

Beschreibung Gesamt / Total Description

SW StorM-Base Plus_DICOM Conformance Statement

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Distribution List

See DMS.

Digital Signatures

Created by / Date:	Reviewed by / Date:	Approved by / Date:
See DMS stamp „Created“	See DMS stamp „Reviewed“	See DMS stamp „Approved“

Change History

Version	Index	Date	Author	Change
1.0	01	04.06.2012	shu	New document
1.0	02	26.09.2014	shu	Storage update MWM update
1.0	03	29.01.2015	shu	Storage attributes update MPPS attributes table added
1.1	03	09.02.2015	shu	Generated UID description updated regarding use of Worklist information

Abbreviations

SMAG	Storz Medical AG
SMT	StorM-Touch
SMB	StorM-Base
ACR	American College of Radiology
ANSI	American National Standards Institute
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element

DIMSE-C	DICOM Message Service Element – Composite
DIMSE-N	DICOM Message Service Element – Normalized
NEMA	National Electrical Manufacturers Association
PDU	Protocol Data Unit
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol / Internet Protocol
UID	Unique Identifier
RIS	Radiology Information System
PACS	Picture Archiving and Communication System

Definitions

none	
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References

None

Note

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1 Introduction

1.1 Purpose of this Document

This document is a provisional DICOM Conformance Statement for the software product StorM-Base.

The StorM-Base is an independent software application specifically tailored for lithotripsy treatments. It is designed for the recording and statistical evaluation of the shock wave therapy, including anamnesis, stone identification, diagnosis/analysis, follow-up, image integration and preparation of reports for patients' attending physicians.

Verification Service is implemented to verify application level communication between remote System and local System.

Basic Worklist Management Service is implemented to retrieve a Worklist from a remote System (RIS, Broker).

Storage Service is implemented to store Images on a remote System (PACS).

Query / Retrieve Service is implemented to retrieve Images from remote System (PACS) for viewing on local System.

An Overview of the networking DIMSE-C services supported by StorM-Base is listed in Table 1:

Table 1 Network Services

Networking SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Verification	Yes	No
Modality Worklist Information Model - FIND	Yes	No
Storage	Yes	No
Query / Retrieve	Yes	No
Modality Performed Procedure Step	Yes	No
Storage commitment	Yes	No
Image Transfer		
Secondary Capture Image Storage	Yes	No
Ultrasound Multi-frame Image Storage	Yes	No

1.2 Sources for this Document

ACR – NEMA Digital Imaging and Communication in Medicine (DICOM) Version 3.0 (2003)

1.3 Connectivity and Interoperability

The Implementation of StorM-Base Verification Service, Basic Worklist Management Service, Storage Service and Query Retrieve Service have been tested to assure correspondence with this Conformance Statement.

But the Conformance Statement and the DICOM Standard does not guarantee interoperability.

2 Implementation Model

The StorM-Base DICOM Interface is an implementation of:

- DICOM Verification Service Class user (SCU)
- DICOM Basic Worklist Management Service Class user (SCU)
- DICOM Storage Service Class user (SCU)
- DICOM Query / Retrieve Service Class user (SCU)
- DICOM Modality Performed Procedure Step Service Class user(SCU)
- DICOM Storage commitment Service Class user(SCU)

The StorM-Base Interface is implemented as a single Application Entity.

