Technical
Publications

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Revision 0

LOGIQworks
CONFORMANCE STATEMENT
for DICOM V3.0

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GE Medical Systems

Ultrasound

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1   Introduction

1.1   Scope and Field of Application

This document is the DICOM Conformance Statement for version 1.0 of the LOGIQworks TruAccess Ultrasound Workstation of GEMS. The purpose of this document is to describe how LOGIQworks collaborates in a DICOM network with other medical imaging applications that conform to the DICOM 3.0 standard.

If the user encounters unspecified private data elements while parsing a GEMS Data Set, the user is well advised to ignore those data elements (per the DICOM v3.0 standard). Unspecified private data element information is subject to change without notice. If, however, the device is acting as a "full fidelity storage device", it should retain and re-transmit all of the private data elements which are sent by GEMS devices.

1.2   References

See Digital Imaging and Communications in Medicine (DICOM), parts 1-15 (NEMA PS 3.1 - 15).

1.3   Definitions

See Digital Imaging and Communications in Medicine (DICOM), parts 1-15 (NEMA PS 3.1-15).

1.4   Symbols and Abbreviations

See Digital Imaging and Communications in Medicine (DICOM), parts 1-15 (NEMA PS 3.1-15).

The name LOGIQworks used in this document refers to version 2.1.0

1.5   Revision History

Version	Date	Description
Preliminary	September 2002	Preliminary Version based on RadWorks 6.0 CS
A	October 1, 2002	Revision A
0	December 18, 2002	Revision 0

1.6 Important Considerations for the Reader

This DICOM Conformance Statement by itself is not sufficient to guarantee successful connectivity between LOGIQworks and equipment from other vendors. The following considerations should be made:

- The integration of equipment from different vendors (including GEMS IT Applicare) goes beyond the scope of the DICOM 3.0 standard and the DICOM Conformance Statements from GEMS and other vendors. It is the responsibility of the user (or user's agent) to assess the application requirements and to design a solution that integrates GEMS equipment with equipment from other vendors.
- When the comparison of this DICOM Conformance Statement with a DICOM Conformance Statement from another vendor indicates that connectivity should be possible it is the responsibility of the user (or user's agent) to verify this by carrying out validation tests and to check whether all required functionality is met.
- With regard to the future evolution of the DICOM 3.0 standard GEMS reserves the right to make changes to the LOGIQworks architecture described in this document. The user (or user's agent) should ensure that any equipment connected via DICOM to GEMS equipment also follows the future evolution of the DICOM 3.0 standard. Failure to do so may result in (partial) loss of connectivity.

2   IMPLEMENTATION MODEL

The LOGIQworks DICOM services are implemented as three separate processes that share a single Application Entity Title. Currently all three processes can all initiate associations with remote application entities while one can accept associations from remote Application Entities as well. In addition the LOGIQworks front-end application can initiate (but not accept[1]) DICOM associations with remote application entities.

2.1   Application Data Flow Diagram

The Implementation Model for the LOGIQworks DICOM services is depicted below:

DICOM
Standard Interface
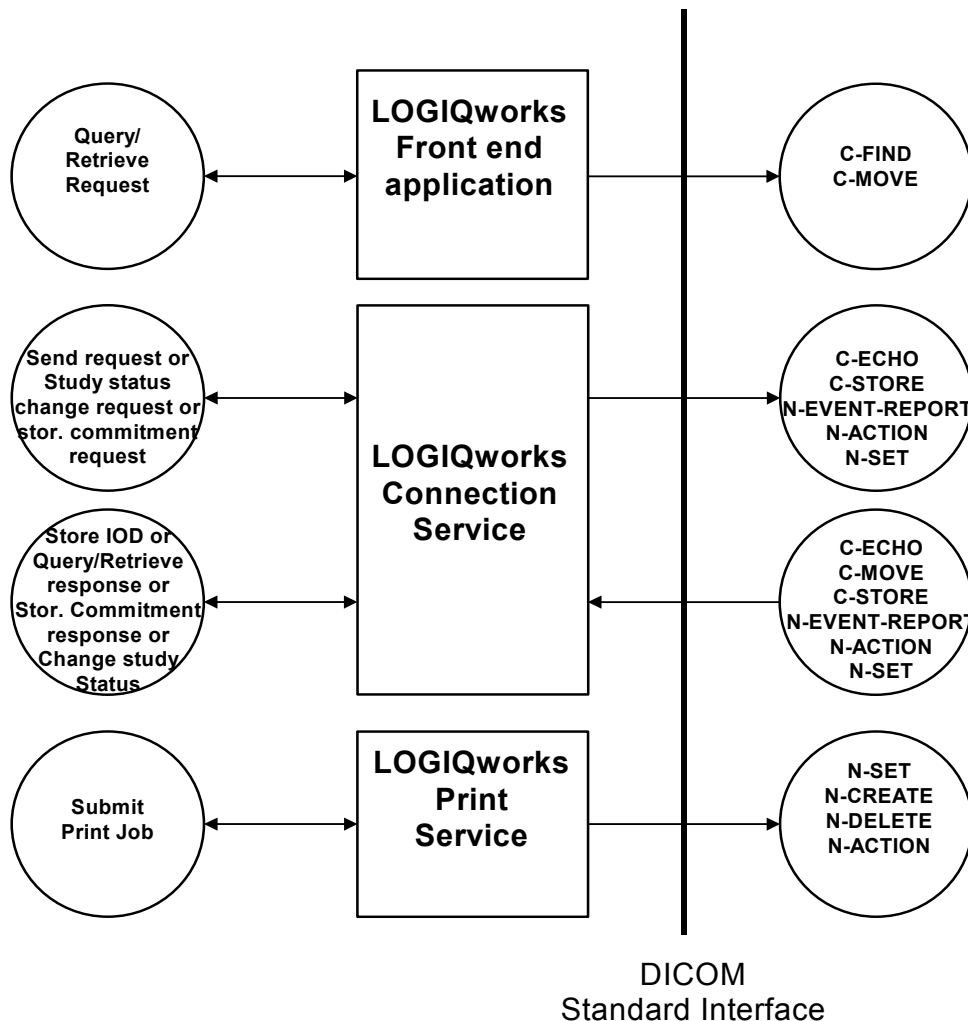
The LOGIQworks DICOM services are implemented as three separate Windows services that run as background processes. They are started automatically during system start-up and will remain active until shutdown. This means that requests for, e.g., image storage can be accepted at all times when the system is up and running regardless of whether the LOGIQworks application is active or not.

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[1] SCP behavior is not supported by the front end application or Database Service but rather by the Connection Service. In other words the Connection Service is the single point of entry for incoming DICOM connectivity, and it's always alive when the system is turned on. The LOGIQworks front-end application can be shut down without influencing incoming DICOM connectivity.

The LOGIQworks Connection Service is responsible for image reception and transmission in addition to accepting requests for database queries and retrieves. It maintains logs of all studies that entered and left the system. It can perform scheduled image transfers to remote Application Entities at all times.

The LOGIQworks front-end application issues queries to remote DICOM databases and initiates import requests. Please note that the destination of imports is the **Error! Reference source not found.** Connection Service.

The LOGIQworks Print Service is responsible for managing print job queues for one or more printers or laser imagers. It supports several protocols of which the DICOM standard is one.

The LOGIQworks Database and Connection Services are integral parts of a LOGIQworks installation. Please note that the Print Service as a whole is an optional component of a LOGIQworks installation.

In addition to the Storage SOP Class support for networking, LOGIQworks also supports the Media Storage Service Class for the Interchange of images as a File Set Reader (FSR) and File Set Creator (FSC). FSR is a standard feature and FSC is an optional feature. See section 3.2 for further details.

2.2   Functional Definitions of Application Entities

The Application Entity of the LOGIQworks Connection Service acts as an SCU for the verification, storage, and storage commitment SOP classes and as an SCP for verification, storage, query, retrieve, and storage commitment SOP classes.

The Application Entity of the LOGIQworks front-end application acts as an SCU for the query and retrieve SOP classes.

The Application Entity of the LOGIQworks Print Service acts as an SCU for the basic grayscale and color print management meta SOP classes, and optionally the Print Job and Basic Annotation Box SOP classes.

2.3   Sequencing of Real World Activities

Not applicable.

3 APPLICATION ENTITY SPECIFICATIONS

3.1 LOGIQworks DICOM services AE Specifications

The LOGIQworks DICOM services provide support for the following DICOM V3.0 SOP Classes, both as an SCU and an SCP:

SOP Classes as SCU and SCP	
SOP Class Name	**SOP Class UID**
Verification	1.2.840.10008.1.1
Detached Study Management	1.2.840.10008.3.1.2.3.1
Patient Root Query/Retrieve Model – FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Model – FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Only Query/Retrieve Model – FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18
Print Job	1.2.840.10008.5.1.1.14
Basic Annotation Box	1.2.840.10008.5.1.1.15
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31
Storage Commitment Push Model	1.2.840.10008.1.20.1
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3
CR Image	1.2.840.10008.5.1.4.1.1.1
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1
CT Image	1.2.840.10008.5.1.4.1.1.2
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1
MR Image	1.2.840.10008.5.1.4.1.1.4
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6
US Image	1.2.840.10008.5.1.4.1.1.6.1
SC Image	1.2.840.10008.5.1.4.1.1.7
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8
Standalone Curve	1.2.840.10008.5.1.4.1.1.9
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1
XA Image	1.2.840.10008.5.1.4.1.1.12.1
XF Image	1.2.840.10008.5.1.4.1.1.12.2
NM Image	1.2.840.10008.5.1.4.1.1.20
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59
PET Image	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129
RT Image	1.2.840.10008.5.1.4.1.1.481.1
RT Dose	1.2.840.10008.5.1.4.1.1.481.2
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3

SOP Classes as SCU and SCP	
SOP Class Name	**SOP Class UID**
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4
RT Plan	1.2.840.10008.5.1.4.1.1.481.5
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7

Though LOGIQworksis able to receive many SOP classes, not all SOP classes can be completely visualized. The following features concern visualization of IODs:

- The DICOM information of all storage IODs can be displayed in raw or formatted form, including private data
- Image type Storage IODs can be displayed with their image data, when their Photometric interpretation is one of the types "MONCHROME1", "MONOCHROME2", "RGB", "PALETTE COLOR", "YBR_FULL" and "YBR_FULL_422".
- Grayscale Softcopy Presentation State IODs can be applied to studies or displayed with their referenced images completely, except for the following sub-features:
    - o Masks
    - o Bitmap Display Shutters
    - o Overlay Planes
    - o Overlay/Curve Activation
- Basic Structured Reports IODs can be displayed, including resolving Image UID references. Enhanced and Comprehensive Structured Reports will be displayed likewise, but their enhanced features like SCOORD Value Types will not be resolved graphically. Their complete contents will be displayed though in a character type way.
- Key Object Note IODs can be either displayed with their images or applied to the images currently displayed. In both cases LOGIQworks only supports references to images of the same study the key note object IOD is part of. 'Foreign' references are just ignored.

3.1.1   Association Establishment Policies

3.1.1.1   General

The configuration of the LOGIQworks DICOM services in the Windows Registry shall define such parameters as Application Entity title, host name, and port number that are shared by the Connection, Database and Print Services. They offer a (configurable) maximum PDU size of 10 MB (10485760 bytes) upon association initiation and on associations initiated by remote applications.

3.1.1.2   Number of Associations

The LOGIQworksConnection Service supports multiple associations both as an SCU and SCP. By default the maximum number of simultaneous associations that the Connection Service will support as an SCP is 4.

When receiving images or processing query and retrieve requests as an SCP the Connection Service will start a new thread for each association that is being handled. As an SCU the Connection Service also supports multiple associations, for instance to verify a remote destination and simultaneously send images to a storage SCP.

The LOGIQworksfront-end application supports multiple associations as an SCU for query and retrieve to different SCPs. Multiple queries and/or retrieves to the same SCP will be performed sequentially.

The LOGIQworks Print Service will queue multiple print jobs such that it only establishes one association as an SCU at a time when it manages multiple laser imagers via DICOM.

