BRAINLAB

DICOM Conformance Statement

quentry®

Version 2.0

Document Revision 1
August 29, 2013

1 Conformance Statement Overview

This is a Conformance Statement for the Brainlab cloud solution Quentry describing the following system and its applications:

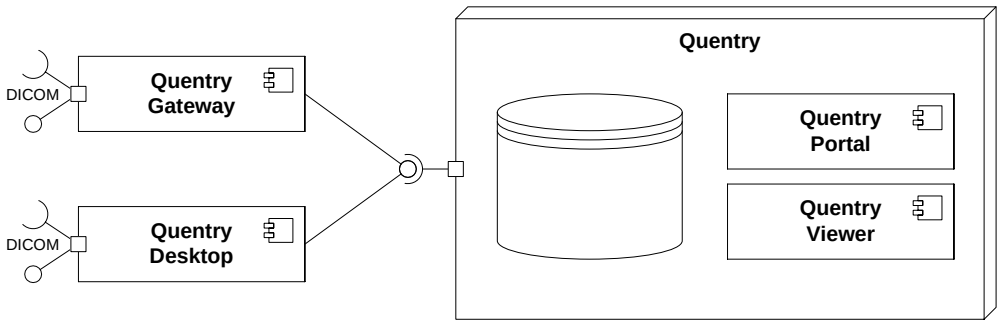

Figure 1-1: Quentry Overview

Application	Description
Quentry Portal	Browser-based portal application to upload, to manage and to download data: • Uploads selected files • Allows download of selected data as ZIP
Quentry Gateway	Service to upload and to download data to and from Quentry: • Allows download of data via DICOM Query/Retrieve. • Receives instances via Storage Service Class and automatically uploads them to an account either configured as default or selected by routing rules. • Provides a web interface either to query an archive and to upload the selected instances or to download selected instances into an archive.
Quentry Desktop	Desktop application to upload and to download data to and from Quentry: • Allows to query archives and to upload the selected and retrieved instances. • Allows download of data via DICOM Query/Retrieve • Receives instances via Storage Service Class. A Quentry user has to log in and manually upload it to a Quentry account.
Quentry Viewer	Cloud-based display software, depending on the license in a basic or an advanced edition.

Table 1-1: Quentry Applications

The table below addresses all supported network services used by the different application entities in Quentry. Applications only consuming data for, e.g., displaying images are marked as SCU. Applications creating data like, e.g., plans are marked as SCP.

Symbol:	Meaning:
●	User of Service (SCU)
■	Provider of Service (SCP)
●/■	Both (SCU/SCP)

SOP Classes	Quentry Desktop	Quentry Gateway	Quentry Viewer
Transfer			
12-lead ECG Waveform Storage	●/■	●/■	
Ambulatory ECG Waveform Storage	●/■	●/■	
Arterial Pulse Waveform Storage	●/■	●/■	
Autorefraction Measurements Storage	●/■	●/■	
Basic Structured Display Storage	●/■	●/■	
Basic Text SR Storage	●/■	●/■	
Basic Voice Audio Waveform Storage	●/■	●/■	
Blending Softcopy Presentation State Storage	●/■	●/■	
Breast Tomosynthesis Image Storage	●/■	●/■	■
Cardiac Electrophysiology Waveform Storage	●/■	●/■	
Chest CAD SR Storage	●/■	●/■	
Colon CAD SR Storage	●/■	●/■	
Color Softcopy Presentation State Storage	●/■	●/■	
Comprehensive SR Storage	●/■	●/■	
Computed Radiography Image Storage	●/■	●/■	■
CT Image Storage	●/■	●/■	■
Deformable Spatial Registration Storage	●/■	●/■	
Digital Intra-oral X-Ray Image Storage - For Presentation	●/■	●/■	■
Digital Intra-oral X-Ray Image Storage - For Processing	●/■	●/■	■
Digital Mammography X-Ray Image Storage - For Presentation	●/■	●/■	■
Digital Mammography X-Ray Image Storage - For Processing	●/■	●/■	■
Digital X-Ray Image Storage - For Presentation	●/■	●/■	■
Digital X-Ray Image Storage - For Processing	●/■	●/■	■
Encapsulated CDA Storage	●/■	●/■	
Encapsulated PDF Storage	●/■	●/■	
Enhanced CT Image Storage	●/■	●/■	■
Enhanced MR Color Image Storage	●/■	●/■	■
Enhanced MR Image Storage	●/■	●/■	■
Enhanced PET Image Storage	●/■	●/■	■
Enhanced SR Storage	●/■	●/■	
Enhanced US Volume Storage	●/■	●/■	■
Enhanced XA Image Storage	●/■	●/■	■

SOP Classes	Quentry Desktop	Quentry Gateway	Quentry Viewer
Enhanced XRF Image Storage	●/■	●/■	■
General Audio Waveform Storage	●/■	●/■	
General ECG Waveform Storage	●/■	●/■	
Grayscale Softcopy Presentation State Storage	●/■	●/■	
Hemodynamic Waveform Storage	●/■	●/■	
Implantation Plan SR Storage	●/■	●/■	
Intraocular Lens Calculations Storage	●/■	●/■	
Intravascular Optical Coherence Tomography Image Storage - For Presentation	●/■	●/■	■
Intravascular Optical Coherence Tomography Image Storage - For Processing	●/■	●/■	■
Keratometry Measurements Storage	●/■	●/■	
Key Object Selection Document Storage	●/■	●/■	
Lensometry Measurements Storage	●/■	●/■	
Macular Grid Thickness and Volume Report Storage	●/■	●/■	
Mammography CAD SR Storage	●/■	●/■	
MR Image Storage	●/■	●/■	■
MR Spectroscopy Storage	●/■	●/■	■
Multi-frame Grayscale Byte Secondary Capture Storage	●/■	●/■	■
Multi-frame Grayscale Word Secondary Capture Storage	●/■	●/■	■
Multi-frame Single Bit Secondary Capture Storage	●/■	●/■	■
Multi-frame True Color Secondary Capture Storage	●/■	●/■	■
Nuclear Medicine Image Storage	●/■	●/■	■
Nuclear Medicine Image Storage (Retired)	●/■	●/■	■
Ophthalmic Axial Measurements Storage	●/■	●/■	
Ophthalmic Photography 16 Bit Image Storage	●/■	●/■	■
Ophthalmic Photography 8 Bit Image Storage	●/■	●/■	■
Ophthalmic Tomography Image Storage	●/■	●/■	■
Ophthalmic Visual Field Static Perimetry Measurements Storage	●/■	●/■	
Positron Emission Tomography Image Storage	●/■	●/■	■
Procedure Log Storage	●/■	●/■	
Pseudo-Color Softcopy Presentation State Storage	●/■	●/■	
Raw Data Storage	●/■	●/■	
Real World Value Mapping Storage	●/■	●/■	
Respiratory Waveform Storage	●/■	●/■	

SOP Classes	Quentry Desktop	Quentry Gateway	Quentry Viewer
RT Beams Treatment Record Storage	●/■	●/■	
RT Brachy Treatment Record Storage	●/■	●/■	
RT Dose Storage	●/■	●/■	
RT Image Storage	●/■	●/■	
RT Ion Beams Treatment Record Storage	●/■	●/■	
RT Ion Plan Storage	●/■	●/■	
RT Plan Storage	●/■	●/■	
RT Structure Set Storage	●/■	●/■	
RT Treatment Summary Record Storage	●/■	●/■	
Secondary Capture Image Storage	●/■	●/■	■
Segmentation Storage	●/■	●/■	■
Spatial Fiducials Storage	●/■	●/■	
Spatial Registration Storage	●/■	●/■	■
Spectacle Prescription Report Storage	●/■	●/■	
Standalone Curve Storage (Retired)	●/■	●/■	
Standalone Modality LUT Storage (Retired)	●/■	●/■	
Standalone Overlay Storage (Retired)	●/■	●/■	
Standalone PET Curve Storage (Retired)	●/■	●/■	
Standalone VOI LUT Storage (Retired)	●/■	●/■	
Stereometric Relationship Storage	●/■	●/■	
Subjective Refraction Measurements Storage	●/■	●/■	
Surface Segmentation Storage	●/■	●/■	
Ultrasound Image Storage	●/■	●/■	■
Ultrasound Image Storage (Retired)	●/■	●/■	■
Ultrasound Multi-frame Image Storage	●/■	●/■	■
Ultrasound Multi-frame Image Storage (Retired)	●/■	●/■	■
Video Endoscopic Image Storage	●/■	●/■	■
Video Microscopic Image Storage	●/■	●/■	■
Video Photographic Image Storage	●/■	●/■	■
Visual Acuity Measurements Storage	●/■	●/■	
VL Endoscopic Image Storage	●/■	●/■	■
VL Microscopic Image Storage	●/■	●/■	■
VL Photographic Image Storage	●/■	●/■	■

