



*Quality  
in  
Quantification*

# QAngio<sup>®</sup> XA 7.0

## DICOM Conformance Statement

## Legal Notices

### Copyright Notice

© 2003-2006 Medis medical imaging systems bv. All rights reserved.

Unless otherwise indicated, this manual is copyrighted and is protected by worldwide copyright laws and treaty provisions. No part of this manual may be copied, reproduced, modified, published or distributed in any form or by any means, for any purpose, without prior written permission of Medis medical imaging systems bv.

### Trademark Acknowledgments

QAngio is a registered trademark of Medis medical imaging systems bv in the Benelux. Linux is a registered trademark of Linus Torvalds. Red Hat and all Red Hat-based trademarks and logos are trademarks or registered trademarks of Red Hat, Inc. in the United States and other countries. SUSE and its logo are registered trademarks of SUSE LINUX AG. UNIX is a registered trademark of The Open Group in the United States and other countries. All other brand, product, and company names mentioned herein are trademarks or registered trademarks of their respective owners.

**Medis medical imaging systems bv**  
Schuttersveld 9  
2316 XG Leiden  
P.O. Box 384  
2300 AJ Leiden  
The Netherlands

Telephone: +31 (0)71 522 32 44  
Fax: +31 (0)71 521 56 17  
E-mail: support@medis.nl  
Web: www.medis.nl

**Medis medical imaging systems, Inc.**  
751 Miller Drive, Suite E-1  
Leesburg, VA 20175-8993  
USA

Telephone: (+1) (703) 737-3795  
Fax: (+1) (703) 737-3793  
E-mail: support@medis.nl  
Web: www.medis.nl

# Table of Contents

- QAngio® XA 7.0..... I
- DICOM Conformance Statement..... I
- Legal Notices..... II
- Table of Contents ..... III
- Introduction ..... 1
- References..... 1
- Conformance Statement ..... 2
- 1 QAngio® XA Network Specification..... 2
- 1.1 Implementation Model..... 2
- 1.1.1 Application Data Flow Diagram ..... 3
- 1.1.2 Functional Definition of the Application Entity..... 4
- 1.1.3 Sequences of Real World Activities ..... 4
- 1.2 AE Specifications ..... 6
- 1.2.1 SOP Classes ..... 6
- 1.2.2 Association Policies ..... 7
- 1.2.2.1 General..... 7
- 1.2.2.2 Number of Associations..... 7
- 1.2.2.3 Asynchronous Nature..... 8
- 1.2.2.4 Implementation Identifying Information ..... 8
- 1.2.3 Association Initiation Policies ..... 8
- 1.2.3.1 Real World Activity: Initiate Connectivity Verification..... 8
- 1.2.3.2 Real World Activity: Query and Retrieve Objects ..... 9
- 1.2.3.3 Real World Activity: Store Objects and Request Storage Commitment ..... 10
- 1.2.3.4 Real World Activity: Send Performed Procedure Status ..... 13
- 1.2.4 Association Acceptance Policies ..... 20
- 1.2.4.1 Real World Activity: Receive Connectivity Verification ..... 20

1.2.4.2	Real World Activity: Receive Objects .....	21
1.2.4.3	Real World Activity: Receive Storage Commitment Response .....	23
1.3	Network interfaces .....	25
1.3.1	Physical Network Interface .....	25
1.3.2	Additional Protocols .....	25
1.4	Configuration .....	25
1.4.1	AE Title and Presentation Address Mapping .....	25
1.4.2	Configurable Parameters .....	25
1.4.2.1	Configurable Parameters of QAngio <sup>®</sup> XA .....	25
2	QAngio <sup>®</sup> XA Media Interchange Specification .....	27
2.1	Implementation Model .....	27
2.1.1	Application Data Flow Diagram .....	27
2.1.2	Functional Definitions of AE's .....	27
2.1.3	Sequences of Real World Activities .....	27
2.2	AE Specifications .....	28
2.2.1	File Meta Information .....	28
2.2.2	Real World Activities .....	28
2.2.2.1	Activity - File Load .....	28
2.2.2.2	Activity - File Save .....	29
2.2.3	Augmented and Private Application Profiles .....	29
2.2.4	Media Configuration .....	29
3	Support of Character Sets .....	30
4	Security .....	31
4.1	Security Profiles .....	31
4.2	Association Level Security .....	31
4.3	Application Level Security .....	31
5	Annexes .....	32
5.1	IOD Contents .....	32
5.1.1	Created SOP Instances .....	32
5.1.2	Usage of Attributes from Received IODs .....	32

5.1.3	Attribute Mapping .....	32
5.1.4	Coerced/Modified fields.....	32
5.2	Data Dictionary of Private Attributes .....	32
5.3	Coded Terminology and Templates.....	32
5.4	Grayscale Image Consistency .....	32
5.5	Standard Extended/Specialized/Private SOP Classes.....	33
5.6	Private Transfer Syntaxes.....	33

---

# Introduction

Exchange of digital information of medical studies is regulated through an extension of the DICOM (Digital Imaging and Communications in Medicine) standard. As this standard grants certain flexibility in additional data, it is necessary for each vendor to describe the specific characteristics of his system in a conformance statement. In this document, the DICOM conformance of the Medis' QAngio<sup>®</sup> XA application is described according to NEMA part PS 3.2.

## About QAngio<sup>®</sup> XA

QAngio<sup>®</sup> XA offers quantification results that enable interventional cardiologists and radiologists to accurately plan interventions and perform post-interventional assessments. It provides researchers with a solid basis for the assessment of new therapies.

QAngio<sup>®</sup> XA is a proven solution for the quantification of angiograms, with a global customer base of clinicians, core laboratories and research institutions.

QAngio<sup>®</sup> XA includes a DICOM communication center designed for Windows which facilitates query, retrieve and store functionality of medical images for clinicians and technicians.

## Used definitions, terms and abbreviations

The following conventions are used in this document:

- NEMA PS 3.x refers to a part of the DICOM standard, x from 1-18 (1);
- Medis refers to Medis medical imaging systems;

## References

1. "The Digital Imaging and Communications in Medicine (DICOM) Standard", Parts 3.1 to 3.18 and Supplements, National Electrical Manufacturers Association; Rosslyn, Virginia, 2004

---

# Conformance Statement

## 1 QAngio<sup>®</sup> XA Network Specification

### 1.1 Implementation Model

The QAngio<sup>®</sup> XA application provides a combination of a DICOM communication center and analytical module. In brief, the objectives of the QAngio<sup>®</sup> XA application as a DICOM communication center are:

- To perform queries on a remote DICOM application and retrieve selected DICOM images and accompanying image information to the machine running QAngio<sup>®</sup> XA;
- Allow remote DICOM applications to store data on the machine running QAngio<sup>®</sup> XA;
- To send DICOM images from the machine running QAngio<sup>®</sup> XA to a remote DICOM application and request storage commitment for these images afterwards.
- To send MPPS status updates to a remote workflow DICOM application.

