DICOM

Conformance Statement

Brilliance Workspace Portal V1
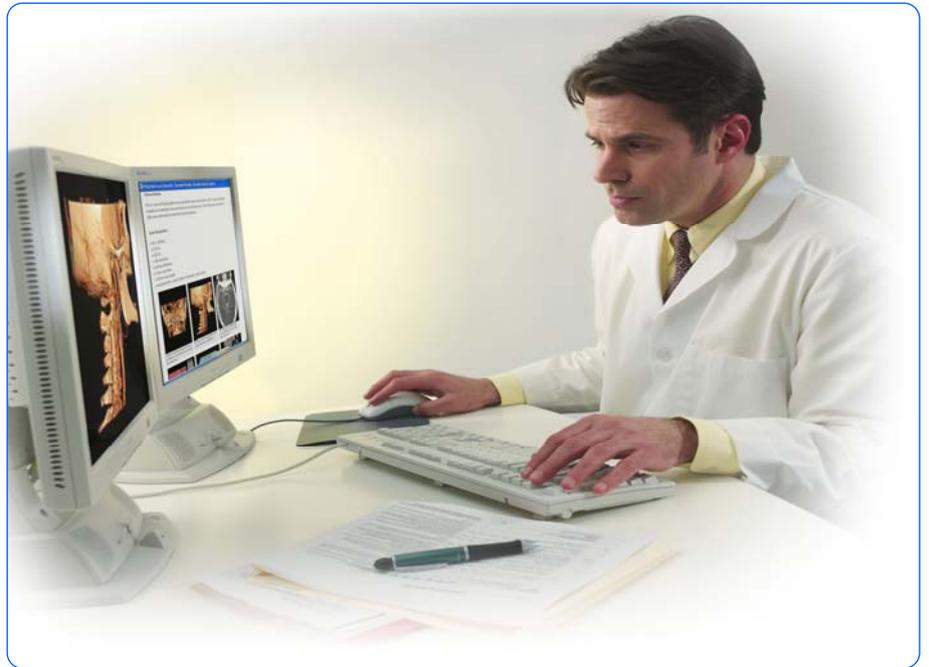
MAR 2007

PHILIPS

1. DICOM CONFORMANCE STATEMENT OVERVIEW

– This conformance statement refers to the Brilliance Workspace Portal V1, Philips' enterprise CT workstation solution for Brilliance CT scanners and clinical applications. Based on client-server architecture, it goes beyond the limits of current traditional workstations by providing enterprise access to advanced CT post-processing.

The first column specifies the used SOP classes exactly as named in PS 3.6. (Ref. PS 3.2 Annex A.) of the DICOM Standard.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
Transfer			
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
Digital X-Ray Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Digital X-Ray Image Storage – for Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	Yes
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
Query/Retrieve			
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Workflow Management			
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No

Note1:   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.

2. TABLE OF CONTENTS

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	Author	Description
1.0.0	15 Jan 2007	PMS-CT	Initial Version for Portal V1

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.

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 [DICOM] PS 3.3 and PS 3.4.
The word Philips in this document refers to Philips Medical Systems.

The following acronyms and abbreviations are used in this document.

AE	Application Entity
ANSI	American National Standard Institute
AP	Application Profile
BOT	Basic Offset Table
CD	Compact Disc
CD-R	CD-Recordable
CD-M	CD-Medical
CR	Computed Radiography
CT	Computed Tomography
DCR	Dynamic Cardio Review
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DIMSE-Composite
DIMSE-N	DIMSE-Normalized
DVD	Digital Versatile Disc
DX	Digital X-Ray
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
FSC	File-set Creator
FSR	File-set Reader
FSU	File-set Updater
GUI	Graphic User Interface
HIS	Hospital Information System
HL7	Health Level Seven
ILE	DICOM Implicit VR Little Endian
IOD	Information Object Definition
ISIS	Information System – Imaging System
MOD	Magneto-Optical Disk
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance
NEMA	National Electrical Manufacturers Association
NM	Nuclear Medicine
PDU	Protocol Data Unit
PET	Positron Emission Tomography

RF   X-Ray Radiofluoroscopic
RIS   Radiology Information System
RT   Radiotherapy
RWA   Real-World Activity
SC   Secondary Capture
SCM   Study Component Management
SCP   Service Class Provider
SCU   Service Class User
SOP   Service Object Pair
TCP/IP   Transmission Control Protocol/Internet Protocol
UID   Unique Identifier
US   Ultrasound
USMF   Ultrasound Multi-frame
WLM   Worklist Management
XA   X-Ray Angiographic

3.5.   References

[DICOM]   Digital Imaging and Communications in Medicine (DICOM), Part 1 – 18
            (NEMA PS 3.1-2006 – PS 3.18-2006),
            National Electrical Manufacturers Association (NEMA)
            Publication Sales 1300 N. 17th Street, Suite 1847
            Rosslyn, Virginia. 22209, United States of America.
            Note that at any point in time the official standard consists of the most
            recent yearly edition of the base standard (currently 2006) PLUS all the
            supplements and correction items that have been approved as Final Text

4. NETWORKING

This section contains the networking related services.

4.1.   Implementation model

The implementation model consists of three sections:
- The application data flow diagram, specifying the relationship between the Application Entities and the "external world" or Real-World Activities,
- A functional description of each Application Entity, and
- The sequencing constraints among them.

4.1.1. Application Data Flow

The system implements and provides DICOM services using the following Application Entities:
- Dicom-Manager
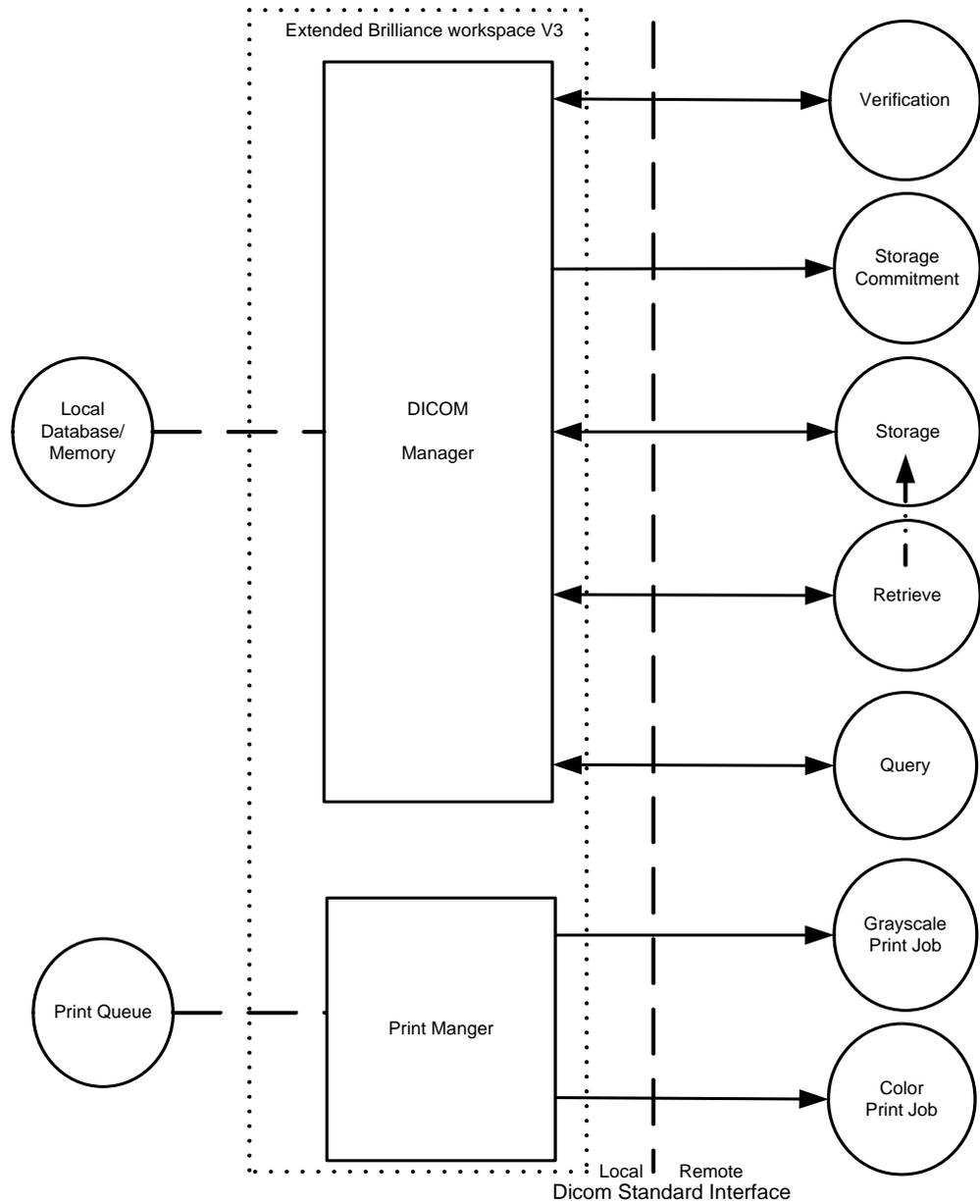
Figure 1: Application Data Flow Diagram