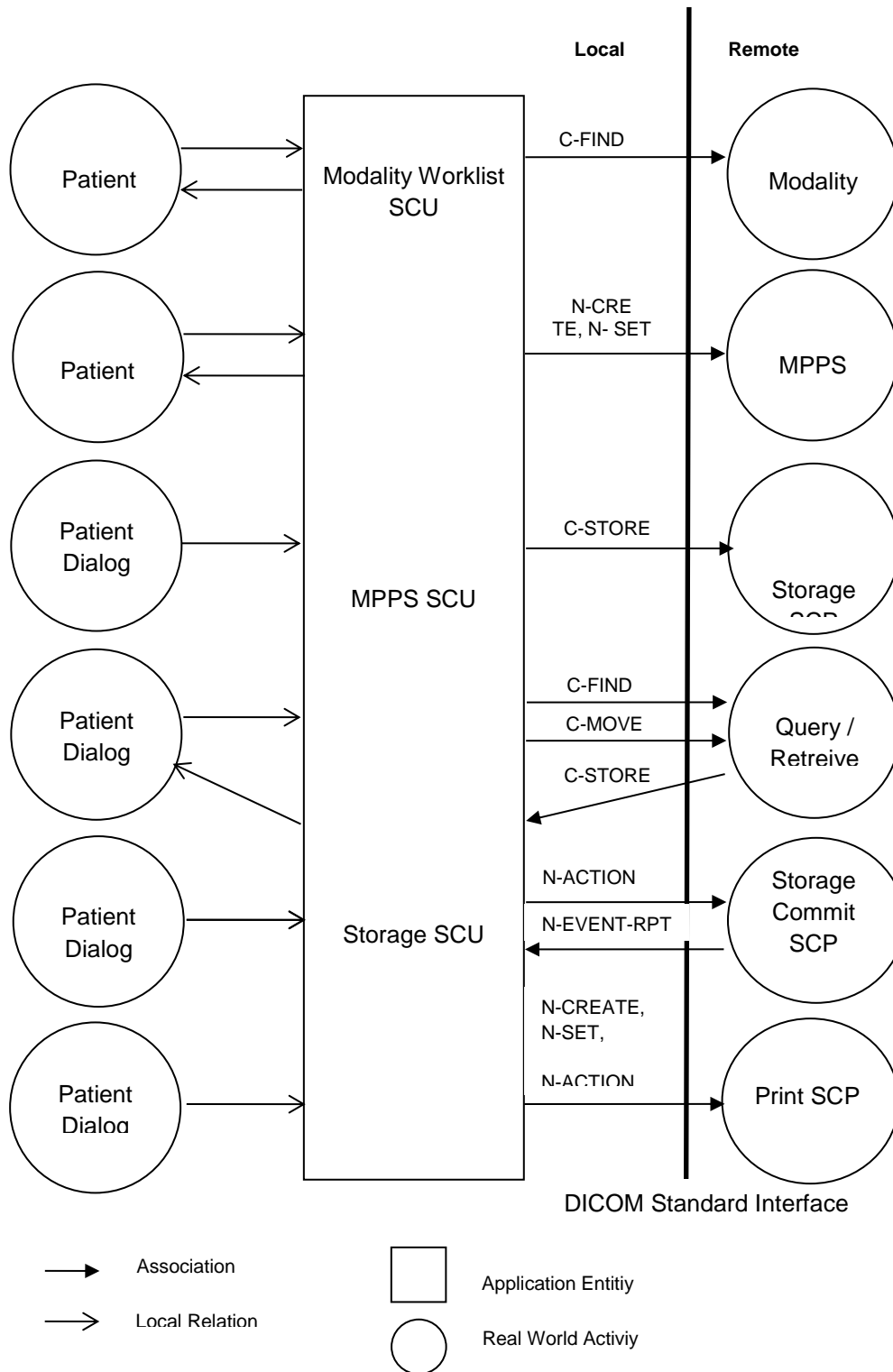
It can acquire patient Worklist from remote Basic Worklist Management Service Class provider (SCP).

It can store Images to a remote Storage Service Class provider (SCP).

It can Query and Retrieve Images for viewing from a remote Query / Retrieve Service Class provider (SCP)

2.1 Application Data Flow Diagram

Figure 1: Application Data Flow Diagram



2.2 Functional Definitions of Application Entity

StorM-Base acts as a single AE with a configurable AE Title.

All communication with the remote application is accomplished utilizing the DICOM protocol over a network using the TCP/IP protocol stack.

SMB Plus does not restrict the communication by checking application entities.

If SMB Plus is directed to retrieve a Worklist (Patient dialog) it acts as a Basic Worklist Management SCU and sends a C-FIND request to a remote Worklist Server using selected search keys. While actual procedure is performed, MPPS (Modality Performed Procedure Step) is created(N-CREATE request) and its status will be updated correct(N-SET).