3.1.1.3   Synchronous Nature

The LOGIQworks DICOM services do not support asynchronous operations and will not perform asynchronous window negotiation.

3.1.1.4   Implementation Identifying Information

The Implementation Class UID is: 1.2.528.1.1001.2.20020314.1
The version name is: AMI_DICOM00_4

3.1.2   Association Initiation Policy

The LOGIQworks Connection Service initiates associations for the following activities:
- The LOGIQworks user wants to send images or other IODs from the local LOGIQworks database to a remote system.
- The LOGIQworks user wants to request storage commitment after images from the local LOGIQworks database have been transmitted to a remote system.
- The LOGIQworks user wants to convey a study status change to a remote system
- The LOGIQworks user wants a remote system to change the study status for a certain study.

The LOGIQworks front-end application initiates associations for the following activities:
- The LOGIQworks user wants to query the contents of a remote database on a Patient, Study, Series or Instance level.
- The LOGIQworks user wants to retrieve studies, series, images or other IODs from a remote database into the local LOGIQworks database.
- The LOGIQworks user wants to retrieve a Modality Worklist from an external Modality Worklist Provider
- The LOGIQworks user wants to send a Modality Performed Procedure Step success message to indicate that a DICOM Modality Worklist item was handled and resulted in a study, ready for reading by the radiologist (using the optional Quality Control module).
- The LOGIQworks user wants to send a Modality Performed Procedure Step failure message to indicate that a DICOM Modality Worklist item will not be handled (using the optional Quality Control module).

The LOGIQworks Print Service initiates associations for the following activities:
- The LOGIQworks user wants to print images to a laser imager.

3.1.2.1   Send Images to a Remote System

3.1.2.1.1 Associated Real World Activity

The user of the LOGIQworks system makes a selection of one or more studies and series in the local Database and subsequently presses the Send button which will initiate the transfer of images from the local database of LOGIQworks to the remote system.

3.1.2.1.2 Proposed Presentation Contexts

Presentation Context Table for Send To Remote System				
Abstract Syntax		Transfer Syntax	Role	Extended
Name	UID			Negotiation
CR Image	1.2.840.10008.5.1.4.1.1.1	See UID list A below	SCU	None
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1	See UID list A below	SCU	None
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1	See UID list A below	SCU	None
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2	See UID list A below	SCU	None
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1	See UID list A below	SCU	None
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3	See UID list A below	SCU	None
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1	See UID list A below	SCU	None
CT Image	1.2.840.10008.5.1.4.1.1.2	See UID list A below	SCU	None
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3	See UID list A below	SCU	None
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	See UID list A below	SCU	None
MR Image	1.2.840.10008.5.1.4.1.1.4	See UID list A below	SCU	None
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5	See UID list A below	SCU	None
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6	See UID list A below	SCU	None
US Image	1.2.840.10008.5.1.4.1.1.6.1	See UID list A below	SCU	None
SC Image	1.2.840.10008.5.1.4.1.1.7	See UID list A below	SCU	None
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1	See UID list A below	SCU	None
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2	See UID list A below	SCU	None
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3	See UID list A below	SCU	None
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4	See UID list A below	SCU	None
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8	See UID list B below	SCU	None
Standalone Curve	1.2.840.10008.5.1.4.1.1.9	See UID list B below	SCU	None
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10	See UID list B below	SCU	None
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11	See UID list B below	SCU	None
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1	See UID list B below	SCU	None
XA Image	1.2.840.10008.5.1.4.1.1.12.1	See UID list A below	SCU	None
XF Image	1.2.840.10008.5.1.4.1.1.12.2	See UID list A below	SCU	None
NM Image	1.2.840.10008.5.1.4.1.1.20	See UID list A below	SCU	None
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1	See UID list A below	SCU	None
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2	See UID list A below	SCU	None
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1	See UID list A below	SCU	None
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2	See UID list A below	SCU	None
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3	See UID list A below	SCU	None
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4	See UID list A below	SCU	None
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11	See UID list B below	SCU	None
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22	See UID list B below	SCU	None
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33	See UID list B below	SCU	None
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	See UID list B below	SCU	None
PET Image	1.2.840.10008.5.1.4.1.1.128	See UID list A below	SCU	None
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129	See UID list B below	SCU	None
RT Image	1.2.840.10008.5.1.4.1.1.481.1	See UID list A below	SCU	None
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	See UID list B below	SCU	None
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	See UID list B below	SCU	None
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4	See UID list B below	SCU	None
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	See UID list B below	SCU	None
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6	See UID list B below	SCU	None
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7	See UID list B below	SCU	None

UID List A:

Transfer Syntaxes for Send To Remote System	
Name	UID
Implicit VR, Little Endian	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, Big Endian	1.2.840.10008.1.2.2
Explicit VR, Lossy JPEG 8-Bit Image Compression	1.2.840.10008.1.2.4.50
Explicit VR, Lossy JPEG 12-Bit Image Compression	1.2.840.10008.1.2.4.51
Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
Explicit VR, RLE Lossless compression	1.2.840.10008.1.2.5
Explicit VR, AMI Wavelet Progressive Lossy Compression	1.2.528.1.1001.4.1.1.2
Explicit VR, AMI JPEG Lossy Compression 8-bit	1.2.528.1.1001.4.2.1.1
Explicit VR, AMI JPEG Lossy Compression 12-bit	1.2.528.1.1001.4.2.1.2
Explicit VR, AMI ZLIB Lossless Compression	1.2.528.1.1001.4.4.1

UID List B:

Transfer Syntaxes for Send To Remote System	
Name	UID
Implicit VR, Little Endian	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, Big Endian	1.2.840.10008.1.2.2

3.1.2.1.3 SOP Specific Conformance Statement for SOP Class Storage

The images stored in the local LOGIQworks database that are to be sent are converted from the local LOGIQworks DICOM 3.0 compliant format to instances of the corresponding SOP Storage class(es) and subsequently sent to the remote system.

LOGIQworks allows image transfers to be scheduled for specific times and has mechanisms for retrying a transfer in case that a transfer failed at an earlier time. After a configurable number of unsuccessful attempts LOGIQworks will mark the transfer as failed. The LOGIQworks system keeps a log of transfers that is viewable by the user. The log indicates the status of transfers.

LOGIQworks provides full (level 2) conformance as SCP of the Storage SOP class. This means that upon sending an image received via DICOM on to another DICOM compliant system it will send out all attributes that it received (this includes private attributes from other vendors).

When the user selects a DICOM Lossy JPEG transfer syntax to be used for sending a certain study to another system the study will be compressed before transmission if it was not already compressed. The attributes "Derivative Description" (0008,2111) and "Lossy Compression" (0008, 2112) will be set to specify that lossy JPEG compression has been applied to the pixel data and this string has to be shown to the user when the images are subsequently viewed (as is done by LOGIQworks). In the case the receiving workstation is from a 3rd party vendor it is their responsibility to display this string correctly.

If the study in the LOGIQworks database was stored in JPEG Lossless or Lossy format (because it was received previously with compression, or compressed before storage) the DICOM JPEG Lossless or Lossy transfer syntax will be requested in addition to and in preference of the explicit and implicit little endian transfer syntaxes. If the C-STORE SCP

chooses not to use the DICOM JPEG Lossless transfer syntax, the image data will be decompressed before it will be sent to the C-STORE SCP.

LOGIQworks is able to send data formerly received or stored in JPEG Lossy format in any uncompressed or JPEG lossless format, or in the original JPEG lossy format, but it will not decompress the pixel data and subsequently recompress it in any lossy compression format. The "Derivation Description" (0008,2111) and "Lossy Compression" (0008, 2112) will still specify that lossy JPEG compression had previously been applied to the pixel data and should still be shown to the user when the images are viewed. For more information see '3.1.3.2 Receive Images from a Remote System'.

3.1.2.2 Query a Remote Database

3.1.2.2.1 Associated Real World Activity

The user of the LOGIQworks system wants to have a view on a remote DICOM database and either views the complete contents of the remote database or fills out a query dialog box with fields for Patient Name, Patient ID, Study date, etc. Wildcards can be used instead of fully specified information to allow flexible queries. The contents of this dialog box and the requested columns in the Remote view can be fully configured, hence the contents of the Query data is dependent on the configuration.

3.1.2.2.2 Proposed Presentation Contexts

Presentation Context Table for Remote Database Query					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name**	**UID**		**Negotiation**
Patient Root Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Study Root Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Patient/Study Only Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.3.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.2.2.3 SOP Specific Conformance Statement for SOP Class Query

The following keys are by default[2] supported for the Patient Root Query:

Level	Description	Tag
Patient	Specific Character Set	(0008,0005)
Patient	Patient's Name	(0010,0010)
Patient	Patient ID	(0010,0020)
Patient	Patient's Birth Date	(0010,0030)
Patient	Patient's Sex	(0010,0040)
Patient	Other Patient IDs	(0010,1000)
Study	Specific Character Set	(0008,0005)
Study	Study Description	(0008,1030)
Study	Study Date	(0008,0020)
Study	Study Instance UID	(0020,000D)
Study	Study ID	(0020,0010)
Study	Performing Physician's Name	(0008,1050)
Study	Accession Number	(0008,0050)
Study	Number of Study Related Series	(0020,1206)
Study	Number of Study Related Instances/Images	(0020,1208)
Series	Series Instance UID	(0020,000E)
Series	Series number	(0020,0011)
Series	Modality	(0008,0060)
Series	Number of Series Related Instances/Images	(0020,1209)
Instance	Instance Number	(0020,0013)
Instance	Rows	(0028,0010)
Instance	Columns	(0028,0011)

The Patient/Study levels in the table above are also supported for the Patient/Study Only Query. For a Study Root Query by default[2] the following keys are supported:

Level	Description	Tag
Study	Specific Character Set	(0008,0005)
Study	Patient's Name	(0010,0010)
Study	Patient ID	(0010,0020)
Study	Patient's Birth Date	(0010,0030)
Study	Patient's Sex	(0010,0040)
Study	Study Description	(0008,1030)
Study	Study Date	(0008,0020)
Study	Study Instance UID	(0020,000D)
Study	Study ID	(0020,0010)
Study	Performing Physician's Name	(0008,1050)
Study	Accession Number	(0008,0050)
Study	Number of Study Related Series	(0020,1206)
Study	Number of Study Related Instances/Images	(0020,1208)
Series	Series Instance UID	(0020,000E)
Series	Series number	(0020,0011)
Series	Modality	(0008,0060)
Series	Number of Series Related Instances/Images	(0020,1209)
Instance	Instance Number	(0020,0013)
Instance	Rows	(0028,0010)
Instance	Columns	(0028,0011)

---

[2] The user is able to add any valid DICOM tag to this query.

LOGIQworks expects the remote Query SCP to perform all of the following matching methods:

Matching methods for Study/Patient Root Query
Method
Single Value Matching
Universal Matching
Wild Card Matching
Range Matching

3.1.2.3 Retrieve from a Remote System

3.1.2.3.1 Associated Real World Activity

After a view on a remote DICOM database has been obtained the user makes a selection of one or more studies, series or images and subsequently presses the Import button. This will initiate the transfer of images from the remote system to the local database of LOGIQworks.

Note that the LOGIQworks front-end application performs the C-MOVE operation while the destination of the resulting C-STORE operation is the LOGIQworks Connection Service.

3.1.2.3.2 Proposed Presentation Contexts

Presentation Context Table for Remote System Retrieve					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Patient Root Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Study Root Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Patient/Study Only Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.2.3.3 SOP Specific Conformance Statement for SOP Class Retrieve

The LOGIQworks front-end application provides standard conformance.

3.1.2.4 Print to a remote Laser Imager

3.1.2.4.1 Associated Real World Activity

The LOGIQworks user selects a study in the local database and submits it to the Print Service as a job for the desired laser imager. The user can choose several parameters such as the layout of the film and number of copies.

Or:

The LOGIQworks user creates a Virtual Film Sheet print job from the studies available in the Viewing module and submits it as a job for the desired laser imager. On a per-image or per-sheet basis several parameters can be altered. When submitting the job the user can choose a few parameters, such as the number of copies.