4.1.2. Functional Definition of AE's

This part contains a functional definition for each individual local Application Entity. It describes in general terms the functions to be performed by the AE, and the DICOM services used to accomplish these functions. In this sense, "DICOM services" refers not only to DICOM Service Classes, but also to lower level DICOM services, such as Association Services.

4.1.2.1.   Functional Definition of DICOM Manager
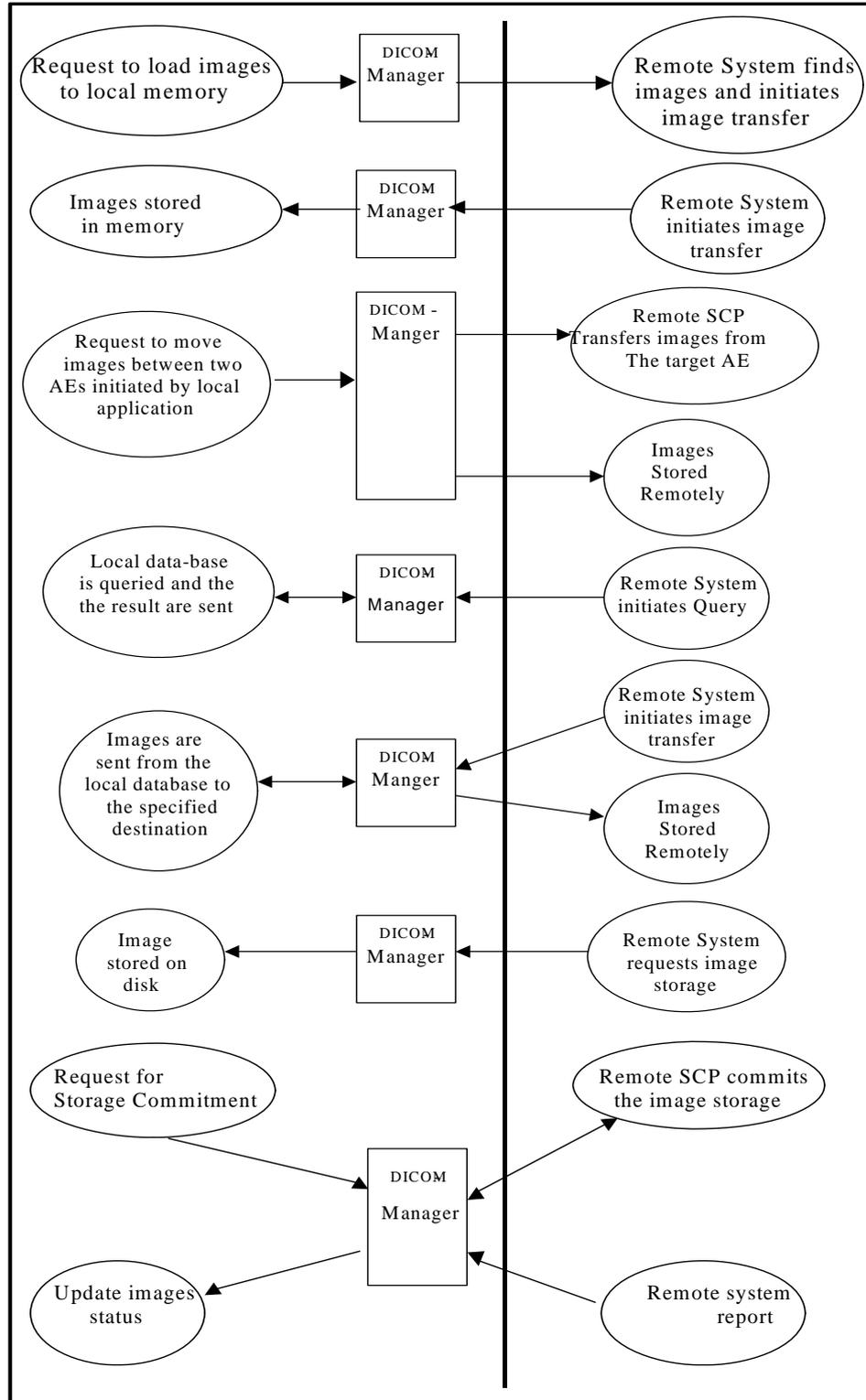
Figure 2: Illustration of DICOM Manager

- The DICOM-Manager is responsible for loading images into memory. The DICOM- Manager gets requests from local image processing and display applications to load images to the memory. It performs these requests using the Query-Retrieve Service Class (C-MOVE only).
- The DICOM-Manager waits for another application to connect at the presentation address configured for its AE title. Memory-Server will accept associations with Presentation Contexts for SOP classes of the Storage and Verification Service Classes. It will receive images on these Presentation Contexts and load them into the system's memory.
- The DICOM Manager is responsible to issue and support the storage commitment service as SCU. When some remote storage device server is configured to support this service, The DICOM Manager establishes association with the specified AE title and sends storage commitment (N-ACTION) request using push the model. After that, it may accept storage commitment (N-EVENT-REPORT) requests on the same association or by establishing another association
- The DICOM Manager waits for another application to connect at the presentation address configured for its AE title. The DICOM Manager will accept associations with Presentation Contexts for Service Object Pair (SOP) classes of the Storage, Query-Retrieve (C-MOVE and C-FIND only) and Verification Service Classes.
- When performing a Storage Service Class (SCP), the DICOM Manager will receive images and store them into the system's local database. The same AE may be used (with a configurable different AE title) to access the local MOD or different local hard disk folders.
- When performing Query-Retrieve Service Class (C-FIND SCP), the DICOM Manager will query its local database according to the request's parameters, and will send the results to the issuer.
- When performing Query-Retrieve Service Class (C-MOVE SCP), the DICOM Manager will issue a C-STORE (SCU) to the target AE for every image found according to the request.