The objectives for QAngio<sup>®</sup> XA as an analytical module are:

- To read and display (real-time) DICOM images from disk and DICOM formatted CDROM and DVD;
- To write DICOM formatted files and file sets containing image information, not necessarily from original DICOM datasets;

In DICOM terms, QAngio<sup>®</sup> XA is an implementation of a DICOM **Query and Retrieve Service Class User (SCU)**. As such, it can send DICOM queries (C-FIND) and move (C-MOVE) requests to a DICOM Query and Retrieve Service Class Provider.

QAngio<sup>®</sup> XA is also an implementation of a DICOM **Storage Service Class User and Service Class Provider**. It can send store (C-STORE) requests to a DICOM Storage Service Class Provider and receive store (C-STORE) requests from a DICOM Storage Service Class User. It can request **Storage Commitment** for stored images (N-ACTION) as a Service Class User and process the status reports from the Storage Commitment Service Class User (N-EVENT-REPORT).

QAngio<sup>®</sup> XA is able to act as a DICOM **Modality Performed Procedure Step (MPPS) Service Class User**. It can send create (N-CREATE) and update (N-SET) requests to an MPPS Service Class Provider to let an Information System know that QAngio<sup>®</sup> XA has started, completed or aborted an analysis.

Finally, QAngio<sup>®</sup> XA is an implementation of a DICOM **Media Storage Service as File Set Updater (FSU), File Set Reader (FSR) and File Set Creator (FSC)**. It supports the 120 mm CDROM medium as described in PS 3.12 - Annex F and the 120 mm DVD medium as described in PS 3.12 - Annex P.

## 1.1.1 Application Data Flow Diagram

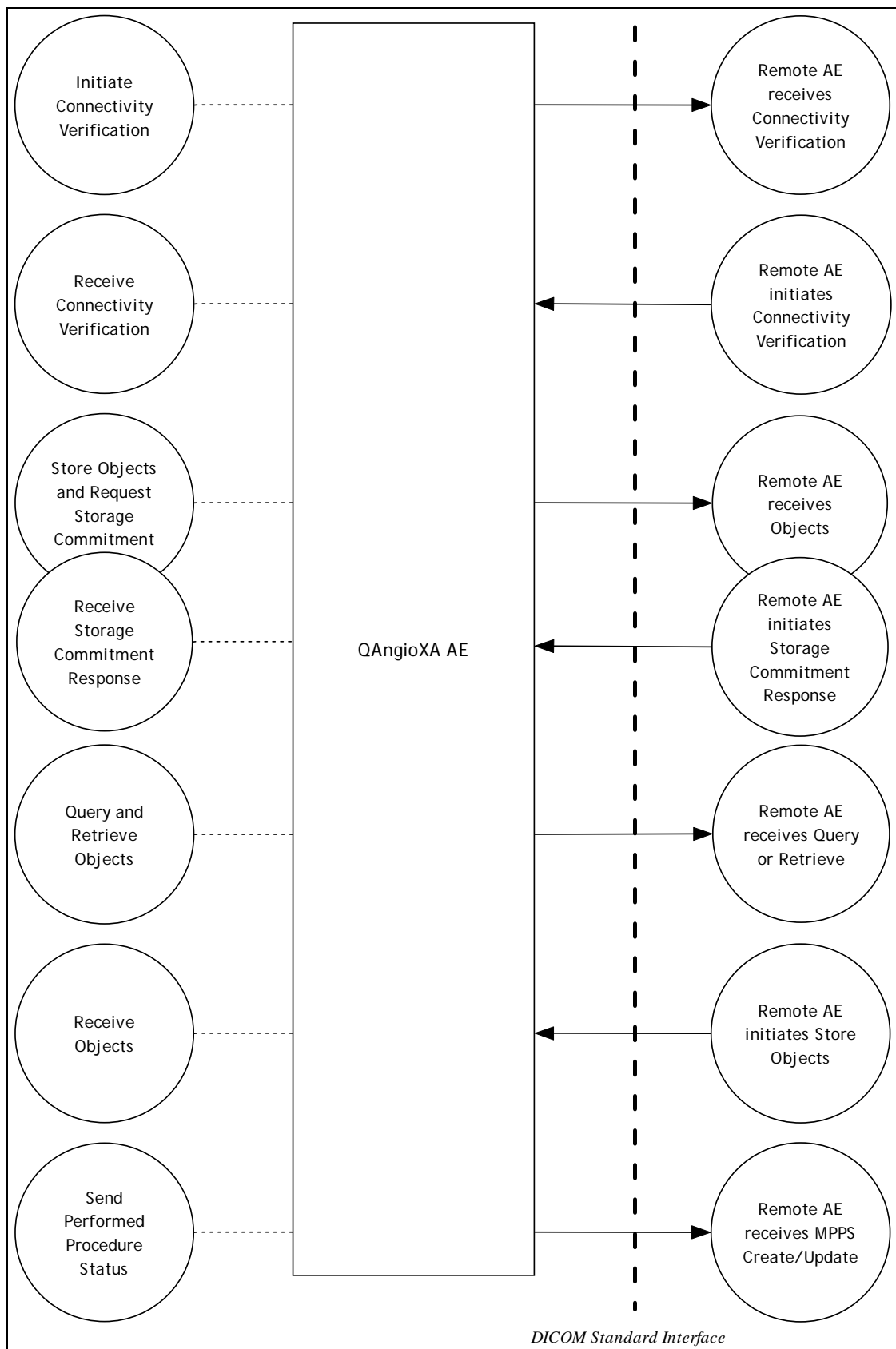


Figure 1.1 QAngio<sup>®</sup> XA application data flow diagram.