3.1.2.4.2 Proposed Presentation Contexts

Presentation Context Table for Remote System Retrieve					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None
Basic Annotation Box[3]	1.2.840.10008.5.1.1.15	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None
Print Job	1.2.840.10008.5.1.1.14	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.4.3 SOP Specific Conformance Statement for Meta SOP Classes Basic Grayscale and Color Print Management

The LOGIQworks Print Service supports the following mandatory SOP classes as defined by the Basic Grayscale Print Management Meta class:

Supported SOP classes as Basic Grayscale Print Management Meta SOP class	
SOP Class Name	**SOP Class UID**
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4
Printer	1.2.840.10008.5.1.1.16

For the Basic Color Print Management Meta SOP class it supports:

Supported SOP classes as Basic Color Print Management Meta SOP class	
SOP Class Name	**SOP Class UID**
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Color Image Box	1.2.840.10008.5.1.1.4.1
Printer	1.2.840.10008.5.1.1.16

---

[3] The Basic Annotation Box SOP class is negotiated only if the Print Destination is configured for it

The LOGIQworks Print Service is able to send the appropriate data to printers that support True Size printing, both for grayscale printers and color printers. The LOGIQworks Print Service will send the pixel data in its native size and additionally sends the Requested Image Size (2020,0030), which is considered to be a request to the Print SCP to Print at that size. Please note that there is no formal way in DICOM to verify whether a DICOM Print SCP actually supports True Size printing, and that some Print SCPs do not report a failure when the Requested Image Size (tag 2020,0030) was requested by the SCU but not supported by the SCP.

As a result LOGIQworks Print Service can be configured in a way that it seems that images will be printed True Size, while they are just printed at a different size. It is up to the system integrator to verify from the printer's DICOM conformance Statement whether that printer supports True Size printing, before setting the True Size option in the configuration for that particular printer.

3.1.2.4.3.1 Conformance for SOP Class Basic Film Session

The LOGIQworks Print Service includes the following attributes in the N-CREATE for the Basic Film Session SOP class:

Attributes for Basic Film Session SOP class N-CREATE		
Description	**Tag**	**Range of values**
Number of Copies	(2000,0010)	1-10000 (Max. user value configurable, default 5)
Print Priority	(2000,0020)	"LOW", "MED", "HIGH" (according to print priority in **Error! Reference source not found.**)
Medium Type	(2000,0030)	<configurable>
Film Destination	(2000,0040)	"MAGAZINE", "PROCESSOR", <more configurable>
Film Session Label	(2000,0050)	<configurable>

The N-SET and N-ACTION are currently unused. The N-DELETE is used to delete the complete Basic Film Session SOP instance hierarchy.

3.1.2.4.3.2 Conformance for SOP Class Basic Film Box

The LOGIQworks Print Service includes the following attributes in the N-CREATE for the Basic Film Box SOP class:

Attributes for Basic Film Box SOP class N-CREATE			
Description	**Tag**	**Usage**	**Range of values**
Annotation Display Format (BAB)	(2010,0010)	A[4]	<configurable>[5]
Film Orientation	(2010,0040)	A	"PORTRAIT", "LANDSCAPE"
Film Size ID	(2010,0050)	A	<configurable>
Magnification Type	(2010,0060)	C[6]	"BILINEAR", "CUBIC", "NONE", <more configurable>
Max Density	(2010,0130)	C	<configurable>
Configuration Information	(2010,0150)	C	<configurable>
Smoothing Type	(2010,0080)	C	<configurable>
Border Density	(2010,0100)	C	<configurable>
Empty Image Density	(2010,0110)	C	<configurable>
Min Density	(2010,0120)	C	<configurable>
Trim	(2010,0140)	C[6]	"YES", "NO", ""

The N-SET is currently unused. The N-ACTION is used to print a complete Basic Film Box SOP instance and N-DELETE is used to delete it after printing.

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[4] A means the attribute is always sent
[5] This value determines the number of Basic Image Box positions
[6] C means the attribute is only sent when not empty

3.1.2.4.3.3 Conformance for SOP Class Basic Grayscale Image Box

The LOGIQworks Print Service includes the following attributes in the N-SET for the Basic Grayscale Image SOP class:

Attributes for Basic Grayscale Image SOP Box class N-SET			
Description	**Tag**	**Usage**	**Range of values**
Image Position	(2020,0010)	A	1…[7]
Preformatted Grayscale Image Sequence	(2020,0110)	A	
> Samples Per Pixel	(0028,0002)	A	1
> Photometric Interpretation	(0028,0004)	A	"MONOCHROME2"
> Rows	(0028,0010)	A	
> Columns	(0028,0011)	A	
> Pixel Aspect Ratio	(0028,0034)	A	
> Bits Allocated[8]	(0028,0100)	A	8, 16
> Bits Stored[1]	(0028,0101)	A	8, 12
> High Bit[1]	(0028,0102)	A	7, 11
> Pixel Representation	(0028,0103)	A	0
> Pixel Data	(7FE0,0010)	A	
Requested Image Size	(2020,0030)	C[9]	hor. size of the image in mm.

3.1.2.4.3.4 Conformance for SOP Class Basic Color Image Box

The LOGIQworks Print Service includes the following attributes in the N-SET for the Basic Color Image Box SOP class:

Attributes for Basic Color Image Box SOP class N-SET			
Description	**Tag**	**Usage**	**Range of values**
Image Position	(2020,0010)	A	1…
Preformatted Color Image Sequence	(2020,0111)	A	
> Samples Per Pixel	(0028,0002)	A	3
> Photometric Interpretation	(0028,0004)	A	
> Planar Configuration	(0028,0006)	A	RGB
> Rows	(0028,0010)	A	
> Columns	(0028,0011)	A	
> Pixel Aspect Ratio	(0028,0034)	A	
> Bits Allocated	(0028,0100)	A	8
> Bits Stored	(0028,0101)	A	8
> High Bit	(0028,0102)	A	7
> Pixel Representation	(0028,0103)	A	0
> Pixel Data	(7FE0,0010)	A	
Requested Image Size	(2020,0030)	C[9]	hor. size of the image in mm.

3.1.2.4.3.5 Conformance for SOP Class Printer

---

[7] Depends on the chosen Image Display format
[8] The LOGIQworks Print Service offers support for either 8 or 12-bit printing. For 12-bit printing Bits Allocated is set to 16, Bits Stored is set to 12, and High Bit is set to 11. For 8-bit printing the values are 8, 8, and 7 respectively.
[9] Only sent when the 'true size' option is used, See additional note in section 3.1.2.4.3 on page 18

The LOGIQworks Print Service shall accept N-EVENT-REPORT and return confirmation accordingly.

Both the LOGIQworks front-end application (option DICOM Printer Status) and the LOGIQworks Print Service uses N-GET for the Printer SOP class to get information from the SCP.

3.1.2.4.4 SOP Specific Conformance for SOP Class Print Job

LOGIQworks can optionally request this SOP Class from the SCP. In case it is supported the LOGIQworks Print Service will track the progress of the current job via N-EVENT-REPORTs and will not send the next job before completion of the current job.

3.1.2.4.5 SOP Specific Conformance for SOP Class Basic Annotation Box

If the Print Destination is configured to use Basic Annotation Box, the Print Service will negotiate the SOP class when setting up the association. In case it is supported the LOGIQworks Print Service will send a Basic Annotation Box N-SET command after it creates the Basic Film Box, using the UID returned from the Basic Film Box N-CREATE.

Attributes for Basic Annotation Box SOP class N-SET			
Description	**Tag**	**Usage**	**Range of values**
Annotation Position	(2030,0010)	A	<configurable>
Text String	(2030,0020)	A	<configurable>

3.1.2.4.6 Optional Meta SOP Classes for Basic Grayscale Print Management

Currently these are not supported by the LOGIQworks Print Service.

3.1.2.4.7 Optional Meta SOP Classes for Basic Color Print Management

Currently these are not supported by the LOGIQworks Print Service.

3.1.2.5 Retrieve a Modality Worklist from a Remote System

3.1.2.5.1 Associated Real World Activity

LOGIQworks can query for a Modality Worklist to aid in merging patient demographics into DICOM images. This prevents the need to enter patient demographics manually and consequently eliminates a source of typing errors.

3.1.2.5.2 Proposed Presentation Contexts

Presentation Context Table for Modality Worklist Management					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.2.5.3 SOP Specific Conformance Statement for SOP Class Modality Worklist Management

LOGIQworks provides standard conformance.

The following keys are supported for the Modality Worklist Management:

Supported keys for Modality Worklist Management			
Module	**Description**	**Tag**	**Type**
Scheduled Procedure Step	Scheduled Procedure Step Sequence	(0040,0100)	R
	>Scheduled Station AE Title	(0040,0001)	R
	>Scheduled Procedure Step Start Date	(0040,0002)	R
	>Scheduled Procedure Step Start Time	(0040,0003)	R
	>Modality	(0008,0060)	R
	>Scheduled Performing Physician	(0040,0006)	R
	>Scheduled Procedure Step Description	(0040,0007)	O
	>Scheduled Station Name	(0040,0010)	O
	>Scheduled Procedure Step Location	(0040,0011)	O
	>Pre-Medication	(0040,0012)	O
	>Scheduled Procedure Step ID	(0040,0009)	O
	>Requested Contrast Agent	(0032,1070)	O
Requested Procedure	Requested Procedure ID	(0040,1001)	O
	Requested Procedure Description	(0032,1060)	O
	Study Instance UID	(0020,000D)	O
	Requested Procedure Priority	(0040,1003)	O
	Patient Transport Arrangements	(0040,1004)	O
Imaging Service Request	Accession Number	(0008,0050)	O
	Requesting Physician	(0032,1032)	O
	Referring Physician's Name	(0008,0090)	O
	Study Status ID	(0032,000A)	O
	Study Priority ID	(0032,000C)	O
Visit Identification	Admission ID	(0038,0010)	O
Visit Status	Current Patient Location	(0038,0300)	O
Patient Identification	Patient's Name	(0010,0010)	R
	Patient ID	(0010,0020)	R
	Issuer of Patient ID	(0010,0021)	LOGIQworks
	Other Patient IDs	(0010,1000)	O
	Other Patient Names	(0010,1001)	O
	Patient's Birth Name	(0010,1005)	O
	Patient's Mother's Birth Name	(0010,1060)	O

Supported keys for Modality Worklist Management			
Module	**Description**	**Tag**	**Type**
	Medical Record Locator	(0010,1090)	O
Patient Demographic	Patient's Birth Date	(0010,0030)	O
	Patient's Birth Time	(0010,0032)	O
	Patient's Sex	(0010,0040)	O
	Patient's Size	(0010,1020)	O
	Patient's Weight	(0010,1030)	O
	Patient's Address	(0010,1040)	O
	Military Rank	(0010,1080)	O
	Branch of Service	(0010,1081)	O
	Country of Residence	(0010,2150)	O
	Region of Residence	(0010,2152)	O
	Patient's Telephone Numbers	(0010,2154)	O
	Ethnic Group	(0010,2160)	O
	Patient's Religious Preference	(0010,21F0)	O
	Patient Comments	(0010,4000)	O
Patient Medical	Medical Alerts	(0010,2000)	O
	Contrast Allergies	(0010,2110)	O
	Pregnancy Status	(0010,21C0)	O
	Special Needs	(0038,0050)	O
	Patient State	(0038,0500)	O

LOGIQworks expects the remote Query SCP to perform all of the following Matching methods

Matching methods for Study/Patient Root Query
Method
Single Value Matching
Universal Matching
Wild Card Matching
Range Matching

LOGIQworks may fill no, one, or multiple attributes in the query request with a non-empty value. LOGIQworks may thus request matching on Optional Matching Key Attributes.

All fields listed above are always included in the query request to ask the SCP to return them for each response. LOGIQworks expects the SCP to return values for all 'R' attributes whereas the attributes marked with 'O' may be optionally filled. Therefore LOGIQworks treats these attributes as Type 3 Return Key Attributes.

3.1.2.6 Send Modality Performed Procedure Step Messages to a Remote System

3.1.2.6.1 Associated Real World Activity

LOGIQworks can send Modality Performed Procedure Step messages (N-CREATE, N-SET) to remote systems, in order to indicate the completion or the discontinuation of a worklist operation.

