Philips Medical Systems
DICOM Conformance Statement

Inturis Suite R2.2

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PHILIPS

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Table of Contents

1 Introduction

This chapter provides general information about the purpose, scope and contents of this Conformance Statement.

1.1 Scope and field of application

The scope of this DICOM Conformance Statement is to facilitate data exchange with equipment of Philips Medical Systems. This document specifies the compliance to the DICOM standard (formally called the NEMA PS 3.X standards). It contains a short description of the applications involved and provides technical information about the data exchange capabilities of the equipment. The main elements describing these capabilities are: the supported DICOM Service Object Pair (SOP) Classes, Roles, Information Object Definitions (IOD) and Transfer Syntaxes.

The field of application is the integration of the Philips Medical Systems equipment into an environment of medical devices. This Conformance Statement should be read in conjunction with the DICOM standard and its addenda [DICOM].

1.2 Intended 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.

1.3 Contents and structure

The DICOM Conformance Statement is contained in chapter 2 through 7 and follows the contents and structuring requirements of DICOM PS 3.2.

1.4 Used definitions, terms and abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3 and PS 3.4.
The word Philips in this document refers to Philips Medical Systems.

1.5 References

[DICOM] The Digital Imaging and Communications in Medicine (DICOM) standard:
NEMA PS 3.X
National Electrical Manufacturers Association (NEMA) Publication Sales
1300 N. 17th Street, Suite 1847
Rosslyn, Va. 22209, United States of America

1.6 Important note to the reader

This 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 a networked 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 analyse 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 assure 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).

1.7 General Acronyms and Abbreviations.

The following acronyms and abbreviations are used in the document.

- ACC American College of Cardiology
- AE Application Entity
- ACR American College of Radiology
- ANSI American National Standard Institute
- BOT Basic Offset Table
- CD-R CD Recordable
- CD-M CD Medical
- DCR Dynamic Cardio Review
- DICOM Digital Imaging and Communication in Medicine
- DIMSE DICOM Message Service Element
- DIMSE-C DICOM Message Service Element-Composite
- DIMSE-N DICOM Message Service Element-Normalized
- ELE Explicit VR Little Endian
- EBE Explicit VR Big Endian
- FSC File Set Creator
- FSR File Set Reader
- GUI Graphic User Interface
- HIS Hospital Information System
- HL7 Health Level Seven
- ILE Implicit VR Little Endian
- IOD Information Object Definition
- ISIS Information System - Imaging System
- NEMA National Electrical Manufacturers Association
- PDU Protocol Data Unit
- RIS Radiology Information System
- RWA Real World Activity
- SC Secondary Capture
- SCM Study Component Management
- SCP Service Class Provider
- SCU Service Class User
- SOP Service Object Pair
- TCP/IP Transmission Control Protocol/Internet protocol
- UID Unique Identifier
- WLM Worklist Management

2 Implementation model

This document is the DICOM Conformance statement for the Philips Medical Systems Inturis Suite R2.2, later referred to as Inturis Suite.

The Inturis Suite is primarily intended for archiving and viewing of X-Ray Angiographic, US multi-frame, US and SC images, Inturis Suite is also capable to handle Query requests and retrieving images.

All of the DICOM features presented in this document are optional and may not be available on all Inturis Suite related products.

The Inturis Suite consists of a Server that handles the Storage, Storage Commitment and Query Retrieve of Images and a several Clients that can read and write media and can view images.

Figure 2-1 gives an overview of the Inturis Suite system in a DICOM network.

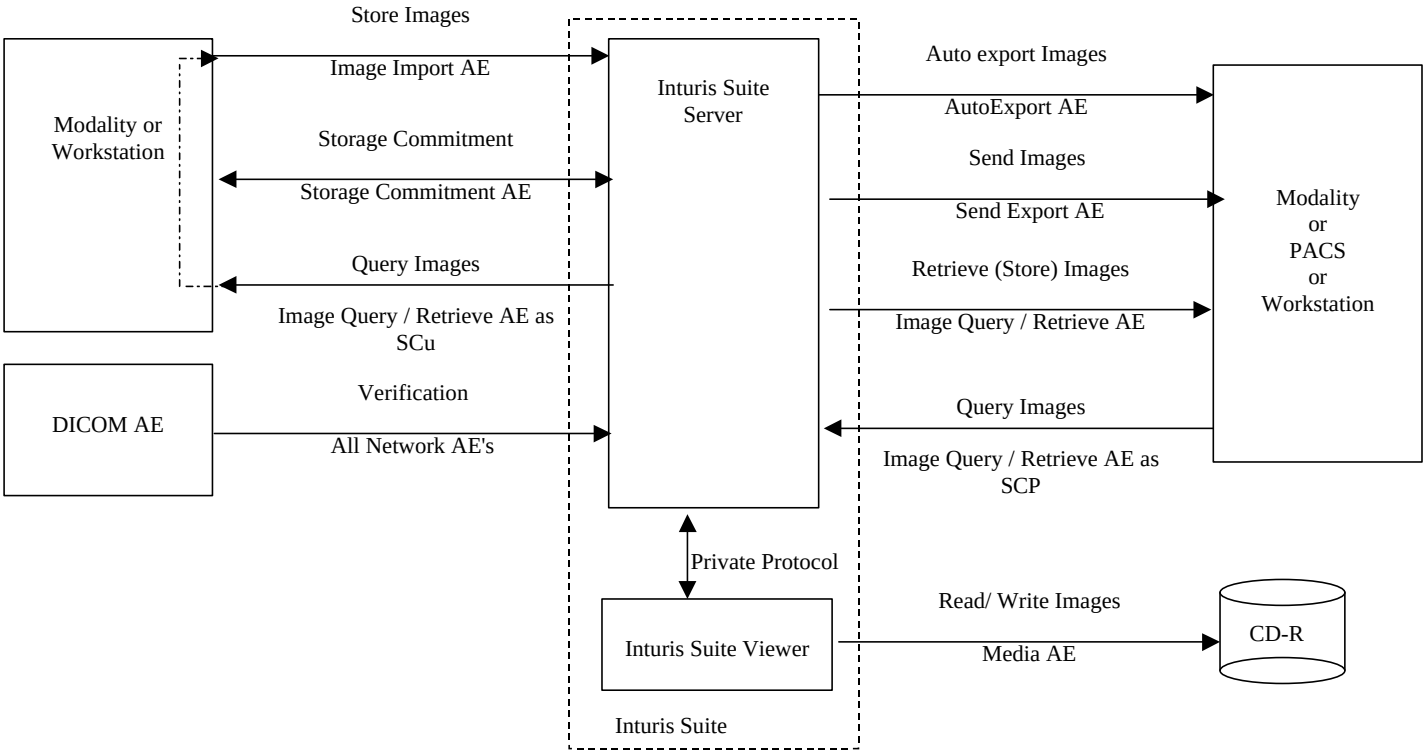

Figure 2-1: Inturis Suite in a DICOM network

2.1 Application Data Flow Diagram

The Inturis Suite related Implementation Model is shown in Figure 2-2 on page 5.