If SMB Plus is directed to store one or more locally acquired Images it acts as a Storage SCU and sends a C-STORE request to a remote Storage Server. In order to ensure the storage, it will also act as Storage commitment SCU by sending the N-ACTION request and the response for the Storage commitment received through N-EVENT-REPORT.

If SMB Plus is directed to query and retrieve Image data from a remote Storage Server it acts as a Query / Retrieve SCU and sends a C-FIND to remote Storage Server.

If SMB Plus retrieves one or more C-FIND responses (for the Query / Retrieve request) from the Storage Server then SMB sends one or more C-MOVE request to remote Storage Server to retrieve the found data. In response to a C_MOVE request for image data, the SMB accepts an association request to store the image and acts for this as a Storage SCP.

If SMB Plus is directed to print the image data it will create the print session and film box using the N-CREATE request and image is set to this film box using the N-SET request. To print this film box, N-ACTION request is send and after completing the printing it will delete the session using N-DELETE request.

2.3 Sequencing of Real World Activities

Real world activities are sequenced as required to meet the definition of the Service Classes.

No additional sequencing activity is needed.

3 AE Specifications

3.1 AE Specifications for the DICOM

SMB provides Standard Conformance to the following DICOM V3.0 **Verification** SOP Class as an **SCU**

Table 2: Verification SOP Class

SOP Class	SOP Class UID
Verification SOP Class	1.2.840.1.1

SMB provides Standard Conformance to the following DICOM V3.0 **Modality Worklist** SOP Class as an **SCU**

Table 3: Modality Worklist SOP Class

SOP Class	SOP Class UID
Modality Worklist Information Model - Find	1.2.840.10008.5.1.4.31

SMB provides Standard Conformance to the following DICOM V3.0 **Storage** SOP Class as an **SCU**

Table 4: Storage SOP Classes

SOP Class	SOP Class UID
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Xray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
Xray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Xray Angiographic Bi-Plane Image Storage	1.2.840.10008.5.1.4.1.1.12.3
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
Positron Emission Tomographic Image Storage	1.2.840.10008.5.1.4.1.1.128
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1

SMB provides Standard Conformance to the following DICOM V3.0 **Query / Retrieve** SOP Class as an **SCU**

Table 5: Query / Retrieve SOP Classes

SOP Class	SOP Class UID
Study Root Query/Retrieve Information Model FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model MOVE	1.2.840.10008.5.1.4.1.2.2.2
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7

SMB provides Standard Conformance to the following DICOM V3.0 **Modality Performed Procedure Step** SOP Class as an **SCU**

Table 6 MPPS Service Class

SOP Class	SOP Class UID
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3

SMB provides Standard Conformance to the following DICOM V3.0 **Storage Commitment** SOP Class as an **SCU**

Table 7 Storage commitment SOP class

SOP Class	SOP Class UID
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1

SMB provides Standard Conformance to the following DICOM V3.0 **Basic Print Management** SOP Class as an **SCU**

Table 8 Print SOP classes

SOP Class	SOP Class UID
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1

3.2 Association Establishment Policies

3.2.1 General

The StorM-Base DICOM application contains no limitations on maximum PDC size.

3.2.2 Number of Associations

The StorM-Base DICOM application supports only a single (none simultaneous) association establishment for association initiation and association acceptance.

3.2.3 Asynchronous Nature

The StorM-Base DICOM application does not support asynchronous communication.

The StorM-Base DICOM application allows single outstanding operation on any association.

3.2.4 Implementation Identifying Information

The StorM-Base application will respond with the following implementation identifying parameters:

- Implementation Class UID: **1.2.826.0.1.3680043.2.500.1**
- Implementation Version Name: **SMBPLUS_10**

3.3 Association Initiation by Real World Activity

The StorM-Base application initiates requests based upon real-world activities for the Verification, Modality Worklist, Query / Retrieve and Storage Service.