LOGIQworks Modality Performed Procedure Step (MPPS) functionality is embedded in the optional Quality Control Module. When configured properly, the MPPS N-CREATE command and the MPPS N-SET command are sent to the configurable AE, one immediately after the other.

MPPS Completion messages can be sent after the user performed a manual match between a study in the local database and an item in the Worklist. The content of both MPPS transactions is collected from the selected item in the DICOM Modality Worklist and the study involved. No user extra input is requested for this operation.

MPPS Discontinue messages can be sent after selecting one single item in the worklist control on the Quality Control Module's desktop (right mouse button menu). When sending a discontinue message, the content of both MPPS transactions is collected from the selected item in the DICOM Modality Worklist.

3.1.2.6.2 Proposed Presentation Contexts

Presentation Context Table for Modality Worklist Management					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.2.6.3 SOP Specific Conformance Statement for SOP Class Modality Performed Procedure Step

LOGIQworks provides standard conformance.
The following keys are supported for the Modality Performed Procedure Step N-CREATE :

Supported keys for Modality Performed Procedure Step N-CREATE			
Module	Description	Tag	Type
Performed Procedure Step Relationship	Patient's Name	(0010,0010)	R[10]
	Patient ID	(0010,0020)	R[10]
	Patient's Birth Date	(0010,0030)	R[10]
	Patient's Sex	(0010,0040)	R[10]
	Referenced Patient Sequence	(0008,1120)	R[11]
	>Referenced SOP Class UID	(0008,1150)	-
	>Referenced SOP Instance UID	(0008,1155)	-
	Scheduled Step Attribute Sequence	(0040,0270)	R
	>Study Instance UID	(0020,000D)	R[12]
	>Referenced Study Sequence	(0008,1110)	R[11]
	>>Referenced SOP Class UID	(0008,1150)	-

---

[10] The information is copied from the study data involved
[11] Always sent empty
[12] The Study Instance UID (0020,000D) is copied from the resulting study in case of a completion message, and it is copied from the DICOM Modality Worklist in case of a discontinue message.

	>>Referenced SOP Instance UID	(0008,1155)	-
	>Accession Number	(0008,0050)	R[10]
	>Placer Order Number/Imaging Service Request	(0040,2006)	O[13]
	>Filler Order Number/Imaging Service Request	(0040,2007)	O[13]
	>Placer Order Number/Imaging Service Request	(0040,2016)	O[13]
	>Filler Order Number/Imaging Service Request	(0040,2017)	O[13]
	>Requested Procedure ID	(0040,1001)	R[13]
	>Requested Procedure Description	(0032,1060)	R[13]
	>Placer Order Number/Procedure	(0040,1006)	O[13]
	>Filler Order Number/Procedure	(0040,1007)	O[13]
	>Scheduled Procedure Step ID	(0040,0009)	R[13]
	>Scheduled Procedure Step Description	(0040,0007)	R[13]
	>Scheduled Action Item Code Sequence	(0040,0008)	R[13]
	>>Code Value	(0008,0100)	O[13]
	>>Coding Scheme designator	(0008,0102)	O[13]
	>>Code Meaning	(0008,0104)	O[13]
Performed Procedure Step Information	Performed Station AE Title	(0040,0241)	R
	Performed Station Name	(0040,0242)	R
	Performed Location	(0040,0243)	R[11]
	Performed Procedure Step Start Date	(0040,0244)	O[10]
	Performed Procedure Step Start Time	(0040,0245)	O[10]
	Performed Procedure Step ID	(0040,0253)	R[14]
	Performed Procedure Step Status	(0040,0252)	R
	Performed Procedure Step Description	(0040,0254)	R[10]
	Comments on the Performed Procedure Step	(0040,0280)	-
	Performed Procedure Type Description	(0040,0255)	R[11]
	Procedure Code Sequence	(0008,1032)	R[13]
	>Code Value	(0008,0100)	R
	>Coding Scheme Designator	(0008,0102)	R
	>Code Meaning	(0008,0104)	R
	Modality	(0008,0060)	R[15]
	Study ID	(0020,0010)	R[16]
	Performed Procedure Step End Date	(0040,0250)	R[17]
	Performed Procedure Step End Time	(0040,0251)	R[17]
	Performed Procedure Step Status	(0040,0252)	R[17]

---

[13] The information is copied from the DICOM Modality Worklist entry involved

[14] The Performed Procedure Step ID is either copied from the study involved (if it was there) or generated by LOGIQworks, according to a configurable format.

[15] The field Modality (0008,0060) is copied from the resulting study in case of a completion message, and it is copied from the DICOM Modality Worklist in case of a discontinue message

[16] The information is copied from the Study data involved

[17] Inserted empty, filled in N-SET

Performed Procedure Step Acquisition Results	Performed Action Item Sequence	(0040,0260)	R[18]
	>Code Value	(0008,0100)	-
	>Coding Scheme Designator	(0008,0102)	-
	>Code Meaning	(0008,0104)	-
	Performed Series Sequence	(0040,0340)	R[10]
	>Performing Physician's Name	(0008,1050)	R[10]
	>Operator's Name	(0008,1070)	R[10]
	>Protocol Name	(0018,1030)	R[10]
	>Series Instance UID	(0020,000E)	R[10]
	>Series Description	(0008,103E)	R[10]
	>Retrieve AE Title	(0008,0054)	R[19]
	>Referenced Image Sequence	(0008,1140)	R[10]
	>>Referenced SOP Class UID	(0008,1150)	R[10]
	>>Referenced SOP Instance UID	(0008,1155)	R[10]
	>Referenced Standalone SOP Instance Sequence	(0040,0220)	-
	>>Referenced SOP Class UID	(0008,1150)	-
	>>Referenced SOP Instance UID	(0008,1155)	-
	Anatomic Structure, Space or Region Sequence	(0008,2229)	-
	>Code Value	(0008,0100)	-

---

[18] Always inserted as an empty field

[19] The retrieve AE Title is set to the AE Title of this **Error! Reference source not found.** installation

Performed Procedure Step Radiation Dose	>Coding Scheme Designator	(0008,0102)	-
	>Code Meaning	(0008,0104)	-
	Total Time of Fluoroscopy	(0040,0300)	O[13]
	Total Number of Exposures	(0040,0301)	O[13]
	Distance Source to Detector SID	(0018,1110)	O[13]
	Distance Source to Entrance	(0040,0306)	O[13]
	Entrance Dose	(0040,0302)	O[13]
	Exposed Area	(0040,0303)	O[13]
	Image Area Dose Product	(0018,115E)	O[13]
	Comments on Radiation Dose	(0040,0310)	O[13]
Performed Procedure Step Billing and Material Management	All Attributes		-

Supported keys for Modality Performed Procedure Step N-SET			
Module	**Description**	**Tag**	**Type**
Performed Procedure Step Information	Performed Procedure Step End Date	(0040,0250)	R
	Performed Procedure Step End Time	(0040,0251)	R
	Performed Procedure Step Status	(0040,0252)	R

3.1.2.7 Verify the Committed Storage of Images on a Remote System

3.1.2.7.1 Associated Real World Activity

When LOGIQworks completes a transmission of images it can optionally verify whether the images have not only been received but also been stored successfully (committed) at the other end.

3.1.2.7.2 Proposed Presentation Contexts

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

3.1.2.7.3 SOP Specific Conformance Statement for SOP Class Storage Commitment Push Model

LOGIQworks provides standard conformance.
After the images and the storage commitment request have been sent, LOGIQworks will immediately close the association and will not wait for a reply from the SCP. Instead the SCP must open a new association to LOGIQworks in order to transmit the response. Thus the N-EVENT-REPORT must occur on a different association than the N-ACTION operation.

3.1.2.7.3.1 Operations

LOGIQworks can request storage commitment for all SOP classes as listed in the table in section 3.1.2.2.2. LOGIQworks supports the Referenced Study Component Sequence Attribute by including the Study Instance UID (0020,000D) of the requested objects. When storage commitment is requested for multiple studies, multiple requests are made, each on a separate association.

The validity of the Transaction UID that is generated for the storage commitment request is based on the system configuration. By default an answer must be obtained from the SCP within a configurable number of hours (default: 6 hours). After this the Transaction UID is no longer valid.

LOGIQworks does not support the optional Storage Media File-Set ID & UID attributes.

3.1.2.7.3.2 Notifications

When LOGIQworks receives a success status the status of the job that requested the storage commitment is changed from "Sent, waiting for storage commitment" to "Sent, storage commitment succeeded" and the job is finished. When deletion of the previously transmitted images is requested as part of the job they will be deleted.

When LOGIQworks receives a failure status the status of the job that requested the storage commitment is changed from "Sent, waiting for storage commitment" to "Error". The job remains in the send queue in an error state and the specific reason for the error can be seen

in the Details dialog. When deletion of the previously transmitted images is requested as part of the job this will not be done.

3.1.2.8 Convey a Study Status Change to a Remote System

3.1.2.8.1 Associated Real World Activity

The LOGIQworks Connection Service sends out a notification (N-EVENT-REPORT) to remote DICOM system, indicating that the study status of that system has changed.

3.1.2.8.2 Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name	UID		Negotiation
Detached Study Management	1.2.840.10008.3.1.2.3.1	Implicit VR, Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR, Little Endian	1.2.840.10008.1.2.1		

3.1.2.8.3 SOP Specific Conformance Statement for SOP Class Detached Study Management

The LOGIQworks Connection Service provides standard conformance.

3.1.2.9 Request a Study Status Change from a Remote System

3.1.2.9.1 Associated Real World Activity

The LOGIQworks Connection Service sends out a request to a remote DICOM system, requesting the change of the study status for a certain study, residing on the remote system. It will use a DICOM N-SET command for this.

3.1.2.9.2 Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name	UID		Negotiation
Detached Study Management	1.2.840.10008.3.1.2.3.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.2.9.3 SOP Specific Conformance Statement for SOP Class Detached Study Management

The LOGIQworks Connection Service provides standard conformance.

3.1.3   Association Acceptance Policy

The LOGIQworks Connection Service accepts associations for the following activities:
- Verification of the DICOM communication between a remote system and LOGIQworks.
- Transfer of images from a remote system to LOGIQworks.
- Processing of a query from a remote system.
- Initiation of a transfer of images to a remote system when a retrieve request is received.
- Commit the storage of images on a LOGIQworks system.
- Receive a Study Status Change Request from a remote system
- Receive a Study Status Change Event from a remote system

LOGIQworks Connection Service can be configured in a way that it will reject association requests from unknown applications. LOGIQworks connection service will always reject associations who use the wrong value for the called AE Title

3.1.3.1   Verify Communication with a Remote System

3.1.3.1.1   Associated Real World Activity

The LOGIQworks Connection Service will respond to verification request made by remote systems.

3.1.3.1.2   Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name	UID		Negotiation
Verification	1.2.840.10008.1.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.1.3   SOP Specific Conformance Statement for SOP Class Verification

The LOGIQworks Connection Service provides standard conformance.

3.1.3.1.4   Presentation Context Acceptance Criterion

There are no specific rules for acceptance and prioritization of presentation contexts and the LOGIQworks Connection Service will accept all presentation contexts that match those listed in the table shown above.

3.1.3.2 Receive Images from a Remote System

3.1.3.2.1 Associated Real World Activity

A remote system wants to send images to the LOGIQworks system via the LOGIQworks Connection Service. Once the transfer is completed the new images will automatically be included in the user's view of the local database of LOGIQworks and can be selected for display.