Implementation model

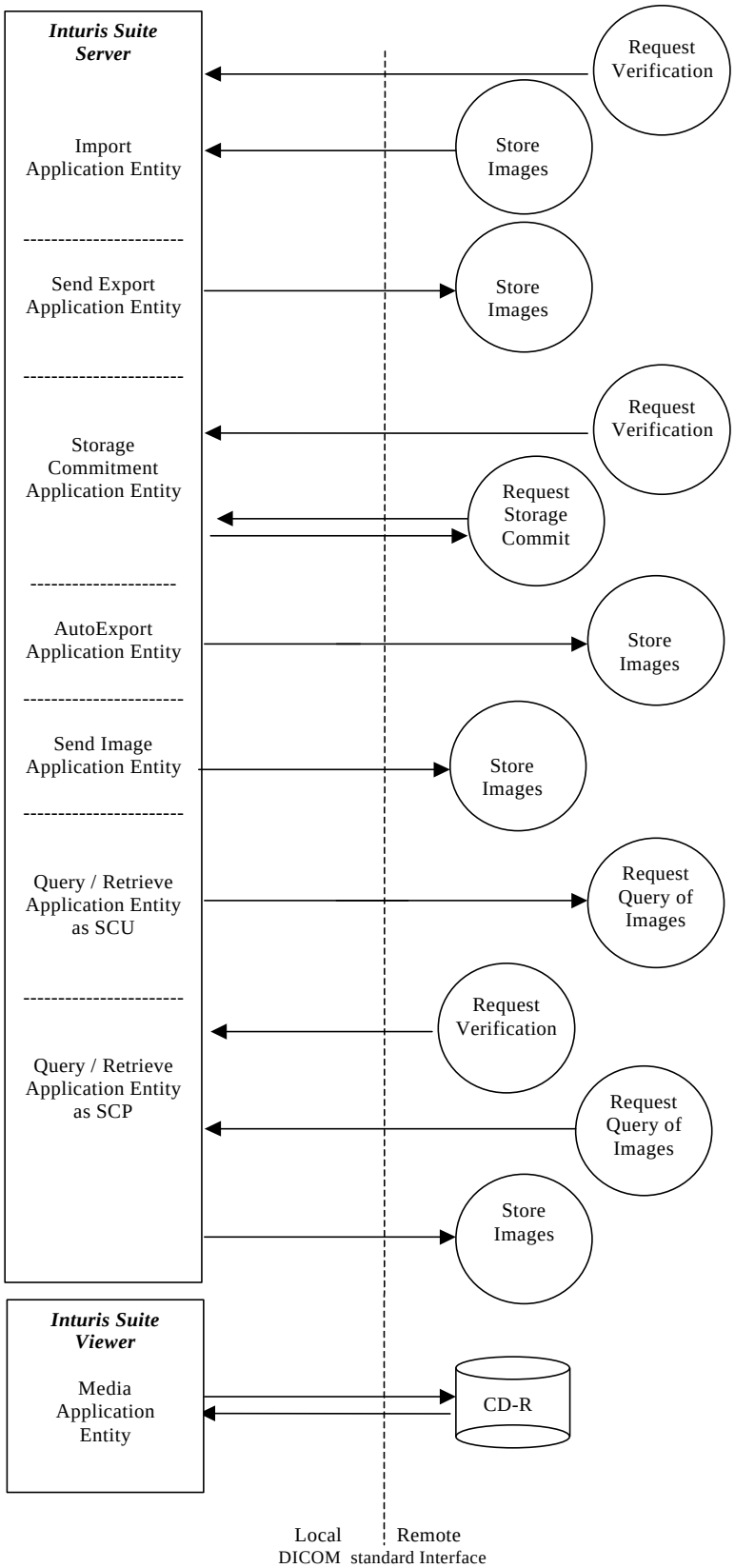

Figure 2-2: Implementation Model Inturis Suite Release 2

As documented in the PS3.4, the arrows in the diagram on the previous page have the following meanings:
- An arrow pointing to the right indicates the local application entity initiates an association
- An arrow pointing to the left indicates the local application entity accepts an association.

2.2 Functional definition of Application Entities

2.2.1 Import Application Entities

The Inturis Suite accepts an association with a remote DICOM AE when the remote system requests image storage using the DICOM Storage service class. Images are stored based on the study information of the Image.

2.2.2 Storage Commitment Application Entity

The Inturis Suite accepts an association with a remote DICOM AE when the remote system requests image Storage Commitment. The Inturis Suite initiates an association with the remote DICOM AE that requested the Storage Commitment to inform the remote DICOM AE about the status of the Storage commitment request.

2.2.3 Auto Export Application Entity

The Inturis Suite initiates an association with a remote DICOM AE when the Inturis Suite requests image storage using the DICOM Storage service class.

2.2.4 Send Images Application Entity

When the Send function in the Inturis Suite Server is addressed the selected images are transmitted using a Storage service. The Inturis Suite initiates an association with a remote DICOM AE when the Inturis Suite requests image storage using the DICOM Storage service class.

2.2.5 Query / Retrieve as SCU Application Entity

The Inturis Suite Query Retrieve as SCU AE entities an association with a remote DICOM AE and requests a query using the DICOM Query / Retrieve service class.

2.2.6 Query / Retrieve as SCP Application Entity

The Inturis Suite Query Retrieve as SCP AE exist of two function:
- The Inturis Suite accepts an association with a remote DICOM AE when the remote system requests a query using the DICOM Query / Retrieve service class.
- When a Retrieve of images is requested, the requested images are transmitted using a Storage service. The Inturis Suite initiates an association with a remote DICOM AE when the Inturis Suite requests image storage using the DICOM Storage service class.

