DICOM Conformance Statement

FORUM® LINK net

Version 2.0

Carl Zeiss Meditec AG

Goeschwitzer Str. 51-52

07745 Jena

GERMANY

www.zeiss.com/med

1   Conformance Statement Overview

FORUM LINK net is a software application tool connecting ophthalmological instruments without DICOM interface to the data management system FORUM. FORUM LINK net converts PDF reports, JPG, BMP, GIF, PNG and TIFF pictures into the DICOM format and transfers them to FORUM. The data are imported from a pre-set directory ("shared folder") which is continually monitored by FORUM LINK net. When a file (e.g. a picture or a report) is saved to this directory by an instrument, FORUM LINK net automatically displays a preview on the monitor. The user has to assign the imported data to a patient either by selecting the patient from a worklist previously sent from FORUM or by querying the respective patient in FORUM. After the patient has been assigned the file will be converted into the DICOM format and transferred to FORUM.

The software application FORUM LINK net allows to connect up to four instruments to FORUM and supports the following functions:

- Query for modality worklist
- Query for patient demographic data
- Store evidence reports
- Store secondary capture images

FORUM LINK net AE runs several DICOM Services as Service Class User and as Service Class Provider for Verification. All DICOM related activities are triggered manually by the operator.

FORUM LINK net allows performing a verification of the configured AEs. The result of this verification contains information about the supported SOP Classes and Transfer Syntaxes.

Depending on the log level, which can be adjusted via Graphical User Interface, extensive information about the DICOM communication can be written to the log file.

This document is structured as suggested in the DICOM Standard (PS 3.2: Conformance).

Table 1-1 Network Services Supported

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Encapsulated PDF Storage	Yes	No
Multi-Frame True Color Secondary Capture Image Storage	Yes	No
Workflow Management		
Verification	Yes	Yes
Modality Worklist Information Model - FIND	Yes	No
Query / Retrieve		
Patient Root Query/Retrieve Information Model – FIND	Yes	No

The SOP Classes are categorized as follows:

Table 1-2 UID Values

UID Value	UID Name	Category
1.2.840.10008.1.1	Verification	Workflow Management
1.2.840.10008.5.1.4.31	Modality Worklist Information Model - FIND	Workflow Management
1.2.840.10008.5.1.4.1.2.1.1	Patient Root Query/Retrieve Information Model - FIND	Query/Retrieve
1.2.840.10008.5.1.4.1.1.104.1	Encapsulated PDF Storage	Transfer
1.2.840.10008.5.1.4.1.1.7.4	Multi-frame True Color Secondary Capture Image Storage	Transfer

The FORUM LINK net does not support Media Interchange.

2   Table of Contents

3   Introduction

3.1 Revision History

Document Version	Date	Author	Changes
I	2018-07-17	mshnau	FORUM LINK net 2.0:
			- Support additional image formats: BMP, GIF, PNG and TIFF images as Multi-frame True Color Secondary Capture Image Storage with uncompressed pixel data
			- Enhanced and adjusted Table 4-9 and 4-12
			- Support Mapping of Ethnic Group from MWL into Storage SOP Instance Header
			- Support entry of Ethnic Group, Acquisition Date Time, Laterality or Image Laterality, Series Description and Accession Number via GUI
			- Show enhanced MWL details like Requested Procedure Comments
			- Improve attribute mapping from MWL and Patient Query into Storage SOP Instances
			- Handling of Patient Name Component Groups added
			- List of supported Modality codes extended
			- Equipment details for FORUM LINK net documented in SC Equipment attributes. General Equipment Module takes equipment details provided in station configuration
			- Burned In Annotation set to YES for all Storage SOP Instances
			- Content Qualification added to SOP Common Modules of Storage SOP Instances
			- Support AutoConnect™ for automatic configuration of DICOM connectivity to FORUM
			- Allow Rotation of PDF

3.2 Audience

This document is written for the people that need to understand how FORUM LINK net will integrate into their healthcare facility. This includes both those responsible for overall imaging network policy and architecture, as well as integrators who need to have a detailed understanding of the DICOM features of the product. This document contains some basic DICOM definitions so that any reader may understand how this product implements DICOM features. However, integrators are expected to fully understand all the DICOM terminology, how the tables in this document relate to the product's functionality, and how that functionality integrates with other devices that support compatible DICOM features.

3.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between FORUM LINK net and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. DICOM by itself does not guarantee interoperability. The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of different Conformance Statements is just the first step towards assessing interconnectivity and interoperability between the product and other DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

3.4 Definitions and Terms

Informal definitions are provided for the following terms used in this Conformance Statement.

The DICOM Standard is the authoritative source for formal definitions of these terms.

Abstract Syntax
> the information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class.
>
> Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.

Application Entity (AE)
> an end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title
> the externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.

Application Context
> the specification of the type of communication used between Application Entities.
>
> Example: DICOM network protocol.

Association
> a network communication channel set up between Application Entities.

Attribute
> a unit of information in an object definition; a data element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower level data elements.
>
> Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

Information Object Definition (IOD)
> the specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The Attributes may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C).
>
> Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Joint Photographic Experts Group (JPEG)
> a set of standardized image compression techniques, available for use by DICOM applications.

Media Application Profile
> the specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs)

Module

> a set of Attributes within an Information Object Definition that are logically related to each other.
>
> Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation

> first phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.

Presentation Context

> the set of DICOM network services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.

Protocol Data Unit (PDU)

> a packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.

Query Key

> an input value for a query process. Query Keys denote the set of DICOM tags that are sent from the SCU to SCP and thus control the query result.

Security Profile

> a set of mechanisms, such as encryption, user authentication, or digital signatures, used by an Application Entity to ensure confidentiality, integrity, and/or availability of exchanged DICOM data

Service Class Provider (SCP)

> role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User).
>
> Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).

Service Class User (SCU)

> role of an Application Entity that uses a DICOM network service; typically, a client.
>
> Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU)

Service/Object Pair (SOP) Class

> the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification.
>
> Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

Service/Object Pair (SOP) Instance

> an information object; a specific occurrence of information exchanged in a SOP Class.
>
> Examples: a specific x-ray image.

Tag

> a 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element.
>
> Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]

Transfer Syntax

> the encoding used for exchange of DICOM information objects and messages.
>
> Examples: JPEG compressed (images), little endian explicit value representation.

Unique Identifier (UID)

> a globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier.

Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

Value Representation (VR)

the format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

3.5 Abbreviations

Table 3-1 Abbreviations used in this document

Abbreviation	Definition
ANAP	Attribute is not always present - applicable for type 3 attributes
AE	Application Entity
AET	Application Entity Title
AUTO	Automatically generated, cannot be modified by the operator
CONFIG	Configurable parameter
CZM	Carl Zeiss Meditec
DICOM	Digital Imaging and Communications in Medicine
ELE	Explicit Little Endian
ILE	Implicit Little Endian
IM	Information Model
IOD	Information Object Definition
JPG-1	JPEG Coding Process 1 transfer syntax; JPEG Baseline; ISO 10918-1
MWL	Modality Worklist
PRQ	DICOM Patient Root Query
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair, union of a specific DICOM service and related IOD.
TCP/IP	Transmission Control Protocol / Internet Protocol
UID	Unique Identifier
USER	User input
VNAP	Value not always present (attribute sent zero length if no value is present) - applicable for type 2 and 2C attributes

3.6 References

NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA (available free at http://medical.nema.org/).

Integrating the Healthcare Enterprise (IHE) EYECARE Technical Framework, rev 4.0, 2016 (available free at http://www.ihe.net/Technical_Framework/index.cfm).

4 Networking

4.1 Implementation Model

4.1.1 Application Data Flow

Figure 4-1 FORUM LINK net Application Software as Acquisition Modality Importer
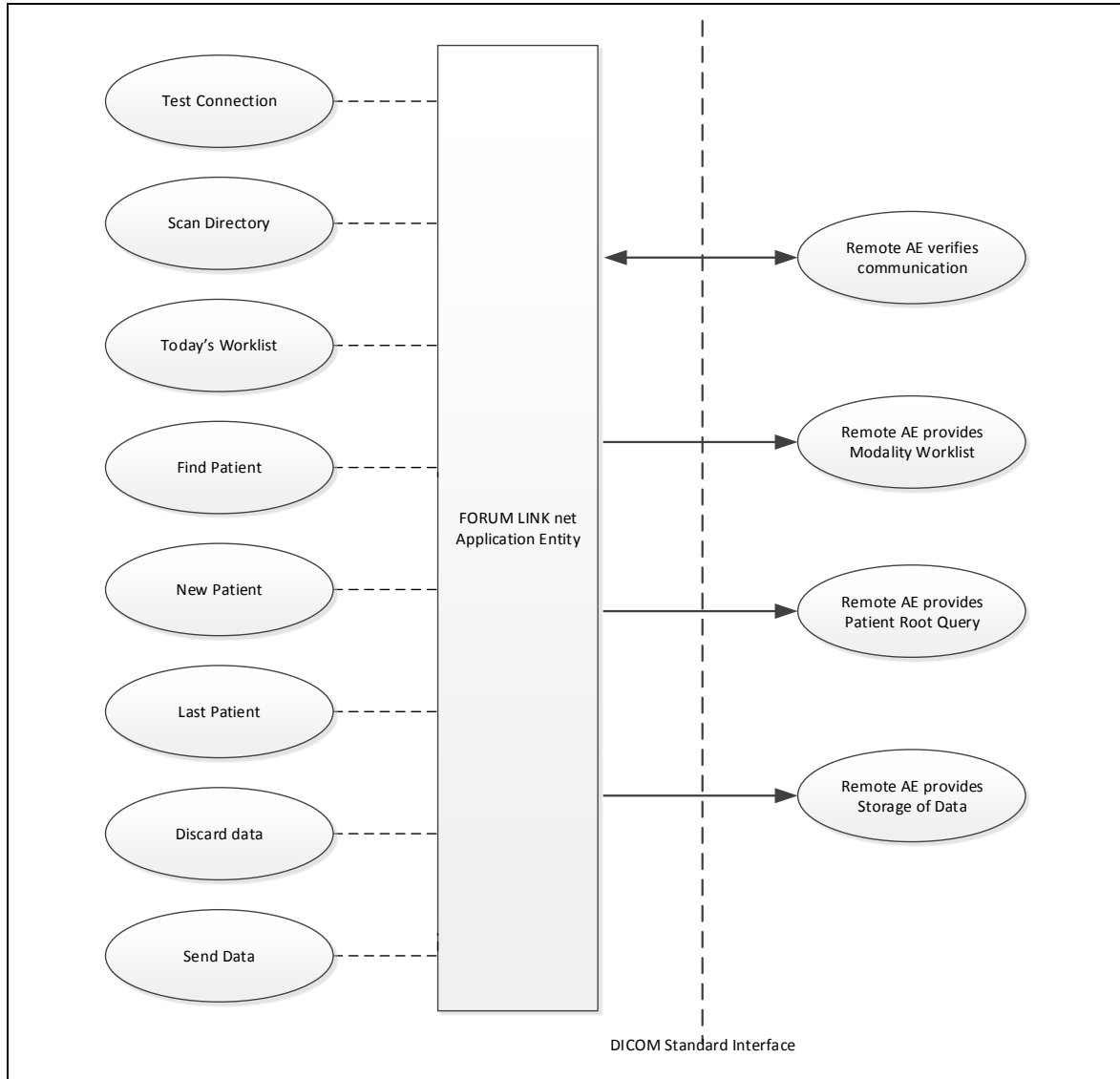
4.1.2 Functional Definition of AEs

4.1.2.1 Functional Definition of FORUM LINK net

FORUM LINK net is a software application tool connecting ophthalmological instruments without DICOM interface to the data management system FORUM. FORUM LINK net converts PDF reports, JPG, BMP, GIF, PNG and TIFF pictures into the DICOM format and transfers them to FORUM. The data are imported from a pre-set directory ("shared folder") which is continually monitored by FORUM LINK net. When a file (e.g. a picture or a report) is saved to this directory by an instrument, FORUM LINK net automatically displays a preview on the monitor. The user has to assign the imported data to a patient either by selecting the patient from a worklist previously sent from FORUM or by querying the

respective patient in FORUM. After the patient has been assigned the file will be converted into the DICOM format and transferred to FORUM.