3.1.3.2.2 Accepted Presentation Contexts

Presentation Context Table for Receive From Remote System				
Abstract Syntax		**Transfer Syntax**	**Role**	**Extended Negotiation**
Name	**UID**			
CR Image	1.2.840.10008.5.1.4.1.1.1	See UID list A below	SCP	None
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1	See UID list A below	SCP	None
DX Image (Process)*	1.2.840.10008.5.1.4.1.1.1.1.1	See UID list A below	SCP	None
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2	See UID list A below	SCP	None
DX Mammography Image (Process)*	1.2.840.10008.5.1.4.1.1.1.2.1	See UID list A below	SCP	None
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3	See UID list A below	SCP	None
DX Intra-oral Image (Process)*	1.2.840.10008.5.1.4.1.1.1.3.1	See UID list A below	SCP	None
CT Image	1.2.840.10008.5.1.4.1.1.2	See UID list A below	SCP	None
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3	See UID list A below	SCP	None
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	See UID list A below	SCP	None
MR Image	1.2.840.10008.5.1.4.1.1.4	See UID list A below	SCP	None
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5	See UID list A below	SCP	None
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6	See UID list A below	SCP	None
US Image	1.2.840.10008.5.1.4.1.1.6.1	See UID list A below	SCP	None
SC Image	1.2.840.10008.5.1.4.1.1.7	See UID list A below	SCP	None
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1	See UID list A below	SCP	None
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2	See UID list A below	SCP	None
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3	See UID list A below	SCP	None
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4	See UID list A below	SCP	None
Standalone Overlay*	1.2.840.10008.5.1.4.1.1.8	See UID list B below	SCP	None
Standalone Curve*	1.2.840.10008.5.1.4.1.1.9	See UID list B below	SCP	None
Standalone Modality LUT*	1.2.840.10008.5.1.4.1.1.10	See UID list B below	SCP	None
Standalone VOI LUT*	1.2.840.10008.5.1.4.1.1.11	See UID list B below	SCP	None
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1	See UID list B below	SCP	None
XA Image	1.2.840.10008.5.1.4.1.1.12.1	See UID list A below	SCP	None
XF Image	1.2.840.10008.5.1.4.1.1.12.2	See UID list A below	SCP	None
NM Image	1.2.840.10008.5.1.4.1.1.20	See UID list A below	SCP	None
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1	See UID list A below	SCP	None
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2	See UID list A below	SCP	None
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1	See UID list A below	SCP	None
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2	See UID list A below	SCP	None
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3	See UID list A below	SCP	None
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4	See UID list A below	SCP	None
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11	See UID list B below	SCP	None
Enhanced Structured Reports*	1.2.840.10008.5.1.4.1.1.88.22	See UID list B below	SCP	None
Comprehensive Structured Reports*	1.2.840.10008.5.1.4.1.1.88.33	See UID list B below	SCP	None
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	See UID list B below	SCP	None
PET Image	1.2.840.10008.5.1.4.1.1.128	See UID list A below	SCP	None
Standalone PET Curve*	1.2.840.10008.5.1.4.1.1.129	See UID list B below	SCP	None
RT Image	1.2.840.10008.5.1.4.1.1.481.1	See UID list A below	SCP	None
RT Dose*	1.2.840.10008.5.1.4.1.1.481.2	See UID list B below	SCP	None
RT Structure Set*	1.2.840.10008.5.1.4.1.1.481.3	See UID list B below	SCP	None
RT Beams Treatment Record*	1.2.840.10008.5.1.4.1.1.481.4	See UID list B below	SCP	None
RT Plan*	1.2.840.10008.5.1.4.1.1.481.5	See UID list B below	SCP	None
RT Brachy Treatment Record*	1.2.840.10008.5.1.4.1.1.481.6	See UID list B below	SCP	None
RT Treatment Summary Record*	1.2.840.10008.5.1.4.1.1.481.7	See UID list B below	SCP	None

UID List A:

Transfer Syntaxes for Reception of Image type IODs From Remote System	
Name	**UID**
Implicit VR, Little Endian	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, Big Endian	1.2.840.10008.1.2.2
Explicit VR, Lossy JPEG 8-Bit Image Compression	1.2.840.10008.1.2.4.50
Explicit VR, Lossy JPEG 12-Bit Image Compression	1.2.840.10008.1.2.4.51
Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
Explicit VR, RLE Lossless compression	1.2.840.10008.1.2.5
Explicit VR, AMI Wavelet Progressive Lossy Compression	1.2.528.1.1001.4.1.1.2
Explicit VR, AMI JPEG Lossy Compression 8-bit	1.2.528.1.1001.4.2.1.1
Explicit VR, AMI JPEG Lossy Compression 12-bit	1.2.528.1.1001.4.2.1.2
Explicit VR, AMI ZLIB Lossless Compression	1.2.528.1.1001.4.4.1

UID List B:

Transfer Syntaxes for Reception of non-image type IODs From Remote System	
Name	**UID**
Implicit VR, Little Endian	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, Big Endian	1.2.840.10008.1.2.2

Note: LOGIQworks is able to receive a large number of IODs. However, LOGIQworks will not always apply the intended behavior, described in the DICOM 3.0 2000 standard, for all of the IODs. IODs marked with a * symbol can only be received, stored, queried for and retrieved, and their contents can be displayed in a generic way. See section 3.1 LOGIQworks DICOM services AE Specifications for a detailed description of the visualization capabilities.

3.1.3.2.3 SOP Specific Conformance Statement for SOP Class Storage

The LOGIQworks Connection Service conforms to the full (level 2) conformance of the Storage SOP class. All Type 1, Type 2 and Type 3 attributes will be retained. In addition private attributes will be stored and included when the image is sent out again.

Upon successful storage of images of a study or series it may automatically be transferred to another system. The LOGIQworks system can be configured such to automatically delete studies or series from its local database when certain criteria are met.

When an image is received that has a SOP Instance UID (0008,0018) that is already present in the LOGIQworks database the transfers itself will complete successfully but the existing image in the database will be kept and the newly received image will be discarded.

When receiving images they will by default be stored in the (compressed, big/little endian) form they arrived. Upon further transmission of lossy compressed images decompression could take place if the negotiation results in an uncompressed or lossless compressed transfer syntax. The receiving system will have to check the Lossy Compression attribute (0028,1210) in order to verify that there was decompression loss when this image was created. LOGIQworks will display the contents of attribute "Derivation Description" (0008,2111) or a descriptive text indicating prior compression loss along with the images, to ensure that the user is aware of the fact that derived pixel data is shown.

There is an option to automatically decompress lossy JPEG compressed images upon receiving, which is only there for performance reasons. The attribute Lossy Compression will be set to "01" and never changed ever after. The attribute "Derivative Description" (0008,2111) keeps its original contents and should still be displayed while viewing the images in third party applications.

LOGIQworks offers support for key images, adhering Supplement 59 of the DICOM 3.0 standard. In addition it is able to treat legacy Key Image labels of Image IODs (i.e. when an image contains the attribute "Image Type" (0008,0008) which includes "KEY_IMAGE" as one of the multiple values then LOGIQworks will treat it as a Key Image).

LOGIQworks is able to receive and send any type of (color) image, i.e. images will not be rejected based on the value of tag Photometric Interpretation (0028,0004). However, LOGIQworks will only be able to display images with Photometric interpretation "MONCHROME1", "MONOCHROME2", "RGB", "PALETTE COLOR", "YBR_FULL" and "YBR_FULL_422". For RGB and YBR_FULL images both planar configuration 0 (Color By Plane) and 1 (Color by Pixel) can be displayed.

3.1.3.2.4 Presentation Context Acceptance Criterion

There are no specific rules for acceptance and prioritization of presentation contexts and the LOGIQworks Connection Service will accept all presentation contexts that match those listed in the table shown above. It will however limit a certain SCU to only one association at a time. This means that when a SCU tries to initiate a request while any previous associations that it made are not completely processed that association will be accepted but actual data transfer will be postponed until all previous associations are completed.

LOGIQworks will accept the first Transfer Syntax from the list it accepts. In case of problems there are configuration options to turn off the acceptance of one or more specific Transfer Syntaxes, in order to make LOGIQworks select a different Transfer Syntax.

3.1.3.3 Query the Error! Reference source not found. Database

3.1.3.3.1 Associated Real World Activity

A remote system wants to see which studies are available on the LOGIQworks system and issues a query.

3.1.3.3.2 Accepted Presentation Contexts

Presentation Context Table for local Database Query					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Patient Root Query/ Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Study Root Query/ Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.3.3 SOP Specific Conformance Statement for SOP Class Query

The LOGIQworks Database Service does not support relational queries. The following keys are by default[20] supported for the Patient Root Query/Retrieve:

Level	Description	Tag
PATIENT	Specific Character Set	(0008,0005)
PATIENT	Patient Name	(0010,0010)
PATIENT	Patient ID	(0010,0020)
PATIENT	Other Patient Ids	(0010,1000)
PATIENT	Patients Date of Birth	(0010,0030)
PATIENT	Patients Sex	(0010,0040)
STUDY	Specific Character Set	(0008,0005)
STUDY	Study Date	(0008,0020)
STUDY	Study Time	(0008,0030)
STUDY	Accession Number	(0008,0050)
STUDY	Modalities in Study	(0008,0061)
STUDY	Referring Physician	(0008,0090)
STUDY	Study Description	(0008,1030)
STUDY	Patient Name	(0010,0010)
STUDY	Patient ID	(0010,0020)
STUDY	Study UID	(0020,000D)
STUDY	Study ID	(0020,0010)
STUDY	Study Status ID	(0032,000A)
STUDY	Reading Physician	(0008,1060)
STUDY	Reason for Study	(0032,1030)
STUDY	Number of Study Related Series	(0020,1206)
STUDY	Number of Study Related Instances/Images	(0020,1208)
STUDY	Retrieve AE Title	(0008,0054)
STUDY	Instance availability	(0008,0056)
SERIES	Specific Character Set	(0008,0005)
SERIES	Modality	(0008,0060)
SERIES	Performing Physician	(0008,1050)
SERIES	Body Part	(0018,0015)
SERIES	Patient Position	(0018,5100)
SERIES	Series UID	(0020,000E)
SERIES	Series Number	(0020,0011)
SERIES	Laterality	(0020,0060)

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[20] System integrators can configure LOGIQworks in a way that any DICOM tag (public/private) can be queried for, on any level.

SERIES	Series Date	(0008,0021)
SERIES	Series Time	(0008,0031)
SERIES	Description	(0008,103E)
SERIES	Protocol	(0018,1030)
SERIES	View Position	(0018,5101)
SERIES	Frame of Reference UID	(0020,0052)
SERIES	Smallest Pixel Value in Series	(0028,0108)
SERIES	Largest Pixel Value in Series	(0028,0109)
SERIES	Institution Name	(0008,0080)
SERIES	Station Name	(0008,1010)
SERIES	Number of Series Related Instances/Images	(0020,1209)
SERIES	Institutional Department Name	(0008,1040)
IMAGE	Repetition Time	(0018,0080)
IMAGE	Echo Time	(0018,0081)
IMAGE	Specific Character Set	(0008,0005)
IMAGE	SOP Class UID	(0008,0016)
IMAGE	SOP Instance UID	(0008,0018)
IMAGE	Image Number	(0020,0013)
IMAGE	Rows	(0028,0010)
IMAGE	Columns	(0028,0011)
IMAGE	Patient Orientation	(0020,0037)
IMAGE	Image Type	(0008,0008)
IMAGE	Derivation Description	(0008,2111)
IMAGE	Slice Thickness	(0018,0050)
IMAGE	Imager Pixel Spacing	(0018,1164)
IMAGE	Image Position (Patient)	(0020,0032)
IMAGE	Pixel Spacing	(0028,0030)
IMAGE	Pixel Aspect Ratio	(0028,0034)
IMAGE	Smallest Image Pixel Value	(0028,0106)
IMAGE	Largest Image Pixel Value	(0028,0107)
IMAGE	Window Center	(0028,1050)
IMAGE	Window Width	(0028,1051)
IMAGE	Window Center & Width Explanation	(0028,1055)
IMAGE	Lossy Image Compression	(0028,2110)
IMAGE	Rescale Intercept	(0028,1052)
IMAGE	Rescale Slope	(0028,1053)
IMAGE	Rescale Type	(0028,1054)
IMAGE	Contrast/Bolus Agent	(0018,0010)
IMAGE	Patient Orientation	(0020,0020)
IMAGE	Acquisition Number	(0020,0012)
IMAGE	Slice Location	(0020,1041)
IMAGE	Instance Creation Date	(0008,0012)
IMAGE	Instance Creation Time	(0008,0013)
IMAGE	Presentation Label	(0070,0080)
IMAGE	Presentation Description	(0070,0081)
IMAGE	Presentation Creation Date	(0070,0082)
IMAGE	Presentation Creation Time	(0070,0083)
IMAGE	Presentation Creator's Name	(0070,0084)
IMAGE	Completion Flag	(0040,A491)
IMAGE	Verification Flag	(0040,A493)
IMAGE	Content Date	(0008,0023)
IMAGE	Content Time	(0008,0033)
IMAGE	Verification Date/Time	(0040,A030)

The following keys are by default[21] supported for the Study Root Query/Retrieve:

Level	Description	Tag
STUDY	Specific Character Set	(0008,0005)
STUDY	Patient Name	(0010,0010)
STUDY	Patient ID	(0010,0020)
STUDY	Other Patient Ids	(0010,1000)
STUDY	Patients Date of Birth	(0010,0030)
STUDY	Patients Sex	(0010,0040)
STUDY	Study Date	(0008,0020)

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[21] System integrators can configure **Error! Reference source not found.** in a way that any DICOM tag (public/private) can be queried for, on any level.