2.2.7 Media Application Entity

The Media AE in the Inturis Suite clients (viewers) supports the following functions;

- Read the DICOMDIR file that represents the contents of the (image) data as recorded. This information is displayed as an ordered list of icon images together (if present) with pertinent identifying information (patient name, etc.) (if present).
- Read the selected image from CD-R device and display it on the monitor of the View Station. This information is displayed as an ordered list of frames of the selected image or as a dynamic review of the selected image.
- Initialization of the CD-R Media, writing a DICOM File-set onto the media.
- Creation of images onto a Media.
- Creation of a DICOMDIR file that represents the contents of the (image) data as recorded.

2.3 Sequencing of Real World Activities

All Real-World Activities as specified in Figure 2.2 may occur independently from each other.

3 AE Specifications

The Network capabilities of the Inturis Suite consists of six DICOM Application Entities:
- An Imaging Import AE
- A Storage Commitment AE
- An Auto Export AE
- A Send Image AE
- A Query / Retrieve as SCU AE
- A Query / Retrieve as SCP AE

These are specified in section 3.1 to section 3.5.

3.1 Inturis Suite Imaging Import AE

The Inturis Suite Imaging Import Application Entity provides Standard Conformance to the DICOM V3.0 SOP classes as an SCP specified in Table 3.1.

Table 3-1: Supported SOP Classes as SCP by the Import AE

SOP class Name	UID
Verification	1.2.840.10008.1.1
SC Image Storage	1.2.840.10008.5.1.4.1.1.7
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1

3.1.1 Association Establishment Policies

3.1.1.1 General

The Inturis Suite always proposes the following DICOM Application Context Name (ACN): 1.2.840.10008.3.1.1.1

The maximum length PDU negotiation is included in all association establishment requests. The default maximum length PDU for an association initiated by the Inturis Suite is: 28 kB.

3.1.1.2 Number of Associations

The number of associations for the storage SCP service that may be active simultaneously is 15. For the verification service only one association can be handled.

3.1.1.3 Asynchronous Nature

DICOM asynchronous mode is not supported meaning that only one transaction may be outstanding over an association at any given point in time.

3.1.1.4 Implementation Identifying Information

The Implementation Class UID is: 1.3.46.670589.16.11.2.2

The implementation version name: “InturisSuite R22”

3.1.2 Association Acceptance Policy

3.1.2.1 Verify Application Level Communication

3.1.2.1.1 Associated Real-World Activity

Inturis Suite accepts Associations from systems that wish to verify application level communication using the C-ECHO command.

3.1.2.1.2 Presentation Context Table

Inturis Suite will accept the presentation contexts as given in the next table.

Table 3-2: Supported Presentation Context by the Import AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

3.1.2.1.3 C-ECHO SCP Conformance

Inturis Suite provides standard conformance.

3.1.2.1.4 Presentation Context Acceptance Criterion

Inturis Suite accepts all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that multiple proposed Presentation Contexts with the same SOP Class but different Transfer Syntaxes are accepted by Inturis Suite. There is no check for duplicate contexts and are therefore accepted.

3.1.2.1.5 Transfer Syntax Selection Policies

Any of the presentation context shown in Table 3-2, are acceptable.

3.1.2.2 Store Images in the Inturis Suite (Image import)

3.1.2.2.1 Associated Real-World Activity

A remote system sets up a connection with the Inturis Suite. The Inturis Suite verifies that the remote system is configured as an allowed input, and that the maximum number of connections is not already reached. After this, the Inturis Suite accepts the connection and communications parameters are negotiated. Upon completion of negotiations the remote system will transfer its image data the Inturis Suite. Once this transfer is completed, the Inturis Suite shall notify the remote system that the transfer is completed successfully and the connection will be closed. The Inturis Suite will accept the presentation context associated with the Image Storage request and reply with a C-STORE response when the complete image has been received on the established association.

The image will be accepted only, if all the attributes defined by the DICOM standard as type 1

are available (present with a value).

3.1.2.2.2 Accepted presentation Contexts

The following table illustrates the Accept presentation contexts for the Image Storage request.

Table 3-3: Accepted Presentation Context by the Import AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	ILE ELE EBE JPEG Lossy Baseline JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1)	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70	SCP	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	ILE ELE EBE JPEG Lossy Baseline JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) RLE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.5	SCP	None
US Image Multi-Frame Storage	1.2.840.10008.5.1.4.1.1.3.1	ILE ELE EBE JPEG Lossy Baseline JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) RLE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.5	SCP	None
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1	ILE ELE EBE JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) JPEG Lossy Baseline	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50	SCP	None

Note: The JPEG process 14 transfer syntax is preferred.

3.1.2.2.3 SOP Specific Conformance

The Inturis Suite can not handle the import of images from different patients or study’s in one association.

The Inturis Suite conforms to the SOP’s of the Storage Service Class at level 2 (full). No data elements are discarded or coerced by the Inturis Suite. The following Attributes can be modified by the Inturis Suite:

Patient Name	0010,0010
Patient Sex	0010,0040
Patient Birthdate	0010,0030
Patient ID	0010,0020
Accession Number	0008,0050

The following table list the actions that are performed when an exception occur, the C-Store Status Responses that are returned by the Inturis Suite Import AE are also mentioned.

Table 3-4: Exception handling

Error type	Error	Action	Codes send in C-STORE STATUS
Refused	Maximum number of connection is reached	Notification sent, logging and connection abort	A7xx
	Remote is not licensed	Notification sent, logging and connection abort	A7xx
Error	Time Out reached	Notification sent, logging and connection abort	Cxxx
	Error on remote system	Abort association and logging	
	Internal error Inturis Suite	Notification sent, logging and connection abort	Cxxx
	Abort by Remote system	Logging and connection abort	
Failure	Cannot understand	logging	Cxxx
Success			0000

For Ultrasound Images only the Image Information Entity level is supported, Images that contain Curve data are rejected. On receiving such an Image The Inturis Suite returns a Failure message “Cannot Understand”.