3.3.1 Real World Activity – Verification

3.3.1.1 Associated Real World Activity – Verification

The StorM-Base application uses the Verification Service Class to test communication with a remote system.

3.3.1.2 Presentation Context – Verification

The StorM-Base application supports the transfer syntaxes listed in Table 9.

It will accept any of the presentation Contexts listed in Table 1010 for **Verification**.

Table 9 Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.1008.1.2

Table 10 Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Verification	1.2.840.10008.1.1	All from Table 9	SCU	None

3.3.2 Real World Activity – Modality Worklist Request

3.3.2.1 Associated Real World Activity – Modality Worklist Request

The StorM-Base application initiates association to remote DICOM Modality Worklist Service if the user clicks on button Worklist in Patient Dialog to retrieve Worklist informations.

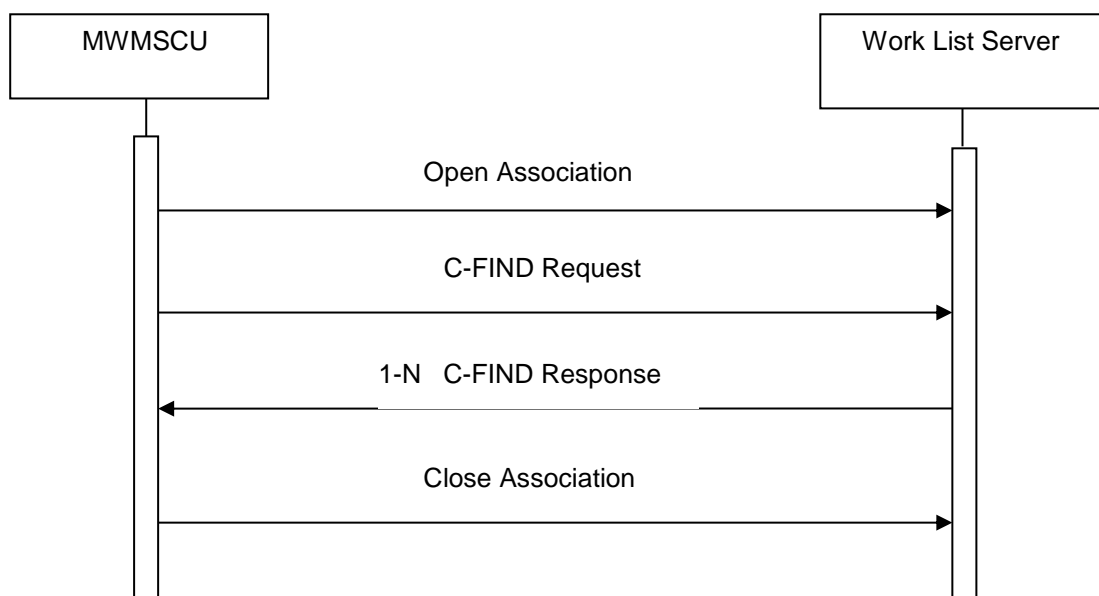


Figure 2 Sequence for Modality Worklist Management

3.3.2.2 Presentation Context – Modality Worklist Request

The StorM-Base application supports the transfer syntaxes listed in Table 11.

It will accept any of the presentation Contexts listed in Table 12 for **Modality Worklist Request**.

Table 11 Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.1008.1.2

Table 12 Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Modality Worklist Information Model - Find	1.2.840.10008.5.1.4.31	All from Table 11	SCU	None

3.3.2.3 SOP Specific Conformance – Modality Worklist Management

The StorM-Base Modality Worklist uses the matching key types listed in Table 13:

Table 13 Matching Key Types

Matching Key Types	
SV	single value match
WC	wild card match
SQ	sequence match
DR	data range match

The StorM-Base Modality Worklist – FIND supports the matching key attributes listed in Table 14:

Table 14 Matching Key Attributes

Attribute Name	Tag	Match Key Type
Scheduled Procedure Step Sequence	0040,0100	SQ
>Scheduled Station AE Title	0040,0001	SV
>Scheduled Procedure Step Start Date	0040,0002	DR
>Modality	0008,0060	SV

