
DICOM

Conformance Statement

Panorama Release 5.2

Panorama 0.6T

Panorama 0.23T

Panorama 0.23T I/T

Panorama 0.23T R/T



This DICOM Conformance Statement is generated for the Panorama 0.23T and Panorama 0.6T systems, which are controlled by using the same Panorama Software.

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1 DICOM CONFORMANCE STATEMENT OVERVIEW

The Overview consist of an overview of the Network Services used by the Panorama Release 5.2

The first column shall specify the SOP classes exactly as named in PS 3.6-2003.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	UID		
Transfer			
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No
Query/Retrieve			
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	No	Yes
Patient Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.1.2	No	Yes
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	No	Yes
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	No	Yes
Workflow Management			
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	No
Print Management			
Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
Basic Grayscale Print Management (Meta)	1.2.840.10008.5.1.1.9	Yes	No
Printer	1.2.840.10008.5.1.1.16	Yes	No

Note: Verification SCP (C-ECHO) is not included in the table above because it is required for any Acceptor of an Association. The Verification SCU details are covered in the details of the conformance statement.

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3 INTRODUCTION

The introduction specifies product and relevant disclaimers as well as any general information that the vendor feels is appropriate.

3.1 Revision History

The revision history provides dates and differences of the different releases.

Table 2: Revision History

Document Version	Date of Issue	Description
01	28 April 2004	First publication

3.2 Audience

This Conformance Statement is intended for:

- (Potential) customers
- System integrators of medical equipment
- Marketing staff interested in system functionality
- Software designers implementing DICOM interfaces

It is assumed that the reader is familiar with the DICOM standard.

3.3 Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2-2003.

This DICOM Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**
Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment. It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.
- **Validation**
Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement. Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the

responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**

The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery.

The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

3.4 Definitions, Terms and Abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3-2003 and PS 3.4-2003. The word Philips in this document refers to Philips Medical Systems.

The following acronyms and abbreviations are used in this document.

AE	Application Entity
ALWAYS	Always Present
ANAP	Attribute Not Always Present
AUTO	Automatically
BOT	Basic Offset Table
CONFIG	Configuration
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
EMPTY	Attribute is sent without a value
ILE	DICOM Implicit VR Little Endian
IOD	Information Object Definition
MWL	Modality Worklist
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
RIS	Radiology Information System
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
USER	User Input
VNAP	Value Not Always Present
VR	Value Representation

3.5 References

- [DICOM] Digital Imaging and Communications in Medicine (DICOM), Part 1 – 16 (NEMA PS 3.1-2003 – PS 3.16-2003), National Electrical Manufacturers Association (NEMA) Publication Sales 1300 N. 17th Street, Suite 1847 Rosslyn, Virginia. 22209, United States of America

4 NETWORKING

This section contains the networking related services (vs. the media related ones).

4.1 Implementation model

The Panorama MR Software is console software controlling an MR image generating system. The software contains following features:

Table 3: Panorama Feature

Feature
DICOM Worklist Management function to obtain a DICOM Worklist
DICOM Image Export function to transfer DICOM MR images and image related data from Panorama to a remote system
DICOM Print function to print images
DICOM Query/Retrieve Server to respond to query and move requests received from remote AE's.

4.1.1 Application Data Flow

Panorama behaves as a system with 4 Application Entities (AE). The related implementation models are shown in figure 1.

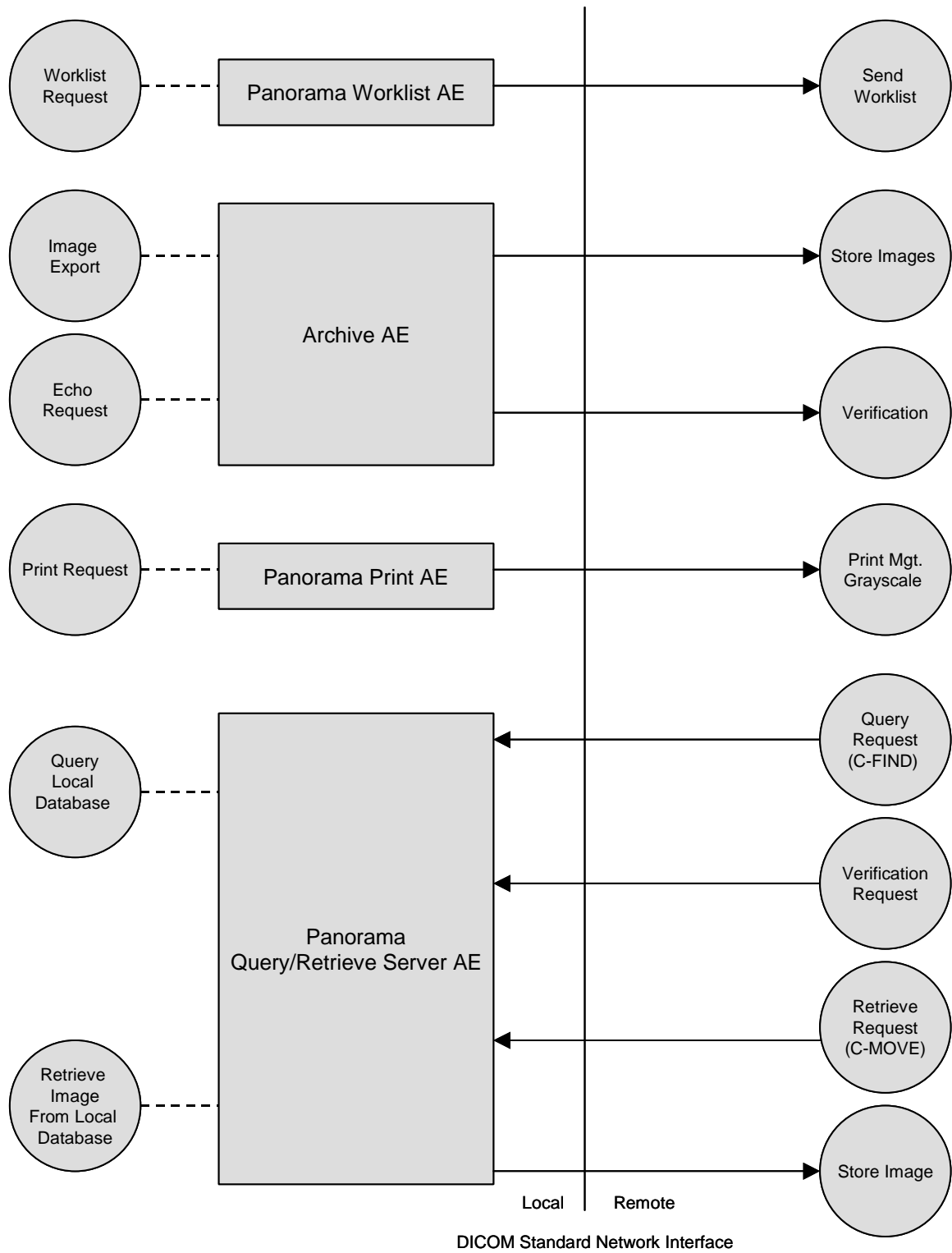


Figure 1: Application Data Flow Diagram

4.1.2 Functional Definition of AE's

4.1.2.1 Functional Definition of Panorama Worklist AE

The Panorama DICOM Modality Worklist feature allows operator to perform Worklist Request. Operator performs the Worklist Request during the examination setup. A worklist is requested from a DICOM Information System like a RIS.

The Panorama Worklist AE acts as a Service Class User (SCU) of the Basic Worklist Management Service Class. It will subsequently request the Worklist data from the configured RIS.

4.1.2.2 Functional Definition of Panorama Export AE

The Panorama DICOM Image Export feature allows operator to perform Image Export and Echo Request. Export Request is activated either manually by user or as a consequence of specific system event like receiving new images from the scanner. At Export Request the images will be converted into DICOM format and sent out to a remote destination. This destination has previously selected by the operator from the user interface. Operator can also perform Echo Request to the selected destination to check whether it is responding using the user interface.

The Panorama Export AE establishes an association with the remote Storage SCP, sends all images in the series, and then terminates the association. If the export function detects an error while sending an image, the export function will notify the operator and request operator intervention. Panorama Export AE can also act as a Verification SCU and check the availability of remote AE.

4.1.2.3 Functional Definition of Panorama Print AE

The Panorama DICOM Print feature allows operator to perform Print Request. Operator exposes selected images to a virtual keypad, selects the printer and presses Print button. At Print Request exposed images are converted to DICOM format and sent out to the selected printer.