For Ultrasound Images the following section gives an overview of the Image formats that are supported:

Table 3-5: US HIGH BIT Supported

Photometric Interpretation	High Bit Value	Storing	Viewing
MONOCHROME2	0007H	Yes	Yes
RGB	0007H	Yes	Yes
YBR_FULL	0007H	Yes	Yes
YBR_FULL_422	0007H	Yes	Yes
YBR_PARTIAL_422	0007H	Yes	Yes
PALETTE COLOR	000FH - 16 bit palette	Yes	Yes
PALETTE COLOR	0007H - 8 bit palette	Yes	Yes

Table 3-6: US PLANAR CONFIGURATION Supported

Photometric Interpretation	Planar Configuration Value	Storing	Viewing
RGB	0000H - color-by-pixel	Yes	Yes
RGB	0001H - color-by-plane	Yes	Yes
YBR_FULL	0001H	Yes	Yes
YBR_FULL_422	0000H	Yes	Yes
YBR_PARTIAL_422	0000H	Yes	Yes

Table 3-7: US BITS ALLOCATED Supported

Photometric Interpretation	Bits Allocated Value	Storing	Viewing
MONOCHROME2	0008H	Yes	Yes
RGB	0008H	Yes	Yes
YBR_FULL	0008H	Yes	Yes
YBR_FULL_422	0008H	Yes	Yes
YBR_PARTIAL_422	0008H	Yes	Yes
PALETTE COLOR	0008H - 8 bit palette	Yes	Yes
PALETTE COLOR	0010H - 16 bit palette	Yes	Yes

Table 3-8: US SAMPLES PER PIXEL Supported

Photometric Interpretation	Samples Per Pixel Value	Storing	Viewing
MONOCHROME2	0001H	Yes	Yes
RGB	0003H	Yes	Yes
YBR_FULL	0003H	Yes	Yes
YBR_FULL_422	0003H	Yes	Yes
YBR_PARTIAL_422	0003H	Yes	Yes
PALETTE COLOR	0001H	Yes	Yes

For the XA Image Storage and SC Image Storage all types of Images can be stored and viewed.

3.1.2.2.4 Presentation Context Acceptance Criterion

Inturis Suite accepts all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that multiple proposed Presentation Contexts with the same SOP Class but different Transfer Syntaxes are accepted by Inturis Suite. There is no check for duplicate contexts and are therefore accepted.

The Images received by the Inturis Suite system are merged on Study UID.

3.1.3 Association Initiation Policy

The Inturis Suite Imaging Import AE doesn’t initiates associations.

3.2 Inturis Suite Storage Commitment AE

The Inturis Suite Storage Commitment Application Entity provides Standard Conformance to the DICOM V3.0 SOP classes as an SCP specified in Table 3-9.

Table 3-9: Supported SOP Classes as SCP by the Storage Commitment AE

SOP class Name	UID
Storage Commitment Push Model	1.2.840.10008.1.20.1
Verification	1.2.840.10008.1.1

3.2.1 Association Establishment Policies

3.2.1.1 General

The Inturis Suite always proposes the following DICOM Application Context Name (ACN): 1.2.840.10008.3.1.1.1

The maximum length PDU negotiation is included in all association establishment requests. The default maximum length PDU for an association initiated by the Inturis Suite is: 28 kB.

3.2.1.2 Number of Associations

The number of associations for the storage commitment SCP service that may be active simultaneously is 15. For the verification service only one associations can be handled.

3.2.1.3 Asynchronous Nature

DICOM asynchronous mode is not supported meaning that only one transaction may be outstanding over an association at any given point in time.

3.2.1.4 Implementation Identifying Information

The Implementation Class UID is: 1.3.46.670589.7.16.11.2.2
The implementation version name: “InturisSuite R22”

3.2.2 Association Initiation Policy

3.2.2.1 Invoke Storage commitment notification

3.2.2.1.1 Associated Real-World Activity

The Inturis Suite will invoke a notification to inform the SCU whether or not it has executed the storage commitment request. In case a failure occurred the Inturis Suite will invoke the notification after minimal 8 hours.

3.2.2.1.2 Propose presentation Contexts

The following table illustrates the proposed presentation contexts for the Storage Commitment service.

Table 3-10: Proposed Presentation Context by the Storage Commitment AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

3.2.2.1.3 SOP Specific Conformance

The Inturis Suite conforms to the N-Event-Report Storage commitment Push Model SOP Class.

The following N-Event-Report attributes are sent:

Table 3-11: N-EVENT-REPORT Attributes

Event Type Name	Event Type ID	Attribute	Tag	Note
Storage Commitment Request Successful	1	Transaction UID	(0008,1195)	
		Referenced SOP Sequence	(0008,1199)	
		>Referenced SOP Class UID	(0008,1150)	
		>Referenced SOP Instance UID	(0008,1155)	
Storage Commitment Request Complete - Failures Exist	2	Transaction UID	(0008,1195)	
		Failed SOP Sequence	(0008,1198)	
		>Referenced SOP Class UID	(0008,1150)	
		>Referenced SOP Instance UID	(0008,1155)	
		>Failure Reason	(0008,1197)	

3.2.3 Association Acceptance Policy

3.2.3.1 Verify Application Level Communication

3.2.3.1.1 Associated Real-World Activity

Inturis Suite accepts Associations from systems that wish to verify application level communication using the C-ECHO command.

3.2.3.1.2 Presentation Context Table

Inturis Suite will accept the presentation contexts as given in the next table

.

Table 3-12: Accepted presentation context by the Storage Commitment AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

3.2.3.1.3 C-ECHO SCP Conformance

Inturis Suite provides standard conformance.

3.2.3.1.4 Presentation Context Acceptance Criterion

Inturis Suite accepts all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that multiple proposed Presentation Contexts with the same SOP Class but different Transfer Syntaxes are accepted by Inturis Suite.
There is no check for duplicate contexts and are therefore accepted.

3.2.3.1.5 Transfer Syntax Selection Policies

Any of the presentation context show in Table 3-12, are acceptable.

3.2.3.2 Storage Commitment Acceptance

3.2.3.2.1 Associated Real-World Activity

Incase no archive is configured or connected, the server shall always notify the requester that the storage commitment failed. In case the number of associations is exceeded the server shall respond to the requestor with a DICOM error. In other cases the Storage Commitment service will accept the Storage commitment request.

3.2.3.2.2 Accepted presentation Contexts

The table Table 3-12, “Accepted presentation context by the Storage Commitment AE,” on page 16 illustrates the accepted presentation contexts for the Image Storage request.

3.2.3.2.3 SOP Specific Conformance

The Inturis Suite provides standard conformance to the Storage commitment Push Model SOP class. The following table lists the actions that are performed when an exception occurs, the Status Responses that are returned by the Inturis Suite Storage Commitment AE are also mentioned.