STUDY	Study Time	(0008,0030)
STUDY	Accession Number	(0008,0050)
STUDY	Modalities in Study	(0008,0061)
STUDY	Referring Physician	(0008,0090)
STUDY	Study Description	(0008,1030)
STUDY	Patient Name	(0010,0010)
STUDY	Patient ID	(0010,0020)
STUDY	Study UID	(0020,000D)
STUDY	Study ID	(0020,0010)
STUDY	Study Status ID	(0032,000A)
STUDY	Reading Physician	(0008,1060)
STUDY	Reason for Study	(0032,1030)
STUDY	Number of Study Related Series	(0020,1206)
STUDY	Number of Study Related Instances/Images	(0020,1208)
STUDY	Retrieve AE Title	(0008,0054)
STUDY	Instance availability	(0008,0056)
SERIES	Specific Character Set	(0008,0005)
SERIES	Modality	(0008,0060)
SERIES	Performing Physician	(0008,1050)
SERIES	Body Part	(0018,0015)
SERIES	Patient Position	(0018,5100)
SERIES	Series UID	(0020,000E)
SERIES	Series Number	(0020,0011)
SERIES	Laterality	(0020,0060)
SERIES	Series Date	(0008,0021)
SERIES	Series Time	(0008,0031)
SERIES	Description	(0008,103E)
SERIES	Protocol	(0018,1030)
SERIES	View Position	(0018,5101)
SERIES	Frame of Reference UID	(0020,0052)
SERIES	Smallest Pixel Value in Series	(0028,0108)
SERIES	Largest Pixel Value in Series	(0028,0109)
SERIES	Institution Name	(0008,0080)
SERIES	Station Name	(0008,1010)
SERIES	Number of Series Related Instances/Images	(0020,1209)
SERIES	Institutional Department Name	(0008,1040)
SERIES	Number of Series Related Instances/Images	(0020,1209)
IMAGE	Repetition Time	(0018,0080)
IMAGE	Echo Time	(0018,0081)
IMAGE	Specific Character Set	(0008,0005)
IMAGE	SOP Class UID	(0008,0016)
IMAGE	SOP Instance UID	(0008,0018)
IMAGE	Image Number	(0020,0013)
IMAGE	Rows	(0028,0010)
IMAGE	Columns	(0028,0011)
IMAGE	Patient Orientation	(0020,0037)
IMAGE	Image Type	(0008,0008)
IMAGE	Derivation Description	(0008,2111)
IMAGE	Slice Thickness	(0018,0050)
IMAGE	Imager Pixel Spacing	(0018,1164)
IMAGE	Image Position (Patient)	(0020,0032)
IMAGE	Pixel Spacing	(0028,0030)
IMAGE	Pixel Aspect Ratio	(0028,0034)
IMAGE	Smallest Image Pixel Value	(0028,0106)
IMAGE	Largest Image Pixel Value	(0028,0107)
IMAGE	Window Center	(0028,1050)
IMAGE	Window Width	(0028,1051)
IMAGE	Window Center & Width Explanation	(0028,1055)
IMAGE	Lossy Image Compression	(0028,2110)
IMAGE	Rescale Intercept	(0028,1052)
IMAGE	Rescale Slope	(0028,1053)
IMAGE	Rescale Type	(0028,1054)
IMAGE	Contrast/Bolus Agent	(0018,0010)
IMAGE	Patient Orientation	(0020,0020)
IMAGE	Acquisition Number	(0020,0012)
IMAGE	Slice Location	(0020,1041)
IMAGE	Instance Creation Date	(0008,0012)
IMAGE	Instance Creation Time	(0008,0013)
IMAGE	Presentation Label	(0070,0080)
IMAGE	Presentation Description	(0070,0081)

IMAGE	Presentation Creation Date	(0070,0082)
IMAGE	Presentation Creation Time	(0070,0083)
IMAGE	Presentation Creator's Name	(0070,0084)
IMAGE	Completion Flag	(0040,A491)
IMAGE	Verification Flag	(0040,A493)
IMAGE	Content Date	(0008,0023)
IMAGE	Content Time	(0008,0033)
IMAGE	Verification Date/Time	(0040,A030)

The following types of attribute matching are supported:

Matching methods for Study/Patient Root Query SCP
Method
Single Value Matching
Universal Matching
Wild Card Matching
Range Matching

3.1.3.3.4 Presentation Context Acceptance Criterion

There are no specific rules for acceptance and prioritization of presentation contexts and the LOGIQworks Connection Service will accept all presentation contexts that match those listed in the table shown above.

3.1.3.4   Retrieve from the LOGIQworks Database

3.1.3.4.1 Associated Real World Activity

A remote system wants to receive data available on the LOGIQworks system and issues a retrieve command.

3.1.3.4.2 Accepted Presentation Contexts

Presentation Context Table for local Database Query					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Patient Root Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		
Study Root Query/ Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.4.3 SOP Specific Conformance Statement for SOP Class Retrieve

The LOGIQworks Connection Service provides standard conformance.

In addition to this it offers relational retrieve whereby for the Patient Root Query/Retrieve Model all studies of a patient can be retrieved by providing a single Patient ID. Also for both the Patient Root Query/Retrieve Model and the Study Root Query/Retrieve Model all images of a study or series can be retrieved by providing a single Study Instance UID or a Study Instance UID with a Series Instance UID.

3.1.3.4.4 Presentation Context Acceptance Criterion

LOGIQworks Connection Service will only accept retrieve requests from DICOM systems for which it has been configured. There are no specific rules for acceptance and prioritization of presentation contexts.

3.1.3.5 Commit Storage of Images in the LOGIQworks Database

3.1.3.5.1 Associated Real World Activity

LOGIQworks can confirm the storage (availability) of images on the local system when it is asked to do so. Note however that LOGIQworks does not provide long term archiving and that therefore there is no guarantee that the committed images will remain on the system for a longer period of time (see also below).

3.1.3.5.2 Accepted Presentation Contexts

Presentation Context Table for Storage Commitment Push Model					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.5.3 SOP Specific Conformance Statement for SOP Class Storage Commitment Push Model

LOGIQworks provides standard conformance.

LOGIQworks will open a new association to the SCU for transmitting the response back and will not transmit the response using the association over which the storage commitment request was sent by the SCU (even if it is still open at the time of sending the response back). Thus the N-EVENT-REPORT will occur on a different association than the N-ACTION operation.

3.1.3.5.3.1 Operations

LOGIQworks only provides temporary commitment for the storage of images. This means that the system can be configured to auto delete studies based on priority rules. LOGIQworks offers a user interface to delete studies.
Additionally LOGIQworks has a Delete Lock mechanism preventing studies to be auto-deleted or accidentally deleted by the user.

LOGIQworks should not be used as a long-term archive. If you want LOGIQworks to retain the received studies (e.g. send them to a long-term storage after LOGIQworks no longer needs it), it needs to be configured as such.

LOGIQworks supports the Referenced Study Component Sequence Attribute by treating it as a Study Instance UID (0020,000D), which is used to speed up the search for the requested objects. When no objects are found with this Study UID, or the Referenced Study Component Sequence Attribute was not present in the request, the complete database is searched for the requested objects.

Committed images can be retrieved via the normal Query/Retrieve mechanism.

3.1.3.5.3.2 Notifications

Upon receiving a storage commitment request LOGIQworks will first wait for a configurable interval (5 seconds by default). It will then verify up to configurable number of retries (3 by default), separated by a configurable interval (15 seconds by default), whether the requested objects are stored on the system. After a fully successful verification (all requested objects could be verified) it will send a N-EVENT-REPORT back to the requester on a dedicated association, reporting storage commitment. If after the last retry not all objects could be verified an N-EVENT-REPORT message is sent back with a list of committed objects and a list of uncommitted objects.

LOGIQworks does not support the optional Storage Media File-Set ID and UID attributes. LOGIQworks does not support the optional Retrieve AE Title (0008,0054) for storage Commitment N-EVENT-REPORTs.

3.1.3.5.4 Presentation Context Acceptance Criterion

There are no specific rules for acceptance and prioritization of presentation contexts and LOGIQworks will accept all presentation contexts that match those listed in the table shown above.

3.1.3.6 Receive a Study Status Change Request from a remote system

3.1.3.6.1 Associated Real World Activity

3.1.3.6.2 Accepted Presentation Contexts

Presentation Context Table for Detached Study Management					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Detached Study Management	1.2.840.10008.3.1.2.3.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.6.3 SOP Specific Conformance Statement for SOP Class Detached Study Management

LOGIQworks provides standard conformance.

3.1.3.6.3.1 Operations

Upon receiving an N-SET command containing the Study UID involved and the new Study Status ID for the study, the LOGIQworks Connection Service will request the study status change from the LOGIQworks Database Service. It will report an error if the study was not found.

3.1.3.6.4 Presentation Context Acceptance Criterion

There are no specific rules for acceptance and prioritization of presentation contexts and LOGIQworks will accept all presentation contexts that match those listed in the table shown above.

3.1.3.7   Receive a Study Status Change Event from a remote system

3.1.3.7.1 Associated Real World Activity

3.1.3.7.2 Accepted Presentation Contexts

Presentation Context Table for Detached Study Management					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended**
Name	**UID**	**Name**	**UID**		**Negotiation**
Detached Study Management	1.2.840.10008.3.1.2.3.1	Explicit VR, Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR, Little Endian	1.2.840.10008.1.2		

3.1.3.7.3 SOP Specific Conformance Statement for SOP Class Detached Study Management.

LOGIQworks provides standard conformance.

3.1.3.7.3.1 Operations

Upon receiving an N-EVENT-REPORT command containing the Study UID involved and the new Study Status ID for the study, the LOGIQworks Connection Service will request the study status change from the LOGIQworks Database Service.

### 3.1.3.7.4 Presentation Context Acceptance Criterion

LOGIQworks Connection Service will only accept retrieve requests from DICOM systems for which it has been configured. There are no specific rules for acceptance and prioritization of presentation contexts.

3.2 LOGIQworks DICOM Media Server AE

LOGIQworks provides standard conformance to the DICOM Media Storage Service
and File Format (PS 3.10) and the Media Storage Application Profiles (PS 3.11) as far as the
reading of uncompressed and JPEG Lossless Non-Hierarchical First Order Prediction
compressed images on CD-Recordable media is concerned.