SOP Classes	Quentry Desktop	Quentry Gateway	Quentry Viewer
VL Slide-Coordinates Microscopic Image Storage	●/■	●/■	■
VL Whole Slide Microscopy Image Storage	●/■	●/■	■
XA/XRF Grayscale Softcopy Presentation State Storage	●/■	●/■	
X-Ray 3D Angiographic Image Storage	●/■	●/■	■
X-Ray 3D Craniofacial Image Storage	●/■	●/■	■
X-Ray Angiographic Bi-Plane Image Storage (Retired)	●/■	●/■	■
X-Ray Angiographic Image Storage	●/■	●/■	■
X-Ray Radiation Dose SR Storage	●/■	●/■	
X-Ray Radiofluoroscopic Image Storage	●/■	●/■	■
Query Retrieve			
Patient Root Query/Retrieve Information Model - FIND	●/■	●/■	
Patient Root Query/Retrieve Information Model - MOVE	●/■	●/■	
Patient Root Query/Retrieve Information Model - GET	●/■	●/■	
Study Root Query/Retrieve Information Model - FIND	●/■	●/■	
Study Root Query/Retrieve Information Model - MOVE	●/■	●/■	
Study Root Query/Retrieve Information Model - GET	●/■	●/■	

Table 1-2: Network services supported by Quentry

The next table addresses all supported Media Storage Application Profiles used by the different application entities in Quentry.

Symbol: Meaning:

- ● Read Files (FSR)
- ■ Write Files (FSC or FSU)
- ●/■ Both (FSR/FSC or FSU)

Media Storage Application Profile	Quentry Portal	Quentry Desk-top
Brainlab General Purpose Media	●/■	●/■

Table 1-3: Media Services supported by Quentry

2 Table of Contents

3 Introduction

3.1 Revision History

Document Revision	Date of Issue	Author	Description
1	August 29, 2013		Initial release for Quentry 2.0

3.2 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

3.3 Remarks

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [1]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

- The comparison of different Conformance Statements is the first step towards assessing interconnectivity between Brainlab and non–Brainlab equipment.
- This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.
- The DICOM standard will evolve to meet the users' future requirements. Brainlab reserves the right to make changes to its products or to discontinue its delivery.

3.4 Abbreviations

There are a variety of terms and abbreviations used in the document that are defined in the DICOM Standard. Abbreviations and terms are as follows:

AE	DICOM Application Entity
AET	Application Entity Title
CD	Compact Disk
CD-R	Compact Disk Recordable
DVD	Digital Versatile Disc
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
HD	Hard Disk
IOD	(DICOM) Information Object Definition
ISO	International Standard Organization
MOD	Magneto Optical Disk
PDU	DICOM Protocol Data Unit
Q/R	Query and Retrieve
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair
xBrain	Brainlab advanced file format

3.5 References

[1] Digital Imaging and Communications in Medicine (DICOM) 3.0, vol. PS 3, NEMA, 2011.
[2] Digital Imaging and Communications in Medicine (DICOM) 3.0, vol. PS 3, NEMA, 2008.

4 Networking

4.1 Implementation Model

4.1.1 Application Data Flow Diagram

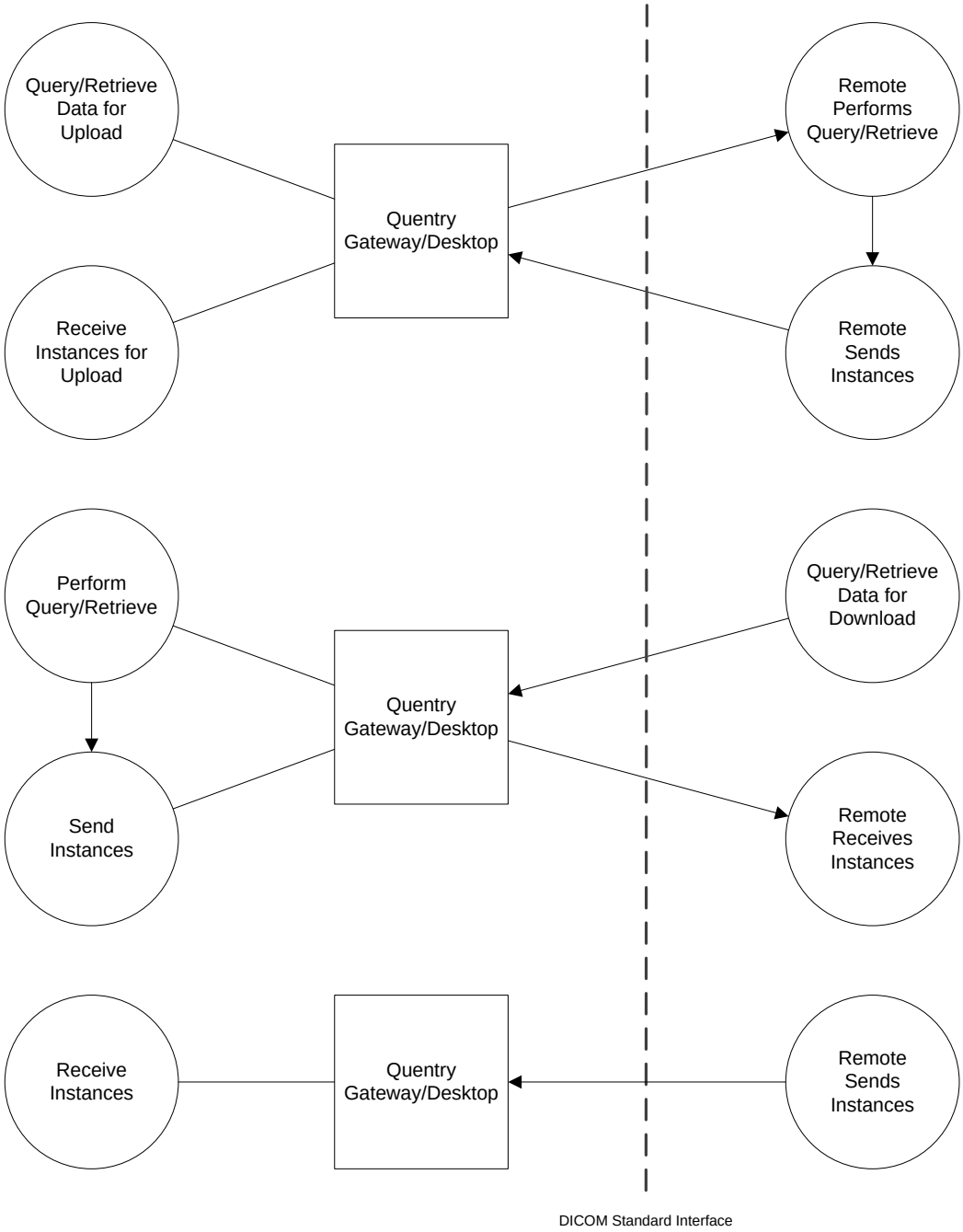

Figure 4-1: Quentry Desktop/Gateway Application Flow Diagram

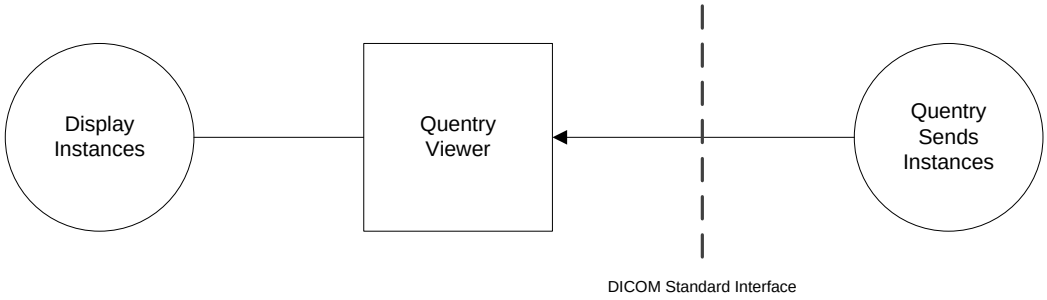

Figure 4-2: Quentry Viewer Application Flow Diagram

4.1.2 Functional Definition of Application Entity (AE)

Some communications and data transfer with remote AEs are accomplished utilizing the DICOM protocol over a network using the TCP/IP protocol stack.