The Panorama Print AE runs as a server process, which accepts requests initiated by Film Control dialog (virtual keypad). Operator fills the film with images using the export button. When the film is complete, the operator presses Print button, which initiates communication with DICOM printer. The Print AE establishes an association with the remote Print SCP, sends a film, queries printer status, and then terminates the association.

4.1.2.4 Functional Definition of Panorama Query/Retrieve Server AE

The Panorama Query/Retrieve Server AE is a separate process running on the system. It responds to query, retrieve and verification requests received from remote AE's.

When Verification Request is received, the Panorama Query/Retrieve Server AE sends a verification response back to the requesting AE.

The Query/Retrieve Server AE runs as a separate process, which is started and stopped by the system's user interface process. While active, server responds to query, retrieve and verification requests initiated by remote Query/Retrieve Service Class SCU. With retrieve request, an association is established to the requested destination AE, all requested SOP Instances are sent to the destination, and association is terminated. After the last processed SOP Instance, a response with possible failure information is sent to the SCU.

4.1.3 Sequencing of Real World Activities

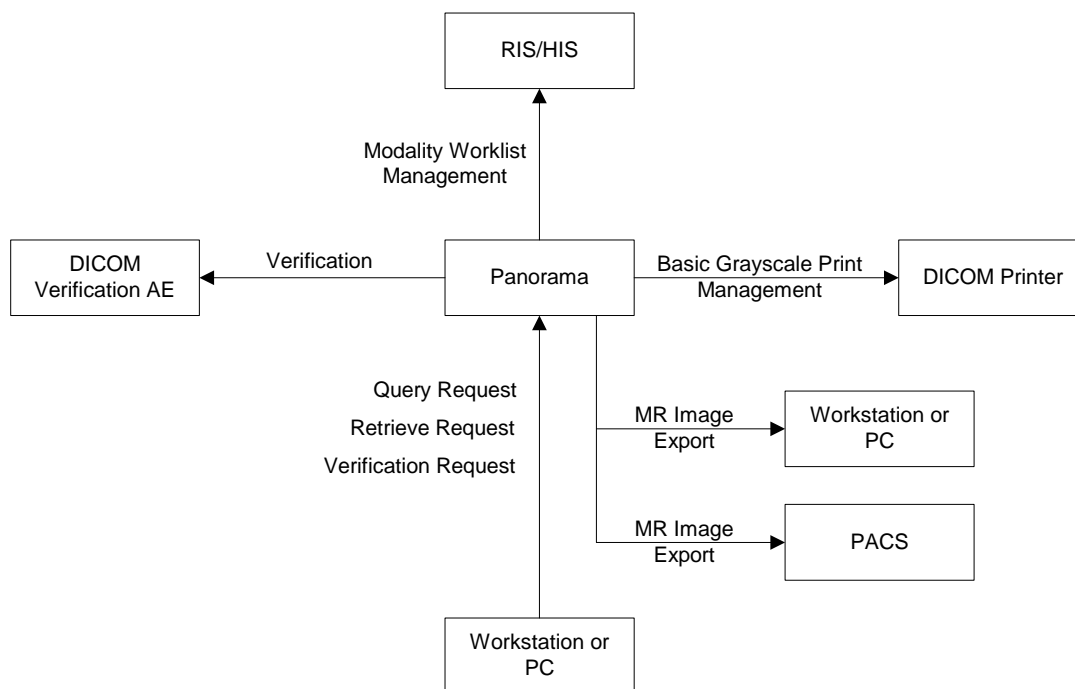


Figure 2: The Panorama system in DICOM Network

When RIS interface is configured, the worklist data can be requested from the RIS. After import of the data, user can add missing data required for examination setup.

With above data, which also can be entered manually, examination scans can be performed. After reconstruction the resulting images can be exported via DICOM. These images can also be sent to a DICOM network printer.

Remote workstation or PC can also query the local image database of Panorama system and retrieve selected images to itself or to some other destination.

4.2 AE Specifications

The four different Application Entity's are specified in the next sections. Specified in section 4.2.1 Panorama Worklist AE, section 4.2.2 Panorama Export AE, section 4.2.3 Panorama Print AE en section 4.2.4 Panorama Query/Retrieve Server AE.

4.2.1 Panorama Worklist AE

4.2.1.1 SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 4: SOP Classes for Panorama Worklist AE

SOP Class Name	SOP Class UID	SCU	SCP
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

4.2.1.2 Association Policies

4.2.1.2.1 General

The PDU size is configurable. The default PDU size 4096 Bytes is given in the configuration as 0. The PDU size = PDU size entered + 6 Bytes. Example 4096 Bytes will be $4096 + 6 = 5002$ Bytes in total. By changing of the PDU size first a restart of the application is needed. During Association the real transfers Bytes will be negotiated.

Table 5: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

4.2.1.2.2 Number of Associations

Panorama Worklist AE will attempt to establish on association at the time.

Table 6: Number of Associations as an Association Initiator for Panorama Worklist AE

Maximum number of simultaneous associations	1
---	---

4.2.1.2.3 Implementation Identifying Information

Table 7: DICOM Implementation Class and Version for Panorama Worklist AE

Application Entity Name	Panorama Worklist AE
Application Entity Version	5.2
Implementation Class UID	2.16.840.1.113662.4.10.1

4.2.1.3 Association Initiation Policy

This describes the conditions under which the AE will initiate an association.

4.2.1.3.1 Association Real-World Activity – Worklist Request (C-FIND)

4.2.1.3.1.1 Description and Sequencing of Activities

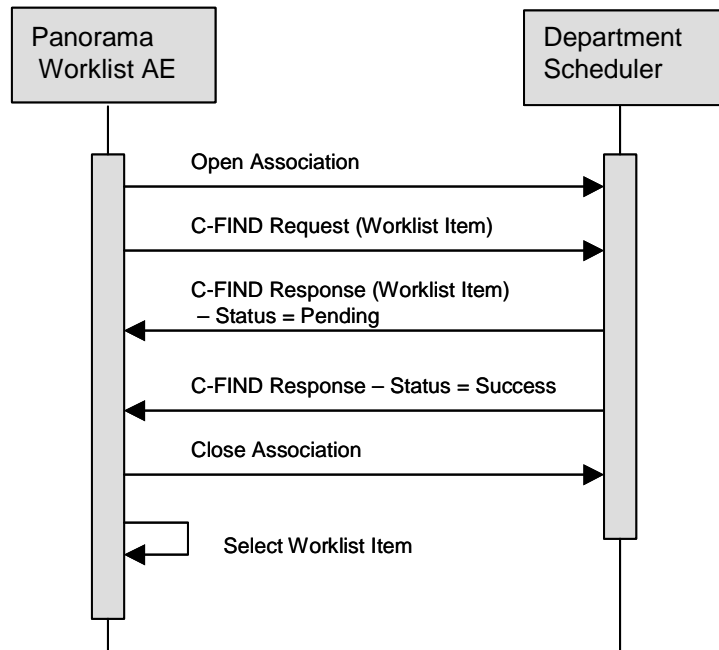


Figure 3: Real World Activity Worklist Request

A Worklist request can be done by the operator, during examination preparation phase, through pressing of the Find-button in the worklist dialog.

4.2.1.3.1.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by Panorama Worklist AE for Association Real-World Activity – Worklist Request (C-FIND) is defined in Table 8.

Table 8: Proposed Presentation Contexts for Worklist Request (C-FIND)

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model - Find	1.2.840.10008.5.1.4.31	ILE	1.2.840.10008.1.2	SCU	None

4.2.1.3.1.3 SOP Specific Conformance for Worklist SOP Classes

Details regarding the status handling behavior from the application level and communication errors are provided in Table 9. The behavior of the AE during communication failure is summarized in Table 10.

Table 9: Modality Worklist Information Model-Find Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	Results are shown.
Cancel	Matching terminated due to Cancel request	FE00	
Failed	Identifier does not match SOP Class	A900	
	Unable to process	Cxxx	
Refused	Out of Resources	A700	

Table 10: Modality Worklist Information Model Find Communication Failure Behavior

Exception	Behavior
Association aborted	Operation cancelled. Error message shown.

4.2.1.4 Overview of the applied Modality Worklist Information Model - FIND SOP Class

This Chapter specifies in detail the applied attributes in the C-FIND Service Elements of this supported SOP Class.