---

## 1.1.2 Functional Definition of the Application Entity

In the network configuration, the QAngio<sup>®</sup> XA Application Entity (AE) can perform the following functions (real world activities):

- **Initiate Connectivity Verification**  
QAngio<sup>®</sup> XA can send a request of the Verification SOP Class as a Service Class User (SCU).
- **Receive Connectivity Verification**  
QAngio<sup>®</sup> XA can respond to requests of the Verification SOP Class as a Service Class Provider (SCP).
- **Store Objects and Request Storage Commitment**  
QAngio<sup>®</sup> XA can establish an association with a remote DICOM Storage Service Class Provider (SCP). A request to store images can be sent to the remote DICOM application. Optionally, after the store command was finished successfully, a request for Storage Commitment can be sent on a new association with a DICOM Storage Commitment Service Class Provider (SCP). Afterwards, QAngio<sup>®</sup> XA will wait for the Storage Commitment on a new association established by the remote AE.
- **Query and Retrieve Objects**  
QAngio<sup>®</sup> XA can establish an association with a remote DICOM Query/Retrieve Service Class Provider (SCP). A Find request can be sent with user defined query fields. Afterwards QAngio<sup>®</sup> XA will wait for Find responses. A Move request for selected studies, series or instances can be sent. Afterwards QAngio<sup>®</sup> XA will wait for Move responses.
- **Receive objects**  
QAngio<sup>®</sup> XA can wait for incoming association requests from a Storage Service Class User (SCU). When an association is accepted, the AE will wait for a Store request. Received DICOM objects will be saved on disk and the remote AE will be notified of the status of their store request.
- **Send Performed Procedure Status**  
QAngio<sup>®</sup> XA can establish an association with a remote DICOM Modality Performed Procedure Step (MPPS) Service Class Provider (SCP). An MPPS Create or Update request can be sent to the remote application to signal the state of the analysis (quantification) process.

## 1.1.3 Sequences of Real World Activities

Before images can be reviewed and analyzed, they should be available on the local system. To accomplish that, the user should:

- Perform a query and retrieve on a remote DICOM application. The remote DICOM application will send the requested data to QAngio<sup>®</sup> XA, which will store the data on local media. The user is able to send an In Progress status update to signal the workflow manager that analysis is started.

After the images have been reviewed and/or analyzed, the following action can be performed:

- Storage of DICOM images or reports on a remote DICOM application, optionally including a request for Storage Commitment. The user is able to send a Completed status update to the workflow manager to indicate that analysis was completed successfully.

A typical data flow example is shown in Figure 1.2.

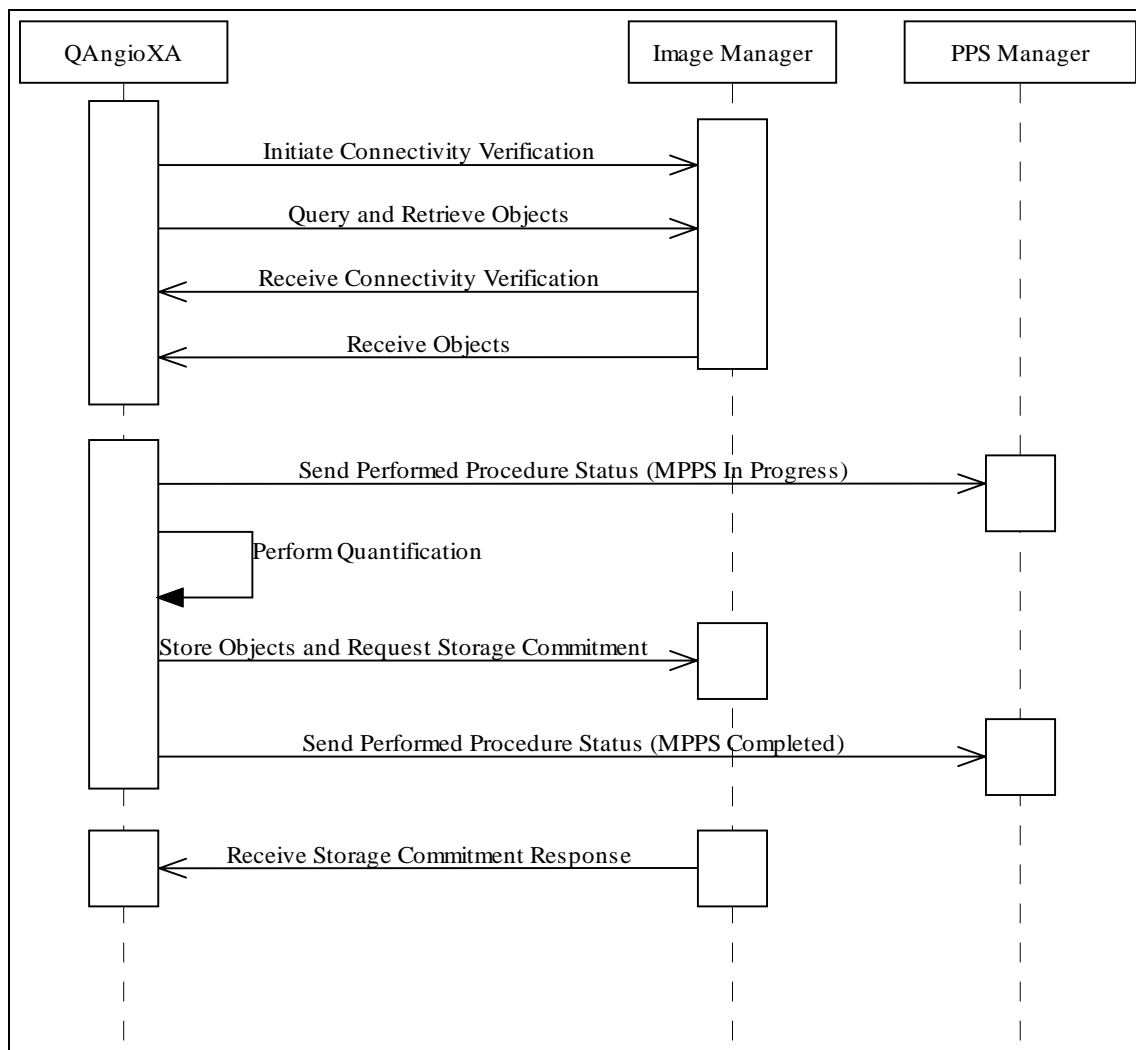


Figure 1.2 QAngio® XA application data flow diagram.

---

## 1.2 AE Specifications

### 1.2.1 SOP Classes

The QAngio® XA AE provides standard conformance to the following DICOM SOP Classes as a Verification SCU and SCP.

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1

Table 1.1 Supported Verification SOP class for QAngio® XA AE as an SCU and SCP.

The QAngio® XA AE provides standard conformance to the following DICOM SOP Classes as a Query Retrieve SCU.

SOP Class Name	SOP Class UID
Patient Root Query/Retrieve Information Model - Find	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model - Move	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Information Model - Find	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - Move	1.2.840.10008.5.1.4.1.2.2.2

Table 1.2 Supported Query Retrieve SOP classes for QAngio® XA AE as an SCU.

The QAngio® XA AE provides standard conformance to the following DICOM SOP Classes as a Storage SCU and Storage SCP.