- **Quentry Gateway:**
  The Quentry Gateway is a service. It receives DICOM instances via the DICOM Storage Service class and automatically uploads them with a registered account to Quentry. It also allows querying and retrieving the data stored in the registered account with the DICOM Query/Retrieve Service Class.
  Additionally it provides a web interface either to query a registered archive and to upload the selected instances or to download selected instances into the registered archive.

- **Quentry Desktop:**
  The Quentry Desktop provides the same functionality as the Quentry Gateway. Additionally it provides a user interface to query other DICOM nodes, to select series for upload and to upload the retrieved data to Quentry.

- **Quentry Viewer:**
  The Quentry Viewer is an application in Quentry. With the basic license is displays DICOM images. With the advanced license it displays other non-image instances like, e.g., segmentations, too.

4.1.3 Sequencing Of Real World Activities

4.1.3.1 Activity - Query/Retrieve Data for Upload:

(1) The user starts the Quentry Desktop.
(2) The user searches for data.
  (a) Send DICOM Query/Retrieve C-FIND requests to get the matching series
(3) The user selects the series to upload:
  (a) Send DICOM C-MOVE request(s) for the selected series.
  (b) Receive DICOM Storage C-STORE requests with the requested instances.
  (c) Send DICOM Storage C-STORE responses.
  (d) Wait to receive final DICOM C-MOVE response.
(4) The Quentry Desktop uploads the retrieved data to Quentry:

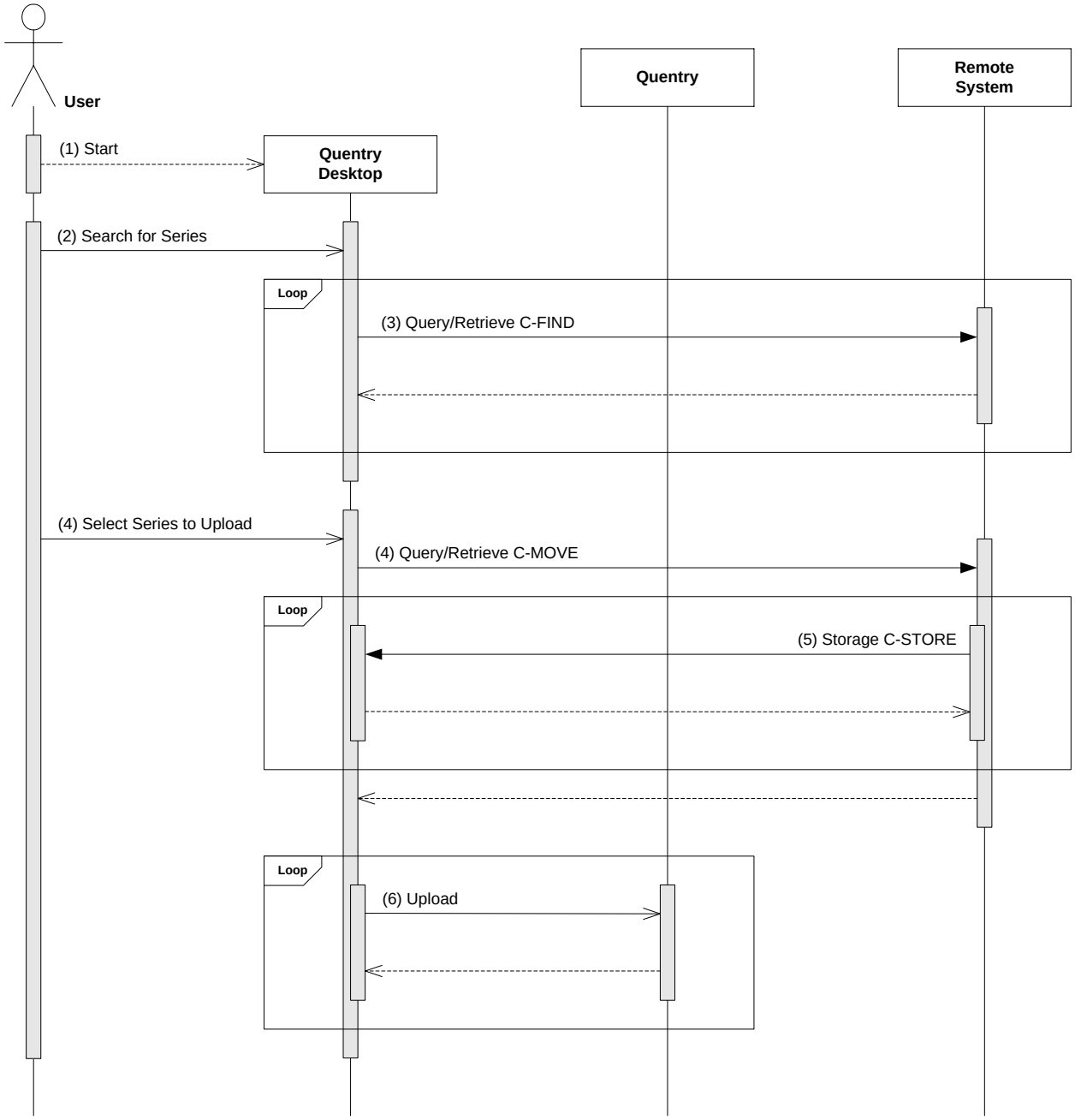

Figure 4-3: Sequencing of Quentry Gateway.

4.2 Application Entity Specifications

4.2.1 Quentry Common Specifications

This section describes the specifications valid for all Quentry application entities.

4.2.1.1 SOP Classes and Transfer Syntaxes

All Quentry applications and performers send or receive a C-ECHO request in order to test the connections to remote AEs. They provide standard conformance to the following SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes

Table 4-1: Quentry commonly supported Verification SOP Classes

In the following table all transfer syntaxes supported by any of the applications are listed:

List Name	List Short Name
Transfer Syntax Name	**Transfer Syntax UID**
Transfer Syntaxes With No Compression	**NOCOMP**
DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2
DICOM Implicit VR Little Endian	1.2.840.10008.1.2
Transfer Syntaxes With Lossless Compression	**COMP**
DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2
DICOM Implicit VR Little Endian	1.2.840.10008.1.2
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)	1.2.840.10008.1.2.4.70
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
RLE Lossless	1.2.840.10008.1.2.5
Transfer Syntaxes with RLE Compression	**RLE**
RLE Lossless	1.2.840.10008.1.2.5
DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2
DICOM Implicit VR Little Endian	1.2.840.10008.1.2
Only Implicit Transfer Syntaxes	**IMPL**
DICOM Implicit VR Little Endian	1.2.840.10008.1.2
Transfer Syntaxes With Lossy Compression	**LOSSY**
DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2
DICOM Implicit VR Little Endian	1.2.840.10008.1.2
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)	1.2.840.10008.1.2.4.70
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51

List Name	List Short Name
Transfer Syntax Name	**Transfer Syntax UID**
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91

Table 4-2: Quentry commonly supported Transfer Syntaxes (for association negotiation)

The transfer syntaxes are organized in so-called transfer syntax lists. For each presentation context specified by an application or performer, the name respectively short sign of the transfer syntax list is mentioned instead of repeating all the transfer syntaxes.

Some Quentry applications and performers support a set of Storage SOP Classes. The following table contains all commonly supported Storage SOP Classes with the mapping to the accepted respectively proposed Transfer Syntax list.