4.2.   AE Specifications

The Brilliance Workspace Portal contains one AE - DICOM Manager described in the subsection 4.2.1.

4.2.1. DICOM Manager

Every detail of this specific Application Entity shall be completely specified under this section.

4.2.1.1.   SOP Classes

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

Table 3: SOP Classes for DICOM Manager

SOP Class Name	SOP Class UID	SCU	SCP
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
Digital X-Ray Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Digital X-Ray Image Storage – for Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage (**)	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage (**)	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes
Grayscale Softcopy Presentation State Storage (*)	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
X-Ray Angiographic Image Storage (***)	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage (***)	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
Nuclear Medicine Image Storage (**)	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Raw Data Storage (*)	1.2.840.10008.5.1.4.1.1.66	Yes	Yes
Key Object Selection Document (*)	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
Encapsulated PDF (*)	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes

Notes:
(*) These SOP Classes are only supported for storage (not for viewing/processing)
(**) These SOP Classes are supported for storage; they are also supported for viewing/processing by certain optional applications when installed on the system
(***) Only single-frame XA/RF are supported

4.2.1.2.   Association Policies

4.2.1.2.1. General

The DICOM standard application context shall be specified.

Table 4: DICOM Application Context

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2. Number of Associations

The number of simultaneous associations that will be accepted by DICOM Manager is limited on 50.

Table 5: Number of Associations as an Association Initiator for DICOM-Manager

Maximum number of simultaneous associations	Unlimited

Table 6: Number of Associations as an Association Acceptor for DICOM-Manager

Maximum number of simultaneous associations	50

4.2.1.2.3. Asynchronous Nature

If the implementation supports negotiation of multiple outstanding transactions this is stated here, along with the maximum number of outstanding transactions supported.

Table 7: Asynchronous Nature as an Association Initiator for DICOM-Manager

Maximum number of outstanding asynchronous transactions	1

4.2.1.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID is documented here. If a version name is supplied, this fact is documented here. Policies defining the values supplied for version name may be stated here.

Table 8: DICOM Implementation Class and Version for DICOM-Manager

Implementation Class UID	1.3.46.670589.33.1.1
Implementation Version Name	BRCONN_3.0

4.2.1.2.5. Communication Failure Handling

The behavior of the AE during communication failure is summarized in Table 9.

Table 9: Communication Failure Behavior

Exception	Behavior
ARTIM Timeout	The system stops the ARTIM timer and close the transport connection

Exception	Behavior
Association Timeout	A release request is sent in order to close the association

4.2.1.3. Association Initiation Policy

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

The behavior of the AE during association rejection is summarized in Table 10.

Table 10: DICOM Association Rejection Handling

Result	Source	Reason/Diagnosis	Behavior
1 – rejected-permanent	1 – DICOM UL service-user	1 – no-reason-given	The connection is closed
		2 – application-context-name-not-supported	The connection is closed
		3 – calling-AE-title-not-recognized	The connection is closed
		7 – called-AE-title-not-recognized	The connection is closed
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	The connection is closed
		2 – protocol-version-not-supported	The connection is closed
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	The connection is closed
		2 – local-limit-exceeded	The connection is closed
2 – rejected-transient	1 – DICOM UL service-user	1 – no-reason-given	The connection is closed
		2 – application-context-name-not-supported	The connection is closed
		3 – calling-AE-title-not-recognized	The connection is closed
		7 – called-AE-title-not-recognized	The connection is closed
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	The connection is closed
		2 – protocol-version-not-supported	The connection is closed
	3 – DICOM UL service-provider (presentation related function)	1 – temporary-congestion	The connection is closed
		2 – local-limit-exceeded	The connection is closed

The behavior of the AE on receiving an association abort is summarized in Table 11.

Table 11: DICOM Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	The connection is closed
2 – DICOM UL service-provider	0 – reason-not-specified	The connection is closed
	1 – unrecognized-PDU	The connection is closed
	2 – unexpected-PDU	The connection is closed
	4 – unrecognized-PDU parameter	The connection is closed
	5 – unexpected-PDU parameter	The connection is closed
	6 – invalid-PDU-parameter value	The connection is closed

The behavior of the AE for sending an association abort is summarized in Table 12.

Table 12: DICOM Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	When the system tries to disconnect before receiving an association accept but after sending association request
		When receiving association accept with no presentation context item
		When receiving association accept where all items in the presentation context item list are not accepted by remote system
		When an association timeout (configurable per remote device) expired (timeout which determines how long to keep an idle association).
		When receiving a PDU whose size is bigger then the agreed max PDU size
2 – DICOM UL service-provider	1 – unrecognized-PDU	When ever the system receives unexpected or unrecognized PDU (according to the DICOM UPPER LAYER PROTOCOL STATE TRANSITION TABLE in chapter 8 of the DICOM standard).

4.2.1.3.1.   (Real-World) Activity – Verification (C-ECHO)

4.2.1.3.1.1. Description and Sequencing of Activities
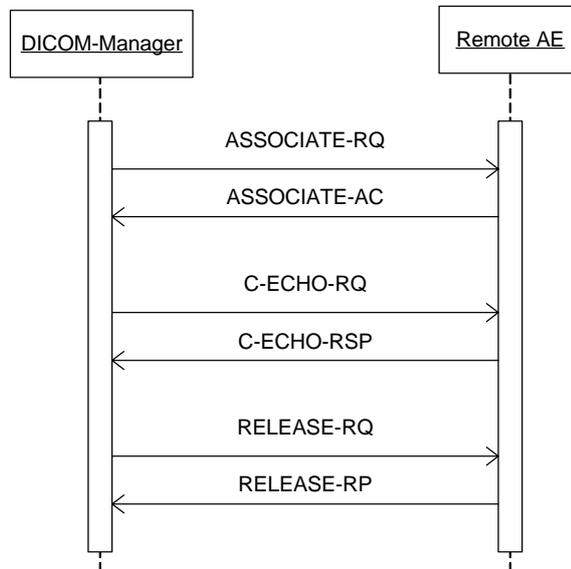
Figure 3: (Real World) Activity – DICOM Manager (C-ECHO SCU)

DICOM Manager initiates an association when the user points to one of the icons in the devices tool-bar, clicks the right mouse button and selects "Verify Connection" operation.

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 DICOM Manager for (Real-World) Activity – Verification (C-ECHO) are defined in Table 13

Table 13: Proposed Presentation Contexts for (Real-World) Activity – DICOM Manager – C-ECHO SCU

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	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

4.2.1.3.1.3. SOP Specific Conformance for SOP Classes

DICOM Manager provides standard conformance to the DICOM V3.0.
All details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors are provided in Table 14.