The software application FORUM LINK net allows to connect up to four instruments to FORUM and supports the following functions:

- Query for modality worklist
- Query for patient demographic data
- Store evidence reports
- Store secondary capture images

FORUM LINK net AE runs several DICOM Services as Service Class User and as Service Class Provider for Verification. All DICOM related activities are triggered manually by the operator.

FORUM LINK net allows performing a verification of the configured AEs. The result of this verification contains information about the supported SOP Classes and Transfer Syntaxes.

Depending on the log level, which can be adjusted via Graphical User Interface, extensive information about the DICOM communication can be written to the log file.

4.1.3 Sequencing of Real-World Activities

To realize the real world activities, the different entities work together. The sequence diagrams shall depict the intended workflow.
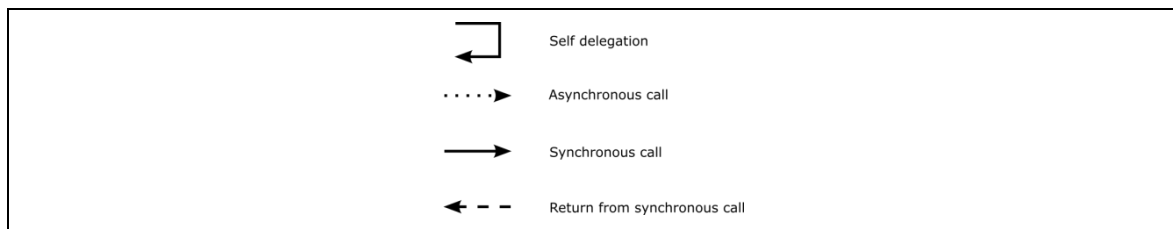
The diagrams use slightly modified UML symbols. The asynchronous call is not depicted as suggested in UML. Some objects do have more than one dashed line. It symbolizes more than one thread.

4.1.3.1 Acquisition Modality Importer Activities

All activities can be triggered manually by the operator with one exception: The "Scan Directory" activity is an activity happening automatically in the background, no user interaction is required. The shown order of the activities is the expected order. Details on DIMSE level will be explained in chapters after this.

Figure 4-2 FORUM LINK net - Acquisition Modality Importer Activities per configured Station
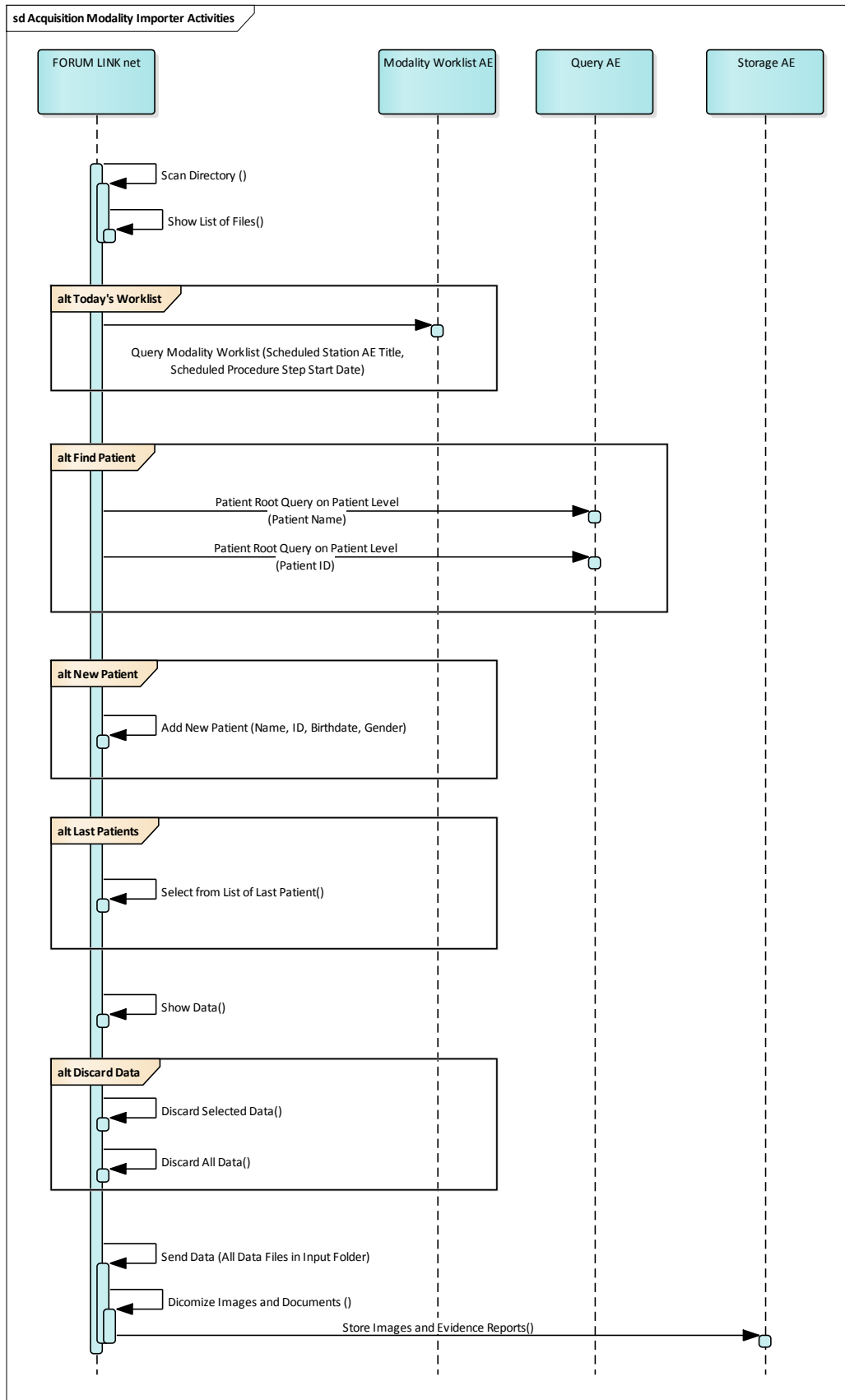
Scan Directory

The Scan Directory activity is an activity happening automatically in the background, no user interaction is required. As soon as a file in one of the supported formats is found, the scanning is limited to the respective scan directory and all supported files in this directory are shown in the list.

Today's Worklist

With FORUM LINK net the operator can query for a DICOM Modality Worklist. The user can specify which station the Modality Worklist shall be queried for in case more than one station has been configured in FORUM LINK net. The matches are listed in a table, where the operator can select the correct Worklist item.

Find Patient

In case the Modality Worklist Provider is not available or the patient has not been scheduled in advance, the operator can also search for patients existing at the Query AE. The operator specifies the search criteria by entering either parts of the patient's name or the patient id.

New Patient

In an unscheduled case a new patient can be created manually. This is not recommended and should only be used as a fallback.

Last Patient

A patient can be selected from the list of already processed patients. Data in the input folder will get assigned to this selected patient. If the selected patient originated from a Worklist item, cached Worklist attributes are also copied so that stored instances get assigned to the corresponding Study.

Discard Data

Discard Data can be triggered by the operator to remove either selected files or all files from the scan directory. These files are not deleted permanently, but moved to a separate subdirectory.

Send Data

The activity can be triggered after input file(s) and corresponding patient information have been selected.

This activity converts the input data into a DICOM compliant format and stores it to the configured Storage Provider. The transferred files are moved into a "transmitted" folder, which gets automatically created in the configured station's source folder.

The following input data formats are supported: JPG, BMP, GIF, PNG, TIFF and PDF.

4.2 AE Specifications

4.2.1 FORUM LINK net AE Specification

4.2.1.1 SOP Classes

Table 4-1 SOP Classes for FORUM LINK net AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	No
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	No
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No

4.2.1.2 Associations Policies

4.2.1.2.1 General

The DICOM standard Application Context Name for DICOM 3.0 is always proposed:

Table 4-2 DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2 Number of Associations

The number of simultaneous associations depends on the usage profile. At a certain point of time there might be two outgoing and one incoming associations simultaneously:

Table 4-3 Number of associations

Maximum number of simultaneous associations	3

4.2.1.2.3 Asynchronous Nature

FORUM LINK net Application Software does not support asynchronous communication (multiple outstanding transactions over a single Association).

4.2.1.2.4 Implementation Identifying Information

Table 4-4 DICOM implementation class and version

Implementation Class UID	1.2.276.0.75.2.5.20
Implementation Version Name	NIM-2.10.0

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Test Connection

4.2.1.3.1.1 Description and Sequencing of Activities

This activity is available during the configuration phase. It facilitates the set up and management of the DICOM Application Entities.

The user can test the application level communication between the configured stations' Application Entity and its peer DICOM Application Entities. During one test call, all peer DICOM Application Entities are contacted.

In the association request FORUM LINK net proposes not only Verification SOP Class, but also all other SOP Classes as supported by FORUM LINK net DICOM interface.

The association is established when the peer DICOM entity accepts the Verification related presentation context. In a sub-sequent step a C-ECHO message is exchanged.

The results of the "Test Connection" activity are shown to the user as success or failure. For e. g. a Storage Provider not only the Verification information is evaluated, but also the response regarding the proposed Storage SOP Classes.

4.2.1.3.1.2 Proposed Presentation Contexts

Following presentation contexts are offered for each initiated association. During this activity the Application Software uses only

- Verification with Transfer Syntax ILE as SCU

Table 4-5 Proposed Presentation Contexts for Activity Test Connection

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID 1.2.840.10008. ...	Name List	UID List 1.2.840.10008. ...		
Verification	1.1	ILE	1.2	BOTH	No
Multi-frame True Color Secondary Capture Image Storage	5.1.4.1.1.7.4	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
		JPG-1	1.2.4.50	SCU	No
Encapsulated PDF Storage	5.1.4.1.1.104.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Patient Root Query/Retrieve Information Model – FIND	5.1.4.1.2.1.1	ILE	1.2	SCU	No
Study Root Query/Retrieve Information Model - FIND	5.1.4.1.2.2.1	ILE	1.2	SCU	No
Modality Worklist Information Model – FIND	5.1.4.31	ILE	1.2	SCU	No

4.2.1.3.1.3 SOP Specific Conformance for Verification SOP Class

The FORUM LINK net Application Software provides standard conformance.

4.2.1.3.2 Activity - Scan Directory

The Scan Directory activity is an activity happening automatically in the background, no user interaction is required. As soon as a file in one of the supported formats is found, the scanning is limited to the respective scan directory. The main application window is shown in the foreground and the associated station tab is selected. All other station tabs get disabled until all files in the currently active scan directory have been processed. All supported files found in the scan directory are displayed in the scan directory list. The file list is continuously updated if additional files are found in the scan directory or detected files get removed. Depending on the configuration a preview image is shown automatically or on user request only. For PDF documents the user has the option to rotate the document shown in the preview. Supported angles are 90°, 180° or -90° clockwise.