SOP Class Name	SOP Class UID	Transfer Syntax
Image Storage SOP Classes		
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	LOSSY
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	LOSSY
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	LOSSY
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	LOSSY
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	LOSSY
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	LOSSY
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	LOSSY
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	LOSSY
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	LOSSY
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	LOSSY
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3	LOSSY
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	LOSSY
Enhanced PET Image Storage	1.2.840.10008.5.1.4.1.1.130	LOSSY
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2	LOSSY
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	LOSSY
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	LOSSY
Intravascular Optical Coherence Tomography Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.14.1	LOSSY
Intravascular Optical Coherence Tomography Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.14.2	LOSSY
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	LOSSY
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	LOSSY
Multi-frame Grayscale Byte Secondary Capture Storage	1.2.840.10008.5.1.4.1.1.7.2	LOSSY
Multi-frame Grayscale Word Secondary Capture Storage	1.2.840.10008.5.1.4.1.1.7.3	LOSSY
Multi-frame Single Bit Secondary Capture Storage	1.2.840.10008.5.1.4.1.1.7.1	LOSSY
Multi-frame True Color Secondary Capture Storage	1.2.840.10008.5.1.4.1.1.7.4	LOSSY
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	LOSSY
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	LOSSY

SOP Class Name	SOP Class UID	Transfer Syntax
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	LOSSY
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	LOSSY
Ophthalmic Tomography Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.4	LOSSY
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	LOSSY
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	COMP
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	LOSSY
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	LOSSY
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	LOSSY
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	LOSSY
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	LOSSY
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	LOSSY
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	LOSSY
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	LOSSY
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	LOSSY
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	LOSSY
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	LOSSY
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	LOSSY
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	LOSSY
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6	LOSSY
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	LOSSY
X-Ray 3D Craniofacial Image Storage	1.2.840.10008.5.1.4.1.1.13.1.2	LOSSY
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	LOSSY
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	LOSSY
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	LOSSY
Non-Image Storage SOP Classes		
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	NOCOMP
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	NOCOMP
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1	NOCOMP
Autorefraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.2	NOCOMP
Basic Structured Display Storage	1.2.840.10008.5.1.4.1.1.131	NOCOMP
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	NOCOMP
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	NOCOMP
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	NOCOMP
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	NOCOMP
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65	NOCOMP
Colon CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.69	NOCOMP
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	NOCOMP
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	NOCOMP
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	NOCOMP
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	NOCOMP

SOP Class Name	SOP Class UID	Transfer Syntax
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	NOCOMP
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	NOCOMP
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2	NOCOMP
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	NOCOMP
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	NOCOMP
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	NOCOMP
Implantation Plan SR Storage	1.2.840.10008.5.1.4.1.1.88.70	NOCOMP
Intraocular Lens Calculations Storage	1.2.840.10008.5.1.4.1.1.78.8	NOCOMP
Keratometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.3	NOCOMP
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	NOCOMP
Lensometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.1	NOCOMP
Macular Grid Thickness and Volume Report Storage	1.2.840.10008.5.1.4.1.1.79.1	NOCOMP
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	NOCOMP
Ophthalmic Visual Field Static Perimetry Measurements Storage	1.2.840.10008.5.1.4.1.1.80.1	NOCOMP
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	NOCOMP
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	NOCOMP
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	NOCOMP
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	NOCOMP
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1	NOCOMP
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	NOCOMP
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	NOCOMP
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	COMP
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	NOCOMP
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	NOCOMP
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	NOCOMP
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	IMPL[1]
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	NOCOMP
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	NOCOMP
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	NOCOMP
Spectacle Prescription Report Storage	1.2.840.10008.5.1.4.1.1.78.6	NOCOMP
Standalone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	NOCOMP
Standalone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	NOCOMP
Standalone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	NOCOMP
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	NOCOMP
Standalone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	NOCOMP
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	NOCOMP
Subjective Refraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.4	NOCOMP

[1] RT Structure Set Instances contains Contour Data (3006,0050) attributes having a VR of DS and a VM of 1-n. Implicit Little Endian transfer syntax allows to store the contour data with a doubled length in comparison to explicit transfer syntax (4 byte length vs. 2 byte length field).

SOP Class Name	SOP Class UID	Transfer Syntax
Visual Acuity Measurements Storage	1.2.840.10008.5.1.4.1.1.78.5	NOCOMP
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	NOCOMP

Table 4-3: Quentry commonly supported Storage SOP Classes with Transfer Syntax mapping

Some Quentry applications and performers support DICOM Query/Retrieve. The following table contains all commonly supported SOP Classes with the mapping to the accepted respectively proposed Transfer Syntax list.

SOP Class Name	SOP Class UID	Transfer Syntax
FIND SOP Classes		
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	NOCOMP
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	NOCOMP
MOVE SOP Classes		
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	NOCOMP
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	NOCOMP
GET SOP Classes		
Patient Root Query/Retrieve Information Model – GET	1.2.840.10008.5.1.4.1.2.1.3	NOCOMP
Study Root Query/Retrieve Information Model – GET	1.2.840.10008.5.1.4.1.2.2.3	NOCOMP

Table 4-4: Quentry commonly supported Query/Retrieve SOP Classes with Transfer Syntax mapping

The usage of these SOP Classes is specified in the sections with the detailed application specifications.

4.2.1.2 Association Initiation Policy

4.2.1.2.1 Activity - Verification

4.2.1.2.1.1 Description and Sequencing of Activities

Quentry applications or performers initiate an association with the intention to use the Verification Service Class.

4.2.1.2.1.2 Proposed Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**
All SCU SOP Classes as listed in Table 4-1	NOCOMP (see Table 4-2)	SCU	None

Table 4-5: Quentry commonly proposed Presentation Contexts.

4.2.1.2.1.3 SOP Specific Conformance

Quentry applications provide standard conformance to the DICOM Verification Service Class. No extended negotiation is implemented.

4.2.1.3 Association Acceptance Policy

4.2.1.3.1 Activity – Verification

4.2.1.3.1.1 Description and Sequencing of Activities

Quentry applications accept an association with the intention to use the Verification Service Class.

4.2.1.3.1.2 Proposed Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**
All SCP SOP Classes as listed in Table 4-1	NOCOMP (see Table 4-2)	SCP	None

Table 4-6: Quentry commonly accepted Presentation Contexts.

4.2.1.3.1.3 SOP Specific Conformance

Quentry applications and performers provide standard conformance to the DICOM Verification Service Class. No extended negotiation is implemented.

4.2.1.4 Association Policies

4.2.1.4.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Application Context Name	1.2.840.10008.3.1.1.1

Table 4-7: Quentry commonly proposed Application Context Name

4.2.1.4.2 Number of Associations

Maximum number of simultaneous Associations (Initiator)	1
Maximum number of simultaneous Associations (Acceptor)	1

Table 4-8: Quentry commonly supported number of associations

4.2.1.4.3 Asynchronous Nature

Quentry applications by default do not support asynchronous communication (multiple outstanding transactions over a single association).

4.2.1.5 Association Acceptance Policy

4.2.1.5.1.1 Transfer Syntax Selection Policy

The Quentry applications accept transfer syntaxes with no compression (explicit before implicit) before those with lossless compression and at least those with lossless compression.

4.2.2 Quentry Gateway Specification

The Quentry Gateway is a service to upload and to download data to and from Quentry:

- Receives instances via Storage Service Class and automatically uploads them to an account either configured as default or selected by routing rules.
- Allows download of data via DICOM Query/Retrieve.
- Provides a web interface either to query an archive and to upload the selected instances or to download selected instances into an archive.

4.2.2.1 SOP Classes and Transfer Syntaxes

The Quentry Gateway allows query, retrieve and storage of DICOM data. It provides standard conformance to the following SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
All Storage SOP Class Names and UIDs as listed in Table 4-3		Yes	Yes
All Query/Retrieve FIND and MOVE SOP Class Names and UIDs as listed in Table 4-4		Yes	Yes
All Query/Retrieve GET SOP Class Names and UIDs as listed in Table 4-4		No	Yes

Table 4-9: Quentry Gateway supported SOP Classes

4.2.2.2 Association Policies

4.2.2.2.1 Implementation Identifying Information

The implementation information for this Application Entity is:

Implementation Class UID	1.2.276.0.20.4.1.3.3.3.0.1.119
Implementation Version Name	QuentryGateway

4.2.2.3 Association Initiation Policy

The Quentry Gateway initiates an association in this case:

- *Query/Retrieve for Upload*
  A Quentry user wants to upload data stored on a remote DICOM node

- *Send Instances*:
  Quentry Gateway sends requested instances.

4.2.2.3.1 Activity – Query/Retrieve for Upload

4.2.2.3.1.1 Description and Sequencing of Activities

A Quentry user actively queries a remote system for instances he/she wants to upload. After selecting the instances the user initiates a C-MOVE transferring them to the Quentry Gateway. The received instances will be uploaded automatically to Quentry.