Table 3-13: Exception handling

Error type	Error	Action	STATUS Response
Error	Processing failure	Notification is sent, logging	0110
Success			0000

In case part of the images in an storage commitment request can't be committed, the Inturis Suite reports a failure of the complete storage commitment request.

3.2.3.2.4 Presentation Context Acceptance Criterion

Inturis Suite accepts all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that multiple proposed Presentation Contexts with the same SOP Class but different Transfer Syntaxes are accepted by Inturis Suite. There is no check for duplicate contexts and are therefore accepted.

3.3 Inturis Suite Auto Export AE

The Inturis Suite Imaging Export Application Entity provides Standard Conformance to the DICOM V3.0 SOP classes as an SCU specified in Table 3.5.

Table 3-14: Supported SOP Classes as SCU by the Export AE

SOP class Name	UID
SC Image Storage	1.2.840.10008.5.1.4.1.1.7
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1

3.3.1 Association Establishment Policies

3.3.1.1 General

The Inturis Suite always proposes the following DICOM Application Context Name (ACN): 1.2.840.10008.3.1.1.1

The maximum length PDU negotiation is included in all association establishment requests. The default maximum length PDU for an association initiated by the Inturis Suite is: 28kB.

3.3.1.2 Number of Associations

For the storage SCU service only one association can be active.

3.3.1.3 Asynchronous Nature

DICOM asynchronous mode is not supported meaning that only one transaction may be outstanding over an association at any given point in time.

3.3.1.4 Implementation Identifying Information

The Implementation Class UID is: 1.3.46.670589.16.11.2.2
The implementation version name: “InturisSuite R22”

3.3.2 Association Initiation Policy

3.3.2.1 Copy Images from Inturis Suite (Image Export)

3.3.2.1.1 Associated Real-World Activity

The Inturis Suite Export AE will only export the images when configured to do so. Via the Configuration file on the system, 2 destinations can be declared/configured. On association as SCP the received images will be automatically sent to the destination sequential. In case Images are retrieved from an remote system as a result of a query/retrieve requested by the Inturis Suite the images are not auto exported.

3.3.2.1.2 Proposed presentation Contexts

The following table illustrates the proposed presentation contexts for the Image Storage request.

Table 3-15: Proposed presentation Context by the Imaging Export AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	ILE ELE EBE JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) JPEG Lossy Baseline	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50	SCU	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	ILE ELE EBE JPEG Lossy Baseline JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) RLE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.5	SCU	None
US Image Multi-Frame Storage	1.2.840.10008.5.1.4.1.1.3.1	ILE ELE EBE JPEG Lossy Baseline JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) RLE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.5	SCU	None
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1	ILE ELE EBE JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) JPEG Lossy Baseline	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50	SCU	None

Note: The JPEG process 14 transfer syntax is preferred.

3.3.2.1.3 SOP Specific Conformance

The Inturis Suite conforms to the SOP's of the Storage Service Class at level 2 (full). No data elements are discarded or coerced by the Inturis Suite. When a attribute with a Value Representation Time or DateTime is exported the time fraction is not supported.

Inturis Suite can perform a transfer syntax conversion according to the following table:

Table 3-16: Transfer syntax conversion

Source Syntax	Destination syntax					
	ILE	ELE	EBE	JPEG lossless	JPEG lossy	RLE
ILE	+	+	+	-	-	-
ELE	+	+	+	-	-	-
EBE	+	+	+	-	-	-
JPEG lossless FOP	+	+	+	+	-	-
JPEG lossy Baseline	-	-	-	-	+	-
RLE	-	-	-	-	-	+

The behaviour on successful and unsuccessful transfer of images is given in the table below.

Table 3-17: Action on received C-STORE STATUS Responses

Service Status	Codes	Behaviour on received Status
Refused	A7xx	Text logging, close association, application released and returns an error. Inturis Suite retries to send the Images.
Error	A9xx	Text logging, close association, application released and returns an error. Inturis Suite retries to send the Images.
	Cxxx	Text logging, close association, application released and returns an error. Inturis Suite retries to send the Images.
Warning	B00x	Text logging. Inturis Suite retries to send the Images.
Success	0000	

3.3.3 Association Acceptance Policy

Inturis Suite Auto Export AE doesn't accept Associations.

3.4 Inturis Suite Send Images AE

The Inturis Suite Imaging Export Application Entity provides Standard Conformance to the DICOM V3.0 SOP classes as an SCU specified in Table 3.5.

Table 3-18: Supported SOP Classes as SCU by the Export AE

SOP class Name	UID
SC Image Storage	1.2.840.10008.5.1.4.1.1.7
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1

3.4.1 Association Establishment Policies

3.4.1.1 General

The Inturis Suite always proposes the following DICOM Application Context Name (ACN): 1.2.840.10008.3.1.1.1

The maximum length PDU negotiation is included in all association establishment requests. The default maximum length PDU for an association initiated by the Inturis Suite is: 28kB.

3.4.1.2 Number of Associations

For the storage SCU service 5 association can be active.

3.4.1.3 Asynchronous Nature

DICOM asynchronous mode is not supported meaning that only one transaction may be outstanding over an association at any given point in time.

3.4.1.4 Implementation Identifying Information

The Implementation Class UID is: 1.3.46.670589.16.11.2.2
The implementation version name: “InturisSuite R22”

3.4.2 Association Initiation Policy

3.4.2.1 Copy Images from Inturis Suite (Image Export)

3.4.2.1.1 Associated Real-World Activity

After the activation of the Send function the Inturis Suite will only export the selected images.

3.4.2.1.2 Proposed presentation Contexts

The following table illustrates the proposed presentation contexts for the Image Storage request.

Table 3-19: Proposed presentation Context by the Send function AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	ILE ELE EBE JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) JPEG Lossy Baseline	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50	SCU	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	ILE ELE EBE JPEG Lossy Baseline JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) RLE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.5	SCU	None
US Image Multi-Frame Storage	1.2.840.10008.5.1.4.1.1.3.1	ILE ELE EBE JPEG Lossy Baseline JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) RLE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.5	SCU	None
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1	ILE ELE EBE JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) JPEG Lossy Baseline	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50	SCU	None

Note: The JPEG process 14 transfer syntax is preferred.

3.4.2.1.3 SOP Specific Conformance

The Inturis Suite conforms to the SOP's of the Storage Service Class at level 2 (full). No data

elements are discarded or coerced by the Inturis Suite. When a attribute with a Value Representation Time or DateTime is exported the time fraction is not supported.