The below tables should be read as follows:

Module name:	The name of the associated module for supported worklist attributes. The module name is written behind the table number.
Attribute name	Attributes supported to build an Panorama Modality Worklist Request Identifier.
Tag:	DICOM tag for this attribute.
VR:	DICOM VR for this attribute.
M:	Matching Keys for (automatic) Worklist Update. An "S" will indicate an attribute value for Single Value Matching, an "R" will indicate an attribute value for Range Matching, an "W" will denote Wildcard Matching (* and ?) and an "U" will indicate an attribute for Universal Matching
R:	Return Keys. An "x" will indicate that this attribute as Return Key with zero length for Universal Matching.
Q:	Interactive Query Key. An "x" will indicate that this attribute as matching key can be used.
D:	Displayed Keys. An "x" indicates that this worklist attribute is displayed to the user during a patient registration dialog.
IOD:	An "x" indicates that this Worklist attribute is included into all object Instances created during performance of the related Procedure Step.

Table 11: Patient Identifier Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Patient's Name	0010,0010	PN	S,W,U		X		
Patient ID	0010,0020	LO	S,U		X		
Issuer of Patient ID	0010,0021	LO		X			
Other Patient Ids	0010,1000	LO		X			
Other Patient Names	0010,1001	PN		X			
Patient's Birth Name	0010,1005	PN		X			
Patient's Mother's Birth Name	0010,1060	PN		X			
Medical Record Locator	0010,1090	LO		X			

Note: Patient Name is saved in capital letters

Table 12: Patient Medical Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Medical Alerts	0010,2000	LO		X			
Contrast Allergies	0010,2110	LO		X			
Smoking Status	0010,21A0	CS		X			
Additional Patient History	0010,21B0	LT		X			
Pregnancy Status	0010,21C0	US		X			
Last Menstrual Date	0010,21D0	DA		X			
Special Needs	0038,0050	LO		X			
Patient State	0038,0500	LO		X			

Table 13: Visit Relationship Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Referenced Patient Sequence	0008,1120	SQ		X			
>Referenced SOP Class UID	0008,1150	UI		X			
>Referenced SOP Instance UID	0008,1155	UI		X			

Table 14: Patient Relationship Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Referenced Visit Sequence	0008,1125	SQ		X			
>Referenced SOP Class UID	0008,1150	UI		X			
>Referenced SOP Instance UID	0008,1155	UI		X			
Referenced Patient Alias Sequence	0038,0004	SQ		X			
>Referenced SOP Class UID	0008,1150	UI		X			
>Referenced SOP Instance UID	0008,1155	UI		X			

Table 15: Patient Demographic Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Patient's Birth Date	0010,0030	DA		X			
Patient's Birth Time	0010,0032	TM		X			
Patient's Sex	0010,0040	CS		X			
Patient's Insurance Plan Code Sequence	0010,0050	SQ		X			
>Code Value	0008,0100	SH		X			
>Coding Scheme Designator	0008,0102	SH		X			
>Code Meaning	0008,0104	LO		X			
Patient's Age	0010,1010	AS		X			
Patient's Size	0010,1020	DS		X			
Patient's Weight	0010,1030	DS		X			
Patient's Address	0010,1040	LO		X			
Military Rank	0010,1080	LO		X			
Branch of Service	0010,1081	LO		X			
Country of Residence	0010,2150	LO		X			
Region of Residence	0010,2152	LO		X			
Patient's Telephone Numbers	0010,2154	SH		X			
Ethnic Group	0010,2160	SH		X			
Occupation	0010,2180	SH		X			
Patient's Religious Preference	0010,21F0	LO		X			
Patient Comments	0010,4000	LT		X			
Patient Data Confidentiality Constraint Description	0040,3001	LO		X			

Table 16: Visit Identification Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Institution Name	0008,0080	LO		X			
Institution Address	0008,0081	ST		X			
Institution Code Sequence	0008,0082	SQ		X			
>Code Value	0008,0100	SH		X			
>Coding Scheme Designator	0008,0102	SH		X			
>Code Meaning	0008,0104	LO		X			
Admission ID	0038,0010	LO		X			
Issuer of Admission ID	0038,0011	LO		X			

Table 17: Visit Status Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Visit Status ID	0038,0008	CS		X			
Current Patient Location	0038,0300	LO		X			
Patient's Institution Residence	0038,0400	LO		X			
Visit Comments	0038,4000	LT		X			

Table 18: Imaging Service Request Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Accession Number	0008,0050	SH		X			
Referring Physician's Name	0008,0090	PN		X			
Requesting Physician	0032,1032	PN		X			

Table 19: Requested Procedure Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Referenced Study Sequence	0008,1110	SQ		X			
>Referenced SOP Class UID	0008,1150	UI		X			
>Referenced SOP Instance UID	0008,1155	UI		X			
Study Instance UID	0020,000D	UI		X			
Requested Procedure Description	0032,1060	LO		X			
Requested Procedure Code Sequence	0032,1064	SQ		X			
>Code Value	0008,0100	SH		X			
>Coding Scheme Designator	0008,0102	SH		X			
>Code Meaning	0008,0104	LO		X			
Requested Procedure ID	0040,1001	SH		X			
Requested Procedure Priority	0040,1003	SH		X			

Table 20: Visit Admission Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Referring Physician's Name	0008,0090	PN		X			
Referring Physician's Address	0008,0092	ST		X			
Referring Physician's Telephone Numbers	0008,0094	SH		X			
Admitting Diagnoses Description	0008,1080	LO		X			
Admitting Diagnosis Code Sequence	0008,1084	SQ		X			
>Code Value	0008,0100	SH		X			
>Coding Scheme Designator	0008,0102	SH		X			
>Code Meaning	0008,0104	LO		X			
Route of Admissions	0038,0016	LO		X			
Admitting Date	0038,0020	DA		X			
Admitting Time	0038,0021	TM		X			

Table 21: Scheduled Procedure Step Module

Attribute Name	Tag	VR	M	R	Q	D	IOD
Scheduled Procedure Step Sequence	0040,0100	SQ		X			
>Modality	0008,0060	CS	S		X		
>Requested Contrast Agent	0032,1070	LO		X			
>Scheduled Station AE Title	0040,0001	AE	S		X		
>Scheduled Procedure Step Start Date	0040,0002	DA	R		X		
>Scheduled Procedure Step Start Time	0040,0003	TM		X			
>Scheduled Procedure Step End Date	0040,0004	DA		X			
>Scheduled Procedure Step End Time	0040,0005	TM		X			
>Scheduled Performing Physician's Name	0040,0006	PN		X			
>Scheduled Procedure Step Description	0040,0007	LO		X			
>Scheduled Action Item Code Sequence	0040,0008	SQ		X			
>Scheduled Procedure Step ID	0040,0009	SH		X			
>Scheduled Station Name	0040,0010	SH		X			
>Scheduled Procedure Step Location	0040,0011	SH		X			
>Pre-Medication	0040,0012	LO		X			
>Scheduled Procedure Step Status	0040,0020	CS		X			
>Comments on the Scheduled Procedure Step	0040,0400	LT		X			

4.2.1.5 Association Acceptance Policy

Panorama Worklist AE does not accept associations.

4.2.2 Panorama Export AE

4.2.2.1 SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 22: SOP Classes for Panorama Export AE

SOP Class Name	SOP Class UID	SCU	SCP
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No
Verification SOP Class	1.2.840.10008.1.1	Yes	No

4.2.2.2 Association Policies

4.2.2.2.1 General

The PDU size is configurable. The default PDU size 4096 Bytes is given in the configuration as 0. The PDU size = PDU size entered + 6 Bytes. Example 4096 Bytes will be 4096 + 6 = 5002 Bytes in total. By changing of the PDU size first a restart of the application is needed. During Association the real transfers Bytes will be negotiated.

Table 23: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

4.2.2.2.2 Number of Associations

Panorama Export AE establishes a new association for each series of images transferred, and terminates the association after each series transfer is complete

Table 24: Number of Associations as an Association Initiator for Panorama Export AE

Maximum number of simultaneous associations	Unlimited
---	-----------

4.2.2.2.3 Implementation Identifying Information

Table 25: DICOM Implementation Class and Version for Panorama Export AE

Application Entity Name	Panorama Export AE
Application Entity Version	5.2
Implementation Class UID	2.16.840.1.113662.4.10.1

4.2.2.3 Association Initiation Policy

This describes the conditions under which the AE will initiate an association.