SOP Class Name	SOP Class UID
Ultrasound Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1

SOP Class Name	SOP Class UID
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33

Table 1.3 Supported Storage SOP classes for QAngio® XA AE as a Storage SCU and SCP.

The QAngio® XA AE provides standard conformance to the following DICOM SOP Classes as a Storage Commitment SCU.

SOP Class Name	SOP Class UID
Storage Commitment Push	1.2.840.10008.1.20.1

Table 1.4 Supported Storage SOP classes for QAngio® XA AE as a Storage Commitment SCU.

The QAngio® XA AE provides standard conformance to the following DICOM SOP Classes as a Modality Performed Procedure Step (MPPS) SCU.

SOP Class Name	SOP Class UID
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3

Table 1.5 Supported Storage SOP classes for QAngio® XA AE as a Modality Performed Procedure Step SCU.

## 1.2.2 Association Policies

### 1.2.2.1 General

QAngio® XA will attempt to establish an association with Application Entities that act as a Verification SCP, Storage SCP, Query Retrieve SCP, Storage Commitment SCP or MPPS SCP.

QAngio® XA will accept associations from Application Entities that act as a Verification SCU, Store SCU or Storage Commitment SCP.

QAngio® XA will only establish or accept associations with or from DICOM Application Entities that are configured as a DICOM node in the QAngio® XA configuration.

The maximum PDU size for the QAngio® XA AE is 28672.

### 1.2.2.2 Number of Associations

The QAngio® XA AE uses a single association to connect to any SCP.

---

### 1.2.2.3 Asynchronous Nature

The QAngio<sup>®</sup> XA AE does not support asynchronous operation (multiple outstanding transactions over a single association).

### 1.2.2.4 Implementation Identifying Information

The implementation is identified by an Implementation Class UID of "1.2.528.1.1003.6.1", where 1.2.528.1.1003 is the MEDIS organization root and 6.1 the identifier and version number of the current implementation. The implementation version name is: "CMS\_6.1".

## 1.2.3 Association Initiation Policies

### 1.2.3.1 Real World Activity: Initiate Connectivity Verification

#### 1.2.3.1.1 Description and Sequencing of Activities

During configuration of the QAngio<sup>®</sup> XA AE a list of DICOM nodes must be specified. The system administrator configuring the system must specify the AE title, hostname and/or IP address and port number of the DICOM node. To test the communication with a DICOM node, the user can press the Test button in the configuration dialog. The QAngio<sup>®</sup> XA AE will send an association request to the selected DICOM node. When an association has been established, a Verification request is sent and the QAngio<sup>®</sup> XA AE will wait for a Verification response and close the association. The result of the test will be displayed to the user.

#### 1.2.3.1.2 Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification Service Class	See Table 1.1	Implicit Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		

Table 1.6 Presentation Context Table.

## 1.2.3.2 Real World Activity: Query and Retrieve Objects

### 1.2.3.2.1 Description and Sequencing of Activities

When the Query and Retrieve is initiated from the QAngio<sup>®</sup> XA, a dialog is presented where the user can select a 'DICOM node' and can provide query keys. After selecting the 'Query' button, the QAngio<sup>®</sup> XA AE will send a single association request to the selected DICOM node. When an association has been established, a Find request is sent with the provided query keys, and the QAngio<sup>®</sup> XA AE will wait for Find responses. The results of the Find request are presented to the user in the dialog. QAngio<sup>®</sup> XA will group the Find responses in a Patient-Study, Series and Instance list. The user can make selections in the Find responses. After pressing the 'Retrieve' button, the QAngio<sup>®</sup> XA AE will close the current association, open a new association and send a Move request for the selected instances and will wait for Move responses.

### 1.2.3.2.2 Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model - Find	See Table 1.2	Implicit Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
Patient Root Query/Retrieve Information Model - Move	See Table 1.2	Implicit Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
Study Root Query/Retrieve Information Model - Find	See Table 1.2	Implicit Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
Study Root Query/Retrieve Information Model - Move	See Table 1.2	Implicit Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		

Table 1.7 Presentation Context Table.

---

## 1.2.3.3 Real World Activity: Store Objects and Request Storage Commitment

### 1.2.3.3.1 Description and Sequencing of Activities

When the Image Storage is initiated from QAngio® XA, a dialog is presented where the user can select a 'DICOM node' and provide query keys. After selecting the 'Query' button, the QAngio® XA AE will present a filtered view on the contents of a local hard disk folder, as specified by the user in the dialog (default value is retrieved from the QAngio® XA options; the 'Local storage folder'). The user can make selections in the displayed file sets.

When the user selects the 'Store' button, an association request is sent to the selected remote DICOM network node. When an association has been established, a Store request is sent with the first selected image, and the QAngio® XA AE will wait for Store responses. The QAngio® XA AE will send Store requests for all selected images. After all images have been sent, the association will be closed.

If the QAngio® XA is configured to request storage commitment, QAngio® XA will try to open a new association and will send a single storage commitment request for all images that have been successfully stored on the remote AE. When a response is received from the remote AE, the association is closed immediately by QAngio® XA. The remote AE is expected to send a Storage Commitment response on a newly opened association with the QAngio® XA (see 1.2.4.3).

The Storage Commitment transaction UIDs are maintained for 72 hours. If no Storage Commitment response is received within 72 hours, the request is considered to have failed. If a Storage Commitment response is received after 72 hours, it is ignored. If QAngio® XA is unable to open an association with the Storage Commitment SCP, an error message is printed in the status window.

Storage Commitment responses will be received and processed by QAngio® XA. The user will have the option to review the images for which storage commitment has been requested, failed or was performed successfully. QAngio® XA does not automatically delete images upon successful storage commitment.

### 1.2.3.3.2 Proposed Presentation Contexts

The proposed presentation context (both abstract syntax and transfer syntax) will be determined dynamically from the properties of the object being stored; during association negotiation only a single abstract syntax will be proposed. The following table presents an overview of all supported presentation contexts.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Ultrasound Multi-Frame Image	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian RLE Lossy JPEG Baseline Lossy JPEG Extended Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.5 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840,10008.1.2.4.70	SCU	None
Ultrasound Image	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian RLE Lossy JPEG Baseline Lossy JPEG Extended Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.5 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840,10008.1.2.4.70	SCU	None
Secondary Capture Image	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Multi-frame Single Bit Capture Image	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Multi-frame Grayscale Byte Secondary Capture Image	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Multi-frame Grayscale Word Secondary Capture Image	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Multi-frame True Color Secondary Capture Image	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
X-Ray Angiographic Image	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian RLE Lossy JPEG Baseline Lossy JPEG Extended Lossless JPEG	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.5 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
X-Ray Radiofluoroscopic Image	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Text SR	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Enhanced SR	See Table 1.3	Implicit Little Endian Explicit Little Endian Explicit Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Comprehensive SR	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
Storage Commitment Push	See Table 1.4	Implicit Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		

Table 1.8 Presentation Context Table.