4.2.2.3.1.2 Proposed Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**
All Query/Retrieve FIND and MOVE SOP Classes as listed in Table 4-4	NOCOMP (see Table 4-2)	SCU	None

Table 4-10: Quentry Gateway proposed Presentation Contexts – Query/Retrieve for Upload

4.2.2.3.1.3 SOP Specific Conformance

The Quentry Gateway provides standard conformance to the DICOM Query/Retrieve FIND and MOVE SOP Classes. No extended negotiation is implemented.

4.2.2.3.2 Activity – Send Instances

4.2.2.3.2.1 Description and Sequencing of Activities

Due to a DICOM Query/Retrieve C-MOVE request a number of DICOM Storage requests are performed to send the requested instances to the requested move destination.

4.2.2.3.2.2 Proposed Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**
All Storage SOP Classes as listed in Table 4-3	All transfer syntaxes as associated to the Storage SOP Classes in Table 4-3	SCU	None

Table 4-11: Quentry Gateway proposed Presentation Contexts – Send Instances

4.2.2.3.2.3 SOP Specific Conformance

The Quentry Gateway provides standard conformance to the DICOM Storage SOP Classes. No extended negotiation is implemented.

4.2.2.4 Association Acceptance Policy

The Quentry Gateway accepts an association in this case:

- *Query/Retrieve Instances*:
  The Quentry Gateway allows other DICOM nodes to query and retrieve instances.

- *Receive Instances*:
  The Quentry Gateway accepts storage requests from other DICOM nodes for upload to Quentry.

4.2.2.4.1 Activity – Query/Retrieve Instances

4.2.2.4.1.1 Description and Sequencing of Activities

The Quentry Gateway accepts DICOM C-FIND requests to query and DICOM C-MOVE and C-GET requests to retrieve instances stored in Quentry

4.2.2.4.1.2 Accepted Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**

All Query/Retrieve SOP Classes as listed in Table 4-4	NOCOMP (see Table 4-2)	SCP	Yes

Table 4-12: Quentry Gateway accepted Presentation Contexts – Query/Retrieve Instances

4.2.2.4.1.3 SOP Specific Conformance

The Quentry Gateway provides standard conformance to the DICOM Query/Retrieve SOP Classes with extensions to the Standard Patient and Study Root Query/Retrieve Information Model – FIND as outlined in section 8.5.1.

All DICOM Query/Retrieve SCP functionality requires authentication using the Basic User Identity Association Profile, i.e. it uses the User Identity association negotiation sub-item, for User-Identity-Type of 1 or 2.

4.2.2.4.2 Activity – Receive Instances

4.2.2.4.2.1 Description and Sequencing of Activities

The Quentry Gateway accepts DICOM Storage requests from other DICOM nodes to upload the instances to Quentry. Received instances will be either uploaded to a configured default account or to an account selected by a set of routing rules.

4.2.2.4.2.2 Accepted Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**
All Storage SOP Classes as listed in Table 4-3	All transfer syntaxes as associated to the Storage SOP Classes in Table 4-3	SCP	None

Table 4-13: Quentry Gateway accepted Presentation Contexts – Receive Instances

4.2.2.4.2.3 SOP Specific Conformance

The Quentry Gateway provides standard conformance to the DICOM Storage SOP Classes. No extended negotiation is supported.

4.2.2.5 Configuration

The Quentry Gateway does not allow configuration of C-MOVE destinations. A C-MOVE request will always return the response to the IP of the caller and to the same port that Quentry Gateway is listening on.

4.2.3 Quentry Desktop Specification

The Quentry Desktop is a desktop application to upload and to download data to and from Quentry:

- Allows to query archives and to upload the selected and retrieved instances.
- Allows download of data via DICOM Query/Retrieve
- Receives instances via Storage Service Class. A Quentry user has to log in and manually upload it to a Quentry account.

4.2.3.1 SOP Classes and Transfer Syntaxes

The Quentry Desktop allows query, retrieve and storage of DICOM data. It provides standard conformance to the following SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
All Storage SOP Class Names and UIDs as listed in Table 4-3		Yes	Yes
All Query/Retrieve FIND and MOVE SOP Class Names and UIDs as listed in Table 4-4		Yes	Yes
All Query/Retrieve GET SOP Class Names and UIDs as listed in Table 4-4		No	Yes

Table 4-14: Quentry Desktop supported SOP Classes

4.2.3.2 Association Policies

4.2.3.2.1 Implementation Identifying Information

The implementation information for this Application Entity is:

Implementation Class UID	1.2.276.0.20.4.1.4.3.3.0.1.152
Implementation Version Name	QuentryDesktop

4.2.3.3 Association Initiation Policy

The Quentry Desktop initiates an association in this case:

- *Query/Retrieve for Upload*
  A Quentry user wants to upload data stored on a remote DICOM node

- *Send Instances*:
  The Quentry Gateway sends requested instances.

4.2.3.3.1 Activity – Query/Retrieve for Upload

4.2.3.3.1.1 Description and Sequencing of Activities

A Quentry user actively queries a remote system for instances he/she wants to upload. After selecting the instances the user initiates a C-MOVE transferring them to the Quentry Desktop application. The received instances will be stored in a queue and the user actively has to initiate the upload to Quentry.

4.2.3.3.1.2 Proposed Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**
All Query/Retrieve FIND and MOVE SOP Classes as listed in Table 4-4	NOCOMP (see Table 4-2)	SCU	None

Table 4-15: Quentry Desktop proposed Presentation Contexts – Query/Retrieve for Upload

4.2.3.3.1.3 SOP Specific Conformance

The Quentry Desktop provides standard conformance to the DICOM Query/Retrieve FIND and MOVE SOP Classes. No extended negotiation is implemented.

4.2.3.3.2 Activity – Send Instances

4.2.3.3.2.1 Description and Sequencing of Activities

Due to a DICOM Query/Retrieve C-MOVE request a number of DICOM Storage requests are performed to send the requested instances to the requested move destination.

4.2.3.3.2.2 Proposed Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**
All Storage SOP Classes as listed in Table 4-3	All transfer syntaxes as associated to the Storage SOP Classes listed in Table 4-3	SCU	None

Table 4-16: Quentry Desktop proposed Presentation Contexts – Send Instances

4.2.3.3.2.3 SOP Specific Conformance

The Quentry Desktop provides standard conformance to the DICOM Storage SOP Classes. No extended negotiation is implemented.

4.2.3.4 Association Acceptance Policy

The Quentry Desktop accepts an association in this case:

- *Query/Retrieve Instances*:
  The Quentry Desktop allows other DICOM nodes to query and retrieve instances.

- *Receive Instances*:
  The Quentry Desktop accepts storage requests from other DICOM nodes for upload to Quentry.

4.2.3.4.1 Activity – Query/Retrieve Instances

4.2.3.4.1.1 Description and Sequencing of Activities

The Quentry Desktop accepts DICOM C-FIND requests to query and DICOM C-MOVE and C-GET requests to retrieve instances stored in Quentry

4.2.3.4.1.2 Accepted Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**
All Query/Retrieve SOP Classes as listed in Table 4-4	NOCOMP (see Table 4-2)	SCP	Yes

Table 4-17: Quentry Desktop accepted Presentation Contexts – Query/Retrieve Instances

4.2.3.4.1.3 SOP Specific Conformance

The Quentry Desktop provides standard conformance to the DICOM Query/Retrieve SOP Classes with extensions to the Standard Patient and Study Root Query/Retrieve Information Model – FIND as outlined in section 8.5.1.

4.2.3.4.2 Activity – Receive Instances

4.2.3.4.2.1 Description and Sequencing of Activities

The Quentry Desktop accepts DICOM Storage requests from other DICOM nodes to upload the instances to Quentry. Received instances will be queued and the user has to log in and to upload manually the queued data to Quentry.

4.2.3.4.2.2 Accepted Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**
All Storage SOP Classes as listed in Table 4-3	All transfer syntaxes as associated to the Storage SOP Classes listed in Table 4-3	SCP	None

Table 4-18: Quentry Desktop accepted Presentation Contexts – Receive Instances

4.2.3.4.2.3 SOP Specific Conformance

The Quentry Desktop provides standard conformance to the DICOM Storage SOP Classes. No extended negotiation is supported.

4.2.3.5 Configuration

The Quentry Desktop does not allow configuration of C-MOVE destinations. A C-MOVE request will always return the response to the IP of the caller and to the same port that Quentry Gateway is listening on.

4.2.4 Quentry Viewer Specification

The Quentry Viewer is a browser based application in the Quentry Portal. It allows viewing of all image based DICOM instances.