4.2.2.3.1 Association Real-World Activity – MR Image Storage

4.2.2.3.1.1 Description and Sequencing of Activities

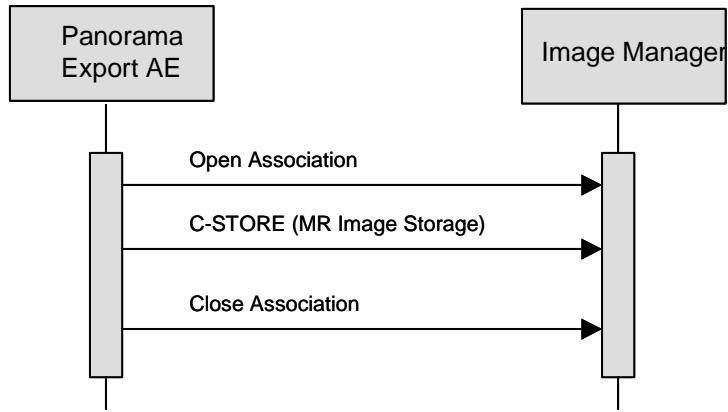


Figure 4: Real World Activity MR Image Storage

Operator selects a number of images sets and presses the Export button.

4.2.2.3.1.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by Panorama Export AE for Association Real-World Activity – MR Image Storage (C-STORE) is defined in Table 26.

Table 26: Proposed Presentation Contexts for MR Image Storage

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	ILE	1.2.840.10008.1.2	SCU	None

4.2.2.3.1.3 SOP Specific Conformance for SOP Classes

Details regarding the status handling behavior from the application level and communication errors are provided in Table 27. The behavior of the AE during communication failure is summarized in Table 28

Table 27: MR Image Storage Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success		0000	
Cancel	Coercion of Data Elements	B000	
	Data Set does not match SOP Class	B007	
	Elements Discarded	B006	
Failed	Data Set does not match SOP Class	A9xx	
	Cannot understand	Cxxx	
Refused	Out of Resources	A7xx	

Table 28: MR Image Storage Communication Failure Behavior

Exception	Behavior
Association aborted	Operation cancelled. Error message shown.

4.2.2.3.2 Association Real-World Activity – Echo Request (C-ECHO)

4.2.2.3.2.1 Description and Sequencing of Activities

Operator presses the Echo button in Export section management dialog.

4.2.2.3.2.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by Panorama Export AE for Association Real-World Activity – Echo Request (C-ECHO) are defined in Table 29

Table 29: Proposed Presentation Contexts for Echo Request

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	ILE	1.2.840.10008.1.2	SCU	None

4.2.2.3.2.3 SOP Specific Conformance for SOP Classes

Panorama Export AE provides standard conformance

4.2.2.4 Association Acceptance Policy

Panorama Export AE does not accept associations.

4.2.3 Panorama Print AE

4.2.3.1 SOP Classes

Panorama Print AE provides conformance to the following DICOM 3.0 SOP Classes.

Table 30: Supported SOPS as SCU

SOP Class Name	SOP Class UID	SCU	SCP
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
> Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
> Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
> Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
> Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No

4.2.3.2 Association Policies

4.2.3.2.1 General

The PDU size is configurable. The default PDU size 4096 Bytes is given in the configuration as 0. The PDU size = PDU size entered + 6 Bytes. Example 4096 Bytes will be 4096 + 6 = 5002 Bytes in total. By changing of the PDU size first a restart of the application is needed. During Association the real transfers Bytes will be negotiated.

Table 31: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

4.2.3.2.2 Number of Associations

Panorama Print AE will attempt to establish one association at the time.

Table 32: Number of Associations as an Association Initiator for Panorama Print AE

Maximum number of simultaneous associations	1
---	---

4.2.3.2.3 Implementation Identifying Information

Table 33: DICOM Implementation Class and Version for Panorama Print AE

Application Entity Name	Panorama Print AE
Application Entity Version	5.2
Implementation Class UID	2.16.840.1.113662.4.10.1

4.2.3.3 Association Initiation Policy

This describes the conditions under which the AE will initiate an association.

4.2.3.3.1 Association Real-World Activity – Print Request

4.2.3.3.1.1 Description and Sequencing of Activities

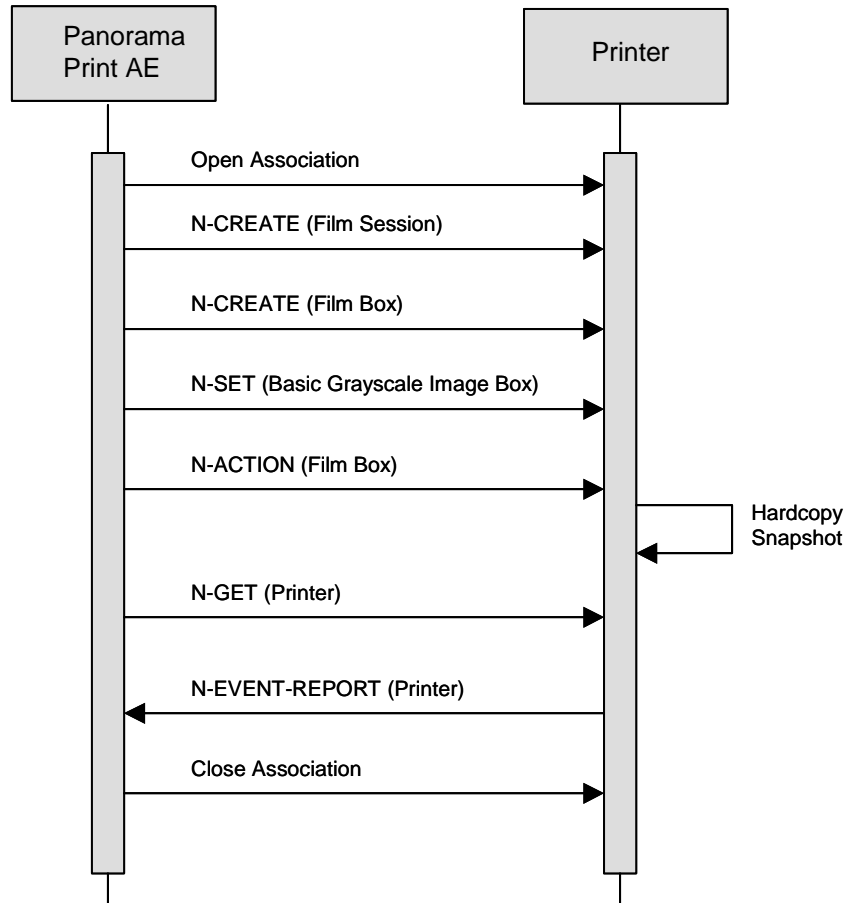


Figure 5: Real World Activity Print

4.2.3.3.1.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by Panorama Print AE for Association Real-World Activity – Print Request is defined in Table 34

Table 34: Proposed Presentation Contexts for Association Real-World Activity – Print Request

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	ILE	1.2.840.10008.1.2	SCU	None

4.2.3.3.1.3 Specific Conformance to Grayscale Print Management Meta SOP Class

Images are printed using the Basic Grayscale Management Meta SOP Class. If any of the return statuses is not Success, the print job is aborted and association is released. After successful print job the Printer Status (2100,0010) and Printer Status Info (2100,0020) is queried using N-GET. The result is displayed at the user interface.

Details regarding the status handling behavior from the application level and communication errors are provided in Table 35. The behavior of the AE during communication failure is summarized in Table 36.

Table 35: Basic Grayscale Print Management Meta SOP Class Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Printing is complete	0000	The result is displayed at the user interface
Not Success		<> 0000	Any of the return status is Not Success, the print job aborted and association is released

Table 36: Basic Grayscale Print Management Meta SOP Class Communication Failure Behavior

Exception	Behavior
Association aborted	Operation cancelled. Error message shown.