4.2.1.3.3   Activity – Today's Worklist

The worklist contains scheduling information for patients. Query Modality Worklist is used to search for the right scheduling information for this instrument. An operator has two options to perform this activity.

4.2.1.3.3.1   Description and Sequencing of Activities

"Today's Worklist"

     The Application Software performs a query with predefined query keys. The applied query keys are:

Table 4-6 Modality Worklist Query for Today's Patients

Tag	Attribute Name	Description
(0040,0100)	Scheduled Procedure Step Sequence	
>(0040,0001)	Scheduled Station Application Entity Title	AE Title as configured for the selected FORUM LINK net station.
>(0040,0002)	Scheduled procedure Step Start Date	Today's Date

Worklist items returned by the Modality Worklist AE are displayed in the results list.

Figure 4-3 Today's Worklist Query
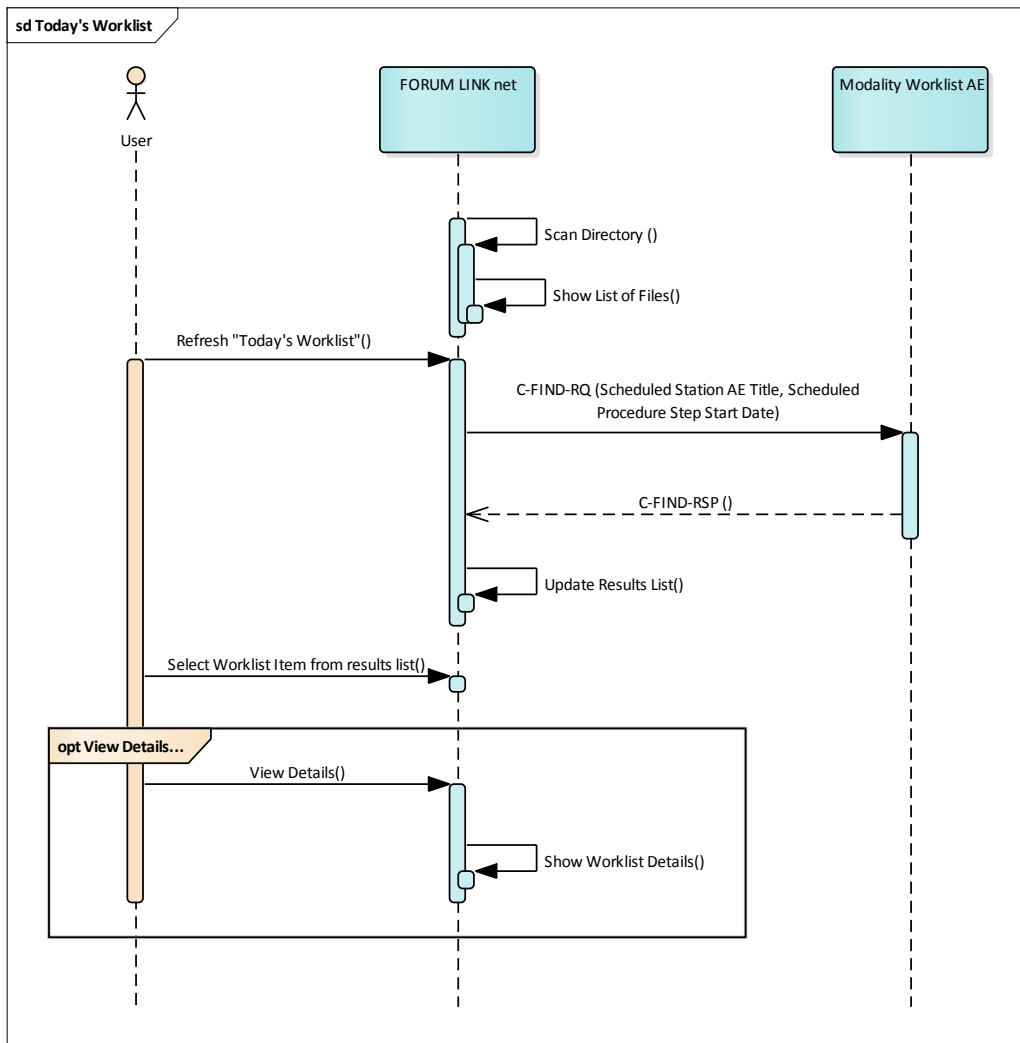
Refresh "Today's Worklist"

> The operator triggers the Modality Worklist search by pressing the "Refresh" button. The Application Software sends a DICOM C-FIND request, which contains the predefined search criteria as configured in the configuration screen. The FORUM LINK net Software waits for the response from the partner Application Entity. FORUM LINK net will accept up to a configurable number of matches. The Application Software checks whether the number of received worklist items overstepped the configurable limit. If the number of received worklist items overstepped the limit, then the Application Software sends a C-CANCEL-RQ, then an A-RELEASE-RQ to the service provider and a message is displayed. Despite this warning, the operator gets results in the result-list.

> After receiving the response, the pick-list is updated. The result-list provides the most important information for a quick overview (see section 0 for the supported set of tags).

Select Worklist Item from Result List

> The operator can select a patient in the pick-list and associates the files listed in the scan directory with the selected worklist item.

View Details

> A detailed view allows a closer look at the selected worklist item. The operator can see more information about patient and scheduling information.

4.2.1.3.3.2 Proposed Presentation Contexts

Following presentation contexts are offered for each initiated association. During this activity the Application Software uses only

▪ "Modality Worklist Information Model - FIND" with Transfer Syntax ILE as SCU

Table 4-7 Proposed Presentation Contexts for Activity Today's Worklist

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID 1.2.840.10008. ...**	**Name List**	**UID List 1.2.840.10008. ...**		
Verification	1.1	ILE	1.2	BOTH	No
Multi-frame True Color Secondary Capture Image Storage	5.1.4.1.1.7.4	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
		JPG-1	1.2.4.50	SCU	No
Encapsulated PDF Storage	5.1.4.1.1.104.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Patient Root Query/Retrieve Information Model – FIND	5.1.4.1.2.1.1	ILE	1.2	SCU	No
Study Root Query/Retrieve Information Model - FIND	5.1.4.1.2.2.1	ILE	1.2	SCU	No
Modality Worklist Information Model – FIND	5.1.4.31	ILE	1.2	SCU	No

4.2.1.3.3.3 SOP Specific Conformance for Modality Worklist SOP Class

Table 4-8 Modality Worklist C-FIND Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	The Software Application stops receiving worklist items. It finally updates the results list.
Pending	Matches are continuing	FF00, FF01	The Application Software checks whether the number of received worklist items overstepped the configurable limit. If yes, gathering is canceled (C-CANCEL-RQ is sent) and the partial search result gets displayed along with a message informing the user about additional results being on the server. If the configurable limit is not yet reached, gathering is continued.
*	*	Any other status code	The user gets an error message.

Table 4-9 Modality Worklist C-FIND Communication Failure Behavior

Exception	Behavior
DIMSE response timeout	The Association is aborted using A-ABORT. The reason is written to the log file. A user alert message is displayed.
Network Timeout	The Application Software is unable to connect to the remote Application Entity. The reason is written to the log file. A user alert message is displayed.
Maximum Association Idle Time exceeded	The Artim timer expires and the socket is closed. The reason is written to the log file.

Table 4-10 Attributes involved in Modality Worklist C-FIND request and response

Tag	Tag Name	Query Keys Matching	Mandatory Query Keys Return	Imported	Displayed in List	Displayed in Details	Copied into SOP Instance
	Scheduled Procedure Step (SPS)						
(0040,0100)	Scheduled Procedure Step Sequence		X				
>(0040,0001)	Scheduled Station Application Entity Title	X					
>(0040,0003)	Scheduled Procedure Step Start Time		X	X		X	
>(0040,0002)	Scheduled Procedure Step Start Date	X	X	X		X	
>(0008,0060)	Modality			X	X	X	
>(0040,0006)	Scheduled Performing Physicians Name			X		X	
>(0040,0007)	Scheduled Procedure Step Description		X[1]	X	X	X	X
>(0040,0010)	Scheduled Station Name						
>(0040,0011)	Scheduled Procedure Step Location						
>(0040,0008)	Scheduled Protocol Code Sequence		X[1]	X		X	X

Tag	Description						
>>(0008,0100)	Code Value		X*	X		X	X
>>(0008,0102)	Coding Scheme Designator		X*	X		X	X
>>(0008,0103)	Coding Scheme Version			X		X	X
>>(0008,0104)	Code Meaning			X		X	X
>(0040,0012)	Pre-Medication						
>(0040,0009)	Scheduled Procedure Step ID		X	X		X	X
>(0032,1070)	Requested Contrast Agent						
>(0040,0020)	Scheduled Procedure Step Status						
Requested Procedure							
(0040,1001)	Requested Procedure ID		X	X	X	X	X
(0032,1060)	Requested Procedure Description		X²	X		X	X
(0032,1064)	Requested Procedure Code Sequence		X²	X		X	X
>(0008,0100)	Code Value		X*	X		X	X
>(0008,0102)	Coding Scheme Designator		X*	X		X	X
>(0008,0103)	Coding Scheme Version			X		X	X
>(0008,0104)	Code Meaning			X		X	X
(0020,000D)	Study Instance UID		X	X			X
(0008,0020)	Study Date			X			X
(0008,0030)	Study Time			X			X
(0008,1110)	Referenced Study Sequence			X			X
>(0008,1150)	Referenced SOP Class UID		X*	X			X
>(0008,1155)	Referenced SOP Instance UID		X*	X			X
(0040,1003)	Requested Procedure Priority						
(0040,1004)	Patient Transport Arrangements						
(0040,1400)	Requested Procedure Comments			X		X	
Imaging Service Request							
(0008,0050)	Accession Number			X	X	X	X
(0032,1032)	Requesting Physician			X		X	X
(0008,0090)	Referring Physicians Name			X		X	X
Visit Identification							
(0038,0010)	Admission ID						
Visit Status							
(0038,0300)	Current Patient Location						
Visit Relationship							
(0008,1120)	Referenced Patient Sequence						
>(0008,1150)	Referenced SOP Class UID						
>(0008,1155)	Referenced SOP Instance UID						
Patient Identification							
(0010,0010)	Patient's Name[1]		X	X	X	X	X
(0010,0020)	Patient ID		X	X	X	X	X
(0010,0021)	Issuer of Patient ID			X	X	X	X
(0010,1000)	Other Patient IDs			X		X	X

Patient Demographic							
(0010,0030)	Patient's Birth Date			X	X	X	X
(0010,0040)	Patient's Sex			X	X	X	X
(0010,1030)	Patient's Weight						
(0040,3001)	Confidentiality Constraint on Patient Data Description						
(0010,2160)	Ethnic Group			X		X	X
(0010,4000)	Patient Comments			X		X	X
Patient Medical							
(0038,0500)	Patient State						
(0010,21C0)	Pregnancy Status						
(0010,2000)	Medical Alerts						
(0010,2110)	Allergies						
(0038,0050)	Special Needs						

Note 1: Only name components of the alphabetic group are displayed in the GUI, but the entire name including all five components of all three component groups are imported and copied into the storage SOP Instance.