Note: This specification does not reflect the complete DICOM capabilities of the Quentry Viewer, but only what kind of DICOM SOP Classes this application supports for display. All other used DICOM services are internal and of no further interest.

4.2.4.1 SOP Classes and Transfer Syntaxes

The Quentry Viewer accepts the following SOP Classes for viewing:

SOP Class Name	SOP Class UID	SCU	SCP
All Image Storage SOP Classes as listed in Table 4-3	All Image Storage SOP Class UIDs listed in Table 4-3	No	Yes

Table 4-19: Quentry Viewer supported SOP Classes

4.2.4.2 Association Policies

4.2.4.2.1 Implementation Identifying Information

The implementation information for this Application Entity is:

Implementation Class UID	1.2.276.0.20.1.1.26.2.0.0
Implementation Version Name	BrainSURF

4.2.4.3 Association Acceptance Policy

The Quentry Viewer accepts an association in this case:

- *Receive Instances*:
  The Quentry Viewer accepts storage requests from the Quentry Portal.

4.2.4.3.1 Activity – Receive Instances

4.2.4.3.1.1 Description and Sequencing of Activities

The Quentry Viewer accepts DICOM Storage requests from the Quentry Portal to display the sent instances.

4.2.4.3.1.2 Accepted Presentation Contexts

Presentation Context Table			
Abstract Syntax	**Transfer Syntax**	**Role**	**Ext. Neg**
All Image Storage SOP Classes as listed in Table 4-3	All transfer syntaxes as associated to the Image Storage SOP Classes in Table 4-3	SCP	None

Table 4-20: Quentry Gateway accepted Presentation Contexts – Receive Instances

4.2.4.3.1.3 SOP Specific Conformance

The Quentry Viewer provides standard conformance to the DICOM Storage SOP Classes. No extended negotiation is supported.

4.3 Network Interfaces

4.3.1 Physical Network Interface

The Quentry applications support the DICOM upper layer using TCP/IP and are indifferent to the physical medium over which TCP/IP executes. The Quentry applications inherit this from the operating system upon which they are executed.

4.3.2 Additional Protocols

The usage of DNS and DHCP is possible and is based on the network configuration of the operating system upon which the Quentry applications execute.

5 Media Interchange

5.1 Implementation Model

5.1.1 Application Data Flow Diagram

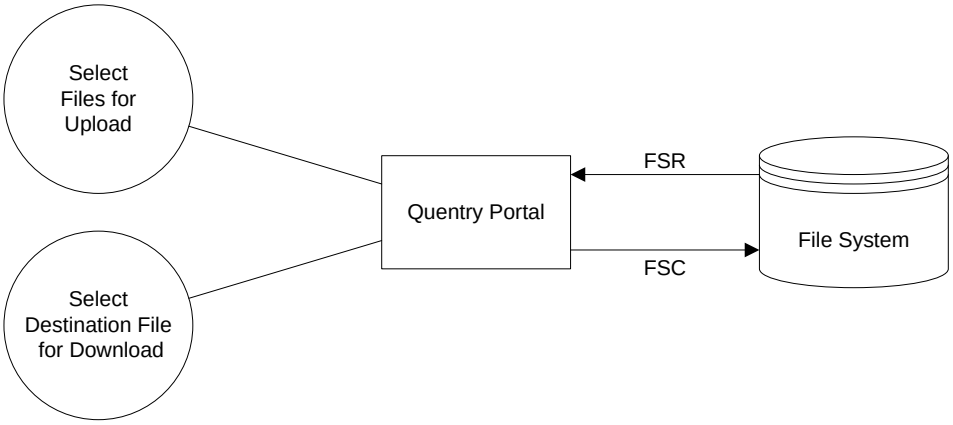

Figure 5-1: The Quentry Portal Data Flow Diagram

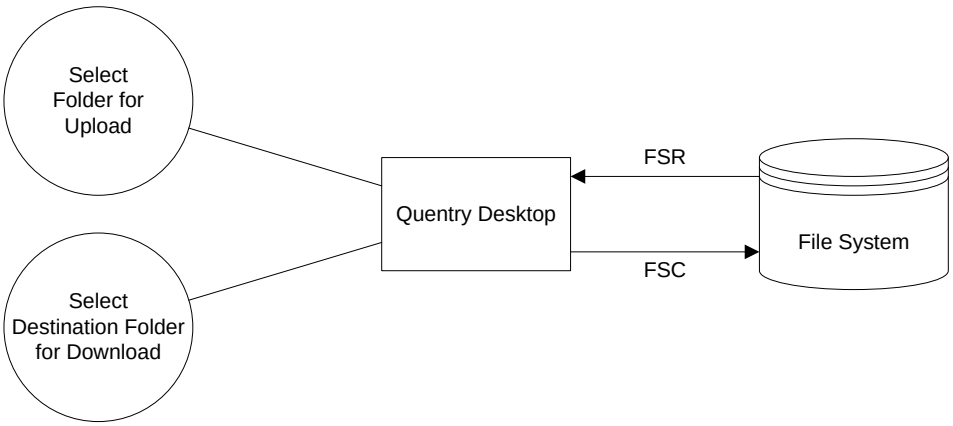

Figure 5-2: The Quentry Desktop Data Flow Diagram

5.1.2 Functional Definitions of AE's

5.1.2.1 Functional Definition of Quentry Portal

- *Upload*:
  The Quentry Portal allows the user to select DICOM files[2]. The files will be scanned and all supported and valid DICOM instances will be presented to the user.
  Finally the user can select one or more series and start the upload.

- *Download*:
  The Quentry Portal allows selecting one or more series for download. All instances will be packed into a single zip file. The user has to specify a destination folder and a zip file name on the file system and can start the download.

5.1.2.2 Functional Definition of Quentry Desktop

- *Upload*:
  The Quentry Desktop allows the user to select a DICOM medium, e.g. a CD, a DVD or a folder in the file system. If the medium contains a DICOMDIR it is evaluated and all indexed instances will be scanned and presented to the user.
  If there is no DICOMDIR, the application will scan the files beneath the selected folder and will present to the user all DICOM instances that are supported and valid.
  Finally the user can select one or more series and start the upload.

- *Download*:
  The Quentry Desktop also allows selecting one or more series for download. Then the user needs to specify a destination folder on the file system and can start the download. All DICOM instances will be saved as files to the destination folder.

5.1.3 Sequencing of Real-World Activities

Not necessary.

5.1.4 File Meta Information Options

See in 5.2 AE Specifications.

[2] Because Quentry is a browser-based software security restrictions do not allow scanning a file system folder or reading a DICOMDIR and loading the addressed DICOM instances. This is the reason the user has to provide files for upload and a zip file for download.

5.2 AE Specifications

5.2.1 Quentry Portal Application Entity Specification

The Quentry Desktop provides standard conformance to the Media Storage Service Class. The application profiles and roles are listed below:

AE Related Application Profiles, Real-World Activities, and Roles			
Supported APs	**Real World Activity**	**Roles**	**Options**
BL-PRV-GEN	Select Files for Upload	FSR	No DICOMDIR
	Select Destination File for Download	FSC	

Table 5-1: Quentry Portal Supported Media Interchange Profiles.

5.2.1.1 File Meta Information for the Application Entity

The Quentry Portal does not change the original Implementation Class UID and Implementation Version Name and it does not write the Source Application Entity Title.

5.2.1.2 Real World Activities

5.2.1.2.1 Activity – Select Files for Upload

The Quentry Portal allows the user to select DICOM files either by presenting a file selection dialog or by drag and drop of files from a file explorer. The portal scans the files and presents all supported and valid SOP instances grouped into series to the user.

The user then can select one or more series and start the upload to Quentry.

5.2.1.2.1.1 Media Storage Application Profiles

The Quentry Portal supports the BL-PRV-GEN Application Profile File System Reader.

5.2.1.2.1.1.1 Option - Supported SOP Classes and Transfer Syntaxes

SOP Class Name	SOP Class UID	Transfer Syntax	Transfer Syntax UID
All SOP Classes from Table 4-2		The original transfer syntax won't be changed; therefore any transfer syntax is supported	

Table 5-2: Quentry Portal supported SOP Classes and Transfer Syntaxes

5.2.1.2.1.1.2 Option - Physical Medium and Medium Format

The Quentry Portal supports reading the PC File System (see [1] PS 3.12, Annex A).

5.2.1.2.1.1.3 Option - Basic Directory

Due to security restrictions of browser-based applications the Quentry Portal does not read any DICOMDIR.