Recommended abbreviations to be used for the following printer tables are:
 VNAP Value Not Always Present (attribute sent zero length if no value is present)
 ANAP Attribute Not Always Present
 ALWAYS Always Present
 EMPTY Attribute is sent without a value

Recommended abbreviations to be used for the source of the data values in the tables are:
 USER the attribute value source is from User input
 AUTO the attribute value is generated automatically or by printer.
 CONFIG the attribute value source is a configurable parameter

4.2.3.3.1.4 Printer SOP Class - N-EVENT-REPORT-RSP

Table 37: Printer Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Printer Status Info	2110,0020	CS		ANAP	AUTO
Printer Name	2110,0030	LO		ALWAYS	AUTO

4.2.3.3.1.5 Printer SOP Class - N-GET-RQ

Panorama Print AE use the Printer SOP Class N-GET operation to obtain information about the current printer status. The attributes obtained via N-GET are listed in the Table below:

Table 38: Printer Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO		ALWAYS	CONFIG
Manufacturer's Model Name	0008,1090	LO		ALWAYS	CONFIG
Device Serial Number	0018,1000	LO		ALWAYS	CONFIG
Software Version(s)	0018,1020	LO		ALWAYS	CONFIG
Date of Last Calibration	0018,1200	DA		ALWAYS	AUTO
Time of Last Calibration	0018,1201	TM		ALWAYS	AUTO
Printer Status	2110,0010	CS		ALWAYS	AUTO
Printer Status Info	2110,0020	CS		ALWAYS	AUTO
Printer Name	2110,0030	LO		ALWAYS	CONFIG

4.2.3.3.1.6 Printer SOP Class - N-EVENT-REPORT-RSP**Table 39: Printer Module**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Printer Status Info	2110,0020	CS		ANAP	AUTO
Printer Name	2110,0030	LO		ALWAYS	AUTO

4.2.3.3.1.7 Basic Film Session SOP Class - N-CREATE-RQ

Any non-sequence attribute of N-CREATE attribute list can be configured to a static value for each SCP. When not configured, the attribute is not send

Table 40: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	2000,0010	IS		ALWAYS	USER
Print Priority	2000,0020	CS		ANAP	CONFIG
Medium Type	2000,0030	CS		ANAP	CONFIG
Film Destination	2000,0040	CS		ANAP	CONFIG
Film Session Label	2000,0050	LO		ANAP	CONFIG
Memory Allocation	2000,0060	IS		ANAP	CONFIG
Owner ID	2100,0160	SH		ANAP	CONFIG

4.2.3.3.1.8 Basic Film Box SOP Class - N-CREATE-RQ

Any non-sequence attribute of N-CREATE attribute list can be configured to a static value for each SCP. When not configured, the attribute is not send.

Table 41: Basic Film Box Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO

Table 42: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
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Image Display Format	2010,0010	ST		ALWAYS	AUTO
Annotation Display Format ID	2010,0030	CS		ANAP	CONFIG
Film Orientation	2010,0040	CS		ALWAYS	AUTO
Film Size ID	2010,0050	CS		ANAP	CONFIG
Magnification Type	2010,0060	CS		ANAP	CONFIG.
Smoothing Type	2010,0080	CS		ANAP	CONFIG
Border Density	2010,0100	CS		ANAP	CONFIG
Empty Image Density	2010,0110	CS		ANAP	CONFIG
Min Density	2010,0120	US		ANAP	CONFIG
Max Density	2010,0130	US		ANAP	CONFIG
Trim	2010,0140	CS		ANAP	CONFIG
Configuration Information	2010,0150	ST		ANAP	CONFIG
Illumination	2010,015E	US		ANAP	CONFIG
Reflected Ambient Light	2010,0160	US		ANAP	CONFIG
Requested Resolution ID	2020,0050	CS		ANAP	CONFIG

4.2.3.3.1.9 Basic Grayscale Image Box SOP Class - N-SET-RQ

Table 43: Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Magnification Type	2010,0060	CS		ANAP	CONFIG
Smoothing Type	2010,0080	CS		ANAP	CONFIG
Min Density	2010,0120	US		ANAP	CONFIG
Max Density	2010,0130	US		ANAP	CONFIG
Configuration Information	2010,0150	ST		ANAP	CONFIG
Image Position	2020,0010	US		ALWAYS	AUTO
Polarity	2020,0020	CS		ANAP	CONFIG
Requested Image Size	2020,0030	DS		ANAP	CONFIG
Requested Decimate/Crop Behavior	2020,0040	CS		ANAP	CONFIG
Preformatted Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO
>Samples per Pixel	0028,0002	US		ALWAYS	AUTO
>Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO
>Rows	0028,0010	US		ALWAYS	AUTO
>Columns	0028,0011	US		ALWAYS	AUTO
>Pixel Aspect Ratio	0028,0034	IS		ALWAYS	AUTO
>Bits Allocated	0028,0100	US		ALWAYS	AUTO
>Bits Stored	0028,0101	US		ALWAYS	AUTO
>High Bit	0028,0102	US		ALWAYS	AUTO
>Pixel Representation	0028,0103	US		ALWAYS	AUTO
>Pixel Data	7FE0,0010	OW		ALWAYS	AUTO

4.2.3.3.1.10 Basic Film Box SOP Class - N-ACTION-RQ

Table 44: Sop Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS		ALWAYS	AUTO
SOP Class UID	0008,0016	UI		ALWAYS	AUTO
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO

4.2.3.4 Association Acceptance Policy

Panorama Print AE does not accept associations.

4.2.4 Panorama Query/Retrieve Server AE

4.2.4.1 SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 45: SOP Classes for Panorama Query Retrieve AE SCU

SOP Class Name	SOP Class UID	SCU	SCP
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No

Table 46 SOP Classes for Panorama Query Retrieve AE SCP

SOP Class Name	SOP Class UID	SCU	SCP
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	No	Yes
Patient Root Query/Retrieve Information Model MOVE	1.2.840.10008.5.1.4.1.2.1.2	No	Yes
Study Root Query/Retrieve Information Model FIND	1.2.840.10008.5.1.4.1.2.2.1	No	Yes
Study Root Query/Retrieve Information Model MOVE	1.2.840.10008.5.1.4.1.2.2.2	No	Yes
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes

4.2.4.2 Association Policies

4.2.4.2.1 General

The PDU size is configurable. The default PDU size 4096 Bytes is given in the configuration as 0. The PDU size = PDU size entered + 6 Bytes. Example 4096 Bytes will be $4096 + 6 = 5002$ Bytes in total. By changing of the PDU size first a restart of the application is needed. During Association the real transfers Bytes will be negotiated.

Table 47: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

4.2.4.2.2 Number of Associations

For every C-MOVE request initiated by remote operator Panorama Query/Retrieve Server AE establishes a new association to the requested destination, provided that the destination has been configured for the server. Simultaneous associations that the AE may have at any time have been limited to 32. By configuration it is possible to limit the number of simultaneous associations the server establish to an AE. Panorama Query/Retrieve Server AE allows only a single outstanding operation on an association.

Table 48: Number of Associations as an Association Initiator for Panorama Query Retrieve AE

Maximum number of simultaneous associations	32
---	----

Table 49: Number of Associations as an Association Acceptor for Panorama Query Retrieve AE

Maximum number of simultaneous associations	32
---	----

4.2.4.2.3 Implementation Identifying Information

Table 50: DICOM Implementation Class and Version

Application Entity Name	Panorama Query Retrieve AE
Application Entity Version	5.1
Implementation Class UID	2.16.840.1.113662.4.10.1

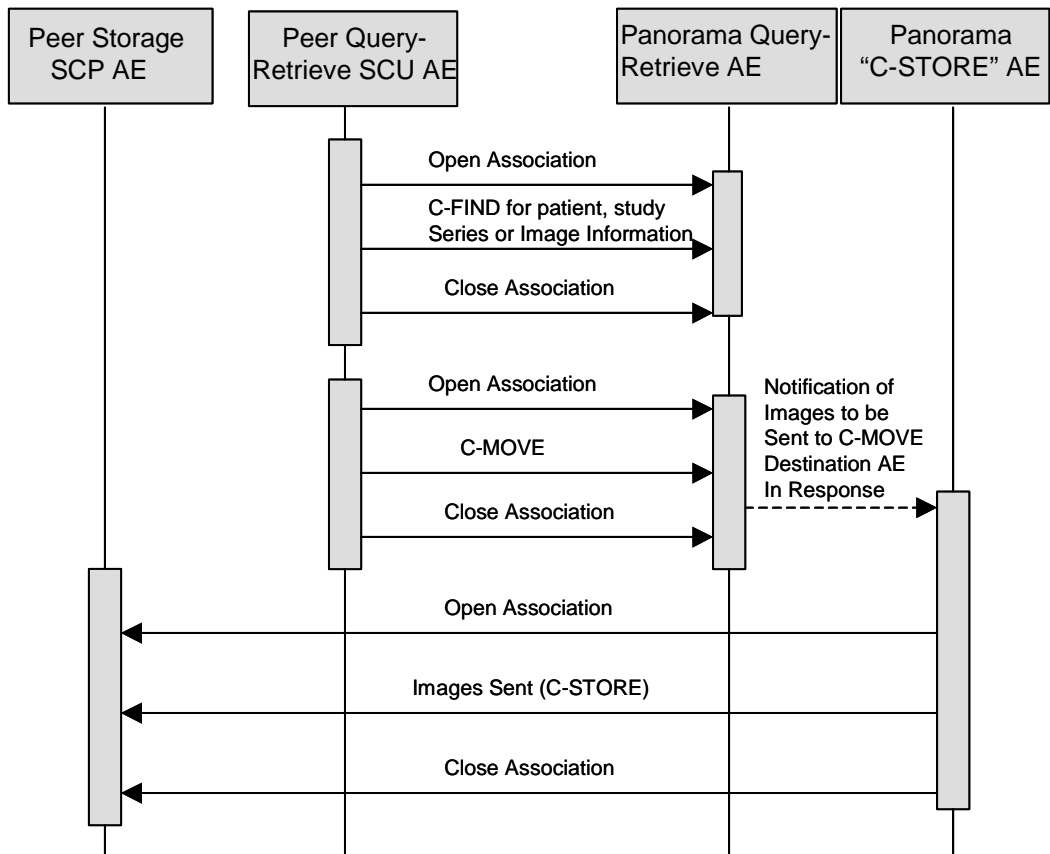


Figure 6: Real World Activity Query/Retrieve

4.2.4.3 Association Initiation Policy

This describes the conditions under which the AE will initiate an association.