## 1.2.3.4 Real World Activity: Send Performed Procedure Status

### 1.2.3.4.1 Description and Sequencing of Activities

Just before a quantitative analysis is started in QAngio<sup>®</sup> XA, the user can send a Performed Procedure Step status "IN PROGRESS" to an MPPS SCP. This can be used to let the remote PPS manager know that the analysis is about to be started. The QAngio<sup>®</sup> XA AE will establish an association with the remote AE and request an MPPS SOP Instance to be created. The UID of the MPPS SOP Instance to be created is generated by QAngio<sup>®</sup> XA and send in the N-CREATE request. After the response from the remote AE is received the association is closed. QAngio<sup>®</sup> XA will display status "In Progress" to the user.

After the analysis is finished and the results are sent to the remote Storage SCP successfully, the user can send a Final Performed Procedure Step status "COMPLETED" or "DISCONTINUED" to the remote AE using a N-SET request. The MPPS "COMPLETED" status is sent if the analysis was performed successfully. The MPPS "DISCONTINUED" status is sent if the analysis was aborted. After the response from the remote AE is received the association is closed. QAngio<sup>®</sup> XA will display status "Completed" or "Discontinued" to the user.

The user is able to send the Final MPPS statuses after the results are sent to the remote Storage SCP successfully. QAngio<sup>®</sup> XA will not wait for a Storage Commitment Response (in case Storage Commitment was requested) to unlock MPPS updates to the user. After a Final status has been sent QAngio<sup>®</sup> XA will not use the same MPPS SOP Instance UID in N-SET requests anymore.

### 1.2.3.4.2 Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Performed	See Table 1.5	Implicit Little Endian	1.2.840.10008.1.2	SCU	None
Procedure Step		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		

Table 1.9 Presentation Context Table.

### 1.2.3.4.3 SOP Specific Conformance

With respect to MPPS conformance, QAngio<sup>®</sup> XA is a “Modality that only conforms to the MPPS SOP Class” as defined in PS 3.17 of the DICOM standard.

The following table provides a description of the MPPS N-CREATE and N-SET request identifiers sent by QAngio<sup>®</sup> XA. A “Zero length” attribute will be sent with zero length. For sequences the multiplicity of contained sequence items is listed.

Modality Performed Procedure Step N-CREATE / N-SET attribute specification					
Attribute Name	Tag	VR	N-CREATE (req. type) value	N-SET (req. type) value	Remarks
Affected / Requested SOP Class UID	N-CREATE (0000,0002) N-SET (0000,0003)	UI	(1) 1.2.840.10008.3.1.2.3.3	(1) 1.2.840.10008.3.1.2.3.3	Uniquely identifies the SOP Class (TF-2: IHE-A.3.5).
Affected / Requested SOP Instance UID	N-CREATE (0000,1000) N-SET (0000,1001)	UI	(1) New QAngio <sup>®</sup> XA generated SOP Instance UID	(1) Same SOP Instance UID as used in N-CREATE request.	Uniquely identifies the SOP Instance (TF-2: IHE-A.3.6).
Specific Character Set	(0008,0005)	CS	(1C) Not included	(Not allowed)	Only required if extended character set is used
Performed Procedure Step Relationship Module					

Modality Performed Procedure Step N-CREATE / N-SET attribute specification					
Attribute Name	Tag	VR	N-CREATE (req. type) value	N-SET (req. type) value	Remarks
Scheduled Step Attributes Sequence	(0040,0270)	SQ	(1) One or more items	(Not allowed)	Sequence containing attributes that are related to the scheduling of the Procedure Step. The Sequence may have one or more Items.
> Study Instance UID	(0020,000D)	UI	(1) Copy Study Instance UID from the analysed XA study	(Not allowed)	Unique identifier for the Study.
> Referenced Study Sequence	(0008,1110)	SQ	(2) Zero or more items. Copy of Referenced Study Sequence in analysed XA study if available	(Not allowed)	Uniquely identifies the Study SOP Instance associated with this Scheduled Procedure Step.
>> Referenced SOP Class UID	(0008,1150)	UI	(1C) Copy of Referenced SOP Class UID in analysed XA study	(Not allowed)	Required if sequence item is present.
>> Referenced SOP Instance UID	(0008,1155)	UI	(1C) Copy of Referenced SOP Instance UID in analysed XA study	(Not allowed)	Required if sequence item is present.
> Accession Number	(0008,0050)	SH	(2) Copy of Accession Number in analysed XA study	(Not allowed)	A departmental IS generated number that identifies the order for the Study.
> Requested Procedure ID	(0040,1001)	SH	(2) Copy of Requested Procedure ID in analysed XA study	(Not allowed)	Identifier of the related Requested Procedure.
> Requested Procedure Description	(0032,1060)	LO	(2) Copy of Requested Procedure Description in analysed XA study	(Not allowed)	Institution-generated administrative description or classification of Requested Procedure.
> Scheduled Procedure Step ID	(0040,0009)	SH	(2) Copy of Scheduled Procedure Step ID in analysed XA study	(Not allowed)	Identifier of the related Scheduled Procedure Step.
> Scheduled Procedure Step Description	(0040,0007)	LO	(2) Copy Scheduled Procedure Step Description from analysed XA study	(Not allowed)	Institution-generated description or classification of the Scheduled Procedure Step to be performed.

Modality Performed Procedure Step N-CREATE / N-SET attribute specification					
Attribute Name	Tag	VR	N-CREATE (req. type) value	N-SET (req. type) value	Remarks
> Scheduled Protocol Code Sequence	(0040,0008)	SQ	(2) Zero or more items. Copy of Scheduled Protocol Code Sequence in analysed XA study if available	(Not allowed)	Sequence describing the Scheduled Protocol following a specific coding scheme.
>> Code Value	(0008,0100)	SH	(1C) Copy of Code Value in analysed XA study	(Not allowed)	Required if sequence item is present.
>> Coding Scheme Designator	(0008,0103)	SH	(1C) Copy of Coding Scheme Designator in analysed XA study	(Not allowed)	Required if sequence item is present.
Patient's Name	(0010,0010)	PN	(2) Copy of Patient's Name in analysed XA study	(Not allowed)	Patient's full legal name.
Patient ID	(0010,0020)	LO	(2) Copy of Patient ID in analysed XA study	(Not allowed)	Primary hospital identification number or code for the patient.
Patient's Birth Date	(0010,0030)	DA	(2) Copy of Patient's Birth Date in analysed XA study	(Not allowed)	Date of birth of the named patient.
Patient's Sex	(0010,0040)	CS	(2) Copy of Patient's Sex in analysed XA study	(Not allowed)	Sex of the named Patient.
Referenced Patient Sequence	(0008,1120)	SQ	(2) Zero items	(Not allowed)	Uniquely identifies the Patient SOP Instance.
Performed Procedure Step Information Module					
Performed Procedure Step ID	(0040,0253)	SH	(1) "QANGIOXA"	(Not allowed)	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.
Performed Station AE Title	(0040,0241)	AE	(1) QAngio <sup>®</sup> XA station AE title	(Not allowed)	AE title of the modality on which the Performed Procedure Step was performed.