The StorM-Base Modality Worklist – FIND supports the return key attributes listed in Table 15:

(The following DICOM Tags are read from the Worklist Provider’s response message)

Table 15 Return Key Attributes

Module	Attribute Name	Tag	Ret.Key	Supported
SOP Common	Specific Character Set	0008,0005	1C	No
Scheduled Procedure Step	Scheduled Procedure Step Sequence	0040,0100	1	Yes
	>Scheduled Station AE Title	0040,0001	1	Yes
	>Scheduled Procedure Step Start Date	0040,0002	1	Yes
	>Scheduled Procedure Step Start Time	0040,0003	1	Yes
	>Modality	0008,0060	1	Yes
	>Scheduled Performing Physician’s Name	0040,0006	2	No
	>Scheduled Procedure Step Description	0040,0007	1C	No
	>Scheduled Station Name	0040,0010	2	No
	>Scheduled Procedure Step Location	0040,0011	2	No
	>Pre-Medication	0040,0012	2C	No
>Scheduled Procedure Step ID	0040,0009	1	Yes	

	>Requested Contrast Agent	0032,1070	2C	No
Requested Procedure	Requested Procedure ID	0040,1001	1	Yes
	Requested Procedure Description	0032,1060	1C	No
	Study Instance UID	0020,000D	1	Yes
	Referenced Study Sequence	0008,1110	2	No
	> Referenced SOP Class UID	0008,1150	1C	No
	> Referenced SOP Inst. UID	0008,1155	1C	No
	Requested Procedure Priority	0040,1003	2	No
	Pat. Transport Arrangements	0040,1004	2	No
Imaging Service Request	Accession Number	0008,0050	2	Yes
	Requesting Physician	0032,1032	2	No
	Referring Physician's Name	0008,0090	2	No
Visit Identification	Admission ID	0038,0010	2	No
Visit Status	Current Patient Location	0038,0300	2	No
Visit Relationship	Referenced Patient Sequence	0008,1120	2	No
	>Referenced SOP Class UID	0008,1150	2	No
	>Referenced SOP Inst.	0008,1155	2	No
Pat. Identification	Patient Name	0010,0010	1	Yes
	Patient ID	0010,0020	1	Yes
Patient Demographic	Patient Birth Date	0010,0030	2	Yes
	Patient Sex	0010,0040	2	Yes
	Patient Weight	0010,1030	2	No
	Patient Address	0010,1040	3	Yes ⁽¹⁾
	Confidentially constraint on patient data	0040,3001	2	No
Patient Medical	Patient State	0038,0500	2	No
	Pregnancy Status	0010,21C0	2	No
	Medical Alerts	0010,2000	2	No
	Contrast Allergies	0010,2110	2	No
	Special Needs	0038,0050	2	No
General Study	Study Description	0008,1030	3	Yes
	Study Date	0008,0020	2	Yes

Note:

- (1) Format is HL7 conform:
 <street address (ST)> ^ <other designation (ST)> ^ <city (ST)> ^ <state or province (ST)> ^ <zip or postal code(ST)> ^ <country (ID)> ^ < address type (ID)> ^ <other geographic designation (ST)> ^ <county/parish code (IS)> ^ <census tract (IS)>

3.3.3 Real World Activity – Storage

3.3.3.1 Associated Real World Activity – Storage

The StorM-Base application initiates association for the transfer of images to remote DICOM Storage Service.

