO	
Institution Code Sequence	0008,0082	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ANAP	AUTO	
>Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ANAP	AUTO	
Other Patient IDs	0010,1000	LO		ANAP	AUTO	
Scheduled Procedure Step Start Date	0040,0002	DA		ANAP	AUTO	
Scheduled Procedure Step Start Time	0040,0003	TM		ANAP	AUTO	
Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO	
Private Creator Group	01E1,0010	LO		ANAP	AUTO	
Private Attribute	01E1,1040	UI		ANAP	AUTO	
Private Creator Group	07A1,0010	LO		ANAP	AUTO	
Private Attribute	07A1,1014	CS		ANAP	AUTO	
Private Creator Group	1001,0010	LO	Philips Imaging DD 001	ANAP	AUTO	
Private Attribute	1001,101D	SH		ANAP	AUTO	
Private Creator Group	2001,0010	LO	Philips Imaging DD 002	ANAP	AUTO	
Private Attribute	2001,10B7	CS		ANAP	AUTO	
Private Attribute	2001,10B8	ST		ANAP	AUTO	
Private Attribute	2001,10B9	LO		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Private Creator Group	200D,0010	LO	Philips US Imaging DD 111	ANAP	AUTO	
Private Attribute	200D,1000	US		ANAP	AUTO	
Private Attribute	200D,1001	LO		ANAP	AUTO	
Private Attribute	200D,1002	US		ANAP	AUTO	
Private Attribute	200D,1004	UT		ANAP	AUTO	
Private Attribute	200D,1005	UT		ANAP	AUTO	
Private Attribute	200D,1006	UT		ANAP	AUTO	
Private Creator Group	5005,0010	LO		ANAP	AUTO	
Private Creator Group	800D,0010	LO	Philips US Imaging DD 111	ANAP	AUTO	
Private Attribute	800D,1000	OB		ANAP	AUTO	
Private Attribute	800D,1001	OB		ANAP	AUTO	
Private Attribute	800D,1003	CS		ANAP	AUTO	
Private Attribute	800D,1004	LO		ANAP	AUTO	
Private Attribute	800D,1005	US		ANAP	AUTO	
Private Attribute	800D,1006	UI		ANAP	AUTO	

8.5.1.5. Comprehensive SR SOP Class

Table 140: Addition of standard and private attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	
Performing Physician's Name	0008,1050	PN		ANAP	AUTO	
Image Type	0008,0008	CS		ANAP	AUTO	
Other Patient IDs	0010,1000	LO		ANAP	AUTO	
Template Identifier	0040,DB00	CS		ANAP	AUTO	
Institution Code Sequence	0008,0082	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ANAP	AUTO	
>Coding Scheme Designator	0008,0102	SH		ANAP	AUTO	
>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ANAP	AUTO	
Scheduled Procedure Step Start Date	0040,0002	DA		ANAP	AUTO	
Scheduled Procedure Step Start Time	0040,0003	TM		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Scheduled Procedure Step Description	0040,0002	LO		ANAP	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO	
>Requested Procedure Description	0032,1060	LO		ANAP	AUTO	
>Requested Procedure ID	0040,1001	SH		ANAP	AUTO	
Private Creator Group	2001,0011	LO		ANAP	AUTO	
Private Attribute	2001,116C	LO		ANAP	AUTO	
Private Attribute	07A1,0010	LO		ANAP	AUTO	
Private Attribute	07A1,1014	UN		ANAP	AUTO	
Private Attribute	1001,0010	LO	Philips Imaging DD 001	ANAP	AUTO	
Private Attribute	1001,101D	SH		ANAP	AUTO	
Private Creator Group	2001,0010	LO	Philips Imaging DD 002	ANAP	AUTO	
Private Attribute	2001,1063	CS		ANAP	AUTO	
Private Attribute	2001,10B6	CS		ANAP	AUTO	
Private Attribute	2001,10B9	LO		ANAP	AUTO	
Private Creator Group	200D,0010	LO	Philips US Imaging DD 111	ANAP	AUTO	
Private Attribute	200D,1000	US		ANAP	AUTO	
Private Attribute	200D,1001	UT		ANAP	AUTO	
Private Attribute	200D,1004	UT		ANAP	AUTO	
Private Attribute	200D,1005	UT		ANAP	AUTO	
Private Attribute	200D,1006	UT		ANAP	AUTO	
Private Creator Group	800D,0010	LO	Philips US Imaging DD 111	ANAP	AUTO	
Private Attribute	800D,1003	CS		ANAP	AUTO	
Private Attribute	800D,1005	US		ANAP	AUTO	
Private Attribute	800D,1006	UI		ANAP	AUTO	

8.5.1.6. Private Template

The templates that comprise the PrivateTID is as indicated in the below figure:

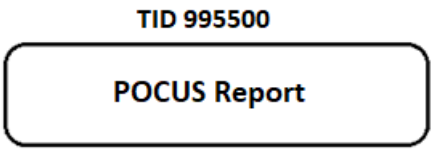

Figure 13: Private Template Structure

This section describes the content of the templates used in the Private Template.

Table 141: Private Templates Used

Template Name	Template ID
Point Of Care UltraSound Report	TID 995500

8.5.1.6.1 TID 995500 POCUS Report

Table 142: TID 995500 POCUS Report

NL	Relation with Parent	Concept Name	VT	VM	Presence of Value	Value
		BCID 995510, “POCUS Procedure Report Document Titles"	CONTAINER	1	ALWAYS	-
>	HAS CONCEPT MOD	DTID 1204 “Language of Content Item and Descendants”	INCLUDE	1	USER DEFINED	-
>	HAS OBS CONEXT	DTID 995520 “Observation Context”	INCLUDE	1	ALWAYS	-
>	CONTAINS	DTID 995530 “POCUS Patient Characteristics”	INCLUDE	1	USER DEFINED	-
>	CONTAINS	EV (111028, DCM, "Image Library")	CONTAINER	1	USER DEFINED	-
>>	CONTAINS	No purpose of reference	IMAGE	1-n	ALWAYS	-
>	CONTAINS	DTID 995540 “POCUS Procedure Summary Section”	CONTAINER	1	ALWAYS	-
>	CONTAINS	DTID T995500-11 “Pelvis and Uterus Section”	CONTAINER	1	USER DEFINED	-
>	CONTAINS	DTID T995500-12 “Ovaries Section”	CONTAINER	1	USER DEFINED	-
>	CONTAINS	DTID T995500-13 “Echo Section”	CONTAINER	1	USER DEFINED	-
>	CONTAINS	DTID T995500-14 “Vascular Ultrasound Section”	CONTAINER	1	USER DEFINED	-
>	CONTAINS	DTID T995500-17 “Abdominal Section”	CONTAINER	1	USER DEFINED	-
>	CONTAINS	DTID 995550-10 “POCUS Ultrasound Section”	CONTAINER	1	ALWAYS	-
>	CONTAINS	DTID T995500-11 “Thyroid Section”	CONTAINER	1	USER DEFINED	-
>	CONTAINS	DTID T995500-12 “Testicle Section”	CONTAINER	1	USER DEFINED	-
>	CONTAINS	DTID T995500-13 “Nerve Sheath Section”	CONTAINER	1	USER DEFINED	-

8.6. Private Transfer Syntaxes

Philips Flash Ultrasound System 5100 Point of Care does not support any private transfer syntaxes.

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