Modality Performed Procedure Step N-CREATE / N-SET attribute specification					
Attribute Name	Tag	VR	N-CREATE (req. type) value	N-SET (req. type) value	Remarks
Performed Station Name	(0040,0242)	SH	(2) QAngio <sup>®</sup> XA station hostname	(Not allowed)	An institution defined name for the modality on which the Performed Procedure Step was performed.
Performed Location	(0040,0243)	SH	(2) QAngio <sup>®</sup> XA station hostname	(Not allowed)	Description of the location at which the Performed Procedure Step was performed.
Performed Procedure Step Start Date	(0040,0244)	DA	(1) Start date of QAngio <sup>®</sup> XA analysis	(Not allowed)	Date on which the Performed Procedure Step started.
Performed Procedure Step Start Time	(0040,0245)	TM	(1) Start time of QAngio <sup>®</sup> XA analysis	(Not allowed)	Time at which the Performed Procedure Step started.
Performed Procedure Step Status	(0040,0252)	CS	(1) "IN PROGRESS"	(3) "DISCONTINUED" or "COMPLETED"	Contains the state of the Performed Procedure Step.
Performed Procedure Step Description	(0040,0254)	LO	(2) "Quantitative Coronary Angiography"	(3) "Quantitative Coronary Angiography"	Institution-generated description or classification of the Procedure Step that was performed.
Performed Procedure Type Description	(0040,0255)	LO	(2) Zero length	(3) Zero length	A description of the type of procedure performed.
Procedure Code Sequence	(0008,1032)	SQ	(2) Zero or more items. Copy of Procedure Code Sequence in analysed XA study if available	(3) Zero or more items. Copy of Procedure Code Sequence in analysed XA study if available	A sequence that conveys the (single) type of procedure performed.
> Code Value	(0008,0100)	SH	(1C) Copy of Code Value in analysed XA study	(1C) Copy of Code Value in analysed XA study	Required if sequence item is present.
> Coding Scheme Designator	(0008,0103)	SH	(1C) Copy of Coding Scheme Designator in analysed XA study	(1C) Copy of Coding Scheme Designator in analysed XA study	Required if sequence item is present.

Modality Performed Procedure Step N-CREATE / N-SET attribute specification					
Attribute Name	Tag	VR	N-CREATE (req. type) value	N-SET (req. type) value	Remarks
Performed Procedure Step End Date	(0040,0250)	DA	(2) Zero length	(3) End date of QAngio® XA analysis	Date on which the Performed Procedure Step ended.  Final State Requirement Type: 1
Performed Procedure Step End Time	(0040,0251)	TM	(2) Zero length	(3) End time of QAngio® XA analysis	Time at which the Performed Procedure Step ended.  Final State Requirement Type: 1
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)	SQ	(3) Zero items.	(3) Zero or one item.  User selected Discontinuation Reason if Performed Procedure Step Status is set to "DISCONTINUED".	The reason the Performed Procedure Step Status was set to DISCONTINUED.
> Code Value	(0008,0100)	SH	-	(1C) Code value for selected Discontinuation Reason	Required if sequence item is present.
> Coding Scheme Designator	(0008,0103)	SH	-	(1C) Copy Coding Scheme Designator from analysed XA study	Required if sequence item is present.
Image Acquisition Results					
Modality	(0008,0060)	CS	(1) "XA"	(Not allowed)	Type of equipment that originally acquired the data used to create the images associated with this Modality Performed Procedure Step.
Study ID	(0020,0010)	SH	(2) Copy of Study ID in the analysed XA study	(Not allowed)	User or equipment generated Study Identifier.
Performed Protocol Code Sequence	(0040,0260)	SQ	(2) Zero or one item.  Copy of Performed Protocol Code Sequence if available	(3) Zero or one item.  Copy of Performed Protocol Code Sequence if available	Sequence describing the Protocol performed for this Procedure Step.
> Code Value	(0008,0100)	SH	(1C) Copy of Code Value in analysed XA study	(1C) Copy of Code Value in analysed XA study	Required if sequence item is present.

Modality Performed Procedure Step N-CREATE / N-SET attribute specification					
Attribute Name	Tag	VR	N-CREATE (req. type) value	N-SET (req. type) value	Remarks
> Coding Scheme Designator	(0008,0103)	SH	(1C) Copy of Coding Scheme Designator in analysed XA study	(1C) Copy of Coding Scheme Designator in analysed XA study	Required if sequence item is present.
Performed Series Sequence	(0040,0340)	SQ	(2) Zero items	(3) One or more items	Attributes of the Series that comprise this Modality Performed Procedure Step.  Final State Requirement Type: 1 (a series must exist for every Performed Procedure Step set to DISCONTINUED or COMPLETED)
> Performing Physician's Name	(0008,1050)	PN	-	(2C) QAngio <sup>®</sup> XA username	Name of the physician(s) administering this Series.  Final State Requirement Type: 2
> Protocol Name	(0018,1030)	LO	-	(1C) "QANGIOXA"	User-defined description of the conditions under which the Series was performed.  Final State Requirement Type: 1
> Operator's Name	(0008,1070)	PN	-	(2C) Zero length	Name(s) of the operator(s) who supporting this Series.  Final State Requirement Type: 2
> Series Instance UID	(0020,000E)	UI	-	(1C) New QAngio <sup>®</sup> XA generated Series Instance UID	Unique Identifier of the Series.  Final State Requirement Type: 1
> Series Description	(0008,103E)	LO	-	(2C) Zero length	User provided description of the Series.  Final State Requirement Type: 2

Modality Performed Procedure Step N-CREATE / N-SET attribute specification					
Attribute Name	Tag	VR	N-CREATE (req. type) value	N-SET (req. type) value	Remarks
> Retrieve AE Title	(0008,0054)	AE	-	(2C) Zero length	Title of the DICOM Application Entity where the Standalone SOP Instances in this Series may be retrieved on the network.  Final State Requirement Type: 2
> Referenced Image Sequence	(0008,1140)	SQ	-	(2C) Zero items	A Sequence that provides reference to one or more sets of Image SOP Class/SOP Instance pairs created during the acquisition of the procedure step.
> Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)	SQ	-	(2C) Zero or more items	Uniquely identifies Structured Report instances created during the acquisition of the procedure step.
>> Referenced SOP Class UID	(0008,1150)	UI	-	(1C) 1.2.840.10008.5.1.4.1.1.88.33	Uniquely identifies the referenced SOP Class.
>> Referenced SOP Instance UID	(0008,1155)	UI	-	(1C) New QAngio <sup>®</sup> XA generated SOP Instance UID	Uniquely identifies the referenced SOP Instance.