5.2.1.2.2 Activity - Select Destination File for Download

The Quentry Portal allows the user to select one or more series for download. All instances will be packed into a single zip file. The user needs to specify a destination file on the file system and can start the download of the zip file.

5.2.1.2.2.1 Media Storage Application Profiles

The Quentry Portal supports the BL-PRV-GEN Application Profile File System Creator.

5.2.1.2.2.1.1 Option - Supported SOP Classes and Transfer Syntaxes

SOP Class Name	SOP Class UID	Transfer Syntax	Transfer Syntax UID
All SOP Classes from Table 4-2		The original transfer syntax won't be changed; therefore any transfer syntax is supported	

Table 5-3: Quentry Portal supported SOP Classes and Transfer Syntaxes

5.2.1.2.2.1.2 Option - Physical Medium and Medium Format

The Quentry Portal supports creating the ZIP File Media (see [1] PS 3.12, Annex V).

5.2.1.2.2.1.3 Option - Basic Directory

The Quentry Portal does not create a DICOMDIR.

5.2.2 Quentry Desktop Application Entity Specification

The Quentry Desktop provides standard conformance to the Media Storage Service Class. The application profiles and roles are listed below:

AE Related Application Profiles, Real-World Activities, and Roles			
Supported APs	**Real World Activity**	**Roles**	**Options**
BL-PRV-GEN	Select DICOM Medium for Upload	FSR	DICOMDIR
	Select Folder for Upload	FSR	No DICOMDIR
	Select Destination Folder for Download	FSC	

Table 5-4: Quentry Desktop Supported Media Interchange Profiles.

5.2.2.1 File Meta Information for the Application Entity

Quentry Desktop writes the following implementation information:

Implementation Class UID	1.2.276.0.20.4.1.4.3.3.0.1.152
Implementation Version Name	QuentryDesktop

5.2.2.2 Real World Activities

5.2.2.2.1 Activity – Select Folder for Upload

The Quentry Desktop allows the user to select a folder by presenting a folder selection dialog. If the selected folder contains a DICOMDIR the application will scan it. If there is no DICOMDIR the application will scan the files in the folder recursively. Then the application presents all supported and valid SOP instances grouped into series to the user.

Finally the user can select one or more series and start the upload to Quentry.

5.2.2.2.1.1 Media Storage Application Profiles

The Quentry Portal supports the BL-PRV-GEN Application Profile File System Reader.

5.2.2.2.1.1.1 Option - Supported SOP Classes and Transfer Syntaxes

SOP Class Name	SOP Class UID	Transfer Syntax	Transfer Syntax UID
All SOP Classes from Table 4-2		The original transfer syntax won't be changed; therefore any transfer syntax is supported	

Table 5-5: Quentry Portal supported SOP Classes and Transfer Syntaxes

5.2.2.2.1.1.2 Option - Physical Medium and Medium Format

The Quentry Portal supports reading the PC File System (see [1] PS 3.12, Annex A).

5.2.2.2.1.1.3 Option - Basic Directory

The Quentry Portal supports reading a DICOMDIR.

5.2.2.2.2 Activity - Select Destination Folder for Download

The Quentry Desktop allows the user to search the portal for certain data. He/she can select one or more of the found series for download. The user has to specify a destination folder on the file system and can start the download of the selected series.

5.2.2.2.2.1 Media Storage Application Profiles

The Quentry Desktop supports the BL-PRV-GEN Application Profile File System Creator.

5.2.2.2.2.1.1 Option - Supported SOP Classes and Transfer Syntaxes

SOP Class Name	SOP Class UID	Transfer Syntax	Transfer Syntax UID
All SOP Classes from Table 4-3		The original transfer syntax won't be changed; therefore any transfer syntax is supported	

Table 5-6: Quentry Portal supported SOP Classes and Transfer Syntaxes

5.2.2.2.2.1.2 Option - Physical Medium and Medium Format

The Quentry Portal supports creating the ZIP File Media (see [1] PS 3.12, Annex V).

5.2.2.2.2.1.3 Option - Basic Directory

The Quentry Portal does not create a DICOMDIR. Therefore it does not check whether some SOP instances already exist but writes the SOP instances into new files for each selected series.

5.3 Augmented and Private Application Profiles

5.3.1 Augmented Application Profiles

None.

5.3.2 Private Application Profiles

5.3.2.1 Brainlab General Purpose Interchange Profile

5.3.2.1.1 Profile Identification

This section defines an Application Profile Class potentially inclusive of all defined Media Storage SOP Classes. This class is intended to be used for the interchange of Composite SOP Instances via any media. Objects from multiple modalities may be included on the same media.

See Table 4-3 for a detailed list of supported Media Storage SOP Classes.

Application Profile	Identifier	Description
Brainlab General Purpose Media Interchange	BL-PRV-GEN	Handles interchange of Composite SOP Instances such as Images, Structured Reports, Presentation States and Waveforms.

Table 5-7: Brainlab General Purpose Media Interchange Profile.

5.3.2.1.2 Clinical Context

This Application Profile facilitates the interchange of images and related data on any media and Brainlab applications.

5.3.2.1.2.1 Roles and Service Class Options

This Application Profile uses the Media Storage Service Class defined in PS3.4.

The Application Entity shall support one or more of the roles of File Set Creator (FSC), File Set Reader (FSR), and File Set Updater (FSU), defined in [1] PS 3.10.

5.3.2.1.2.1.1 File Set Creator

The role of File Set Creator shall be used by Application Entities which generate a File Set under this Image Interchange Class of Application Profiles.

Optionally, File Set Creators shall be able to generate the Basic Directory SOP Class in the DICOMDIR file with all subsidiary Directory Records related to the Image SOP Classes stored in the File Set. The Application Entity acting as a File Set Creator generates a File Set under a BL-PRV-GEN Application Profile.

5.3.2.1.2.1.2 File Set Reader

The role of File Set Reader shall be used by Application Entities that receive a transferred File Set under the Image Interchange Class of Application Profiles.

Optionally File Set Readers shall be able to read the DICOMDIR directory file and all the SOP Instance files defined for this Application Profile, for which a Conformance Statement is made, using the defined Transfer Syntax.

5.3.2.1.2.1.3 File Set Updater

The role of File Set Updater is used by Application Entities which receive a transferred File Set under the Image Exchange Class of Application Profiles and update it by the addition (or deletion) of images or information to (or from) the medium.

File Set Updaters shall be able to generate one or more of the SOP Instances defined for this Application Profile, for which a Conformance Statement is made, and optionally to read and update the DICOMDIR file.

5.3.2.2 BL-PRV-GEN Profile Class

5.3.2.2.1 SOP Classes and Transfer Syntaxes

This Application Profile is based on the Media Storage Service Class (see [1] PS 3.4).

IOD	SOP Class UID	Transfer Syntax	FSC	FSR	FSU
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian 1.2.840.10008.1.2.1	Optional	Optional	Optional
Composite Instance Storage	Defined in Conformance Statement	Defined in Conformance Statement	Optional	Mandatory	Optional

Table 5-8: BL-PRV-GEN SOP Classes and Transfer Syntaxes.

5.3.2.2.2 Physical Medium and Medium Format

BL-PRV-GEN requires either the PC File System (see [1] PS 3.12, Annex A) or the ZIP File Media (see [1] PS 3.12, Annex V).

Furthermore this profile supports all media like CD, DVD, USB, CF, MMC or SD which seamlessly integrates into the OS file system for reading, writing and updating. It also supports filenames not fulfilling the 8 + 3 rule of the above mentioned PC File System.

5.3.2.2.3 Directory Information in DICOMDIR

Conformant Application Entities may include in the DICOMDIR File the Basic Directory IOD containing Directory Records at the Patient and the subsidiary Study and Series levels, appropriate to the SOP Classes in the File Set.

All DICOM files in the File Set incorporating SOP Instances defined for the specific Application Profile shall be referenced by Directory Records.

All implementations shall include the DICOM Media Storage Directory in the DICOMDIR file. There shall be exactly one or no DICOMDIR file per File Set. The DICOMDIR file shall be in the root directory of the medium.

The Patient ID at the patient level shall be unique for each patient directory record in one File Set.

If there is no DICOMDIR this profile allows recursive scanning of file systems for DICOM instances.

Whether the DICOMDIR is supported and how a file system scan is performed needs to be described in the Conformance Statement.