3.2.1 Implementation Model

3.2.1.1 Application Data Flow Diagram
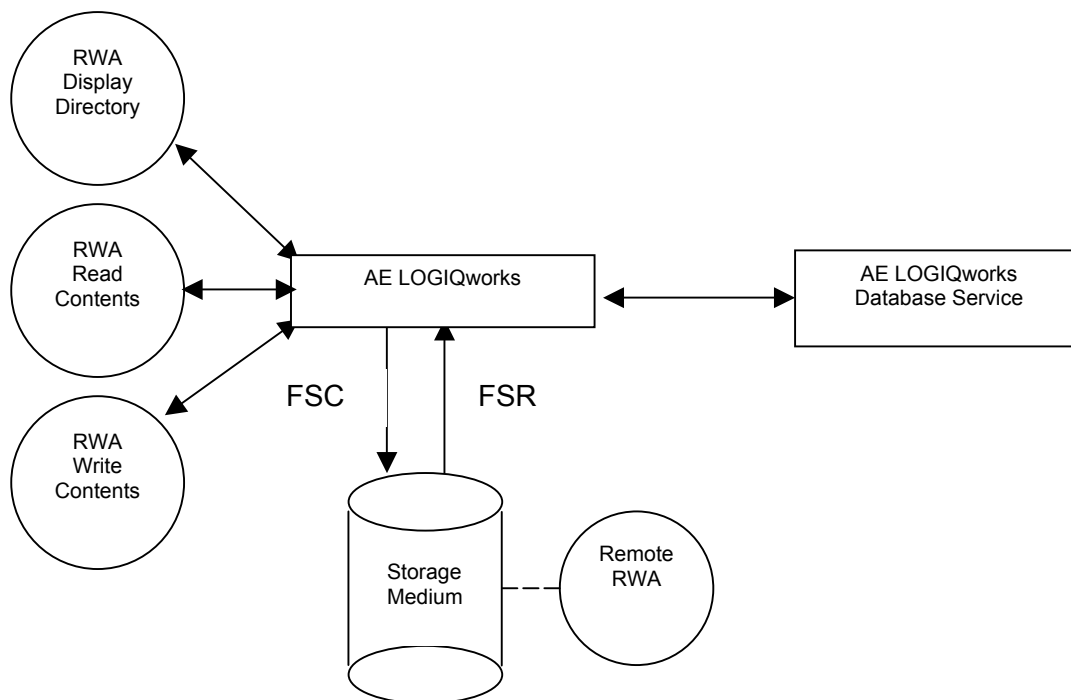
The LOGIQworks Media Server application flow consists of the following items:
- The LOGIQworks front-end application serves both as a FSC and a FSR. In this role it is
  able to read directory information from the storage medium, to import images from the
  storage medium and to write images and directory information to the storage medium.
- The three Real World Activities involved are available through the LOGIQworks AE's user
  interface.

LOGIQworks does not support writing of multi session CD-R disks.

3.2.1.2 File Meta Information Options

The Implementation Class UID is 1.2.528.1.1001.2.20020314.1
The Implementation Version Name is "AMI_DICOM00_4"

3.2.2 AE Specifications

3.2.2.1 Application Entity LOGIQworks Database Service Specification

LOGIQworks supports the following application profile:

Supported Application Profile	
Description	**3.2.2.1.1 Identifier**
General Purpose CD-R Image Interchange profile	STD-GEN-CD

3.2.2.2 Real-World Activities

LOGIQworks supports the following Real World Activities within the profile mentioned above:

Real World Activities and roles[22]			
Supported Application Profiles	**Real World Activity**	**Role**	**SC Option**
STD-GEN-CD	Display Directory of CD-R disk	FSR	Interchange
	Read image(s) from CD-R disk	FSR	Interchange
	Write image(s) on CD-R disk	FSC	Interchange

Please note that to ensure compliance to the STD-GEN-CD application profile the system integrator or user must select the Explicit Little Endian transfer syntax by turning off the check box *JPEG Lossless compressed* (default value: Off) in the Single Media Archive configuration.

3.2.2.2.1 Real World Activity: Display Directory of CD-R disk

LOGIQworks will act as a FSR when reading the directory of the medium. This will result in an overview of the patients, studies, series and images in LOGIQworks.

The display is structured in one of the following ways:

Types of queries	
Type of query	**Levels**
Study Root Query	Study, Series, Image
Patient Root Query	Patient, Study, Series, Image

        At least the Patient Name and Patient ID fields are necessary for a correct display of the directory information. The following DICOMDIR keys are used for the user to be able to distinguish between the objects.
Reading of the directory contents is a standard feature of LOGIQworks.

3.2.2.2.2 Real World Activity Read images from CD-R disk

LOGIQworks will act as a FSR when reading all/selected images from the CD-R medium. This feature will be available through the Import command or the View command from the Remote View area.

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[22] The LOGIQworks software allows for more flexibility than this profile describes. Documentation for extended configuration is available.

LOGIQworks is able to read images only if they belong to one of the following SOP classes:

SOP classes for import of DICOM Part 10 images	
Name	**UID**
CR Image	1.2.840.10008.5.1.4.1.1.1
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1
DX Image (Process)*	1.2.840.10008.5.1.4.1.1.1.1.1
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2
DX Mammography Image (Process)*	1.2.840.10008.5.1.4.1.1.1.2.1
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3
DX Intra-oral Image (Process)*	1.2.840.10008.5.1.4.1.1.1.3.1
CT Image	1.2.840.10008.5.1.4.1.1.2
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1
MR Image	1.2.840.10008.5.1.4.1.1.4
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6
US Image	1.2.840.10008.5.1.4.1.1.6.1
SC Image	1.2.840.10008.5.1.4.1.1.7
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4
Standalone Overlay*	1.2.840.10008.5.1.4.1.1.8
Standalone Curve*	1.2.840.10008.5.1.4.1.1.9
Standalone Modality LUT*	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT*	1.2.840.10008.5.1.4.1.1.11
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1
XA Image	1.2.840.10008.5.1.4.1.1.12.1
XF Image	1.2.840.10008.5.1.4.1.1.12.2
NM Image	1.2.840.10008.5.1.4.1.1.20
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive Structured Reports*	1.2.840.10008.5.1.4.1.1.88.33
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59
PET Image	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve*	1.2.840.10008.5.1.4.1.1.129
RT Image	1.2.840.10008.5.1.4.1.1.481.1
RT Dose*	1.2.840.10008.5.1.4.1.1.481.2
RT Structure Set*	1.2.840.10008.5.1.4.1.1.481.3
RT Beams Treatment Record*	1.2.840.10008.5.1.4.1.1.481.4
RT Plan*	1.2.840.10008.5.1.4.1.1.481.5
RT Brachy Treatment Record*	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record*	1.2.840.10008.5.1.4.1.1.481.7

LOGIQworks is able to read images only if they have one of the following transfer syntaxes:

Transfer syntaxes for import of DICOM Part 10 images	
Name	**UID**
Implicit VR, Little Endian	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, Big Endian	1.2.840.10008.1.2.2
Explicit VR, Lossy JPEG 8-Bit Image Compression	1.2.840.10008.1.2.4.50
Explicit VR, Lossy JPEG 12-Bit Image Compression	1.2.840.10008.1.2.4.51
Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
Explicit VR, RLE Lossless compression	1.2.840.10008.1.2.5

Note that this feature comprises reading of volumes created according to the STD-GEN-CD application profile, regardless of the setting of the *JPEG lossless Compression* flag (which only applies to writing of DICOM Part 10 volumes).

Importing of studies from a DICOM Part 10 Volume is a standard feature of LOGIQworks.

3.2.2.2.3 Real World Activity: Write images

LOGIQworks will act as a FSC when writing all or selected patients, studies or series from the local database view to random access archive media (like MODs). LOGIQworks uses a third party library from VOB Software GMBH to accomplish this.

LOGIQworks is able to write images of the following SOP classes:

SOP classes for writing DICOM Part 10 images	
Name	**UID**
CR Image	1.2.840.10008.5.1.4.1.1.1
DX Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.1
DX Image (Process)	1.2.840.10008.5.1.4.1.1.1.1.1
DX Mammography Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.2
DX Mammography Image (Process)	1.2.840.10008.5.1.4.1.1.1.2.1
DX Intra-oral Image (Presentation)	1.2.840.10008.5.1.4.1.1.1.3
DX Intra-oral Image (Process)	1.2.840.10008.5.1.4.1.1.1.3.1
CT Image	1.2.840.10008.5.1.4.1.1.2
US Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.3
US Multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1
MR Image	1.2.840.10008.5.1.4.1.1.4
NM Image (Retired)	1.2.840.10008.5.1.4.1.1.5
US Image (Retired)	1.2.840.10008.5.1.4.1.1.6
US Image	1.2.840.10008.5.1.4.1.1.6.1
SC Image	1.2.840.10008.5.1.4.1.1.7
Multi-Frame Single Bit SC Image	1.2.840.10008.5.1.4.1.1.7.1
Multi-Frame Grayscale Byte SC Image	1.2.840.10008.5.1.4.1.1.7.2
Multi-Frame Grayscale Word SC Image	1.2.840.10008.5.1.4.1.1.7.3
Multi-Frame True Color SC Image	1.2.840.10008.5.1.4.1.1.7.4
Standalone Overlay	1.2.840.10008.5.1.4.1.1.8
Standalone Curve	1.2.840.10008.5.1.4.1.1.9
Standalone Modality LUT	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT	1.2.840.10008.5.1.4.1.1.11
Grayscale Softcopy Presentation State	1.2.840.10008.5.1.4.1.1.11.1
XA Image	1.2.840.10008.5.1.4.1.1.12.1
XF Image	1.2.840.10008.5.1.4.1.1.12.2
NM Image	1.2.840.10008.5.1.4.1.1.20
VL Image (Retired)	1.2.840.10008.5.1.4.1.1.77.1
VL Multi-frame Image (Retired)	1.2.840.10008.5.1.4.1.1.77.2
VL Endoscopic Image	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image	1.2.840.10008.5.1.4.1.1.77.1.4
Basic Text Structured Reports	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structured Reports	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive Structured Reports	1.2.840.10008.5.1.4.1.1.88.33
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59
PET Image	1.2.840.10008.5.1.4.1.1.128
Standalone PET Curve	1.2.840.10008.5.1.4.1.1.129
RT Image	1.2.840.10008.5.1.4.1.1.481.1
RT Dose	1.2.840.10008.5.1.4.1.1.481.2
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3
RT Beams Treatment Record	1.2.840.10008.5.1.4.1.1.481.4
RT Plan	1.2.840.10008.5.1.4.1.1.481.5
RT Brachy Treatment Record	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record	1.2.840.10008.5.1.4.1.1.481.7

LOGIQworks is able to write images in one of the following transfer syntaxes (configurable):

Transfer syntaxes for writing DICOM Part 10 images	
Name	**UID**
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70

If images are stored non-compressed in the LOGIQworks local database, and *JPEG Lossless compressed* is configured for writing DICOM Part 10 studies, the compression is performed prior to saving the images. Please note that this feature lies outside the scope of the STD-GEN-CD Application Profile. If a requested compression is not possible for some reason, the images will be saved non-compressed with Explicit VR and Little Endian transfer syntax.

Writing studies to a DICOM Part 10 Volume is an optional feature of LOGIQworks, which requires a separate license.