## 1.2.4 Association Acceptance Policies

### 1.2.4.1 Real World Activity: Receive Connectivity Verification

#### 1.2.4.1.1 Description and Sequencing of Activities

The QAngio<sup>®</sup> XA AE will be listening on the configured port number for association requests. If an association request is received that contains at least one of the presentation contexts from Table 1.10 and originates from an application entity that is configured in the QAngio<sup>®</sup> XA configuration and conforms to the security rules as presented in section 4.2, the association will be accepted.

#### 1.2.4.1.2 Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification Service Class	See Table 1.1	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		

Table 1.10 Presentation Context Table.

## 1.2.4.2 Real World Activity: Receive Objects

### 1.2.4.2.1 Description and Sequencing of Activities

The QAngio<sup>®</sup> XA AE will be listening on the configured port number for association requests. If an association request is received that contains at least one of the presentation contexts from Table 1.11 and originates from an application entity that is configured in the QAngio<sup>®</sup> XA configuration as a Storage SCU and conforms to the security rules as presented in section 4.2, the association will be accepted.

### 1.2.4.2.2 Accepted Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Ultrasound Multi-Frame Image	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
		RLE	1.2.840.10008.1.2.5		
		Lossy JPEG Baseline	1.2.840.10008.1.2.4.50		
		Lossy JPEG Extended	1.2.840.10008.1.2.4.51		
		Lossless JPEG	1.2.840.10008.1.2.4.70		

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Ultrasound Image	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
		RLE	1.2.840.10008.1.2.5		
		Lossy JPEG Baseline	1.2.840.10008.1.2.4.50		
		Lossy JPEG Extended	1.2.840.10008.1.2.4.51		
		Lossless JPEG	1.2.840.10008.1.2.4.70		
Secondary Capture Image	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
Multi-frame Single Bit Capture Image	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
Multi-frame Grayscale Byte Secondary Capture Image	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
Multi-frame Grayscale Word Secondary Capture Image	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
Multi-frame True Color Secondary Capture Image	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
X-Ray Angiographic Image	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
		RLE	1.2.840.10008.1.2.5		
		Lossy JPEG Baseline	1.2.840.10008.1.2.4.50		
		Lossy JPEG Extended	1.2.840.10008.1.2.4.51		
		Lossless JPEG	1.2.840.10008.1.2.4.70		
Basic Text SR	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
Enhanced SR	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		
Comprehensive SR	See Table 1.3	Implicit Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		

Table 1.11 Presentation Context Table.

### 1.2.4.3 Real World Activity: Receive Storage Commitment Response

#### 1.2.4.3.1 Description and Sequencing of Activities

The QAngio® XA AE will be listening on the configured port number for association requests. If an association request is received that contains at least one of the presentation contexts from Table 1.12 and originates from an application entity that is configured in the QAngio® XA configuration as a Storage SCP and conforms to the security rules as presented in section 4.2 and the SCP negotiates the SCP role (explicitly stating that QAngio® XA should support the Storage Commitment SCU role), the association will be accepted.

### 1.2.4.3.2 Accepted Presentation Contexts

The QAngio® XA AE only accepts the SCU role, since it is not able to process Storage Commitment requests itself.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Storage Commitment Push	See Table 1.4	Implicit Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit Little Endian	1.2.840.10008.1.2.1		
		Explicit Big Endian	1.2.840.10008.1.2.2		

Table 1.12 Presentation Context Table.

---

## 1.3 Network interfaces

This section describes the network interface for QAngio® XA.

### 1.3.1 Physical Network Interface

The application is indifferent to the physical medium over which TCP/IP executes; which is dependent on the underlying operating system and hardware.

### 1.3.2 Additional Protocols

When host names rather than IP addresses are used in the configuration properties to specify presentation addresses for remote AEs, the application is dependent on the name resolution mechanism of the underlying operating system.

## 1.4 Configuration

This section describes the configuration parameters for the QAngio® XA application.

### 1.4.1 AE Title and Presentation Address Mapping

Within the QAngio® XA application, DICOM nodes must be defined in the Configuration dialog. A DICOM node contains the called AE Title, the hostname, the IP address (optional), the port number and the timeout value for network communication. Also, the DICOM role of the DICOM node must be specified here; Query Retrieve Service Class Provider, Storage Service Class Provider or Storage Service Class User.

The DICOM node settings are stored in a configuration file that can be shared by multiple QAngio® XA applications. The values are loaded at the start of the program and stored every time the configuration dialog is closed.

### 1.4.2 Configurable Parameters

#### 1.4.2.1 Configurable Parameters of QAngio® XA

The following parameters may be configured for QAngio® XA:

- Application Entity title (default value QANGIOXA)
- Timeout value (default 60 seconds)
- Port number (default 104)

---

A system administrator can change the values of the parameters in the Options dialog. The values are stored in the application configuration file and are loaded at the start of the program and stored just before exiting.

---

## 2 QAngio<sup>®</sup> XA Media Interchange Specification

### 2.1 Implementation Model

#### 2.1.1 Application Data Flow Diagram

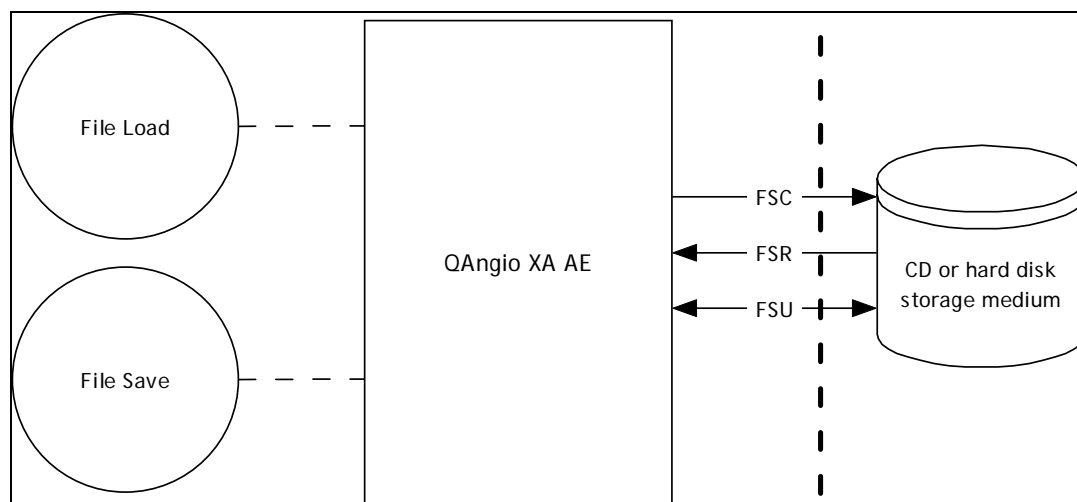


Figure 2.1 QAngio<sup>®</sup> XA application data flow diagram.