Table 14: DICOM C-ECHO Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Success	The SCU has successfully send C-ECHO
Other than Success	<>0000	Problems with sending the C-ECHO	The SCU failed to send the C-ECHO; user is notified

4.2.1.3.2. (Real-World) Activity – Storage (C_STORE)

4.2.1.3.2.1. Description and Sequencing of Activities
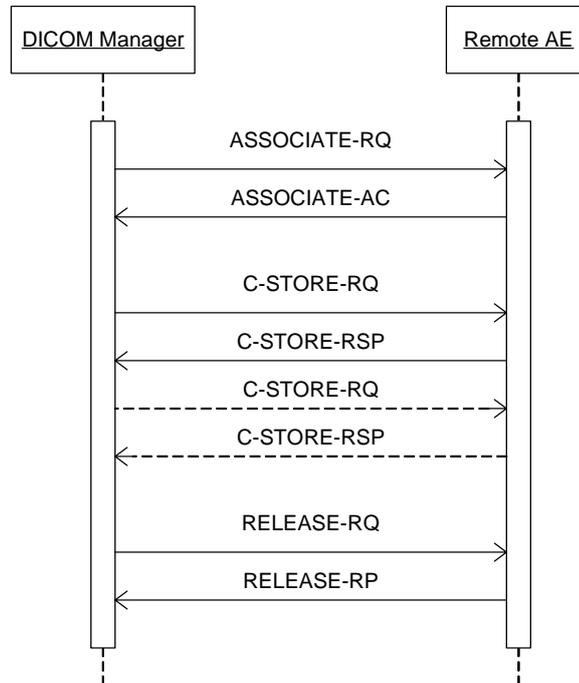
Figure 4: (Real World) Activity – DICOM Manager (C-STORE SCU)

The associated Real-World Activity is a request for retrieval of images from the disk/memory and storage of the images to a remote system using a C-STORE command.

4.2.1.3.2.2. 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 DICOM Manager for (Real-World) Activity – DICOM Manager (C-STORE SCU) are defined in Table 15. Explicit VR Transfer Syntaxes for a specific AE target may be restricted using the configuration utility.

Table 15: Proposed Presentation Contexts for (Real-World) Activity – DICOM Manager – C-STORE SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Digital X-Ray Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Digital X-Ray Image Storage – for Processing	1.2.840.10008.5.1.4.1.1.1.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

DICOM Manager prefers an explicit Transfer Syntax encoding. If offered a choice of Transfer Syntax's in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax:
- DICOM Explicit VR Little Endian.
- DICOM Implicit VR Little Endian.

4.2.1.3.2.3. SOP Specific Conformance for SOP Classes

DICOM Manager provides standard conformance to the DICOM V3.0 Storage Service Class as an SCU for SOP Classes mentioned in the previous section.

Multiple C-STORE operations can be performed over a single association.
Upon receiving a C-STORE confirmation containing a successful status, this implementation will perform the next C-STORE operation (if this operation is the result of the Series Level Move request). The association will be kept open if possible.

Any unsuccessful status (error or warning), returned in the C-STORE confirmation, results in termination of sending further C-Store requests (if any in the queue) and reporting of the error to the system log file.

There are two timeouts for the association. One timeout, "Association Timeout" is used to close an idle association. For C-Store the default is 120 sec but can be configured per remote node. The other timeout is "Service Timeout" which detects that no data is transmitted over the association and closes it. The default for C-Store is 5 minutes.

The system creates CT, PET, NM, Single and Multi-frame Secondary Capture Images and RT Structure Sets. In section 7.1.1 an overview of the created objects is defined.

All details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors are provided in Table 16.

Table 16: DICOM C-STORE Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Success	Storage successful.
Failure	0122	Refused – SOP Class not supported	Message by transfer result – Unknown reason
	A700	Refused – Out of Resources	Message by transfer result – Out of Resources
	A900	Error - Data Set does not match SOP	Message by transfer result – Unknown reason
	C000	Error – Cannot understand	Message by transfer result – Store failed
Warning	B000	Coercion of Data Elements	Warning status is treated as success
	B006	Elements Discarded	Warning status is treated as success
	B007	Data Set does not match	Warning status is treated as success

4.2.1.3.3. (Real-World) Activity – Storage Commitment

4.2.1.3.3.1. Description and Sequencing of Activities
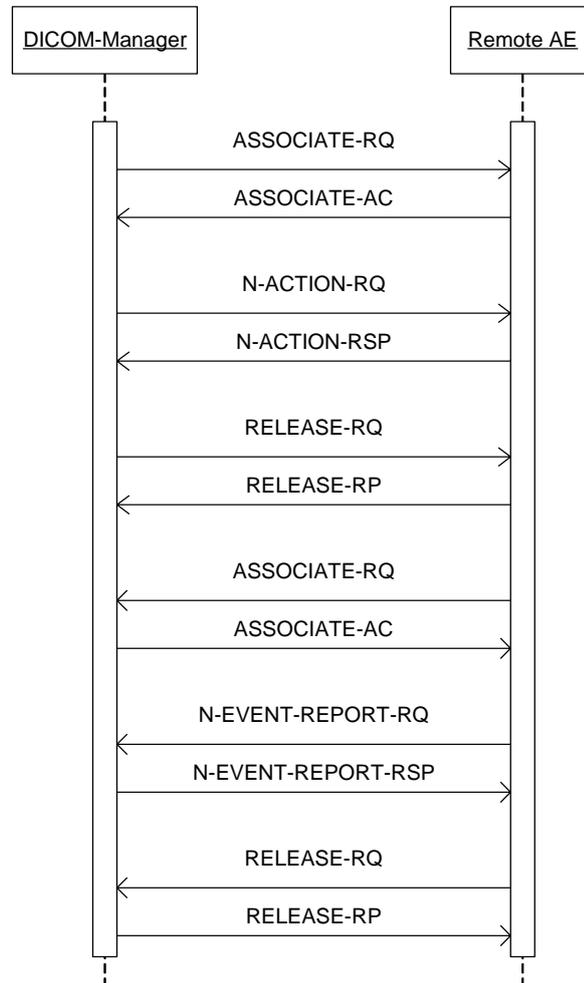
Figure 5: (Real World) Activity – DICOM Manager (Storage Commitment)

DICOM-Manager will attempt to initiate a new association when requested to commit the images that were stored on a remote device, which supports the storage Commitment Service.

The associated real world activity for the N-ACTION is a storage commitment request to the remote storage device.

The associated real world activity for the N-EVENT-REPORT operation is the completion of the storage commitment by the remote device. DICOM-Manager will issue a failure status if it is unable to properly handle the storage commitment report event.

4.2.1.3.3.2. 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 DICOM Manager for (Real-World) Activity – Storage Commitment are defined in Table 17

Table 17: Proposed Presentation Contexts for (Real-World) Activity – DICOM Manager – Storage Commitment

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

4.2.1.3.3.3. SOP Specific Conformance for SOP Classes

DICOM-Manager provides standard conformance to the DICOM V3.0 Storage Commitment Service Class using Push Model as an SCU.

Multiple N-ACTION requests can be performed over a single association. Multiple N-EVENT-REPORT requests can be accepted over a single association.
After all N-ACTION requests that are waiting in the stack are issued, association will be closed with the timeout of 60 seconds.

A remote system reports about storage commitment completion using N-EVENT-REPORT command. The system can also accept the N-EVENT-REPORT commands over a separate association initiated by the remote system, using reverse role negotiation.

All details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors are provided in Table 18 for N-ACTION and in Table 20 for N-EVENT-REPORT
.