4.2.4.3.1 Association Real-World Activity C-STORE

4.2.4.3.1.1 Description and Sequencing of Activities

Remote Query/Retrieve SCU sends a retrieve (C-MOVE) request, which perform the C-Store. The C-Store has the same code as the Export operation used, but is configured differently. (see Figure 6) So it is the Query/Retrieve AE that performs the C-Store, but since you can configure a different AE-title for each C-Store operation, it can also look like it would be a different application entity performing the C-Store.

4.2.4.3.1.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by Panorama Query/Retrieve Server AE for Association Real-World Activity - C-STORE is defined in Table 51

Table 51: Proposed Presentation Contexts for Association Real-World Activity – MR Image Storage

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	ILE	1.2.840.10008.1.2	SCU	None

The implementation of the initiator shall document which transfer syntax will be chosen in case multiple transfer syntaxes are accepted in the association acceptance.

4.2.4.3.1.3 SOP Specific Conformance for C-STORE SOP Classes

Image Export is performed using the MR-Image Storage SOP Class
 If errors are detected, no error message is displayed. Instead the Panorama Query/Retrieve Server AE reports errors to the Query/Retrieve Service Class SCU as in the standard specifies.

4.2.4.4 Association Acceptance Policy

The Panorama Query/Retrieve Server accepts associations only from AE's, which have been configured for the server. The server can accept multiple simultaneous connections even from a single AE. The server accepts associations for verification, queries and retrieve requests.

Table 52: Association Rejection Reasons

Result	Source DICOM UL	Reason/ Diag	Explanation
1-reject-permanent	service-provider-(ACSE-related-function)	1-no reason-given	The Association request could not be parsed. An Association request with the same format will not succeed at a later time.

The Panorama does not separate association rejection reasons. Some checks are performed after the association is already accepted. If reason to reject the association after these checks is found the connection is terminated. Checks that are performed after association acceptance include Calling AE Title check and maximum number of allowed connections.

4.2.4.4.1 Association Real-World Activity Verification

4.2.4.4.1.1 Description and Sequencing of Activities

Remote Query/Retrieve SCU sends a verification (C-ECHO) request.

4.2.4.4.1.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by Panorama Query/Retrieve Server AE for Association Real-World Activity - C-ECHO is defined in Table 53

Table 53: Proposed Presentation Contexts for Association Real World Activity - Verification

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	ILE	1.2.840.10008.1.2	SCP	None

The implementation of the initiator shall document which transfer syntax will be chosen in case multiple transfer syntaxes are accepted in the association acceptance.

4.2.4.4.1.3 SOP Specific Conformance for C-STORE SOP Classes

Panorama Query/Retrieve Server AE provides standard conformance to the Verification SOP Class. Panorama Query/Retrieve Server AE accepts above mentioned presentation contexts, if an association with a remote DICOM AE has been accepted.

4.2.4.4.2 Association Real-World Activity - C-FIND

4.2.4.4.2.1 Description and Sequencing of Activities

Remote Query/Retrieve SCU sends a query (C-FIND) request. (See figure 6)

4.2.4.4.2.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by Panorama Query/Retrieve Server AE for Association Real-World Activity - C-FIND are defined in Table 54

Table 54: Proposed Presentation Contexts for Association Real-World Activity - C-FIND

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	ILE	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	ILE	1.2.840.10008.1.2	SCP	None

The implementation of the initiator shall document which transfer syntax will be chosen in case multiple transfer syntaxes are accepted in the association acceptance.

4.2.4.4.2.3 SOP Specific Conformance for SOP Classes

Wild Card Matching does not support case sensitivity. All Wild Card queries will be processed without case sensitivity, including attributes with PN Value Presentation. Accession Number (0008,0050) matching is not supported with studies that have been scanned with software versions prior to R3.0.3. Panorama Query/Retrieve Server AE assumes that Accession Number attribute for those studies is empty. Accession Number is processed according to standard with studies that have been scanned with software versions R3.0.3 or later.

Panorama Query/Retrieve Server AE does not support priority processing. All queries are processed with same priority. Relational searches are not supported. Panorama Query/Retrieve Server AE accepts above mentioned presentation contexts, if an association with a remote DICOM AE has been accepted.

Details regarding the status handling behavior from the application level and communication errors are provided in Table 55. The behavior of the AE during communication failure is summarized in Table 56

Table 55: Query Retrieve – C-FIND - Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	Results are shown.
Error	Unable to process	C204	Internal Error. Association is released.
Warning	Coercion of Data Elements	B000	Association is released.
	Data Set does not match SOP Class	B007	Association is released.

Table 56: Query Retrieve – C-FIND - Communication Failure Behavior

Exception	Behavior
Timeout	Connection released. Information written to an application log.
Association aborted.	Operation cancelled. Information written to an application log.

4.2.4.4.2.4 Overview of the applied SOP Classes

This chapter specifies in detail the applied attributes in the Query/Retrieve Server Element of this supported SOP Class.

Table 57: Patient Root Information Model

Attribute Name	Tag	VR	Type of Matching
Specific Character Set	0008,0005	CS	
SOP Instance UID	0008,0018	UI	
Study Date	0008,0020	DA	
Study Time	0008,0030	TM	
Accession Number	0008,0050	SH	See exceptions above.
Query/Retrieve Level	0008,0052	CS	
Retrieve AE Title	0008,0054	AE	
Modality	0008,0060	CS	
Referring Physician's Name	0008,0090	PN	No matching performed.
Study Description	0008,1030	LO	No matching performed.
Series Description	0008,103E	LO	No matching performed.
Patient's Name	0010,0010	PN	No case sensitivity.
Patient ID	0010,0020	LO	
Body Part Examined	0018,0015	CS	
Protocol Name	0018,1030	LO	No matching performed.
Study Instance UID	0020,000D	UI	
Series Instance UID	0020,000E	UI	
Study ID	0020,0010	SH	
Series Number	0020,0011	IS	
Instance Number	0020,0013	IS	

Table 58: Study Root Information Model

Attribute Name	Tag	VR	Type of matching
Specific Character Set	0008,0005	CS	
SOP Instance UID	0008,0018	UI	
Study Date	0008,0020	DA	
Study Time	0008,0030	TM	
Accession Number	0008,0050	SH	See exceptions above
Query/Retrieve Level	0008,0052	CS	
Retrieve AE Title	0008,0054	AE	
Modality	0008,0060	CS	
Referring Physician's Name	0008,0090	PN	No matching performed.
Study Description	0008,1030	LO	No matching performed
Series Description	0008,103E	LO	No matching performed
Patient's Name	0010,0010	PN	No case sensitivity
Patient ID	0010,0020	LO	
Body Part Examined	0018,0015	CS	
Protocol Name	0018,1030	LO	No matching performed
Study Instance UID	0020,000D	UI	
Series Instance UID	0020,000E	UI	
Study ID	0020,0010	SH	
Series Number	0020,0011	IS	
Instance Number	0020,0013	IS	
Number of Series Related Instances	0020,1209	IS	

4.2.4.4.3 Association Real-World Activity - C-MOVE

4.2.4.4.3.1 Description and Sequencing of Activities

Panorama Query/Retrieve Server AE does not support relational retrieves.

4.2.4.4.3.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by Panorama Query/Retrieve Server AE for Association Real-World Activity - C-MOVE are defined in Table 59.