#### 2.1.2 Functional Definitions of AE's

The QAngio<sup>®</sup> XA AE can perform the following functions (real world activities):

- It can read an existing DICOM File-set from media. This includes DICOM File-sets from CD-ROM and hard disk. The (multi-frame) images that have been read will be displayed in a thumbnail overview and can be reviewed in one or more windows. More than one image can be reviewed at the same time.
- It can update a piece of media, writing additional SOP instances to an already existing DICOM File-set.
- It can create a new DICOM File-set on media. The image and accompanying information that is saved on media does not necessarily have to be an original DICOM dataset.

#### 2.1.3 Sequences of Real World Activities

Before images can be reviewed and/or analyzed, they should be loaded into the QAngio<sup>®</sup> XA application system. To accomplish that, the user should:

- Load (one or more) File-sets from media.

After the images have been reviewed and/or analyzed, the following action can be performed:

- Save (one or more) File-sets on media.

---

## 2.2 AE Specifications

The QAngio® XA AE provides standard conformance to the DICOM Interchange Option of the Media Storage Service Class. The Application Profiles and roles are listed in Table 2.1.

In addition the following non-standard storage is supported:

- Individual DICOM files can also be written without an accompanying File-set description in a DICOMDIR. Files as well as File-sets can only be stored on hard disk, not directly onto CD-ROM.

Application Profile	Identifier	Real-world Activity	Role	SC Option
General Purpose CD-R Interchange	STD-GEN-CD	File Save	FSC	Interchange
Basic cardiac XA studies on CD-ROM media	STD-XABC-CD	File Load	FSR	Interchange
		File Save	FSC FSU	

Table 2.1 Supported Application Profiles and roles for QAngio® XA AE.

### 2.2.1 File Meta Information

The AE title for media storage is set by the QAngio® XA application and cannot be configured by the user.

The implementation information written to the File Meta Header in each file is an Implementation Class UID of "1.2.528.1.1003.6.1", where 1.2.528.1.1003 is the MEDIS organization root and 6.1 the identifier and version number of the current implementation. The implementation version name is: "CMS\_6.1".

### 2.2.2 Real World Activities

#### 2.2.2.1 Activity - File Load

The QAngio® XA AE acts as an FSR using the Interchange option when requested to read DICOM files from media.

##### 2.2.2.1.1 Media storage application profiles

The QAngio® XA application supports the STD-XABC-CD Application Profile.

---

## 2.2.2.2 Activity - File Save

The QAngio<sup>®</sup> XA AE is able to:

- Save a visual report of a performed analysis in DICOM Secondary Capture format to hard disk.
- Export a report of a performed analysis in DICOM Structured Report format to hard disk using the Ventricular Analysis Template (TID 3202) or the Quantitative Arterial Analysis Template (TID 3213). The template used can be identified by looking at the value of the Content Template Sequence (0040,A504).

The QAngio<sup>®</sup> XA AE acts as an FSC using the Interchange options when requested to save image data as a new DICOM File-set.

The QAngio<sup>®</sup> XA AE acts as an FSU using the Interchange options when requested to save changes to an existing DICOM File-Set.

The QAngio<sup>®</sup> XA AE can only save DICOM File-sets on hard disk.

### 2.2.2.2.1 Media storage application profiles

The QAngio<sup>®</sup> XA application supports the STD-XABC-CD Application Profile. In addition, the QAngio<sup>®</sup> XA application supports the STD-GEN-CD Application Profile for the SOP Classes and Transfer Syntaxes listed in Table 2.2.

#### 2.2.2.2.2 Options

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian	1.2.840.10008.1.2.1
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Explicit VR Little Endian	1.2.840.10008.1.2.1

Table 2.2 SOP Classes and Transfer Syntaxes for QAngio<sup>®</sup> XA

## 2.2.3 Augmented and Private Application Profiles

QAngio<sup>®</sup> XA does not support any augmented or private application profiles.

## 2.2.4 Media Configuration

The AE title for media storage is set by the QAngio<sup>®</sup> XA application and cannot be configured by the user.

---

## 3 Support of Character Sets

QAngio<sup>®</sup> XA supports extended character set "ISO\_IR 100" which is the Latin alphabet No 1, supplementary set.

---

## 4 Security

### 4.1 Security Profiles

None supported.

### 4.2 Association Level Security

QAngio<sup>®</sup> XA will only accept association requests from AE titles that are registered as a DICOM node in the QAngio<sup>®</sup> XA configuration.

If the checkbox 'Accept associations from any host' in the Storage SCP settings (See Options) is **not** checked and the remote DICOM Node requests a store association with our SCP, the Storage SCP checks if the host name of the remote node matches the host name as configured. If the host name cannot be resolved, the IP address filled in is used to verify the remote DICOM node. If the IP address cannot be resolved, the association will be rejected.

### 4.3 Application Level Security

None supported.

---

## 5 Annexes

### 5.1 IOD Contents

#### 5.1.1 Created SOP Instances

None.

#### 5.1.2 Usage of Attributes from Received IODs

No SOP class specific fields are required.

The local database, remote query and directory browsers make use of the conventional identification attributes to distinguish patients, studies, series and instances.

#### 5.1.3 Attribute Mapping

Not applicable.

#### 5.1.4 Coerced/Modified fields

No coercion is performed.

### 5.2 Data Dictionary of Private Attributes

No private attributes are defined.

### 5.3 Coded Terminology and Templates

QAngio<sup>®</sup> XA does not support the use of coded terminology.

### 5.4 Grayscale Image Consistency

Not applicable.

---

## 5.5 Standard Extended/Specialized/Private SOP Classes

None

## 5.6 Private Transfer Syntaxes

None.