Table 18: DICOM N-ACTION Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Success	The request for storage commitment is considered successfully stored
Other than Success	<>0000	Problems with sending the N-ACTION	The association is aborted and the request for storage commitment is marked as failed

Table 19: Storage Commitment N-EVENT-REPORT Behavior

Event Type Name	Event Type	Behavior
Storage Commitment Request Successful	1	Successfully committed instances are marked as "transferred"
Storage Commitment Request Complete – Failures Exist	2	

Table 20: DICOM N-EVENT-REPORT Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Success	The storage commitment result has been successfully received.
Failure	0211	Unrecognized Operation	The transaction UID in the N-EVENT-REPORT request is not recognized..
	0213	Resource Limitation	The Transaction UID in the N-EVENT-REPORT request has expired.
	0113	No Such Event Type	An invalid Event Type ID was supplied in the N-EVENT-REPORT.
	0110	Processing Failure	An internal error occurred during processing
	0115	Invalid Argument Value	One of more SOP Instance UIDs with the Referenced SOP Sequence (0008.1199) or Failed SOP Sequence (0008,1198) was not included in the Storage Commitment Request associated with this Transaction UID.

4.2.1.3.4. (Real-World) Activity – DICOM-Manager C-FIND (SCU)

4.2.1.3.4.1. Description and Sequencing of Activities

DICOM-Manager initiates an association when the user clicks on one of the icons in the devices tool-bar.

The DICOM-Manager searches (C-FIND) by Study Level following by Series level and, optionally (configurable), by Image Level. The association remains open until the user explicitly closes it by clicking again on the device icon - the Query will be closed with a C-Release
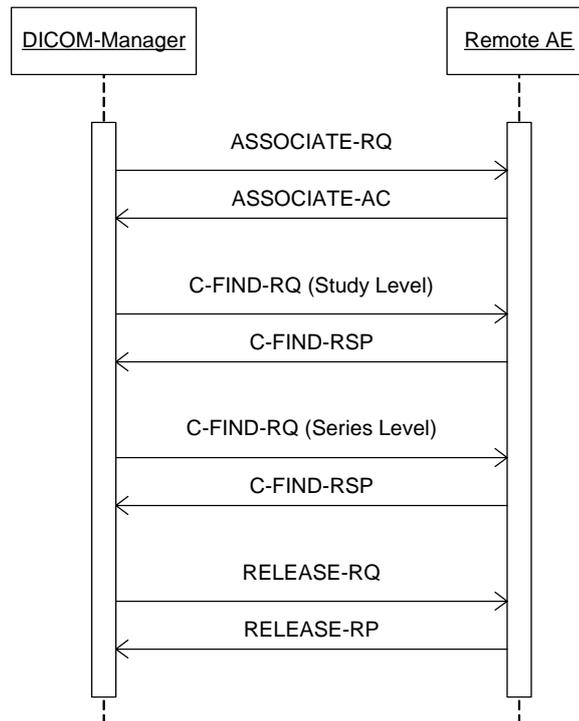
Figure 6: (Real World) Activity – DICOM-Manager C-FIND (SCU)

4.2.1.3.4.2. 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 Archive-Manager for (Real-World) Activity – DICOM-Manager C-FIND (SCU) are defined in Table 21

Table 21: Proposed Presentation Contexts for (Real-World) Activity – Archive-Manager C-FIND (SCU)

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root Query /Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

4.2.1.3.4.3. SOP Specific Conformance for SOP Classes

The DICOM-Manager provides standard conformance to the DICOM V3.0.
The DICOM-Manager supports the following Study and Series level attributes
Sub-selection on the received list of patients after query will be done on the local
memory.

Table 22: Supported Study and Series Query Level Attributes

Query Level	Query Key			Value	Type of matching
	Name	**Tag**	**VR**		
Study	Specific Character Set	0008,0005	CS	None	None
	Study Date	0008,0020	DA	User Input	S, U, R
	Study Time	0008,0030	TM		None
	Accession Number	0008,0050	SH	User Input	S
	Query/Retrieve Level	0008,0052	CS	STUDY	S
	Modalities in Study	0008,0061	CS	User Input	S
	Referring Physician's Name *	0008,0090	PN	User Input	S, U, *
	Study Description	0008,1030	LO	User Input	S, U, *
	Patient's Name *	0010,0010	PN	User Input	S, U, *
	Patient ID	0010,0020	LO	User Input	S, U, *
	Patient's Birth Date	0010,0030	DA		None
	Patient's Birth Time	0010,0032	TM		None
	Patient's Sex	0010,0040	CS		None
	Study Instance UID	0020,000D	UI		None
	Study ID	0020,0010	SH		None
	Number of Study Related Series	0020,1206	IS		None
	Number of Study Related Images	0020,1208	IS		None
	Performed Procedure Step Description	0040,0254	LO		None
Series	Specific Character Set	0008,0005	CS		None
	Series Date	0008,0021	DA		None
	Series Time	0008,0031	TM		None
	Query/Retrieve Level	0008,0052	CS	SERIES	S
	Modality	0008,0060	CS		None
	Manufacturer	0008,0070	LO		None
	Series Description	0008,103E	LO		None
	Body Part Examined	0018,0015	CS		None
	Protocol Name	0018,1030	LO		None
	Study Instance UID	0020,000D	UI	Parent Study	None
	Series Instance UID	0020,000E	UI		None
	Series Number	0020,0011	IS		None
	Number of Series Related Instances	0020,1209	IS		None
	Performed Procedure Step Start Date	0040,0244	DA		None
	Performed Procedure Step Start Time	0040,0245	TM		None

Query Level	Query Key			Value	Type of matching
	Name	**Tag**	**VR**		
	Request Attributes Sequence	0040,0275	SQ		None
	>Requested Procedure ID	0040,1001	SH		None
	>Scheduled Procedure Step ID	0040,0009	SH		None
Image	Specific Character Set	0008,0005	CS		None
	Image Type	0008,0008	CS		None
	Instance Creation Date	0008,0012	DA		None
	Instance Creation Time	0008,0013	TM		None
	SOP Class UID	0008,0016	UI		None
	SOP Instance UID	0008,0018	UI		None
	Query/Retrieve Level	0008,0052	CS	IMAGE	S
	Contrast Bolus Agent	0018,0010	LO		None
	Slice Thickness	0018,0050	DS		None
	KVP	0018,0060	DS		None
	Series Instance UID	0020,000E	UI		None
	Instance Number	0020,0013	IS		None
	Patient Orientation	0020,0020	CS		None
	Image Orientation Patient	0020,0037	DS		None
	Slice Location	0020,1041	DS		None
	Sample per Pixel	0028,0002	US		None
	Photometric Interpretation	0028,0004	CS		None
	Rows	0028,0010	US		None
	Columns	0028,0011	US		None
	Pixel Spacing	0028,0030	DS		None

* Note: The column Type of Matching of the table should be read as follows:
The types of Matching supported by the C-FIND SCP. A "S" indicates the identifier attribute can specify Single Value Matching, a "R" will indicate Range Matching, a "*" will denote wildcard matching, an "U" will indicate universal matching, and "L" will indicate that UID lists are supported for matching. "NONE" indicates that no matching is supported, but that values for this element in the database can be returned.