Inturis Suite can perform a transfer syntax conversion according to the following table:

Table 3-20: Transfer syntax conversion

Source Syntax	Destination syntax					
	ILE	ELE	EBE	JPEG lossless	JPEG lossy	RLE
ILE	+	+	+	-	-	-
ELE	+	+	+	-	-	-
EBE	+	+	+	-	-	-
JPEG lossless FOP	+	+	+	+	-	-
JPEG lossy Baseline	-	-	-	-	+	-
RLE	-	-	-	-	-	+

The behaviour on successful and unsuccessful transfer of images is given in the table below.

Table 3-21: Action on received C-STORE STATUS Responses

Service Status	Codes	Behaviour on received Status
Refused	A7xx	Text logging, close association, application released and returns an error. Inturis Suite retries to send the Images.
Error	A9xx	Text logging, close association, application released and returns an error. Inturis Suite retries to send the Images.
	Cxxx	Text logging, close association, application released and returns an error. Inturis Suite retries to send the Images.
Warning	B00x	Text logging. Inturis Suite retries to send the Images.
Success	0000	

3.4.3 Association Acceptance Policy

Inturis Suite Auto Export AE doesn’t accepts Associations.

3.5 Inturis Suite Query / Retrieve as SCU AE

The Inturis Suite Query / Retrieve Imaging Application Entity provides Standard Conformance to the DICOM V3.0 SOP classes as an SCP specified in Table 3-22.

Table 3-22: Supported SOP Classes as SCU by the Query/ Retrieve AE

SOP class Name	UID
Study Root Only Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Only Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

3.5.1 Association Establishment Policies

3.5.1.1 General

The Inturis Suite always proposes the following DICOM Application Context Name (ACN): 1.2.840.10008.3.1.1.1

The maximum length PDU negotiation is included in all association establishment requests. The default maximum length PDU for an association initiated by the Inturis Suite is: 28 kB.

3.5.1.2 Number of Associations

The number of associations for the Query/Retrieve SCU service that may be active simultaneously is 5.

3.5.1.3 Asynchronous Nature

DICOM asynchronous mode is not supported meaning that only one transaction may be outstanding over an association at any given point in time.

3.5.1.4 Implementation Identifying Information

The Implementation Class UID is: 1.3.46.670589.7.16.11.2.2
The implementation version name: “InturisSuite R22”

3.5.2 Association Initiation Policy

3.5.2.1 Query Remote system

3.5.2.1.1 Associated Real-World Activity

Inturis Suite initiates Associations to other systems that support Query Retrieve Study Root only service.

3.5.2.1.2 Presentation Context Table

Inturis Suite will Propose the presentation contexts as given in the next table.

Table 3-23: Accepted Presentation Context by the Query Retrieve AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Note: Any of the Standard Query Retrieve FIND SOP classes listed in Table 3-22, “Supported SOP Classes as SCU by the Query/ Retrieve AE,” on page 24.

3.5.2.1.3 C-FIND SCU Conformance

Only hierarchical queries are supported.

The DICOM Query Retrieve SCU AE supports queries based on the combination of the following attributes:

- Patient ID
- Patient’s Name
- Accession Number
- Study Date
- Patient Birth Date
- Patient Birth Sex
- Modalities in study

The DICOM Q/R SCU supports the attribute matching types defined in the DICOM standard document PS 3.4 as follows

- Single Value Matching for all acquirable data elements
- Universal Matching for all acquirable data elements
- Wild Card Matching for Person Name data elements
- Range Matching for Date data elements

The following table list the actions that are performed when an exception occur.

Table 3-24: Exception handling

Error type	Error	Action	STATUS Code
Refused	Maximum number of connection is reached	Logging and connection abort	A7xx
Error	Time Out reached	Logging and connection abort	Cxxx
	Error on acquisition system	Abort association and logging	
	Internal error Inturis Suite	Logging and connection abort	
	Network error	Logging, connection abort and all query results are discarded	
Success			0000

3.5.2.2 Request Retrieve Images from the Inturis Suite Database

3.5.2.2.1 Associated Real-World Activity

Inturis Suite initiates Associations to retrieve images from the Remote devices using the C-MOVE command.

3.5.2.2.2 Presentation Context Table

Inturis Suite will propose the presentation contexts as given in the next table:

Table 3-25: Accepted Presentation context by the Query Retrieve AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Note: Any of the Standard Query Retrieve MOVE SOP classes listed in Table 3-22, “Supported SOP Classes as SCU by the Query/ Retrieve AE,” on page 24.

3.5.2.2.3 C-MOVE SCU Conformance

Inturis Suite supports all Query Retrieve SOP classes listed in Table 3-22.
The following table list the actions that are performed when an exception occur.

Table 3-26: Exception handling

Error type	Error	Action	STATUS Code
Refused	Maximum number of connection is reached	Logging and connection abort	A7xx
Error	Time Out reached	Logging and connection abort	Cxxx
	Error on acquisition system	Abort association and logging	
	Internal error Inturis Suite	Logging and connection abort	
	Network error	Logging, connection abort and all query results are discarded	
Success			0000

3.5.3 Association Acceptance Policy

Inturis Suite Query Retrieve SCU AE doesn’t accept associations.

3.6 Inturis Suite Query / Retrieve as SCP AE

The Inturis Suite Query / Retrieve Imaging Application Entity provides Standard Conformance to the DICOM V3.0 SOP classes as an SCP specified in Table 3-22.

Table 3-27: Supported SOP Classes as SCP by the Query/ Retrieve AE

SOP class Name	UID
Verification	1.2.840.10008.1.1
Patient Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Study Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Patient/Study Only Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Only Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2

When a Query / Retrieve MOVE service is requested the Inturis Suite shall set up an storage service. When the Send function is activated the Inturis Suite shall also set up an storage service.

Table 3-28: Supported Storage SOP Classes as SCU by the Query/ Retrieve AE

SOP class Name	UID
SC Image Storage	1.2.840.10008.5.1.4.1.1.7
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1

3.6.1 Association Establishment Policies

3.6.1.1 General

The Inturis Suite always proposes the following DICOM Application Context Name (ACN): 1.2.840.10008.3.1.1.1

The maximum length PDU negotiation is included in all association establishment requests. The default maximum length PDU for an association initiated by the Inturis Suite is: 28 kB.