Values of column "Mandatory Query Keys Return":

X

> The tag shall be present in the Modality Worklist C-FIND response. If any required tag is missing the relevant Modality Worklist C-FIND response item (Scheduled Procedure Step) will be ignored and not imported by the application software.

X*

> The tag shall be present in the Modality Worklist C-FIND response if its enclosing sequence is present. If any required tag is missing the relevant Modality Worklist C-FIND response item (Scheduled Procedure Step) will be ignored and not imported by the application software.

X[1]

> Either the Scheduled Procedure Step Description (0040,0007) or the Scheduled Protocol Code Sequence (0040,0008) or both shall be present in the Modality Worklist C-FIND response according to the DICOM standard. The application software does not check the presence of these attributes.

X[2]

> Either the Requested Procedure Description (0032,1060) or the Requested Procedure Code Sequence (0032,1064) or both shall be present in the Modality Worklist C-FIND response. The application software does not check the presence of these attributes.

4.2.1.3.4   Activity – Find Patient

Query is used to get patient information from a DICOM server.

4.2.1.3.4.1   Description and Sequencing of Activities

Figure 4-4 Find patient
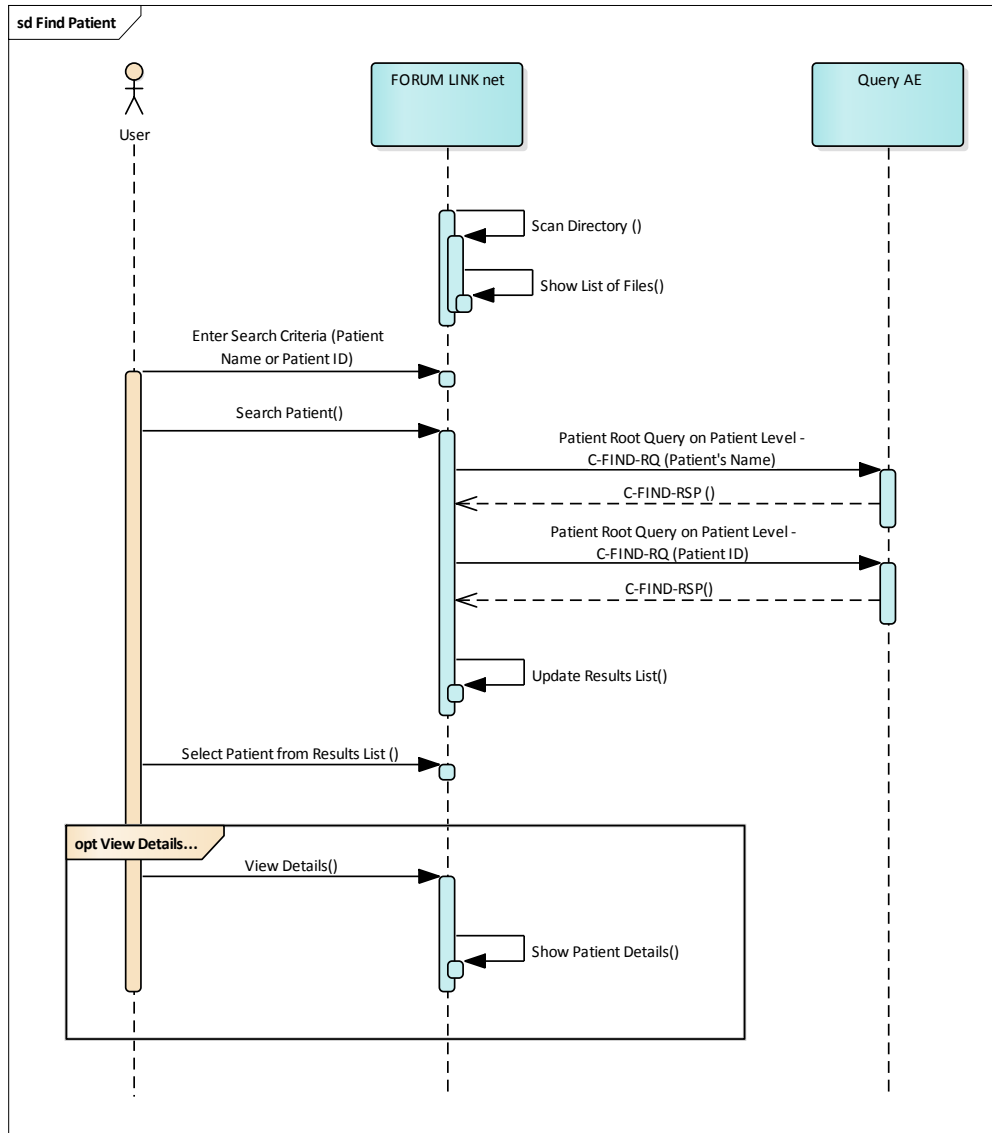
Find Patient

     The activity "Search Patient" can be triggered by the operator at any time by using the search functionality on the "Find Patient" tab.

Enter Search Criteria

     The operator can interactively query for patients. The GUI allows the user to enter patient name or patient id in a search field. The search criteria entered will be mapped to the following two DICOM query keys:

(0010,0010)   Patient's Name

(0010,0020)   Patient ID

The queries are issued as two separate C-FIND-requests.

For more details on supported query keys see Table 4-15 Query key details.

Search Patient

> The operator triggers the search after he or she filled in search criteria and pressed the "Search" button. The Application Software sends a Patient Root Query based DICOM C-FIND-RQ which contains the entered search criteria. The Application Software waits for the response from the Query Provider and accepts up to a configurable number of matches. If the number of matches exceeds this limit, the Application Software shows an information about truncated search results and a request to apply more specific query keys. Despite this warning, the operator gets results in the results list.
>
> After receiving the response, the patient results list is updated. The patient results list provides the most important information for a quick overview: Patient Name, Patient ID, Issuer of Patient ID, Date of Birth, and Gender.
>
> The operator can start over, redefine query keys and trigger the query again. This can be performed as often as required, until he or she finds the correct patient entry.
>
> **Important note:** If no search criteria is entered an unconstraint DICOM Patient Root Query will be issued to the Query Provider. An unconstraint query can have negative influence on the performance and is not recommended.

Select Patient from Results List

> The operator can then select one single patient.

View Details

> Once a patient is selected from the results list, the operator has the option to display more details for the selected patient by clicking the "Details" button. In addition to Patient Name, Patient ID, Issuer of Patient ID, Date of Birth and Gender also Ethnic Group, Other Patient IDs and Patient Comments are shown.

4.2.1.3.4.2 Proposed Presentation Contexts

Following presentation contexts are offered for each initiated association. During this activity the Application Software uses only

- ▪ "Patient Root Query/Retrieve Information Model - FIND" with Transfer Syntax ILE as SCU

Table 4-11 Proposed Presentation Contexts for Activity Find Patient

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID 1.2.840.10008. ...**	**Name List**	**UID List 1.2.840.10008. ...**		
Verification	1.1	ILE	1.2	BOTH	No
Multi-frame True Color Secondary Capture Image Storage	5.1.4.1.1.7.4	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
		JPG-1	1.2.4.50	SCU	No
Encapsulated PDF Storage	5.1.4.1.1.104.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Patient Root Query/Retrieve Information Model – FIND	5.1.4.1.2.1.1	ILE	1.2	SCU	No
Study Root Query/Retrieve Information Model - FIND	5.1.4.1.2.2.1	ILE	1.2	SCU	No
Modality Worklist Information Model – FIND	5.1.4.31	ILE	1.2	SCU	No

4.2.1.3.4.3 SOP Specific Conformance for Patient Root and Study Root Query/Retrieve SOP Class as SCU

Table 4-12 Query C-FIND Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	The Application Software finishes receiving query results. It finally updates the pick list.
Pending	Matches are continuing	FF00, FF01	The Application Software checks whether the number of received responses overstepped the configurable limit. If yes, gathering is canceled (C-CANCEL-RQ is sent) and the partial search result gets displayed along with a message informing the user about additional results being on the server. If the configurable limit is not yet reached, gathering is continued.
Refused	Out of Resources	A700	An error message is shown to the operator. The Application Software logs this event and gives up. The pick-list is then empty.
Failure	Identifier does not match SOP Class	A900	
Failure	Unable to process	C000 - CFFF	
Cancel	Matching terminated due to Cancel request	FE00	
*	*	Any other status code	

Table 4-13 Query C-FIND Communication Failure Behavior

Exception	Behavior
DIMSE response timeout	The Association is aborted using A-ABORT. The reason is written to the log file. A user alert message is displayed.
Network Timeout	The Application Software is unable to connect to the remote Application Entity. The reason is written to the log file. A user alert message is displayed.
Maximum Association Idle Time exceeded	The Artim timer expires and the socket is closed. The reason is written to the log file.

Table 4-14 PATIENT level keys for the Patient Root Query/Retrieve Information Model (request and response)

Tag	Tag Name	Query Keys Matching	Query Keys Return	Imported	Displayed	Copied into SOP Instance
(0010,0010)	Patient's Name[1]	X	X*	X	X, D	X
(0010,0020)	Patient ID	X	X*	X	X, D	X
(0010,0021)	Issuer of Patient ID		X	X	X, D	X
(0010,0030)	Patient's Birth Date		X	X	X, D	X
(0010,0040)	Patient's Sex		X	X	X, D	X
(0010,1000)	Other Patient IDs		X	X	D	X
(0010,2160)	Ethnic Group		X	X	D	X

(0010,4000)	Patient Comments		X	X	D	X

Note [1]: Only name components of the alphabetic group are displayed in the GUI per default, but the entire name including all five components of all three component groups are imported and copied into the storage SOP Instance.

Values of column "Query Keys Matching":

X

     The value is included in the query request as matching key if not empty.

Values of column "Query Keys Return":

X

     The tag is included in the Patient Root Query/Retrieve C-FIND request as a return key (zero-length).

X*

     The tag is included in the Patient Root Query/Retrieve C-FIND request as a return key (zero-length) only in case no search criteria has been entered in the GUI. The query triggered results in an unconstraint query.

Values of column "Imported":

X

     The value gets imported in the application. Thus this value may have influence in Information Objects which will be created as a result of the performed examination.

Values of column "Displayed":

X

     Values of this tag are instantly visible in the results list.

D

     Values of this tag are visible in the details screen only.

Values of column SOP Instance:

X

     Values of marked tags will be stored in the created SOP Instances. See section "mapping of attributes" in 8.1.3 Attribute Mapping.

Table 4-15 Query key details

Tag	Tag Name	Description
(0010,0010)	Patient's Name	The default value is empty string.
		Wildcards "*" or "?" can be entered anywhere in the search field to perform a more flexible search. A trailing wildcard "*" is automatically added if not specified by the operator.
		A caret "^" character (5EH) or comma "," in a search value is interpreted as delimiter between name components, i.e. family name, given name, middle name, name prefix, name suffix.
		A search value may contain the equal sign "=", but only the alphabetic group of a search value is taken into account, i.e. the equal sign and all following characters are ignored.
		This is a DICOM Standard query key on Patient level.
(0010,0020)	Patient ID	The default value is empty string.
		The operator can enter each value that conforms to the Value Representation LO.
		Wildcards "*" or "?" can be entered anywhere in the search field to perform a more flexible search. By default no trailing wildcard "*" is automatically added, but needs to get specified explicitly by the operator.
		This is a DICOM Standard query key on Patient level.