All details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors are provided in Table 23

Table 23: DICOM C-FIND Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Success	Matching successful.
Failure	A700	Refused	Out of Resources
	A900	Failed	Unknown reason
	C000	Failed	Unknown reason

4.2.1.3.5. (Real-World) Activity – DICOM-Manager C-MOVE (SCU)

4.2.1.3.5.1. Description and Sequencing of Activities

DICOM-Manager initiates an association when an image processing application asks for image loading from a specified source device using a proprietary IPC protocol.
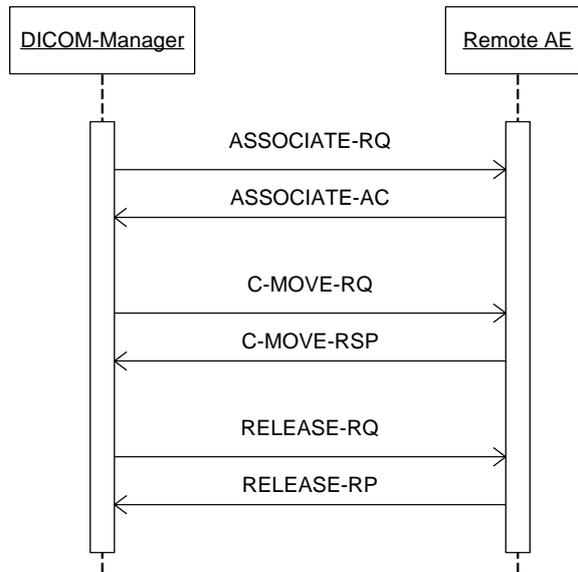
Figure 7: (Real World) Activity – DICOM-Manager C-MOVE (SCU)

4.2.1.3.5.2. 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 Memory-Manager for (Real-World) Activity – Memory-Manager C-MOVE (SCU) are defined in Table 24.

Table 24: Proposed Presentation Contexts for (Real-World) Activity – DICOM-Manager C-MOVE (SCU)

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	ILE ELE	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

4.2.1.3.5.3. SOP Specific Conformance for SOP Classes

DICOM-Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCU for the SOP Class Study Root Query/Retrieve Information Model – Move.
All details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors are provided in Table 25.

Table 25: DICOM C-MOVE Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Success	Storage successful.
Failure	A701	Refused – Out of Resources	Message by transfer result – Refused Unknown reason
	A702	Refused – Out of Resources	Message by transfer result – Refused Store Failed
	A801	Refused – Move Destination Unknown	Message by transfer result – Refused Unknown target
	A900	Error – Identifier Does Not Match SOP Class	Message by transfer result – Failed Unknown reason
	C000	Error – Unable to Process	Message by transfer result – Failed Store Failed
Warning	B000	Sub-operations complete – One or more failures	When ever one of the store operations failed
Cancel	FE00	Cancel	Message by transfer result – Refused Connection closed on timeout.

4.2.1.4. Association Acceptance Policy

Each AE specification shall contain a description of the association acceptance policies of the AE. This describes the conditions under which the AE will accept an association.

The AE association rejection policies are summarized in Table 26.

Table 26: DICOM Association Rejection Policies

Result	Source	Reason/Diagnosis	Explanation
1 – rejected-permanent	1 – DICOM UL service-user	2 – application-context-name-not-supported	When receiving association request and the application context name is not supported
		3 – calling-AE-title-not-recognized	When receiving association request and the calling AE title is not supported
		7 – called-AE-title-not-recognized	When receiving association request and the called AE title is not supported
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	When receiving association request and all of the items in the presentation context item list are not supported by the system
		2 – protocol-version-not-supported	When receiving an association request and the protocol version received is not supported

The behavior of the AE on receiving an association abort is summarized in Table 27:

Table 27: DICOM Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	The connection is closed
2 – DICOM UL service-provider	0 – reason-not-specified	The connection is closed
	1 – unrecognized-PDU	The connection is closed
	2 – unexpected-PDU	The connection is closed
	4 – unrecognized-PDU parameter	The connection is closed
	5 – unexpected-PDU parameter	The connection is closed
	6 – invalid-PDU-parameter value	The connection is closed

The behavior of the AE for sending an association abort is summarized in Table 27:

Table 28: DICOM Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 – DICOM UL service-user	0 – reason-not-specified	When an association timeout (configurable per remote device) expired (timeout which determines how long to keep an idle association). When receiving a PDU whose size is bigger then the agreed max PDU size

Source	Reason/Diagnosis	Behavior
2 – DICOM UL service-provider	1 – unrecognized-PDU	When ever the system receives unexpected or unrecognized PDU (according to the DICOM UPPER LAYER PROTOCOL STATE TRANSITION TABLE in chapter 8 of the DICOM standard).

4.2.1.4.1.　(Real-World) Activity – DICOM Manager (C-ECHO SCP)

4.2.1.4.1.1. Description and Sequencing of Activities

A remote system requests verification from DICOM Manager using the C-ECHO command.
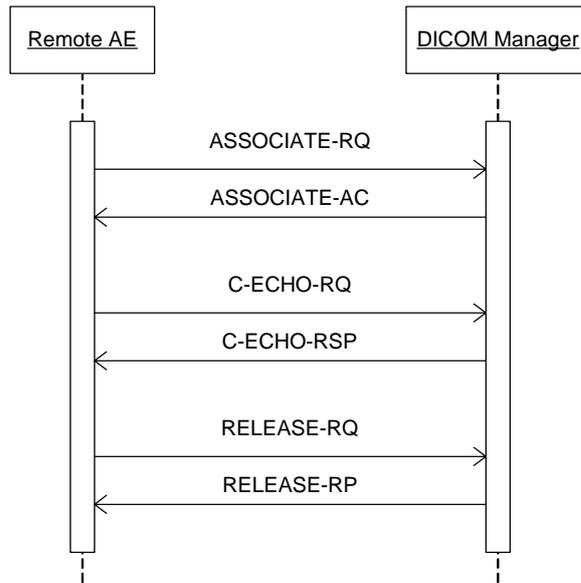

Figure 8: (Real World) Activity – DICOM Manager (C-ECHO SCP)

4.2.1.4.1.2. Accepted Presentation Contexts

Any of the presentation contexts shown in Table 29 is acceptable to DICOM Manager (C-ECHO SCP).

Table 29: Acceptable Presentation Contexts for <(Real-World) Activity – DICOM Manager (C-ECHO SCP)

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 ELE	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

4.2.1.4.1.3. SOP Specific Conformance for SOP Classes

DICOM Manager (C-ECHO SCP) provides standard conformance to the DICOM V3.0 verification SOP Class.

The behavior of an Application Entity SOP class is summarized as shown in Table 30. The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 30: DICOM Manager (C-ECHO SCP) Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Success	C-ECHO command was successful received
Other than Success	<>0000	Problems with receiving the C-ECHO	Problems with receiving the C-ECHO

4.2.1.4.2. (Real-World) Activity – DICOM Manager (C-STORE SCP)

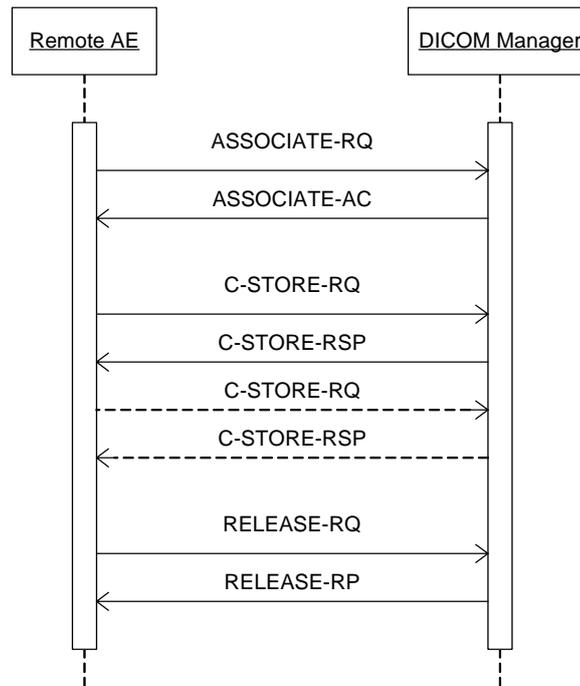#### 4.2.1.4.2.1. Description and Sequencing of Activities

Figure 9: (Real World) Activity – DICOM Manager C-STORE (SCP)

The real world activity associated with the C-STORE operation is the storage of the image in the memory of the system upon which DICOM Manager is running in order to make it available for immediate processing by applications. DICOM Manager will issue a failure status if it is unable to store the image in the memory.