Table 59: Proposed Presentation Contexts for Association Real-World Activity - C-MOVE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model MOVE	1.2.840.10008.5.1.4.1.2.1.2	ILE	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Information Model - MOVE.	1.2.840.10008.5.1.4.1.2.2.2	ILE	1.2.840.10008.1.2	SCP	None

The implementation of the initiator shall document which transfer syntax will be chosen in case multiple transfer syntaxes are accepted in the association acceptance.

4.2.4.4.3.3 SOP Specific Conformance for Move SOP Classes

Panorama Query/Retrieve Server AE accepts above mentioned presentation contexts, if an association with a remote DICOM AE has been accepted.

Details regarding the status handling behavior from the application level and communication errors are provided in Table 60. The behavior of the AE during communication failure is summarized in Table 61

Table 60: Query/Retrieve – C-MOVE - Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	Results are shown.
Error	Unable to process	C204	Internal Error. Association is released.
Warning	Coercion of Data Elements	B000	Association is released.
	Data Set does not match SOP Class	B007	Association is released.

Table 61: Query-Retrieve-C-MOVE- Communication Failure Behavior

Exception	Behavior
Timeout	Connection released. Information written to an application log.
Association aborted.	Operation cancelled. Information written to an application log.

4.3 Network Interfaces

4.3.1 Physical Network Interface

Panorama provides DICOM 3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM 3.0 Standard. No OSI stack communications are provided with this implementation.

Panorama inherits the TCP/IP stack from Windows system upon which it executes. Panorama system supports Ethernet v2.0 and IEEE802.3, 10/100 BASE-T

4.3.2 Additional Protocols

No relevance information

4.4 Configuration

4.4.1 AE Title/Presentation Address Mapping

4.4.1.1 Local AE Titles

The local AE title mapping and configuration shall be specified. The following table shall be used:

Table 62: AE Title Configuration Table

Application Entity	Default AE Title	Default TCP/IP Port
Panorama Worklist AE	No default	Not Applicable<Specify>
Panorama Export AE	GyroPano	104
Panorama Print AE	No default	104
Panorama Query/Retrieve Server AE	GyroPano	104

4.4.1.2 Remote AE Title/Presentation Address Mapping

Configuration of remote host names and port numbers shall be specified here.

4.4.1.2.1 Remote SCP Panorama Worklist AE

DICOM Modality Worklist Management SCU configuration requires the following information from the remote DICOM Modality Worklist Management SCP host (i.e. the server from where the patient information should be retrieved):

AE Title For example "NODE_1"
Port TCP/IP port number for DICOM Worklist transfers.

The DICOM Modality Worklist Management as SCU contains following configurable parts:

- The Worklist connection to the DICOM Worklist SCP Server.
- The Worklist Query dialog started from the Examination's Patient dialog.
- The custom configuration for the DICOM Export operation to send data received from Worklist in DICOM export instead of the default one.

The HOSTS file in Windows 2000 is used for resolving TCP/IP names against addresses. The host name used in DICOM configuration must be defined also in the HOSTS file, if there is no name server configured for the network connection.

4.4.1.2.2 Remote SCP Panorama Export AE

The DICOM configuration requires the following information from the remote DICOM host (i.e. the workstation where the images will be transferred):

AE Title Usually is this a name in capital letter, such as "NODE_1"
Port TCP port number for DICOM transfers. Default is 104.
IP address IP-address of the remote system.

The Panorama Export AE can be configured multiple settings, which can add and delete different DICOM elements into the export operation. With these custom elements the site can configure the DICOM transfer from Panorama system to contain specific, fixed DICOM elements, if the receiving system requires some additional information. The different configuration settings can be selected from the Custom-list, which can be accessed through DICOM Export Property dialog's advanced settings.

The HOSTS file in Windows 2000 is used for resolving TCP/IP names against addresses. The host name used in DICOM configuration must be defined also in the HOSTS file, if there is no name server configured for the network connection.

4.4.1.2.3 Remote SCP Panorama Print AE

DICOM Print configuration requires the following information from the remote DICOM Printer hosts (i.e. the printer or server where the films will be transferred):

AE Title For example "PRINTSERVER"
Port TCP port number for DICOM transfer. Default is usually 104.
IP address IP-address of the remote printer/server

The HOSTS file in Windows 2000 is used for resolving TCP/IP names against addresses. The host name used in DICOM configuration must be defined also in the HOSTS file, if there is no name server configured for the network connection.

4.4.1.2.4 Remote SCP Panorama Query/Retrieve Server AE

Every client connection must be configured separately for security reasons. For every client following information is needed. With information server can identify client and allow connection.

AE Title Usually is this a name in capital letter, such as "NODE_1".
IP address IP-address of the remote system or TCP/IP-name,
if there is a name server in the network.

When client retrieves images, it informs server the destination, where images are to be transferred. This transfer operation corresponds to export operation. Information required for export is needed for every transfer destination.

4.4.2 Parameters

The specification of important operational parameters and, if configurable, their default value and range shall be specified here. The parameters that apply to all Application Entities should be specified in a "General Parameters" section while those specific to particular Application Entities should be specified in separate sections specific to each AE. The following table shall be used.

Table 63: Configuration Parameters table

Parameter	Configurable YES/NO	Default Value
General Parameter		
Max PDU Receive Size	Yes	Value 0 (= 4096 bytes) PDU = PDU entered + 6 bytes
Max PDU Send Size	Yes	Value 0 (=4096 bytes) same as receive size
Time-out waiting for acceptance or rejection response to an Association Request (Application Level Timeout).	Yes	60s
Time-out waiting for a response to an Association release request (Application Level Timeout).	Yes	60s
Time-out for completion of a TCP/IP connect request (Low-level timeout).	Yes	5s
Time-out awaiting a Response to a DIMSE Request (Low-level timeout).	Yes	5s
Time-out for waiting for data between TCP/IP-packets (Low-level timeout).	Yes	5s
Storage SCU Parameters		
Storage SCU time-out waiting for a response to a C-STORE RQ	No	60s
Number of times a failed send job may be retried	No	0
Maximum number of simultaneously initiated Associations by the Storage AE	No	unlimited
Query/Retrieve Parameters		
Maximum PDU size	Yes	Value 0 (= 4096 bytes)
Maximum Number of simultaneous Associations	Yes	32
Q/R SCP time-out waiting on an open Association for the next message	Yes	60min
Modality Worklist Parameters		
Modality Worklist SCU time-out waiting for the final response to a C-FIND-RQ	No	60s
Maximum number of Worklist items	No	1
Query Worklist for specific Scheduled Station AE Title.	Yes	EMPTY
Query for specific Modality Value	Yes	MR
Print Parameters		
Print SCU time-out waiting for a response to a N-CREATE-RQ	No	60s
Print SCU time-out waiting for a response to a N-SET-RQ	No	60s
Print SCU time-out waiting for a response to a N-ACTION-RQ	No	60s
Number of times a failed print-job may be retried.	No	0
Maximum Number of simultaneous Associations	No	1

Additional configuration parameters such as hardware options for e.g. a printer shall be specified as well.

5 MEDIA INTERCHANGE

Panorama 5.2 does not support Media Storage.

6 SUPPORT OF CHARACTER SETS

The Panorama system supports Extended Character Set: ISO_IR 100, which is the Latin alphabet NO1, supplementary set.

For the MR Panorama are the following characters invalid for the Fields Patient's name (0010,0010) and Patient ID (0010,0020) "V[]:|<>+=;,.'\$%\$*?"

7 SECURITY

7.1 Security Profiles

Any support for security profiles as defined in PS 3.15-2003 shall be described here:

An implementation shall declare which level of security features it supports, including such things as:

- a. The conditions under which the implementation preserves the integrity of digital signatures (e.g. is the implementation bit-preserving).
- b. The conditions under which the implementation verifies incoming digital signatures.
- c. The conditions under which the implementation replaces digital signatures.

7.2 Association Level Security

Any support for security at the association level (e.g. allowing only certain AE Titles and/or IP addresses to open an association) shall be specified here.

7.3 Application Level Security

Any support for additional application level security as it applies to the DICOM communication (e.g. passwords, biometrics) can be described here.

8 ANNEXES

8.1 IOD Contents

8.1.1 Created SOP Instances

This section specifies each IOD created (including private IOD's). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Recommended abbreviations to be used for the tables are:

VNAP	Value Not Always Present (attribute sent zero length if no value is present)
ANAP	Attribute Not Always Present
ALWAYS	Always Present
EMPTY	Attribute is sent without a value

Recommended abbreviations to be used for the source of the data values in the tables are:

USER	the attribute value source is from User input
AUTO	the attribute value is generated automatically
MWL,MPPS, etc.	the attribute value is the same as that use for Modality Worklist, Modality Performed Procedure Step, etc.
CONFIG	the attribute value source is a configurable parameter

Specification of a company web address can refer to sample SOP instances that are available.