3.6.1.2 Number of Associations

The number of associations for the Query/Retrieve SCP service that may be active simultaneously is 7. For the verification service at least one associations can be handled simultaneous. For the Storage part of the Query/ Retrieve function can handle 5 simultaneous association.

3.6.1.3 Asynchronous Nature

DICOM asynchronous mode is not supported meaning that only one transaction may be outstanding over an association at any given point in time.

3.6.1.4 Implementation Identifying Information

The Implementation Class UID is: 1.3.46.670589.7.16.11.2.2
The implementation version name: “InturisSuite R22”

3.6.2 Association Initiation Policy

3.6.2.1 Storage part of Query/ Retrieve AE

3.6.2.1.1 Associated Real-World Activity

After the C-MOVE request the Inturis Suite will only export the requested images.

3.6.2.1.2 Proposed presentation Contexts

The following table illustrates the proposed presentation contexts for the Image Storage request.

Table 3-29: Proposed presentation Context by the Imaging Export AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	ILE ELE EBE JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) JPEG Lossy Baseline	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50	SCU	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	ILE ELE EBE JPEG Lossy Baseline JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) RLE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.5	SCU	None
US Image Multi-Frame Storage	1.2.840.10008.5.1.4.1.1.3.1	ILE ELE EBE JPEG Lossy Baseline JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) RLE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.5	SCU	None
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1	ILE ELE EBE JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1) JPEG Lossy Baseline	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50	SCU	None

Note: The JPEG process 14 transfer syntax is preferred.

3.6.2.1.3 SOP Specific Conformance

The Inturis Suite conforms to the SOP's of the Storage Service Class at level 2 (full). No data elements are discarded or coerced by the Inturis Suite.

Inturis Suite can perform a transfer syntax conversion according to the following table:

Table 3-30: Transfer syntax conversion

Source Syntax	Destination syntax					
	ILE	ELE	EBE	JPEG lossless	JPEG lossy	RLE
ILE	+	+	+	-	-	-
ELE	+	+	+	-	-	-
EBE	+	+	+	-	-	-
JPEG lossless FOP	+	+	+	+	-	-
JPEG lossy Baseline	-	-	-	-	+	-
RLE	-	-	-	-	-	+

The behaviour on successful and unsuccessful transfer of images is given in the table below.

Table 3-31: C-STORE STATUS Responses

Service Status	Codes	Further Meaning Status
Refused	A7xx	Text logging, close association, application released and returns an error
Error	A9xx	Text logging, close association, application released and returns an error
	Cxxx	Text logging, close association, application released and returns an error
Warning	B00x	Text logging
Success	0000	

3.6.3 Association Acceptance Policy

3.6.3.1 Verify Application Level Communication

3.6.3.1.1 Associated Real-World Activity

Inturis Suite accepts Associations from systems that wish to verify application level communication using the C-ECHO command.

3.6.3.1.2 Presentation Context Table

Inturis Suite will Accept the presentation contexts as given in the next table.

Table 3-32: Accepted Presentation Context by the Query Retrieve AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

3.6.3.1.3 C-ECHO SCP Conformance

Inturis Suite provides standard conformance.

3.6.3.1.4 Presentation Context Acceptance Criterion

Inturis Suite accepts all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that multiple proposed Presentation Contexts with the same SOP Class but different Transfer Syntaxes are accepted by Inturis Suite.
There is no check for duplicate contexts and are therefore accepted.

3.6.3.1.5 Transfer Syntax Selection Policies

Any of the presentation context show in Table 3-32, are acceptable.

3.6.3.2 Query the Inturis Suite Database

3.6.3.2.1 Associated Real-World Activity

Inturis Suite accepts Associations from systems that wish to query the Inturis Suite database using the C-FIND command.

3.6.3.2.2 Presentation Context Table

Inturis Suite will Accept the presentation contexts as given in the next table.

Table 3-33: Accepted Presentation Context by the Query Retrieve AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

Note: Any of the Standard Query Retrieve FIND SOP classes listed in Table 3-27, “Supported SOP Classes as SCP by the Query/ Retrieve AE,” on page 27.

3.6.3.2.3 C-FIND SCP Conformance

Relational queries are not supported. Inturis Suite simultaneously handles simultaneous C-FIND requests.

The DICOM Query / Retrieve SCP supports hierarchical queries only
The DICOM Query / Retrieve SCP supports queries for all unique and required patient, study, series and instance level keys / attributes, as follows:

- Patient ID
- Patient's Name
- Study Instance UID
- Study ID
- Accession Number
- Study Date
- Study Time
- Modality
- Series Number
- Series Instance UID
- Instance Number
- SOP Instance UID

The DICOM Query / Retrieve SCP supports queries for the following optional patient study, series and instance level keys / attributes

- Patient's Birth Date
- Patient's Sex
- Referring Physicians Name
- Body Part
- Protocol Name

The DICOM Q/R SCP supports all the attribute matching types defined in the DICOM standard document PS 3.4 except Sequence Matching, as follows

- Single Value Matching for all acquirable data elements
- Universal Matching for all acquirable data elements
- List of UID Matching for all Instance UID data elements
- Wild Card Matching for Person Name data elements
- Wild Card Matching for ID strings
- Range Matching for Date data elements

If the FIND query is such that more than 1000 matches are found the Query/Retrieve SCP returns an error “out of resources” indicating there are more matches than the system can handle. Other errors that are returned are shown in:

Table 3-34: Returned status responses by the Query / Retrieve AE

Service Status	Further Meaning	Status Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied.	0000	None
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	Identifier
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this Identifier.	FF01	Identifier

3.6.3.2.4 Presentation Context Acceptance Criterion

Inturis Suite accepts all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that multiple proposed Presentation Contexts with the same SOP Class but different Transfer Syntaxes are accepted by Inturis Suite. There is no check for duplicate contexts and are therefore accepted.

3.6.3.3 Request Retrieve Images from the Inturis Suite Database

3.6.3.3.1 Associated Real-World Activity

Inturis Suite accepts Associations from systems that wish to retrieve images from the Inturis Suite database using the C-MOVE command.

3.6.3.3.2 Presentation Context Table

Inturis Suite will accept the presentation contexts as given in the next table:

Table 3-35: Accepted Presentation context by the Query Retrieve AE

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE ELE EBE	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

Note: Any of the Standard Query Retrieve MOVE SOP classes listed in Table 3-27, “Supported SOP Classes as SCP by the Query/ Retrieve AE,” on page 27.