LOGIQworks creates DICOMDIR files for the DICOM Part 10 Volumes, containing the following keys:

Keys exported to the DICOMDIR File			
Directory Record Type	**Key description**	**Tag**	**Type**
PATIENT	Specific Character Set	(0008,0005)	1C
PATIENT	Patient Name	(0010,0010)	2
PATIENT	Patient ID	(0010,0020)	1
PATIENT	Other Patient Ids	(0010,1000)	3
STUDY	Specific Character Set	(0008,0005)	1C
STUDY	Study Date	(0008,0020)	1
STUDY	Study Time	(0008,0030)	1
STUDY	Accession Number	(0008,0050)	2
STUDY	Modalities in Study	(0008,0061)	
STUDY	Referring Physician	(0008,0090)	3
STUDY	Study Description	(0008,1030)	3
STUDY	Patient Name	(0010,0010)	2
STUDY	Patient ID	(0010,0020)	1
STUDY	Patients Date of Birth	(0010,0030)	2
STUDY	Patients Sex	(0010,0040)	2
STUDY	Study UID	(0020,000D)	1C
STUDY	Study ID	(0020,0010)	1
STUDY	Study Status ID	(0032,000A)	
STUDY	Reading Physician	(0008,1060)	3
STUDY	Reason for Study	(0032,1030)	
SERIES	Specific Character Set	(0008,0005)	1C
SERIES	Modality	(0008,0060)	1
SERIES	Performing Physician	(0008,1050)	3
SERIES	Body Part	(0018,0015)	3
SERIES	Patient Position	(0018,5100)	2C
SERIES	Series UID	(0020,000E)	1
SERIES	Series Number	(0020,0011)	1
SERIES	Laterality	(0020,0060)	3
SERIES	Series Date	(0008,0021)	3
SERIES	Series Time	(0008,0031)	3
SERIES	Description	(0008,103E)	3
SERIES	Protocol	(0018,1030)	3
SERIES	View Position	(0018,5101)	2
SERIES	Frame of Reference UID	(0020,0052)	1
SERIES	Smallest Pixel Value in Series	(0028,0108)	3
SERIES	Largest Pixel Value in Series	(0028,0109)	3
SERIES	Institution Name	(0008,0080)	3
SERIES	Station Name	(0008,1010)	3
SERIES	Institutional Department Name	(0008,1040)	3
IMAGE	Repetition Time	(0018,0080)	2C
IMAGE	Echo Time	(0018,0081)	2
IMAGE	Specific Character Set	(0008,0005)	1C
IMAGE	SOP Class UID	(0008,0016)	1
IMAGE	SOP Instance UID	(0008,0018)	1C
IMAGE	Image Number	(0020,0013)	1
IMAGE	Rows	(0028,0010)	3
IMAGE	Columns	(0028,0011)	3
IMAGE	Patient Orientation	(0020,0037)	2C
IMAGE	Image Type	(0008,0008)	3
IMAGE	Derivation Description	(0008,2111)	3
IMAGE	Slice Thickness	(0018,0050)	2
IMAGE	Imager Pixel Spacing	(0018,1164)	3
IMAGE	Image Position (Patient)	(0020,0032)	2C
IMAGE	Pixel Spacing	(0028,0030)	1
IMAGE	Pixel Aspect Ratio	(0028,0034)	1C
IMAGE	Smallest Image Pixel Value	(0028,0106)	3
IMAGE	Largest Image Pixel Value	(0028,0107)	3
IMAGE	Window Center	(0028,1050)	1C
IMAGE	Window Width	(0028,1051)	1C
IMAGE	Window Center & Width Explanation	(0028,1055)	3

Keys exported to the DICOMDIR File			
Directory Record Type	**Key description**	**Tag**	**Type**
IMAGE	Lossy Image Compression	(0028,2110)	3
IMAGE	Rescale Intercept	(0028,1052)	1
IMAGE	Rescale Slope	(0028,1053)	1
IMAGE	Rescale Type	(0028,1054)	1
IMAGE	Contrast/Bolus Agent	(0018,0010)	2
IMAGE	Patient Orientation	(0020,0020)	2C
IMAGE	Acquisition Number	(0020,0012)	3
IMAGE	Slice Location	(0020,1041)	3
IMAGE	Instance Creation Date	(0008,0012)	3
IMAGE	Instance Creation Time	(0008,0013)	3
OVERLAY	Specific Character Set	(0008,0005)	1C
OVERLAY	Overlay Number	(0020,0022)	2
MODALITY LUT	Specific Character Set	(0008,0005)	1C
MODALITY LUT	Lookup table Number	(0020,0026)	1
VOI LUT	Specific Character Set	(0008,0005)	1C
VOI LUT	Lookup table Number	(0020,0026)	1
CURVE	Specific Character Set	(0008,0005)	1C
CURVE	Curve Number	(0020,0024)	1
PRESENTATION	Specific Character Set	(0008,0005)	1C
PRESENTATION	SOP Instance UID	(0008,0018)	1C
PRESENTATION	Instance Number	(0020,0013)	1
PRESENTATION	Presentation Label	(0070,0080)	1
PRESENTATION	Presentation Description	(0070,0081)	2
PRESENTATION	Presentation Creation Date	(0070,0082)	1
PRESENTATION	Presentation Creation Time	(0070,0083)	1
PRESENTATION	Presentation Creator's Name	(0070,0084)	2
PRESENTATION	Referenced Series Sequence	(0008,1115)	1
SR DOCUMENT	Instance Number	(0020,0013)	1
SR DOCUMENT	Completion Flag	(0040,A491)	1
SR DOCUMENT	Verification Flag	(0040,A493)	1
SR DOCUMENT	Content Date	(0008,0023)	1
SR DOCUMENT	Content Time	(0008,0033)	1
SR DOCUMENT	Verification Date/Time	(0040,A030)	1C
SR DOCUMENT	Concept Name Code Sequence	(0040,A043)	1
SR DOCUMENT	Content Sequence	(0040,A730)	1C
RT DOSE	Specific Character Set	(0008,0005)	1C
RT DOSE	SOP Instance UID	(0008,0018)	1C
RT DOSE	Instance Number	(0020,0013)	1
RT DOSE	Dose Summation Type	(3004,000A)	1
RT STRUCTURE SET	Specific Character Set	(0008,0005)	1C
RT STRUCTURE SET	SOP Instance UID	(0008,0018)	1C
RT STRUCTURE SET	Instance Number	(0020,0013)	1
RT STRUCTURE SET	Structure Set Label	(3006,0002)	1
RT STRUCTURE SET	Structure Set Date	(3006,0008)	2
RT STRUCTURE SET	Structure Set Time	(3006,0009)	2
RT PLAN	Specific Character Set	(0008,0005)	1C
RT PLAN	SOP Instance UID	(0008,0018)	1C
RT PLAN	Instance Number	(0020,0013)	1
RT PLAN	RT Plan Label	(300A,0002)	1
RT PLAN	RT Plan Date	(300A,0006)	2
RT PLAN	RT Plan Time	(300A,0007)	2
RT TREAT RECORD	Specific Character Set	(0008,0005)	1C
RT TREAT RECORD	SOP Instance UID	(0008,0018)	1C
RT TREAT RECORD	Instance Number	(0020,0013)	1
RT TREAT RECORD	Treatment Date	(3008,0250)	2
RT TREAT RECORD	Treatment Time	(3008,0251)	2
KEY OBJECT DOC	Instance Number	(0020,0013)	1
KEY OBJECT DOC	Content Date	(0008,0023)	1
KEY OBJECT DOC	Content Time	(0008,0033)	1

3.2.3   Character Sets

LOGIQworks may change the value of the tag (0008,0005) Character Set on incoming studies before they are written to a DICOM Part 10 Medium. This will only happen if a user operation

or automatic merge operation will change an existing IOD. This may lead to multi-valued Character Set values in cases where multiple non-ASCII scripts are used within the same IOD. In case the IODs contents haven't changed, the value for the Character Set (0008,0005) is retained and therefore depends on the system that created the DICOM IOD.

4   COMMUNICATION PROFILE

4.1   Supported Communication Stacks

The LOGIQworks DICOM services provide DICOM V3.0 TCP/IP Network Communication
Support as defined in Part 8 of the DICOM Standard.

4.2   OSI Stack

Not supported.

4.3   TCP/IP Stack

The LOGIQworks DICOM services use the TCP/IP stack from the Microsoft Windows 2000
operating system on which it executes.

4.3.1   Physical Media Support

The LOGIQworks DICOM services are not dependent on the physical medium over which the
TCP/IP executes.

4.4   Point-to-Point Stack

Not supported.

5 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS

5.1 Augmented and private application profiles

LOGIQworks' TruAccess Raw Data Processing module is able to create Secondary Capture Image Objects that can be stored to the local LOGIQworks database.

5.2 Standard Extended / Specialized / Private SOPs

LOGIQworks is able to create Grayscale Softcopy Presentation State IODs containing references to color images. This mechanism is used to store measurements, annotations, windowing operations and image transformations.

LOGIQworks provides full (level 2) conformance as SCP of the Storage SOP class. This means that upon sending an image received via DICOM on to another DICOM compliant system it will send out all attributes that it received. This includes private attributes from other GEMS products that are e.g. based on GEMS TruAccess technology and private attributes from other vendors.

The GEMS TruAccess Raw Data information is stored in private data elements designated by the Private Creator element:

Element Name	Tag	VR	VM	Description
Private Creator	7FE1,00xx	LO	1	GEMS_Ultrasound_MovieGroup_001

This means that all private tags starting with 7FE1,xx will belong to the GEMS_Ultrasound_MovieGroup_001.

Ultrasound TruAccess Raw Data created by GEMS LOGIQ Ultrasound scanners include preview image information in private data elements designated by the Private Creator element:

Element Name	Tag	VR	VM	Description
Private Creator	6003,00xx	LO	1	GEMS_Ultrasound_ImageGroup_001

This means that all private tags starting with 6003,00xx will belong to the GEMS_Ultrasound_ImageGroup_001.

5.3 Private Transfer Syntaxes

LOGIQworks is able to use the following private transfer syntaxes for compressed exchange of image type IODs:

Private Transfer Syntaxes for exchange of Image type IODs	
Name	**UID**
Explicit VR, AMI Wavelet Progressive Lossy Compression	1.2.528.1.1001.4.1.1.2
Explicit VR, AMI JPEG Lossy Compression 8-bit	1.2.528.1.1001.4.2.1.1
Explicit VR, AMI JPEG Lossy Compression 12-bit	1.2.528.1.1001.4.2.1.2
Explicit VR, AMI ZLIB Lossless Compression	1.2.528.1.1001.4.4.1

All Transfer Syntaxes listed above are based on the Explicit and Little Endian Transfer syntax, and use the encapsulated form of transferring Pixel Data in tag (7FE0,0010). The Value Representation for the Pixel Data tag will be OB.

6 CONFIGURATION

The configuration of the LOGIQworks DICOM services are stored in the Windows Registry. Only accounts (secured by passwords) with the right level of security will be able to change the configuration. This will typically be done by support personnel.

6.1 AE Title/Presentation Address Mapping

The AE title shared by the LOGIQworks services and front-end application is configurable and defaults to AE_<hostname>. The port on which the LOGIQworks Connection Service listens is also configurable and defaults to 104.

All remote systems that want to communicate with the LOGIQworks Connection Service have to be configured. For systems that want to act as SCUs of the Connection Service SCP SOP classes the following information may be needed:
- The AE title.
- The host name.
- The port number.

For systems with which the LOGIQworksDICOM services want to act as SCU the following information is needed:
- The AE title.
- The host name.
- The port number.

6.2 Configurable Parameters

LOGIQworks offers configuration of the following parameters, as far as the DICOM Communication is concerned.

Configurable		
Name	Values	Description
Max. number of Associations	1…	Maximum number of simultaneous incoming associations accepted by the Connection Service
PDU Packet Size	0 or 4096 – 4194304	Proposed size of PDU packets, both in SCP and SCU role. The value of zero indicates that **Error! Reference source not found.** is capable to accept PDU packets of any size.
Strict DICOM	True, False	Accept or reject incoming DICOM IODs when they contain type 1 violations.
Send Explicit VR	True, False	Determines whether or not Explicit Little Endian Transfer syntax is proposed when acting as a CStore SCU.

7 SUPPORT OF EXTENDED CHARACTER SETS

LOGIQworks offers full support for the following character sets:

Support Character Sets	
Name	**Value**
Default Character repertoire	ISO_IR 6, <none>
single-byte JIS X 0201 (Katakana)	ISO_IR 13, ISO 2022 IR 13
single-byte JIS X 0201 (Romaji)	ISO_IR 14
multi-byte JIS X 0208 (1983)	ISO_IR 87, ISO 2022 IR 87
Latin – 1 character repertoire	ISO_IR 100, ISO 2022 IR 100
Latin – 2 character repertoire	ISO_IR 101, ISO 2022 IR 101
Latin – 3 character repertoire	ISO_IR 109, ISO 2022 IR 109
Latin – 4 character repertoire	ISO_IR 110, ISO 2022 IR 110
Greek	ISO_IR 126, ISO 2022 IR 126
Arabic	ISO_IR 127, ISO 2022 IR 127
Hebrew	ISO_IR 138, ISO 2022 IR 138
Cyrillic	ISO_IR 144, ISO 2022 IR 144
Latin – 5 character repertoire	ISO_IR 148, ISO 2022 IR 148
multibyte JIS X 212	ISO_IR 159, ISO 2022 IR 159