4.2.1.3.5 Activity – New Patient

The activity "New Patient" can be triggered by the operator at any time if no other activity is in progress.

This activity has no direct effect on DICOM messaging.

During this activity, the Application Software allows the operator to enter patient demographics. The patient created by this operation is subject to fill the DICOM header of the DICOM file created during the next "Send data" activity.

This activity corresponds to the unscheduled case and shall only be used as fallback as the approach is much more error prone than the scheduled case (Today's Worklist).

4.2.1.3.6 Activity – Last Patient

The activity "Last Patient" can be triggered by operator at any time if no other activity is in progress.

This activity has no direct relation to DICOM messaging.

During this activity, the Application Software provides a list of patients for which the "Send data" activity has been recently performed. The same patient information and possibly worklist data of the selected patient is then subject to fill the DICOM header of the DICOM file created during the next "Send data" activity.

DICOM files created for patients selected from the "Last Patients" tab have a newly generated study if the patient data originated from an unscheduled case. If the last patient data originated from a scheduled case, the DICOM files are added to the same study as the DICOM files previously sent for the same patient and also include the copied Modality Worklist information.

4.2.1.3.1 Activity – Discard Data

The activity "Discard Data" can be triggered by the operator at any time, if no other activity is in progress and if the scan directory of the selected station contains files of the supported file type.

This activity has no direct relation to DICOM messaging.

Discard single files
> The active station tab shows a list of files located in the scan directory. If the operators selects one dedicated line in this list and clicks on the button "Discard", the selected file is removed from the scan directory without any further notice.

Discard all files in the station's scan directory
> In case the operator clicks on the "Discard All" button, all files in the active scan directory are removed from the scan directory without any further notice.

The files discarded are not permanently deleted but moved into a subdirectory (.\discarded\<YYYYMMDD>) of the stations scan folder.

4.2.1.3.2 Activity – Send Data

The activity "Send data" can be triggered by the operator when the following two pre-requisites are fulfilled:

- Data in one of the following formats is available in the scan-directory configured for the selected station: PDF, JPG, BMP, GIF, PNG or TIFF.
- A Patient or Worklist Item has been selected from one of the four patient tabs: Today's Worklist, Find Patient, New Patient, Last Patients.

4.2.1.3.2.1 Description and Sequencing of Activities

Figure 4-5 Send data
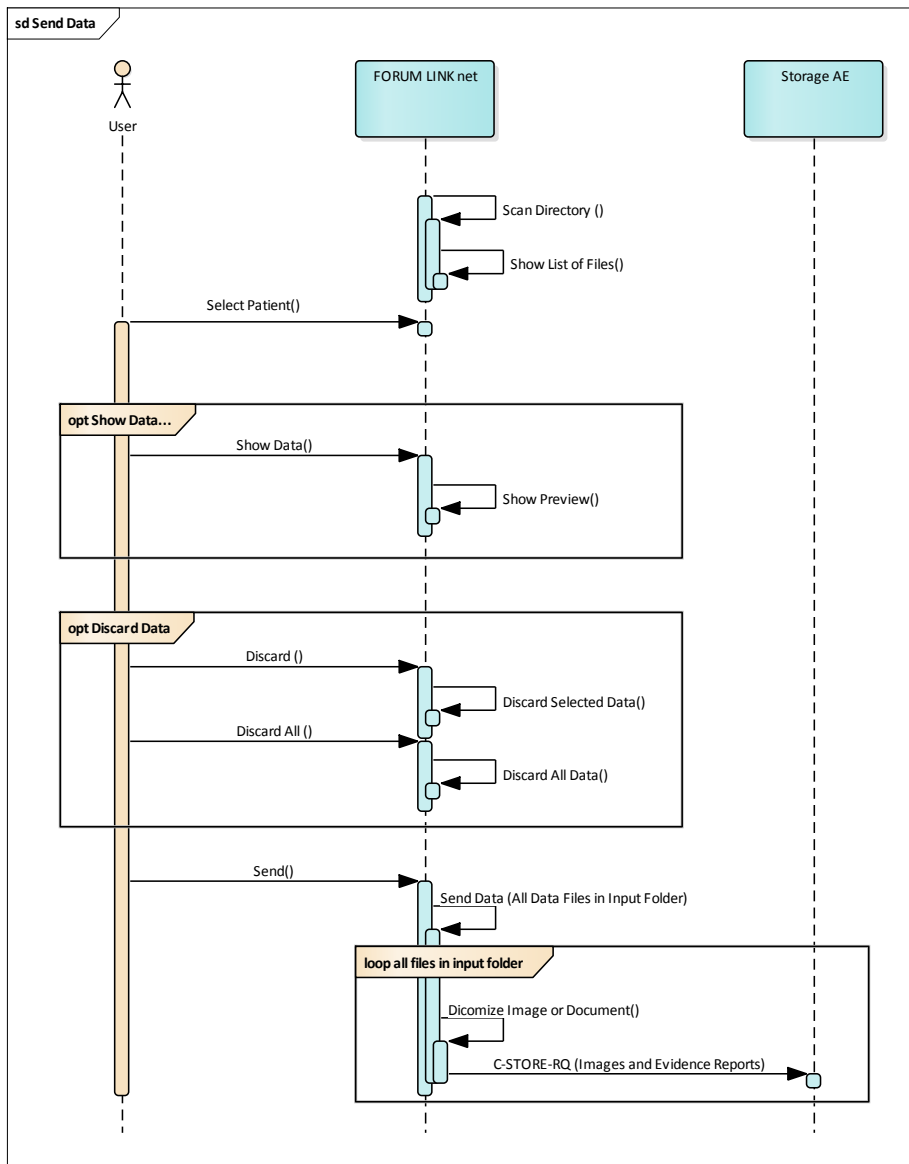
"Send Data"

    The activity "Send data" can be triggered by the operator as soon as a file is available in one of the scan directories and the corresponding patient information has been selected. The patient information can result from the following activities: Today's Worklist, Find Patient, New Patient or Last Patients.

    The currently active patient information is then subject to fill the DICOM header created during the "Send data" activity.

    In case the input file is a PDF document, the "Send data" activity creates an Encapsulated PDF DICOM object. If the input file is a JPG, BMP, GIF, PNG or TIFF image, the application creates a Multi-frame True Color Secondary Capture DICOM object. The newly created DICOM object is sent to the configured Storage Provider.

    After the DICOM objects have been successfully sent, the original files are moved from the station's scan directory to the subfolder .\transmitted\<YYYYMMDD>.

    In case an error occurs during send, the original files are moved from the station's scan directory to the subfolder .\failed\<YYYYMMDD>.

4.2.1.3.2.2 Proposed Presentation Contexts

Following presentation contexts are offered for each initiated association. During this activity the Application Software uses only

- Encapsulated PDF with Transfer Syntax ELE
- Encapsulated PDF with Transfer Syntax ILE as fallback
- Multi-frame True Color Secondary Capture with Transfer Syntax JPG-1
- Multi-frame True Color Secondary Capture with Transfer Syntax ELE
- Multi-frame True Color Secondary Capture with Transfer Syntax ILE as fallback

Table 4-16 Proposed Presentation Contexts for Activity Send data

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID 1.2.840.10008. ...**	**Name List**	**UID List 1.2.840.10008. ...**		
Verification	1.1	ILE	1.2	BOTH	No
Multi-frame True Color Secondary Capture Image Storage[1]	5.1.4.1.1.7.4	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
		JPG-1	1.2.4.50	SCU	No
Encapsulated PDF Storage[2]	5.1.4.1.1.104.1	ILE	1.2	SCU	No
		ELE	1.2.1	SCU	No
Patient Root Query/Retrieve Information Model – FIND	5.1.4.1.2.1.1	ILE	1.2	SCU	No
Study Root Query/Retrieve Information Model - FIND	5.1.4.1.2.2.1	ILE	1.2	SCU	No
Modality Worklist Information Model – FIND	5.1.4.31	ILE	1.2	SCU	No

[1] In case multiple Transfer Syntaxes are accepted during the Association Acceptance, FORUM LINK net software application chooses JPG-1 for JPEG converted images and ELE for RGB converted images (PNG, BMP, TIFF and GIF). In case JPEG Baseline (JPG-1) is not supported by the Acceptor and a JPEG converted image is supposed to be sent, the software application will report an error and the send operation will fail.

[2] In case multiple Transfer Syntaxes are accepted during the Association Acceptance, FORUM LINK net software application chooses ELE as preferred transfer syntax.

4.2.1.3.2.3 SOP Specific Conformance for Storage SOP Classes

Table 4-17 Storage C-STORE Response Status Handling Behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The Application Software returns from this activity, prompting a success message.
Warning	Coercion of Data Elements	B000	The Application Software returns from this activity, prompting a success message, but logs this event as warning.
Warning	Data Set does not match SOP Class	B007	
Warning	Elements Discarded	B006	
Refused	Out of Resources	A700 – A7FF	

Error	Data Set does not match SOP Class	A900 – A9FF	An error message is shown to the operator. The Application Software logs this event and returns.
Error	Cannot Understand	C000 – CFFF	
*	*	Any other status value	

Table 4-18 C-STORE Communication Failure Behavior

Exception	Behavior
DIMSE response timeout	The Association is aborted using A-ABORT. The reason is written to the log file. A user alert message is displayed.
Network Timeout	The Application Software is unable to connect to the remote Application Entity. The reason is written to the log file. A user alert message is displayed.
Maximum Association Idle Time exceeded	The Artim timer expires and the socket is closed. The reason is written to the log file.

4.2.1.4 Association Acceptance Policy

4.2.1.4.1 Activity – Verify Communication

The activity can be performed at any time. The service is available as soon as the Application Software has been started.

4.2.1.4.1.1 Description and Sequencing of Activities

The Software AE responds to verification requests made by remote AEs.

4.2.1.4.1.2 Accepted Presentation Contexts

Table 4-19 Acceptable Presentation Context for Activity Verify Communication

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID 1.2.840.10008. ...	Name List	UID List 1.2.840.10008. ...		
Verification	… 1.1	ILE	… 1.2	BOTH	No

4.2.1.4.1.3 SOP Specific Conformance for Verification SOP Class as SCP

The Application Software AE provides standard conformance.

4.3 Network Interfaces

4.3.1 Physical Network Interface

The instrument application uses the communication stack as offered by the Operating System.

4.3.2 Additional Protocols

Both IP addresses and host names are supported and get resolved. Else no additional protocols are supported.

4.3.3 IPv4 and IPv6 Support

The FORUM LINK net supports IPv4 and IPv6 Addresses.

4.4 Configuration

Local application entity and remote application entity information can be configured in the Application Configuration -> Networking Tab.

It is also possible to configure timeout, institution, and worklist item limit parameters via the Application Configuration screen.

4.4.1 AE Title/Presentation Address Mapping

The mapping from AE Title to TCP/IP addresses and ports is configurable and set at the time of configuration.

4.4.1.1 Local AE Titles

The IP address cannot be configured in the FORUM LINK net configuration screen, but is administered on the Operating System level.

The Application Entity Title for each of the four stations is configured in the Application -> Configuration -> Institution Tab.

The Application Entity Title of a Station is the leading information and is used in Modality Worklist Queries. As soon as an AE Title has been assigned, the respective station is active and Station Name, Scan Directory and Modality are further mandatory fields that need to get specified.

The local DICOM Listening Port is the same for all four stations and gets configured via the Application -> Configuration -> Networking Tab, "Local Application Entity" section.