4.2.1.4.2.2. Accepted Presentation Contexts

Any of the Presentation Contexts shown in Table 31 is acceptable to the DICOM Manager C-STORE as SCP.

Table 31: Acceptable Presentation Contexts for (Real-World) Activity – DICOM Manager (C-STORE SCP)

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Digital X-Ray Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.1.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Digital X-Ray Image Storage – for Processing	1.2.840.10008.5.1.4.1.1.1.1.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None

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	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Encapsulated PDF	1.2.840.10008.5.1.4.1.1.104.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	ELE ILE	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None

4.2.1.4.2.3. SOP Specific Conformance for SOP Classes

DICOM Manager provides standard conformance to the DICOM V3.0 Storage Service Class as a SCP.
DICOM Manager conforms to the SOPs of the Storage Service Class at Level 2 (Full). In case of a successful C-STORE, the stored image may be accessed by the processing applications

The user determines the duration of the storage.
If the DICOM Manager returns one of the following status codes, it means that the C-Store has been unsuccessful.

Table 32: Memory-Server C-STORE (SCP) Status Response

Service Status	Code	Further Meaning	Description
Success	0000	Successful	When ever the store operation succeeded
Failure	C000	Failed	When ever the store operation failed

4.2.1.4.3. (Real-World) Activity – DICOM Manager (C-FIND SCP)

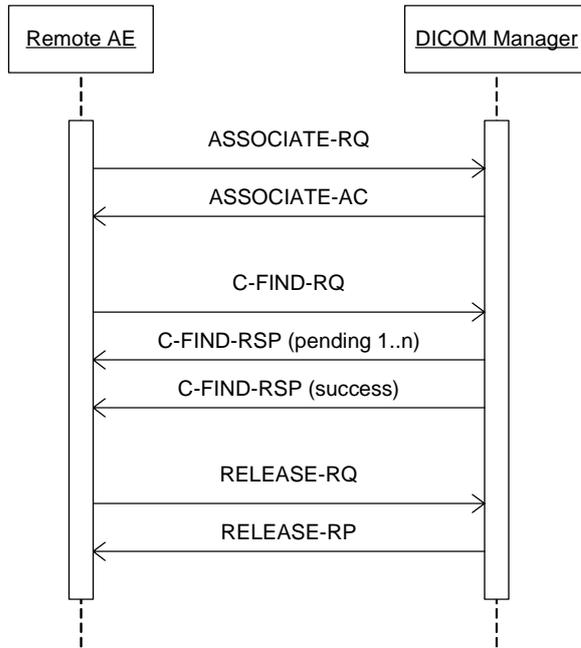#### 4.2.1.4.3.1. Description and Sequencing of Activities

Figure 10: (Real World) Activity – Disk-Server (C-FIND SCP)

The Real World activity associated with the C-FIND command is an examination of the disk content. DICOM Manager will issue a failure status if it is unable to process the query request.

4.2.1.4.3.2. Proposed Presentation Contexts

Any of the Presentation Contexts show in Table 33 is acceptable to the DICOM Manager (C-FIND SCP).

Table 33: Proposed Presentation Contexts for <(Real-World) Activity – DICOM Manager (C-FIND SCP)

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	ILE ELE	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None

4.2.1.4.3.3. SOP Specific Conformance for SOP Classes

DICOM Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCP for the following SOP Class: Study Root Query/Retrieve Information Model - FIND, UID=1.2.840.10008.5.1.4.1.2.2.1.

Disk-Server does not support Relational Search.

All Required (R) and Unique (U) Study, Series and Image level keys for the Study Root Query/Retrieve Information Model are supported.

Unsupported fields will not be returned in the C-FIND response.

C-FIND-CANCEL is supported. However, some C-FIND responses may be forwarded before the C-FIND-CANCEL takes effect.

All details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors are provided in Table 34

Table 34: DICOM C-Find Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Matching complete	Matching successful
Failure	C000	General failure status	When ever the find operation failed

4.2.1.4.4. (Real-World) Activity – DICOM Manager (C-MOVE SCP)

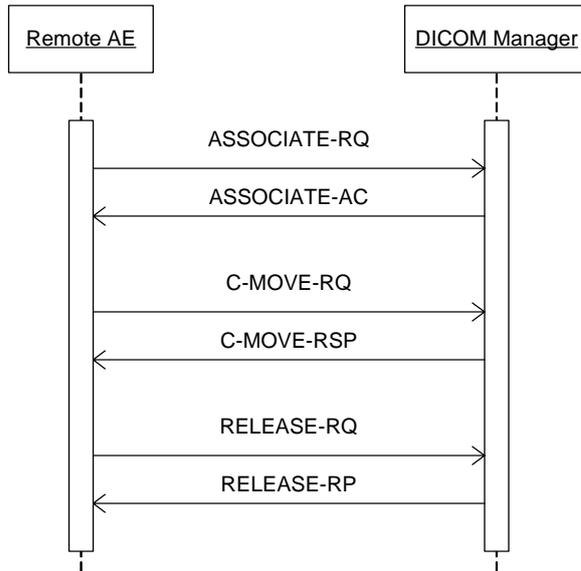#### 4.2.1.4.4.1. Description and Sequencing of Activities

Figure 11: (Real World) Activity – DICOM Manager (C-MOVE SCP)

The Real World activity associated with the C-MOVE command is retrieval of images from the disk and storage of the images to a remote system using a C-STORE command.
DICOM Manager will issue a failure status if it is unable to process the transfer request

4.2.1.4.4.2. Proposed Presentation Contexts

Any of the Presentation Contexts show in Table 35 is acceptable to the DICOM Manager (C-MOVE SCP).

Table 35: Proposed Presentation Contexts for <(Real-World) Activity – DICOM Manager (C-MOVE SCP)

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	ILE ELE	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None

4.2.1.4.4.3. SOP Specific Conformance for SOP Classes

DICOM Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCP for the following SOP Class: Study Root Query/Retrieve Information Model - MOVE, UID=1.2.840.10008.5.1.4.1.2.2.2.
Prioritization of C-MOVE requests is not supported.

DICOM Manager does not support relational C-MOVE requests.
All images requested in the C-MOVE will be sent over a single association (the association will not be established and torn down for each image).

All details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors are provided in Table 36

Table 36: DICOM C-MOVE Command Response Status Handling Behavior

Service Status	Code	Further Meaning	Behavior
Success	0000	Matching complete	When ever the move operation succeeded.
Failure	A801	Refused – Move Destination Unknown	When ever the move destination is unknown to the system.
	C000	Error – Unable to Process	When ever the move operation failed.
Warning	B000	Sub-operations Complete – One or more Failures	When ever one of the store operations failed.
Pending	FF00	Pending	For every store response received.
Cancel	FE00	Cancel	When receiving a cancel move request.

4.3. Network Interfaces

4.3.1. Physical Network Interface

The Brilliance Workspace Portal application provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of [DICOM].