Private attributes should be specified.

8.1.1.1 MR Image IOD

Table 64: IOD of created MR Image module

IE	Module	Reference	Presence of Module
Patient	Patient	Table 65	ALWAYS
Study	General Study	Table 67	ALWAYS
	Patient Study	Table 66	ANAP
Series	General Series	Table 68	ALWAYS
Frame of Reference	Frame of Reference	Table 69	ALWAYS
Equipment	General Equipment	Table 70	ALWAYS
Image	General Image	Table 72	ALWAYS
	Image Plane	Table 71	ALWAYS
	Image Pixel	Table 73	ALWAYS
	Contrast/Bolus	Table 74	ANAP
	MR Image	Table 77	ALWAYS
	VOI LUT	Table 75	ALWAYS
	SOP Common	Table 76	ALWAYS

8.1.1.2 Modules

Table 65: MR Image Storage SOP Class - C-STORE-RQ - Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN		ALWAYS	USER
Patient ID	0010,0020	LO		ANAP	USER
Patient's Birth Date	0010,0030	DA		ANAP	CONFIG
Patient's Sex	0010,0040	CS		ANAP	USER
Patient Comments	0010,4000	LT		ANAP	CONFIG

Table 66: MR Image Storage SOP Class - C-STORE-RQ - Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Admitting Diagnoses Description	0008,1080	LO		EMPTY	AUTO
Patient's Weight	0010,1030	DS		ANAP	CONFIG

Table 67: MR Image Storage SOP Class - C-STORE-RQ - General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	0008,0020	DA		ALWAYS	AUTO
Study Time	0008,0030	TM		ALWAYS	AUTO
Accession Number	0008,0050	SH		ANAP	MWL, USER
Referring Physician's Name	0008,0090	PN		ANAP	USER
Study Description	0008,1030	LO		ANAP	CONFIG
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	CONFIG
Study Instance UID	0020,000D	UI		ALWAYS	AUTO
Study ID	0020,0010	SH		ALWAYS	AUTO

Table 68: MR Image Storage SOP Class - C-STORE-RQ - General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Date	0008,0021	DA		ALWAYS	AUTO
Series Time	0008,0031	TM		ALWAYS	AUTO
Modality	0008,0060	CS	"MR"	ALWAYS	AUTO
Series Description	0008,103E	LO		ANAP	USER
Performing Physician's Name	0008,1050	PN		ANAP	CONFIG
Operator's Name	0008,1070	PN		ANAP	CONFIG
Body Part Examined	0018,0015	CS		ANAP	USER
Protocol Name	0018,1030	LO		ANAP	USER
Patient Position	0018,5100	CS		ALWAYS	USER
Series Instance UID	0020,000E	UI		ALWAYS	AUTO
Series Number	0020,0011	IS		ALWAYS	AUTO
Laterality	0020,0060	CS	.	ANAP	USER

Table 69: MR Image Storage SOP Class - C-STORE-RQ - Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO
Position Reference Indicator	0020,1040	LO		ANAP	AUTO

Table 70: MR Image Storage SOP Class - C-STORE-RQ - General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO		ALWAYS	CONFIG
Institution Name	0008,0080	LO		ANAP	CONFIG
Station Name	0008,1010	SH		ANAP	CONFIG
Manufacturer's Model Name	0008,1090	LO		ALWAYS	CONFIG
Device Serial Number	0018,1000	LO		ALWAYS	CONFIG
Software Version(s)	0018,1020	LO		ALWAYS	CONFIG

Table 71: MR Image Storage SOP Class - C-STORE-RQ - Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Slice Thickness	0018,0050	DS		ALWAYS	AUTO
Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO
Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO
Slice Location	0020,1041	DS		ALWAYS	AUTO
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO

Table 72: MR Image Storage SOP Class - C-STORE-RQ - General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Content Date	0008,0023	DA		ALWAYS	AUTO
Content Time	0008,0033	TM		ALWAYS	AUTO
Referenced Image Sequence	0008,1140	SQ		ANAP	CONFIG
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO
>Referenced Frame Number	0008,1160	IS		ALWAYS	AUTO
Instance Number	0020,0013	IS		ANAP	CONFIG
Patient Orientation	0020,0020	CS		ANAP	USER
Images in Acquisition	0020,1002	IS		ANAP	AUTO
Image Comments	0020,4000	LT		ANAP	CONFIG

Table 73: MR Image Storage SOP Class - C-STORE-RQ - Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Rows	0028,0010	US		ALWAYS	AUTO
Columns	0028,0011	US		ALWAYS	AUTO
Bits Stored	0028,0101	US	8	ALWAYS	AUTO
High Bit	0028,0102	US	7	ALWAYS	AUTO
Pixel Representation	0028,0103	US	0000H = Unsigned integer	ALWAYS	AUTO
Pixel Data	7FE0,0010	OW		ALWAYS	AUTO

Table 74: MR Image Storage SOP Class - C-STORE-RQ - Contrast/bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Contrast/Bolus Agent	0018,0010	LO		ANAP	USER

Table 75: MR Image Storage SOP Class - C-STORE-RQ - VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	0028,1050	DS		ALWAYS	AUTO
Window Width	0028,1051	DS		ALWAYS	AUTO

Table 76: MR Image Storage SOP Class - C-STORE-RQ - SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.4	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO

Table 77: MR Image Storage SOP Class - C-STORE-RQ - MR Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	0008,0008	CS		ALWAYS	AUTO
Scanning Sequence	0018,0020	CS		ALWAYS	AUTO
Sequence Variant	0018,0021	CS		ALWAYS	AUTO
Scan Options	0018,0022	CS		ANAP	CONFIG
MR Acquisition Type	0018,0023	CS		ANAP	AUTO
Sequence Name	0018,0024	SH		ANAP	AUTO
Repetition Time	0018,0080	DS		ANAP	AUTO
Echo Time	0018,0081	DS		ANAP	AUTO
Inversion Time	0018,0082	DS		ANAP	AUTO
Number of Averages	0018,0083	DS		ANAP	AUTO
Imaging Frequency	0018,0084	DS		ANAP	AUTO
Imaged Nucleus	0018,0085	SH		ANAP	AUTO
Spacing Between Slices	0018,0088	DS		ANAP	AUTO
Echo Train Length	0018,0091	IS		ANAP	AUTO
Percent Phase Field of View	0018,0094	DS		ANAP	AUTO
Trigger Time	0018,1060	DS		EMPTY	AUTO
Reconstruction Diameter	0018,1100	DS		ANAP	AUTO
Receiving Coil	0018,1250	SH		ANAP	AUTO
Flip Angle	0018,1314	DS		ANAP	AUTO
Temporal Position Identifier	0020,0100	IS		ALWAYS	AUTO
Number of Temporal Positions	0020,0105	IS		ALWAYS	AUTO
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO
Photometric Interpretation	0028,0004	CS	MONOCHROME 2	ALWAYS	AUTO
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO

8.1.2 Usage of Attributes from Received IOD's

Not applicable.

8.1.3 Attribute Mapping

The relationships between attributes received via Modality Worklist, stored in acquired images are summarized in Table 78. The MR Panorama R5.2 does not handle MPPS.

Table 78: Attribute mapping between modality worklist, image MPPS

Modality Worklist	Image IOD	MPPS IOD
Accession Number	Accession Number	-
Institution Name	Institution Name	-
Referring Physician's Name	Referring Physician's Name	-
Admitting Diagnoses Description	Admitting Diagnoses Description	-
Patient's Name	Patient's Name	-
Patient ID	Patient ID	-
Patient's Birth Date	Patient's Birth Date	-
Patient's Sex	Patient's Sex	-
Patient's Weight	Patient's Weight	-
Study Instance UID	Study Instance UID	-
>Modality	Modality	-

8.1.4 Coerced/Modified fields

Not applicable

8.2 Data Dictionary of Private Attributes

No private attributes are sent.

8.3 Coded Terminology and Templates

No special information.

8.4 Grayscale Image consistency

No special information.

8.5 Standard Extended/Specialized/Private SOPs

Panorama conforms to the Verification, Basic Print, Worklist and Query/Retrieve Classes as Standard SOP Classes (i.e. no private attributes are defined).

8.6 Private Transfer Syntaxes

No Private Transfer Syntaxes are supported.