The default DICOM Listening Port is 11113.

In case AutoConnect is enabled in both FORUM LINK net and FORUM, the Local AE configuration is registered automatically in the FORUM AE Title Administration.

4.4.1.2 Remote AE Titles

The mapping of external AE Titles to TCP/IP addresses and ports is configurable. The FORUM LINK net Application Software allows setting up a remote Application Entity for a combined Storage and Query Provider and a separate one for the Modality Worklist Service. For all Application Entities, the host name or IP, the Port and the Application Entity Title must be known.

- Remote Application Entity: Storage / Query Provider
    - „AE Title", Default: CZMA
    - „IP Address", Default: 127.0.0.1
    - „Port", Default: 11119
- Remote Application Entity: Worklist Provider
    - „AE Title", Default: CZMAMWL
    - „IP Address", Default: 127.0.0.1

o „Port", Default: 11119

In case AutoConnect is enabled in both FORUM LINK net and FORUM, the configuration of Remote Application Entities can be performed automatically using the AutoConnect button.

4.4.2 Parameters

4.4.2.1 General Parameters

The general parameters are shared for associations to any of the configured AE.

Table 4-20 Configuration Parameters Table

Parameter	Configurable (Yes/No)	Default Value
General Parameters		
DIMSE RSP Timeout	Yes (10 – 60 sec.)	20 sec
Network Timeout	Yes (5-20 sec.)	5 sec.
Max. Association Idle Time	Yes (10 – 60 sec.)	30 sec
Network log level	Yes (TRACE; DEBUG, INFO, WARN, ERROR, FATAL)	INFO
(0008,0080) Institution Name	Yes	Empty
(0008,1040) Institutional Department Name	Yes	Empty
(0008,0081) Institution Address	Yes	Empty
(0008,1010) Station Name	Yes	Empty
(0008,0060) Modality	Yes (AR, DOC, GM, IOL, IOP, KER, LEN, OAM, OP, OPM, OPT, OPV, OT, SRF, US, VA, XC)	Empty
(0008,0070) Manufacturer	Yes	Empty
(0008,1090) Model Name	Yes	Empty
Laterality	Yes • (0020,0060) Series Laterality (L or R) or • (0020,0062) Image Laterality (L, R or B) or • No Laterality Attribute	Series Laterality (L or R)
(0008,103E) Series Description	Yes	Empty
(0042,0010) PDF Document Title	Yes	Empty
(22A1,xx01) PDF Document Type	Yes	Empty
(0020,4000) Image Comments	Yes	Empty
AE Specific Parameters		
Modality Worklist SCU Parameters		
Maximum Query Responses (Modality Worklist IM, Patient Root Q/R Information Model and Study Root Q/R Information Model)	Yes (10-999)	100
Automatic MWL update	No	Only Manual

Scheduled Station AE Title (Today's Worklist Query)	Depends on currently active Station	Same as active Station AE Title
Scheduled Procedure Step Start Date (Today's Worklist Query)	No	Today
Patient Root Q/R SCU Parameters		
Maximum Query Responses (Modality Worklist IM, Patient Root Q/R Information Model and Study Root Q/R Information Model)	Yes (10-999)	100
Storage SCP Parameters		
No specific configuration required The configuration of port number and Application Entity Title are part of the Local Application Entity setup (see 4.4.1.1 Local AE Titles).		
Verification SCP Parameters		
No specific configuration required The configuration of port number and Application Entity Title are part of the Local Application Entity setup (see 4.4.1.1 Local AE Titles).		

5   Media Interchange

Media Interchange is not scope of this document since Media Interchange is not supported by FORUM LINK net Application Software.

6 Support of Character Sets

All application entities described in the previous chapters support UTF-8 character set.

Table 6-1 Supported Character Set

Supported Specific Character Set	
Character Set Description	**Defined Term**
UTF-8 encoded Unicode	ISO_IR 192

7   Security

The DICOM capabilities of the FORUM LINK net Application Software do not support any specific security measures.

- It is assumed that FORUM LINK net Application Software is used within a secured environment. It is assumed that a secured environment includes at a minimum Firewall or router protections to ensure that only approved external hosts have network access to FORUM LINK net Application Software

- Firewall or router protections to ensure that FORUM LINK net Application Software only has network access to approve external hosts and services.

- Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN))

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

8   Annexes

8.1 IOD Contents

8.1.1   Created SOP Instance(s)

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

ALWAYS
> Module is always present

NEVER
> Module is never present

Abbreviations used for presence of values:

VNAP
> Value Not Always Present (attribute sent zero length if no value is present), applicable for Type 2 and 2C attributes

ANAP
> Attribute is not always present, applicable for Type 3 attributes

ALWAYS
> Attribute is always present with a value, applicable for all types of attributes

EMPTY
> Attribute is sent without a value, applicable for Type 2 attributes

Abbreviations used for sources of data:

USER
> The attribute value source is from User input.

AUTO
> The attribute value is generated automatically.

MWL
> The attribute value is the same as the value received using a DICOM Modality Worklist service.

CONFIG
> The attribute value source is a configurable parameter.

PRQ
> The attribute value is same as the value received using a DICOM Patient Root Query service.

8.1.1.1 Encapsulated Pdf IOD

Table 8-1 Encapsulated Pdf IOD – Module Overview

IE	Module	Usage	Presence of Module
Patient	Patient	MANDATORY	ALWAYS
	Clinical Trial Subject	OPTIONAL	NEVER
Study	General Study	MANDATORY	ALWAYS
	Patient Study	OPTIONAL	NEVER
	Clinical Trial Study	OPTIONAL	NEVER
Series	Encapsulated Document Series	MANDATORY	ALWAYS
	Clinical Trial Series	OPTIONAL	NEVER
	Czm Encapsulated Pdf Series Extension	OPTIONAL	ALWAYS
Equipment	General Equipment	MANDATORY	ALWAYS
	Sc Equipment	MANDATORY	ALWAYS
Encapsulated Document	Encapsulated Document	MANDATORY	ALWAYS
	Sop Common	MANDATORY	ALWAYS
	Czm Encapsulated Pdf Instance Extension	OPTIONAL	ALWAYS
	Specialized Encapsulated Document	OPTIONAL	ALWAYS

8.1.1.2 Multi-frame True Color Secondary Capture Image IOD

Table 8-2 Multi-frame True Color Secondary Capture Image IOD, Module Overview

IE	Module	Usage	Presence of Module
Patient	Patient	MANDATORY	ALWAYS
	Clinical Trial Subject	OPTIONAL	NEVER
Study	General Study	MANDATORY	ALWAYS
	Patient Study	OPTIONAL	NEVER
	Clinical Trial Study	OPTIONAL	NEVER
Series	General Series	MANDATORY	ALWAYS
	Clinical Trial Series	OPTIONAL	NEVER
Frame of Reference	Frame Of Reference	CONDITIONAL	NEVER
	Synchronization	OPTIONAL	NEVER
Equipment	General Equipment	OPTIONAL	ALWAYS
	Sc Equipment	MANDATORY	ALWAYS
Image	General Image	MANDATORY	ALWAYS
	Image Pixel	MANDATORY	ALWAYS
	Cine	CONDITIONAL	NEVER
	Multi Frame	MANDATORY	ALWAYS
	Frame Pointers	OPTIONAL	NEVER
	Device	OPTIONAL	NEVER
	Multi Frame Functional Groups	OPTIONAL	NEVER
	Multi Frame Dimension	OPTIONAL	NEVER
	Specimen	OPTIONAL	NEVER
	Sc Image	OPTIONAL	NEVER
	Sc Multi Frame Image	MANDATORY	ALWAYS
	Sc Multi Frame Vector	CONDITIONAL	NEVER
	Icc Profile	OPTIONAL	NEVER
	Sop Common	MANDATORY	ALWAYS
	Frame Extraction	CONDITIONAL	NEVER
	Czm Multi Frame True Color Sc Image Extension	OPTIONAL	ALWAYS

8.1.1.3 Common Modules

Table 8-3 Module "Patient" of Created SOP Instance

Attribute Name	Tag	VR	Value	PoV	Source
Patient's Name	(0010,0010)	PN	All 3 Person Name component groups are copied from MWL or PRQ as provided. User input is only possible for all name components of the alphabetic group per default.	VNAP	USER, MWL, PRQ
Patient ID	(0010,0020)	LO	Primary hospital identification number or code for the patient.	VNAP	USER, MWL, PRQ
Issuer of Patient ID	(0010,0021)	LO	Identifier of the Assigning Authority copied from MWL or PRQ. Newly created patient records have default value "LINKnet" which can be changed or removed by user input.	ANAP	USER, MWL, PRQ
Patient's Birth Date	(0010,0030)	DA	Birth date of the patient.	VNAP	USER, MWL, PRQ
Patient's Sex	(0010,0040)	CS	Sex of the named patient. Enumerated Values: M = male F = female O = other	VNAP	USER, MWL, PRQ
Other Patient IDs	(0010,1000)	LO	All Other Patient IDs are copied from MWL or PRQ as provided. User input is possible for a single other patient ID.	ANAP	USER, MWL, PRQ
Ethnic Group	(0010,2160)	SH	Ethnic group or race of the patient.	ANAP	USER, MWL, PRQ
Patient Comments	(0010,4000)	LT	User-defined additional information about the patient.	ANAP	USER, MWL, PRQ

Table 8-4 Module "General Study" of Created SOP Instances

Attribute Name	Tag	VR	Value	PoV	Source
Study Instance UID	(0020,000D)	UI	Provided value from MWL in scheduled case. Generated UID in unscheduled case with root 1.2.276.0.75.2.5.60.25.1.	ALWAYS	MWL, AUTO
Study Date	(0008,0020)	DA	Copy from Study Date attribute in MWL response if both Study Date and Time are available, otherwise generated value.	ALWAYS	MWL, AUTO
Study Time	(0008,0030)	TM	Value copied from Study Date attribute in MWL response if both Study Date and Time are available, otherwise generated value.	ALWAYS	MWL, AUTO
Referring Physician's Name	(0008,0090)	PN	Value copied from corresponding MWL attribute.	VNAP	MWL
Study ID	(0020,0010)	SH	Value copied from Requested Procedure ID (0040,1001) in MWL or generated in unscheduled case.	ALWAYS	MWL, AUTO
Accession Number	(0008,0050)	SH	Value copied from corresponding MWL attribute. User may input a value in unscheduled case.	VNAP	MWL, USER

Study Description	(0008,1030)	LO	Value copied from Requested Procedure Description (0032,1060) in MWL.	ANAP	MWL
Physician(s) of Record	(0008,1048)	PN	Value copied from Requesting Physician (0032,1032) in MWL.	ANAP	MWL
Referenced Study Sequence	(0008,1110)	SQ	Value copied from corresponding MWL attribute.	ANAP	MWL
> Referenced SOP Class UID	(0008,1150)	UI	Value copied from corresponding MWL attribute.	ALWAYS	MWL
> Referenced SOP Instance UID	(0008,1155)	UI	Value copied from corresponding MWL attribute.	ALWAYS	MWL
Procedure Code Sequence	(0008,1032)	SQ	Value copied from Requested Procedure Code Sequence (0032,1064) in MWL.	ANAP	MWL
> Include 'Code Sequence Macro'.			Value copied from corresponding MWL attributes.	ALWAYS	MWL