Brilliance Workspace Portal inherits its TCP/IP stack from Windows XP (i.e. the operating system platform).

Brilliance Workspace Portal supports a single network interface: Ethernet ISO.8802-3. With standard supported physical medium include:
- IEEE 802.3 10BASE-TX
- IEEE 802.3 100BASE-TX (Fast Ethernet)
- IEEE 802.3 1000BASE-X (Fiber Optic Gigabit Ethernet).
.

4.3.2. Additional Protocols

Additional protocols such as used for network management are listed here.

4.4. Configuration

The Brilliance Workspace Portal system is configured by means of a configuration program. This program is accessible at start-up of the Brilliance Workspace Portal system. It is password protected and intended to be used by the administrator onsite or Philips Customer Support Engineers only.

4.4.1. AE Title/Presentation Address Mapping

This mapping (including IP and port numbers) is defined during the system Networking Procedure.
Configurable are the parameters:
- Calling AE Titles
- Called AE Titles
- Maximum PDU size
- Manufacturer
- Model
- Version
- Association timeout
- ARTIM timer
- Large Archive – Force Filter when querying this device
- Archived – Mark studies as Archived when copying them to this device
- Supported Move/Query levels
- Disable explicit transfer syntaxes to be proposed at the association negotiation
- Enable generation of DICOM overlays ("burn-in" instead)

4.4.1.1. Local AE Titles

The local AE title mapping and configuration shall be specified. The default AE titles are based on the system host name defined by the service engineer as part of the system configuration. The following table shall be used:

Table 37: AE Title Configuration Table

Application Entity	Default AE Title	Default TCP/IP Port
DICOM-Manager	<hostname> <hostname><localfolder>	104

4.4.1.2. Remote AE Title/Presentation Address Mapping

Remote AE Title, IP-Address and Port-number are freely configurable.

4.4.2. Parameters

The specification of important operational parameters, their default value and range (if configurable) is specified here.

Table 38: Configuration Parameters table

Parameter	Configurable	Default Value
General Parameters		
Release Timeout	Yes	30 seconds
Port-Number	Yes	104
Maximum PDU size the AE can receive	Yes	16352
Maximum PDU size the AE can send	Yes	16352
Transfer Syntax support, ILE, ELE There is a configuration option to turn off Explicit VR support	Yes	ILE, ELE
Storage / Retrieve Timeout	Yes	5 Minutes
Artim timeout	Yes	5 Minutes
Max association number	Yes	50

5. SUPPORT OF CHARACTER SETS

Any support for character sets beyond the default character repertoire in Network and Media services shall be described here.

Table 39, Supported DICOM Character Sets

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Single-byte Character Sets without Code Extensions					
Default repertoire	-	-	ISO-IR 6	G0	ISO 646
Latin alphabet No. 1	ISO_IR 100	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 100	G1	Supplementary set of ISO 8859

6. SECURITY

6.1.   Security Profiles
None supported.

6.2.   Association Level Security
None supported

6.3.   Application Level Security
None supported

7. ANNEXES

7.1. IOD Contents

7.1.1. Created SOP Instances

7.1.1.1. General Rules

This section specifies the IODs created by the Brilliance Workspace Portal.

Abbreviations used for the IOD tables are,

COPY   the module is copied from the source images
ALWAYS   the module is always present (created)
CONDITIONAL   the module exists under specified condition

The Brilliance Workspace Portal reflects the fact that the IOD created by the workstation are always based on some source images after the viewing/processing applied and the modified images are saved. Most of the attributes or even the whole modules (Patient, General Study, etc.) are just copied from the source images. The base of the copied attribute is the DICOM Standard.

The following table lists the modules that are always copied from the source images when the created SOP Class IOD is the same as the source SOP Class IOD,

Table 40, Modules Copied to the Derived IODs Table

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module		COPY
	Clinical Trial Subject Module		COPY
Study	General Study Module		COPY
	Patient Study Module		COPY
	Clinical Trial Study Module		COPY
Series	General Series Module		ALWAYS CREATED
	Clinical Trial Series Module		COPY
Frame of Reference	Frame of Reference Module		COPY
Equipment	General Equipment Module		COPY

7.1.1.2. SC Image IOD Modules

Table 41, SC Image IOD Modules Table

Information Entity	Module Name	Presence of Module
Patient	Patient Module	COPY
Study	General Study Module	COPY
	Patient Study Module	COPY
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	COPY

Information Entity	Module Name	Presence of Module
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SC Image Module	ALWAYS
	Overlay Plane	CONDITIONAL - if present in the displayed image
	Modality LUT	CONDITIONAL – if Bits Stored > 8
	VOI LUT Module	CONDITIONAL – if Bits Stored > 8
	SOP Common Module	ALWAYS

7.1.1.3. Key Object Selection Document IOD Modules

Table 42, Key Object Selection Document IOD Modules Table

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module		COPY
Study	General Study Module		COPY
	Patient Study Module		COPY
Series	Key Object Document Series Module		ALWAYS
Equipment	General Equipment Module		COPY
Document	Key Object Document		ALWAYS
	SR Document Content		ALWAYS
	SOP Common Module		ALWAYS

7.1.1.4. Encapsulated PDF IOD Modules

Table 43, Encapsulated PDF IOD Modules Table

Information Entity	Module Name	Reference	Presence of Module
Patient	Patient Module		COPY
	Specimen Identification		COPY
Study	General Study Module		COPY
	Patient Study Module		COPY
Series	Encapsulated Document Series		ALWAYS
Equipment	General Equipment Module		COPY
	SC Equipment Module		ALWAYS
Image	Encapsulated Document		ALWAYS
	SOP Common Module		ALWAYS

7.1.2. Usage of Attributes from Received IOD's

The following attributes must be present in the received IOD to be accepted,

For all IODs,

- SOP Class UID (0008,0016)
- Study Instance UID (0020,000D)
- Series Instance UID (0020,000E)

For Image IODs,

- Pixel Data (7FE0,0010) - size is not 0
- Rows (0028,0010)
- Columns (0028,0011)
- Bits Allocated (0028,0100)

7.1.3. Attribute Mapping

Not Applicable

7.1.4. Coerced/Modified fields

In the received IODs, the following attributes may be modified under certain conditions,

Table 44, Modified Attributes

Attribute	Tag	When Modified
Patient name	0010,0010	if empty will be set to "Unknown"
Patient Id	0010,0020	if empty will be set to "Unknown"
Rows	0028,0010	fixed if rows* coloums doesnt match pixel data size
Sop Instance UID	0008,0018	generate new if missing

7.2. Data Dictionary of Private Attributes

Not Applicable.

7.3. Coded Terminology and Templates

Brilliance Workspace Portal uses the following Content groups and Templates.

Table 141, Content groups

Content groups Name	Content ID
Patient Orientation	CID 19
Patient Orientation Modifier	CID 20
Patient Gantry Relationship	CID 21
PET Radionuclide	CID 4020
PET Radiopharmaceuticals	CID 4021
Route of Administration	CID 11
Nuclear Medicine Projections	CID 26
NM Procedural State Values	CID 3101

Table 141, Used Templates

Template Name	Template ID
NM Acquisition Context	TID 3470

7.4. Grayscale Image Consistency

Not applicable.

7.5. Standard Extended/Specialized/Private SOPs

No Specialized or Private SOP Classes are supported.

7.6. Private Transfer Syntaxes

No Private Transfer Syntaxes are supported