5.3.2.2.4 Additional Keys

File Set Creators and Updaters are required to generate the mandatory elements specified in [1] PS 3.3.

5.3.2.2.5 Other Parameters

Not applicable.

5.3.2.2.6 Security Parameters

Not applicable.

6 Support of Character Sets

Quentry in common supports the following character sets:

- ISO_IR 100 (ISO 8859-1; Latin Alphabet No. 1: Western Europe)
- ISO_IR 101 (ISO 8859-2; Latin Alphabet No. 2: Central Europe)
- ISO_IR 109 (ISO 8859-3; Latin Alphabet No. 3: Southern Europe)
- ISO_IR 110 (ISO 8859-4; Latin Alphabet No. 4: Northern Europe)
- ISO_IR 144 (ISO 8859-5; Cyrillic)
- ISO_IR 127 (ISO 8859-6; Arabic)
- ISO_IR 126 (ISO 8859-7; Greek)
- ISO_IR 138 (ISO 8859-8; Hebrew)
- ISO_IR 148 (ISO 8859-9; Turkish)
- ISO_IR 13 (JIS X 0201; Japanese: Katakana, Romaji))
- ISO 2022 IR 13 (JIS X 0201; with code extensions; Japanese: Katakana, Romaji)
- ISO 2022 IR 87 (JIS X 0208; with code extensions; Japanese: Kanji)
- ISO 2022 IR 159 (JIS X 0212; with code extensions; Japanese: Kanji)
- ISO 2022 IR 149 (KS X 1001; with code extensions; Korean: Hangul, Hanja)
- ISO_IR 192 (Unicode UTF-8)
- GB18030 (Chinese)

Service Class Mapping:

1 Storage Service Class as SCP and SCU
2 Query/Retrieve Service Class as SCP and SCU
3 Query/Retrieve Service Class C-FIND responses as SCP
4 Brainlab General Purpose Media Profile File System Reader

Character Set	Quentry Desktop		Quentry Gateway		Quentry Portal	Quentry Viewer
Service Class	**1,2,4**	**3**	**1,2,4**	**3**	**4**	**1**
ISO_IR 100	●		●		●	●
ISO_IR 101	●		●		●	●
ISO_IR 109	●		●			●
ISO_IR 110	●		●			●
ISO_IR 144	●		●		●	●
ISO_IR 127	●		●		●	●
ISO_IR 126	●		●		●	●
ISO_IR 138	●		●		●	●
ISO_IR 13	●		●			●
ISO 2022 IR 13	●		●			●
ISO 2022 IR 87	●		●			●
ISO 2022 IR 159	●		●			
ISO 2022 IR 149	●		●			
ISO_IR 192	●	●	●	●	●	●
GB18030	●		●			●

Table 6-1: Quentry application and service class specific supported character sets

The Quentry Desktop and Quentry Gateway applications send C-FIND responses with the default character set by default. But if some of the response attributes contains characters beyond the default character repertoire, the C-FIND responses are encoded with “ISO_IR 192”.

7 Security Profiles

7.1 Security Profiles

Both Quentry Gateway and Quentry Desktop support the Basic User Identity Association Profile.

7.2 Association Level Security

None supported.

7.3 Application Level Security

Quentry Portal, Quentry Gateway and Quentry Desktop de-identify data according to the DICOM Attribute Confidentiality Profile De-Identifier of the DICOM Standard 2008 (see [2], Annex E).

The De-identification:

- All private attributes will be removed.
- All attributes with value representation UI will be replaced consistently with a new UID value, except
- Media Storage SOP Class UID (0002,0002)
- Transfer Syntax UID (0002,0010)
- Implementation Class UID (0002,0012)
- SOP Class UID (0008,0016)
- Referenced SOP Class UID (0008,1150)
- See Table 7-1 for de-identification actions for all other attributes.
- The user may specify values for
- Patient's Name (0010,0010)
- Patient ID (0010,0020)
- Patient's Birth Date (0010,0030)
- Patient's Sex (0010,0040)
- All attributes to replace with value representation of
- UI, PN, LO, LT, ST, UT, AE and SH will be replaced by a user specific hash value of the attributes value.
- DA, TM and DT will be replaced with the same date

Attribute Name	Tag	Action
Accession Number	(0008,0050)	New Value
Additional Patient's History	(0010,21B0)	Empty
Admitting Diagnoses Description	(0008,1080)	Empty
Content Sequence	(0040,A730)	Empty
Derivation Description	(0008,2111)	Empty
Device Serial Number	(0018,1000)	Empty
Ethnic Group	(0010,2160)	Empty
Image Comments	(0020,4000)	Empty
Institution Address	(0008,0081)	Empty
Institution Name	(0008,0080)	Empty

Attribute Name	Tag	Action
Institutional Department Name	(0008,1040)	Empty
Medical Record Locator	(0010,1090)	Empty
Name of Physician(s) Reading Study	(0008,1060)	Empty
Occupation	(0010,2180)	Empty
Operators Name	(0008,1070)	Empty
Other Patient Ids	(0010,1000)	Empty
Other Patient Names	(0010,1001)	Empty
Patient Comments	(0010,4000)	Empty
Patient ID	(0010,0020)	New Value
Patient's Age	(0010,1010)	Empty
Patient's Birth Date	(0010,0030)	New Value
Patient's Birth Time	(0010,0032)	New Value
Patient's Name	(0010,0010)	New Value
Patient's Sex	(0010,0040)	"O"
Patient's Size	(0010,1020)	Empty
Patient's Weight	(0010,1030)	Empty
Performing Physicians' Name	(0008,1050)	Empty
Physician(s) of Record	(0008,1048)	Empty
Protocol Name	(0018,1030)	Empty
Referring Physician's Address	(0008,0092)	Empty
Referring Physician's Name	(0008,0090)	Empty
Referring Physician's Telephone Numbers	(0008,0094)	Empty
Request Attributes Sequence	(0040,0275)	Empty
Series Description	(0008,103E)	Empty
Station Name	(0008,1010)	Empty
Study Description	(0008,1030)	Empty
Study ID	(0020,0010)	Empty

Table 7-1: De-Identification

8 Annexes

8.1 IOD Contents

8.1.1 Created SOP Instances

Quentry does not create any DICOM SOP Instances.

8.1.2 Usage of Attributes from Received IODs

8.1.2.1 Image IODs

In general the Quentry viewers support any kind of DICOM image, but there are some restrictions:

- Grayscale with 1 samples per pixel and 8 or 16 bits allocated
- Color with 3 samples per pixel, “RGB”, “YBR_FULL” or “YBR_FULL_422”, 8 bits allocated and unsigned pixel representation
- Palette color with 1 sample per pixel and 8 or 16 bits allocated

All other image formats are not supported and therefore will not be displayed.

8.1.2.2 Segmentation IODs

The Quentry viewers does not support Segmentation instances with a Segmentation Type (0062,0001) of “BINARY” and Columns (0028,0011) with a value which is not a multiple of 8.

8.1.3 Attribute Mapping

No attribute mapping is performed.

8.1.4 Coerced/Modified fields

No coercion is performed.

8.2 Data Dictionary of Private Attributes

8.2.1 Group 0401,[01] Brainlab-S5-AccessCredentials

Tag	Name	VR	VM	Description
(0401,00-[01])	Private Creator	LO	1	“Brainlab-S5-AccessCredentials”
(0401,[01]-20)	Dataset Owner ID	LO	1	

8.3 Coded Terminology and Templates

None.

8.4 Grayscale Image Consistency

Not supported.

8.5 Standard Extended/Specialized/Private SOP Classes

8.5.1 Standard Extended Patient and Study Root Query/Retrieve Information Model – FIND

The identifier in a C-FIND request conditionally may contain for each retrieval level the Dataset Owner ID (0401,[01]-20).

Description	Tag	Type
Dataset Owner ID	(0401,[01]-20)	O

Table 8-1: Additional Query/Retrieve C-FIND Query Keys

8.5.1.1 C-FIND SCU Behavior

To access the data of a special Quentry patient folder the C-FIND SCU may set the Dataset Owner ID (0401,[01]-20) with the ID of the patient folder to retrieve.

8.5.1.2 C-FIND SCP Behavior

If the C-FIND identifier contains the Dataset Owner ID (0401,[01]-20) with the ID of a patient folder the SCP has to restrict the query results to only instances assigned to the Quentry patient folder.

8.6 Private Transfer Syntaxes

None.

9 Indexes

9.1 Index of Tables

9.2 Index of Figures