Table 8-5 Module "General Equipment" of Created SOP Instances

Attribute Name	Tag	VR	Value	PoV	Source
Manufacturer	(0008,0070)	LO	Manufacturer of the equipment that produced the composite instances.	VNAP	CONFIG
Institution Name	(0008,0080)	LO	Institution where the equipment that produced the composite instances is located.	ALWAYS	CONFIG
Institution Address	(0008,0081)	ST	Mailing address of the institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
Station Name	(0008,1010)	SH	User defined name identifying the machine that produced the composite instances.	ALWAYS	CONFIG
Institutional Department Name	(0008,1040)	LO	Department in the institution where the equipment that produced the composite instances is located.	ANAP	CONFIG
Manufacturer's Model Name	(0008,1090)	LO	Manufacturer's model name of the equipment that produced the composite instances.	ANAP	CONFIG
Device Serial Number	(0018,1000)	LO		NEVER	
Software Version(s)	(0018,1020)	LO		NEVER	

8.1.1.4 Encapsulated PDF Modules

Table 8-6 Module "Encapsulated Document Series" of Created Encapsulated PDF SOP Instance

Attribute Name	Tag	VR	Value	PoV	Source
Modality	(0008,0060)	CS	Defined Terms: AR = Autorefraction DOC = Document GM = General Microscopy IOL = Intraocular Lens Data IOP = Intraocular Pressure KER = Keratometry LEN = Lensometry OAM = Ophthalmic Axial Measurements OP = Ophthalmic Photography OPM = Ophthalmic Mapping OPT = Ophthalmic Tomography OPV = Ophthalmic Visual Field OT = Other SRF = Subjective Refraction US = Ultrasound VA = Visual Acuity XC = External Camera Photography	ALWAYS	CONFIG
Series Instance UID	(0020,000E)	UI	Generated UID with root 1.2.276.0.75.2.5.60.25.2.	ALWAYS	AUTO
Series Number	(0020,0011)	IS	A consecutive number 1, 2, 3,… that identifies the Series produced on this equipment within a Study. New Series get triggered for each "Send". Different Series are created for images and reports as well as for different laterality values if laterality information gets stored on series level.	ALWAYS	AUTO
Series Description	(0008,103E)	LO	Description of the Series.	ANAP	CONFIG
Request Attributes Sequence	(0040,0275)	SQ	Sequence that contains attributes from the Imaging Service Request. A single Item is included in this sequence.	ANAP	MWL
> Requested Procedure ID	(0040,1001)	SH	Identifier that identifies the Requested Procedure in the Imaging Service Request. Value copied from corresponding MWL attribute.	ALWAYS	MWL
> Requested Procedure Description	(0032,1060)	LO	Value copied from corresponding MWL attribute.	ANAP	MWL
> Requested Procedure Code Sequence	(0032,1064)	SQ	Item copied from corresponding MWL attribute.	ANAP	MWL
>> Include 'Code Sequence Macro'.			Values copied from corresponding MWL attributes.	ALWAYS	MWL
> Scheduled Procedure Step ID	(0040,0009)	SH	Identifier that identifies the Scheduled Procedure Step. Value copied from corresponding MWL attribute.	ALWAYS	MWL
> Scheduled Procedure Step Description	(0040,0007)	LO	Values copied from corresponding MWL attributes.	ANAP	MWL

> Scheduled Protocol Code Sequence	(0040,0008)	SQ	Item(s) copied from corresponding MWL attribute.	ANAP	MWL
>> Include 'Code Sequence Macro'.			Values copied from corresponding MWL attributes.	ALWAYS	MWL

Table 8-7 Module "Czm Encapsulated Pdf Series Extension" of Created Encapsulated PDF SOP Instance

Attribute Name	Tag	VR	Value	PoV	Source
Laterality	(0020,0060)	CS	Laterality of (paired) body part examined in case configuration is set to store laterality as Series Laterality. Possible values are: R = right L = left Attribute is missing if user chooses laterality "undefined" or configuration is set to store laterality as Image Laterality. B = both is not used.	ANAP	USER

Table 8-8 Module "Sc Equipment" of Created Encapsulated PDF SOP Instance

Attribute Name	Tag	VR	Value	PoV	Source
Conversion Type	(0008,0064)	CS	Describes the kind of image conversion. DI = Digital Interface	ALWAYS	AUTO
Secondary Capture Device Manufacturer	(0018,1016)	LO	Carl Zeiss Meditec	ALWAYS	AUTO
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	LO	FORUM LINK net	ALWAYS	AUTO
Secondary Capture Device Software Version(s)	(0018,1019)	LO	<major>.<minor>.<patch>.<revision> For example: 2.0.0.7875	ALWAYS	AUTO

Table 8-9 Module "Encapsulated Document" of Created Encapsulated PDF SOP Instance

Attribute Name	Tag	VR	Value	PoV	Source
Instance Number	(0020,0013)	IS	A consecutive number 1, 2, 3, … that identifies this SOP Instance within a series produced on this equipment.	ALWAYS	AUTO
Content Date	(0008,0023)	DA	The date the document content creation was started taken from last modified date of the file.	ALWAYS	ACQUISITION
Content Time	(0008,0033)	TM	The time the document content creation was started taken from last modified date of the file.	ALWAYS	ACQUISITION
Acquisition Datetime	(0008,002A)	DT	The date and time that the original generation of the data in the document started.	ALWAYS	USER
Image Laterality	(0020,0062)	CS	Laterality of (paired) body part examined in case configuration is set to store laterality as Image Laterality. Possible	ANAP	USER

Attribute Name	Tag	VR	Value	PoV	Source
			values are: R = right L = left B = both left and right Attribute is missing if user chooses laterality "undefined" or configuration is set to store laterality as Series Laterality. U = unpaired is not used.		
Burned In Annotation	(0028,0301)	CS	Indicates whether or not the encapsulated document contains sufficient burned in annotation to identify the patient and date the data was acquired. Value is always set to YES.	ALWAYS	AUTO
Document Title	(0042,0010)	ST	The title of the document.	VNAP	CONFIG
Concept Name Code Sequence	(0040,A043)	SQ	A coded representation of the document title is not provided.	EMPTY	AUTO
MIME Type of Encapsulated Document	(0042,0012)	LO	The type of the encapsulated document stream described using the MIME Media Type (see RFC 2046). Value always set to: application/pdf	ALWAYS	AUTO
Encapsulated Document	(0042,0011)	OB	Encapsulated Document stream, containing a document encoded according to the MIME Type.	ALWAYS	ACQUISITION

Table 8-10 Module "Sop Common" of Created Encapsulated PDF SOP Instance

Attribute Name	Tag	VR	Value	PoV	Source
SOP Class UID	(0008,0016)	UI	Uniquely identifies the SOP Class. 1.2.840.10008.5.1.4.1.1.104.1	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Uniquely identifies the SOP Instance. Generated UID with root 1.2.276.0.75.2.5.60.25.3.	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS	ISO_IR 192	ALWAYS	AUTO
Instance Creation Date	(0008,0012)	DA	Date the SOP Instance was created.	ALWAYS	AUTO
Instance Creation Time	(0008,0013)	TM	Time the SOP Instance was created.	ALWAYS	AUTO
Content Qualification	(0018,9004)	CS	Content Qualification Indicator. Value set to PRODUCT for an officially released software.	ALWAYS	AUTO

Table 8-11 Module "Czm Encapsulated Pdf Instance Extension" of Created Encapsulated PDF SOP Instance

Attribute Name	Tag	VR	Value	PoV	Source
Image Comments	(0020,4000)	LT	User-defined comments about the document.	ANAP	CONFIG

Table 8-12 Module "Specialized Encapsulated Document" of Created Encapsulated PDF SOP Instance

Group ID: 22A1
Private Creator String: "99CZM_SpecializedEncapsulatedDocument"

Attribute Name	Tag	VR	Value	PoV	Source
document type	(22A1,1001)	LO	User-defined type of the document.	ANAP	CONFIG

Table 8-13 Module "CZM NIM Internal" of Created Encapsulated PDF SOP Instance

Group ID: 2201
Private Creator String: "99CZM_NIM_INTERNAL_01"

Attribute Name	Tag	VR	Value	PoV	Source
lod_name_meta_info	(2201,xx00)	LT	SpecializedEncapsulatedPdf	ALWAYS	AUTO
Czm_xml_version	(2201,xx01)	LT	2.12	ALWAYS	AUTO
private_module_names_and_versions	(2201,xx02)	LT	SpecializedEncapsulatedDocument	ALWAYS	AUTO

8.1.1.5 Multi Frame True Color Secondary Capture Image Modules

Table 8-14 Module "General Series" of Created Multi Frame True Color Sc Image SOP Instances

Attribute Name	Tag	VR	Value	PoV	Source
Series Instance UID	(0020,000E)	UI	Generated UID with root 1.2.276.0.75.2.5.60.25.2.	ALWAYS	AUTO
Series Number	(0020,0011)	IS	A consecutive number 1, 2, 3, … that identifies the Series produced on this equipment within a Study. New Series get triggered for each "Send". Different Series are created for images and reports as well as for different laterality values if laterality information gets stored on series level.	ALWAYS	AUTO
Laterality	(0020,0060)	CS	Laterality of (paired) body part examined in case configuration is set to store laterality as Series Laterality. Possible values are: R = right L = left Attribute is missing if user chooses laterality "undefined" or configuration is set to store laterality as Image Laterality.	ANAP	USER
Series Description	(0008,103E)	LO	Description of the Series.	ANAP	CONFIG
Request Attributes Sequence	(0040,0275)	SQ	Sequence that contains attributes from the Imaging Service Request. A single Item is included in this sequence.	ANAP	MWL
> Requested Procedure ID	(0040,1001)	SH	Identifier that identifies the Requested Procedure in the Imaging Service Request. Value copied from corresponding MWL attribute.	ALWAYS	MWL
> Requested Procedure Description	(0032,1060)	LO	Value copied from corresponding MWL attribute.	ANAP	MWL

> Requested Procedure Code Sequence	(0032,1064)	SQ	Item copied from corresponding MWL attribute.	ANAP	MWL
>> Include 'Code Sequence Macro'.			Values copied from corresponding MWL attributes.	ALWAYS	MWL
> Scheduled Procedure Step ID	(0040,0009)	SH	Identifier that identifies the Scheduled Procedure Step. Value copied from corresponding MWL attribute.	ALWAYS	MWL
> Scheduled Procedure Step Description	(0040,0007)	LO	Values copied from corresponding MWL attributes.	ANAP	MWL
> Scheduled Protocol Code Sequence	(0040,0008)	SQ	Item(s) copied from corresponding MWL attribute.	ANAP	MWL
>> Include 'Code Sequence Macro'.			Values copied from corresponding MWL attributes.	ALWAYS	MWL

Table 8-15 Module "Sc Equipment" of Created Multi Frame True Color Sc Image SOP Instances

Attribute Name	Tag	VR	Value	PoV	Source
Conversion Type	(0008,0064)	CS	Describes the kind of image conversion. DI = Digital Interface	ALWAYS	AUTO
Modality	(0008,0060)	CS	Defined Terms: AR = Autorefraction DOC = Document GM = General Microscopy IOL = Intraocular Lens Data IOP = Intraocular Pressure KER = Keratometry LEN = Lensometry OAM = Ophthalmic Axial Measurements OP = Ophthalmic Photography OPM = Ophthalmic Mapping OPT = Ophthalmic Tomography OPV = Ophthalmic Visual Field OT = Other SRF = Subjective Refraction US = Ultrasound VA = Visual Acuity XC = External Camera Photography	ALWAYS	CONFIG
Secondary Capture Device Manufacturer	(0018,1016)	LO	Carl Zeiss Meditec	ALWAYS	AUTO
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	LO	FORUM LINK net	ALWAYS	AUTO
Secondary Capture Device Software Version(s)	(0018,1019)	LO	<major>.<minor>.<patch>.<revision> For example: 2.0.0.7875	ALWAYS	AUTO