3.6.3.3.3 C-MOVE SCP Conformance

Inturis Suite supports all Query Retrieve SOP classes listed in Table 3-27. A C-STORE connection is built after the C-MOVE request, for C-STORE conformance see section 3.6.2.1 on page 28. Inturis Suite does not send Intermediate C-MOVE response with status pending.

Errors that are returned by the Inturis Suite Query / Retrieve AE are:

Table 3-36: Returned status responses by the Query / Retrieve AE

Service Status	Further Meaning	Status Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied.	0000	None
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	Identifier
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this Identifier.	FF01	Identifier

3.6.3.3.4 Presentation Context Acceptance Criterion

Inturis Suite accepts all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that multiple proposed Presentation Contexts with the same SOP Class but different Transfer Syntaxes are accepted by Inturis Suite.

There is no check for duplicate contexts and are therefore accepted.

3.7 Inturis Suite AE Media Specification

The Inturis Suite AE provides Standard Conformance to the DICOM Media Storage Service and File Format (PS 3.10) and the Media Storage Application Profiles (PS 3.11).

The supported Application Profiles, their Roles and the Service Class (SC) options, all defined in DICOM terminology, are listed in Table 3-37.

Table 3-37: Supported Application Profiles

Application Profile	Identifier	Real World Activity	Role	SC Option
Basic cardiac X-Ray Angiographic Studies on CD-R media.	STD-XABC-CD	Write image(s) on CD-R disk	FSC	Interchange
	STD-XABC-CD	Read image(s) from CD-R disk	FSR	Interchange
1024 X-Ray Angiographic Studies on CD-R Media.	STD-XA1K-CD	Write image(s) on CD-R disk	FSC	Interchange
	STD-XA1K-CD	Read image(s) on CD-R disk	FSR	Interchange
Ultrasound Studies on CD-R Media	STD-US-ID-SF-CD	Write image(s) on CD-R disk	FSC	Interchange
	STD-US-ID-SF-CD	Read image(s) on CD-R disk	FSR	Interchange
	STD-US-ID-MF-CD	Write image(s) on CD-R disk	FSC	Interchange
	STD-US-ID-MF-CD	Read image(s) on CD-R disk	FSR	Interchange
General Studies on CD-R Media (General Purpose CD-R)	STD-GEN-CD	Write image(s) on CD-R disk	FSC	Interchange
	STD-GEN-CD	Read image(s) on CD-R disk	FSR	Interchange

3.7.1 AE Specification: DICOM Recording

3.7.1.1 Application Entity Title

The Application Entity title is registered into the DICOM File Meta Information header and is supported by the CD-writer (CD write option) acting as a FSC.

Application Entity Title: “INTURISPRO_FSC”

3.7.1.2 RWA Transfer of an Examination

The SOP instances as provided by the RWA are written to the CD-R media and a corresponding DICOMDIR is created.

3.7.1.3 Application Profiles for this RWA

See Table 3-38 on page 36 for an overview of the support of the Application Profiles.

Table 3-38: Conformance supported Application Profiles

Application Profile Identifier	Supported SOP Classes		Supported Transfer syntaxes	
	Name	UID	Name	UID
STD-XABC-CD	XA Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1)	1.2.840.10008.1.2.4.70
STD-XA1K-CD	XA Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless First-Order Prediction (Process 14) (Selection Value 1)	1.2.840.10008.1.2.4.70
	SC Image	1.2.840.10008.5.1.4.1.1.7	ELE	1.2.840.10008.1.2.1
STD-US-ID-SF-CD	US Image	1.2.840.10008.5.1.4.1.1.6.1	ELE JPEG Lossy Baseline RLE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.5
STD-US-ID-MF-CD	US Image	1.2.840.10008.5.1.4.1.1.3.1	ELE JPEG Lossy Baseline RLE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.5
STD-GEN-CD	All Image formats in Table 3-1 on page 8		ELE	1.2.840.10008.1.2.1

The following table gives an overview of the Defined Photometric interpretation and transfer syntax pairs for the STD-US-ID-SF-CD Application Profile.

Table 3-39: Defined Photometric interpretation and transfer syntax pairs

Photometric Interpretation Value	Transfer Syntax	
	Name	UID
MONOCHROME2	ELE RLE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.5
RGB	ELE RLE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.5
PALETTE COLOR	ELE RLE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.5
YBR_FULL	RLE	1.2.840.10008.1.2.5
YBR_FULL_422	ELE JPEG Lossy Baseline	1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50
YBR_PARTIAL_422	ELE JPEG Lossy Baseline	1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50

For conversion of Transfer syntaxes see Table 3-16 on page 20.

3.7.1.4 DICOMDIR keys

In the DICOMDIR file a Basic Directory IOD is present, containing Directory records at the patient, study, series and image level.

3.7.2 AE Specification: DICOM Reading

3.7.2.1 Application Entity Title

Not applicable.

3.7.2.2 RWA Review and Analysis of an Examination

The “DICOM Reader” AE will act as a FSR using the Interchange option when reading the directory of the medium and when reading the requested images.

3.7.2.3 Application Profile(s) for this RWA

Refer to Table 3-37 for the list of Application Profiles that invoke this AE.

4 Communication Profiles

4.1 Supported Communication Stacks

TCP/IP is the only protocol stack supported.

4.2 TCP/IP Stack

The TCP/IP stack as supported by the underlying Operating System.

4.3 API

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

4.3.1 Physical Media Support

Supported physical medium include:

- IEEE 802.3-1995 (Fast Ethernet) 100BASE-TX.
- IEEE 802.3-1995 10BASE-TX

5 Extensions/Specializations/Privatizations

The viewer can write complete studies to one or more CDs depending on the study size. Further more one viewer can review and upload:

- Multi Patient CDs
- Multi Study CDs
- Multi CD studies

6 Configuration

6.1 AE Title/Presentation Address mapping

In the Inturis Suite the local Network and Media AE titles as well as the IP Address and the TCP listen port associated with these AE is configurable. The different AE's in the Inturis Suite system can be configured to use the same AE title.

The Inturis Suite only accepts association of AE Title hat are configured in the Inturis Suite system.

7 Support of Extended Character Sets

The Inturis Suite supports Extended Character Set “ISO_IR 100” which is the Latin alphabet No 1, supplementary set.