Table 8-16 Module "General Image" of Created Multi Frame True Color Sc Image SOP Instances

Attribute Name	Tag	VR	Value	PoV	Source
Instance Number	(0020,0013)	IS	A consecutive number 1, 2, 3, … that identifies this SOP Instance within a series produced on this equipment.	ALWAYS	AUTO
Patient Orientation	(0020,0020)	CS		EMPTY	AUTO
Content Date	(0008,0023)	DA	The date the image pixel data creation was started taken from last modified date of the file.	ALWAYS	ACQUISITION
Content Time	(0008,0033)	TM	The time the image pixel data creation was started taken from last modified date of the file.	ALWAYS	ACQUISITION
Image Type	(0008,0008)	CS	DERIVED\SECONDARY in case of a BMP, GIF, PNG, or TIFF image. Attribute not present in case of a JPEG image.	ANAP	AUTO
Acquisition Datetime	(0008,002A)	DT	The date and time that the acquisition of data that resulted in this image started.	ALWAYS	USER
Derivation Description	(0008,2111)	ST	"%s image format converted to RGB color model." in case of a BMP, GIF, PNG, or TIFF image with "%s" set to corresponding image format. Attribute not present in case of a JPEG image.	ANAP	AUTO
Image Comments	(0020,4000)	LT	User-defined comments about the image.	ANAP	CONFIG
Lossy Image Compression	(0028,2110)	CS	01 in case of a JPEG image. Attribute not present in case of a BMP, GIF, PNG, or TIFF image.	ANAP	AUTO
Lossy Image Compression Method	(0028,2114)	CS	ISO_10918_1 in case of a JPEG image. Attribute not present in case of a BMP, GIF, PNG, or TIFF image.	ANAP	AUTO

Table 8-17 Module "Image Pixel" of Created Multi Frame True Color Sc Image SOP Instances

Attribute Name	Tag	VR	Value	PoV	Source
Samples per Pixel	(0028,0002)	US	3	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	YBR_FULL_422 in case of a JPEG image. RGB in case of a BMP, GIF, PNG, or TIFF image.	ALWAYS	AUTO
Rows	(0028,0010)	US	Number of rows in the image.	ALWAYS	AUTO
Columns	(0028,0011)	US	Number of columns in the image.	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	0	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OW|OB	A data stream of the pixel samples that comprise the Image.	ALWAYS	AQUISITION
Planar Configuration	(0028,0006)	US	0	ALWAYS	AUTO

Table 8-18 Module "Multi Frame" of Created Multi Frame True Color Sc Image SOP Instances

Attribute Name	Tag	VR	Value	PoV	Source
Number of Frames	(0028,0008)	IS	1	ALWAYS	AUTO

Table 8-19 Module "Sc Multi Frame Image" of Created Multi Frame True Color Sc Image SOP Instances

Attribute Name	Tag	VR	Value	PoV	Source
Burned In Annotation	(0028,0301)	CS	Indicates whether or not image contains sufficient burned in annotation to identify the patient and date the image was acquired. Value is always set to YES.	ALWAYS	AUTO

Table 8-20 Module "Sop Common" of Created Multi Frame True Color Sc Image SOP Instances

Attribute Name	Tag	VR	Value	PoV	Source
SOP Class UID	(0008,0016)	UI	Uniquely identifies the SOP Class. 1.2.840.10008.5.1.4.1.1.7.4	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Uniquely identifies the SOP Instance. Generated UID with root 1.2.276.0.75.2.5.60.25.3.	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS	ISO_IR 192	ALWAYS	AUTO
Instance Creation Date	(0008,0012)	DA	Date the SOP Instance was created.	ALWAYS	AUTO
Instance Creation Time	(0008,0013)	TM	Time the SOP Instance was created.	ALWAYS	AUTO
Content Qualification	(0018,9004)	CS	Content Qualification Indicator. Value set to PRODUCT for an officially released software.	ALWAYS	AUTO

Table 8-21 Module "Czm Multi Frame True Color Sc Image Extension" of Created Multi Frame True Color Sc Image SOP Instances

Attribute Name	Tag	VR	Value	PoV	Source
Image Laterality	(0020,0062)	CS	Laterality of (paired) body part examined in case configuration is set to store laterality as Image Laterality. Possible values are: R = right L = left B = both left and right Attribute is missing if user chooses laterality "undefined" or configuration is set to store laterality as Series Laterality. U = unpaired is not used.	ANAP	USER

Table 8-22 Module "CZM NIM Internal" of Created Multi Frame True Color Sc Image SOP Instances

Group ID: 2201
Private Creator String: "99CZM_NIM_INTERNAL_01"

Attribute Name	Tag	VR	Value	PoV	Source
Iod_name_meta_info	(2201,xx00)	LT	MultiFrameTrueColorScImage	ALWAYS	AUTO
Czm_xml_version	(2201,xx01)	LT	2.12	ALWAYS	AUTO

8.1.2   Usage of Attributes from Received IOD's

The usage of attributes of Modality Worklist IODs is described in Table 4-10 Attributes involved in Modality Worklist C-FIND request and response.

The usage of attributes imported through a Patient Root Query is described in Table 4-14 PATIENT level keys for the Patient Root Query/Retrieve Information Model (request and response).

8.1.3   Attribute Mapping

In scheduled case, the following attributes are mapped from Modality Worklist to instances of Encapsulated PDF IOD and Multi-frame True Color Secondary Capture Image IOD.

Table 8-23 Attribute Mapping

Modality Worklist		Instance IOD		Editable
(0010,0010)	Patient's Name	(0010,0010)	Patient's Name	No
(0010,0020)	Patient ID	(0010,0020)	Patient ID	No
(0010,0021)	Issuer of Patient ID	(0010,0021)	Issuer of Patient ID	No
(0010,1000)	Other Patient IDs	(0010,1000)	Other Patient IDs	No
(0010,0030)	Patient's Birth Date	(0010,0030)	Patient's Birth Date	No
(0010,0040)	Patient's Sex	(0010,0040)	Patient's Sex	No
(0010,2160)	Ethnic Group	(0010,2160)	Ethnic Group	No
(0010,4000)	Patient Comments	(0010,4000)	Patient Comments	No
(0008,0050)	Accession Number	(0008,0050)	Accession Number	No
(0032,1032)	Requesting Physician	(0008,1048)	Physician(s) of Record	No

(0008,0090)	Referring Physicians Name	(0008,0090)	Referring Physicians Name	No
(0040,1001)	Requested Procedure ID	(0020,0010)	Study ID	No
		(0040,0275) >(0040,1001)	Request Attributes Sequence > Requested Procedure ID	No
(0032,1060)	Requested Procedure Description	(0008,1030)	Study Description	No
(0032,1064)	Requested Procedure Code Sequence	(0008,1032)	Procedure Code Sequence	No
>(0008,0100)	Code Value	>(0008,0100)	Code Value	No
>(0008,0102)	Coding Scheme Designator	>(0008,0102)	Coding Scheme Designator	No
>(0008,0103)	Coding Scheme Version	>(0008,0103)	Coding Scheme Version	No
>(0008,0104)	Code Meaning	>(0008,0104)	Code Meaning	No
(0020,000D)	Study Instance UID	(0020,000D)	Study Instance UID	No
(0008,0020)	Study Date	(0008,0020)	Study Date	No
(0008,0030)	Study Time	(0008,0030)	Study Time	No
(0008,1110)	Referenced Study Sequence	(0008,1110)	Referenced Study Sequence	No
>(0008,1150)	Referenced Sop Class UID	>(0008,1150)	Referenced Sop Class UID	No
>(0008,1155)	Referenced Sop Instance UID	>(0008,1155)	Referenced Sop Instance UID	No
>(0040,0007)	Scheduled Procedure Step Description	(0040,0275) >(0040,0007)	Request Attributes Sequence > Scheduled Procedure Step Description	No
>(0040,0008)	Scheduled Protocol Code Sequence	(0040,0275) >(0040,0008)	Request Attributes Sequence > Scheduled Protocol Code Sequence	No
>>(0008,0100)	Code Value	>>(0008,0100)	Code Value	No
>>(0008,0102)	Coding Scheme Designator	>>(0008,0102)	Coding Scheme Designator	No
>>(0008,0103)	Coding Scheme Version	>>(0008,0103)	Coding Scheme Version	No
>>(0008,0104)	Code Meaning	>>(0008,0104)	Code Meaning	No
>(0040,0009)	Scheduled Procedure Step ID	(0040,0275) >(0040,0009)	Request Attributes Sequence > Scheduled Procedure Step ID	No

8.1.4 Coerced/Modified Fields

Those tags are listed in chapter 4.2.1.3.3 Activity – Today's Worklist. Other attributes provided via the Modality Worklist get lost and are not available in the FORUM LINK net Application Software.

8.2 Data Dictionary of Private Attributes

The Private Attributes included in the SOP Instances created by FORUM LINK net are listed in the Tables below. FORUM LINK net reserves blocks of private attributes in groups 2201 and 22A1.

Table 8-24 Private Dictionary Group (2201,00xx) = "99CZM_NIM_INTERNAL_01"

Occurs in: Encapsulated PDF and Multi-frame True Color Secondary Capture Image Storage SOP Instance

Tag	Attribute Name	VR	VM
(2201,00xx)	Private Creator	LO	1
(2201,xx00)	Iod_name_meta_info	LT	1
(2201,xx01)	Czm_xml_version	LT	1
(2201,xx02)	private_module_names_and_versions	LT	1

Table 8-25 Private Dictionary Group (22A1,00xx) = "99CZM_SpecializedEncapsulatedDocument"

Occurs in: Encapsulated PDF Storage SOP Instance

Tag	Attribute Name	VR	VM
(22A1,00xx)	Private Creator	LO	1
(22A1,xx01)	Document_type	LO	1

8.3 Coded Terminology and Templates

Not applicable.

8.4 Greyscale Image Consistency

Not applicable.

8.5 Standard Extended / Specialized/ Private SOP Classes

The following extensions are used in the IODs described in Chapter 8.1.1 Created SOP Instance(s):

Table 8-7 Module "Czm Encapsulated Pdf Series Extension" of Created Encapsulated PDF SOP Instance

Table 8-11 Module "Czm Encapsulated Pdf Instance Extension" of Created Encapsulated PDF SOP Instance

Table 8-12 Module "Specialized Encapsulated Document" of Created Encapsulated PDF SOP Instance

Table 8-13 Module "CZM NIM Internal" of Created Encapsulated PDF SOP Instance

Table 8-21 Module "Czm Multi Frame True Color Sc Image Extension" of Created Multi Frame True Color Sc Image SOP Instances

Table 8-22 Module "CZM NIM Internal" of Created Multi Frame True Color Sc Image SOP Instances

8.6 Private Transfer Syntaxes

No Private Transfer Syntax is supported.

Carl Zeiss Meditec AG
Goeschwitzer Str. 51-52
07745 Jena
GERMANY
info.meditec@zeiss.com
www.zeiss.com/med
www.zeiss.com/dicom