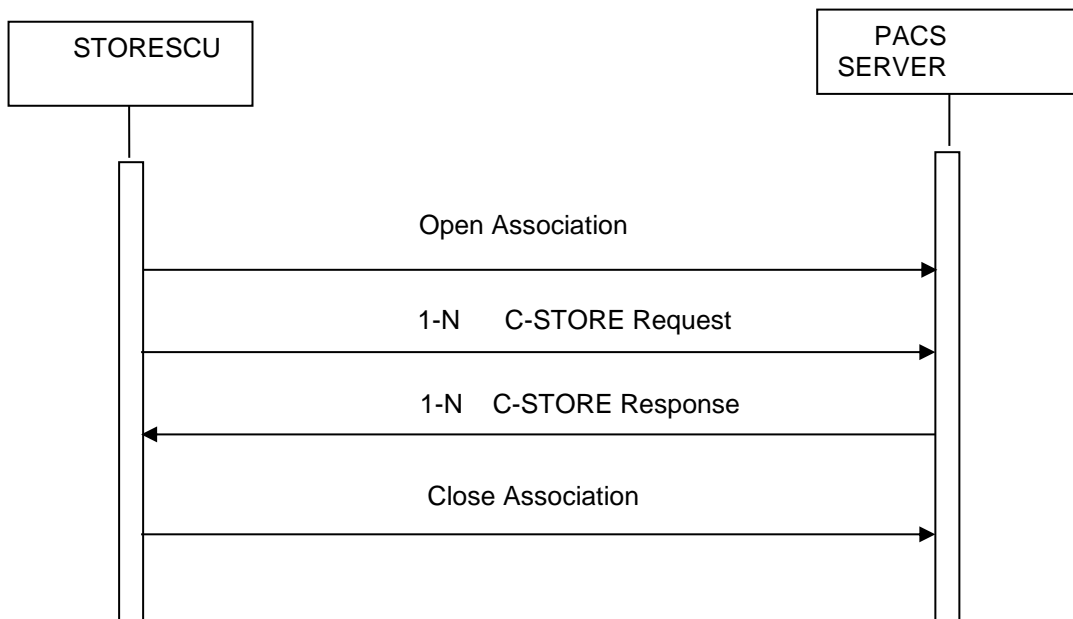


Figure 3 Sequence for Storage

3.3.3.2 Presentation Context – Storage

The StorM-Base application supports the transfer syntaxes listed in Table 16 and Table 17.

It will accept any of the presentation Contexts listed in Table 18 for **Storage**.

Table 16 Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.1008.1.2

Table 17 Compressed Syntaxes

Transfer Syntax	UID
JPEG Losless	1.2.840.1008.1.2.4.70
JPEG Baseline	1.2.840.1008.1.2.4.50
RLE Losless	1.2.840.1008.1.2.5

Table 18 Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	All from Table 16 and Table 17	SCU	None

Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	All from Table 16 and Table 17	SCU	None
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3.3.3.3 SOP Specific Conformance –Storage – Secondary Capture Image Storage

The StorM-Base application supports the modules listed in Table 19:

(Note: these are all mandatory modules, all not mandatory modules are not supported.)

Table 19 Modules

IE	Module	Reference (see 1.2)	Usage
Patient	Patient	C.7.1.1	M
Study	General Study	C.7.2.1	M
Series	General Series	C.7.3.1	M
Equipment	SC Equipment	C.8.6.1	M
	General Equipment	C.7.5.1	U
Image	General Image	C.7.6.1	M
	Image Pixel	C.7.6.3	M
	SC Image	C.8.6.2	M
	SOP Common	C.12.1	M

The StorM-Base application supports the attributes as listed in Table 20:

Table 20 Attributes

Module	Attribute Name	Tag	Type	Supported
Patient	Patient's Name	0010,0010	2	Yes
	Patient ID	0010,0020	2	Yes
	Patient's Birth Date	0010,0030	2	Yes
	Patient's Sex	0010,0040	2	Yes
General Study	Study Instance UID	0020,000D	1	Yes
	Study Date	0008,0020	2	Yes
	Study Time	0008,0030	2	Yes
	Referring Physician's Name	0008,0090	2	Yes
	Study ID	0020,0010	2	Yes
	Accession Number	0008,0050	2	Yes
	Study Description	0008,1030	3	Yes
General Series	Series Instance UID	0020,000E	1	Yes
	Series Number	0020,0011	2	Yes
	Request Attributes Sequence	0040,0275	3	Yes
	>Requested Procedure ID	0040,1001	1C	Yes
	>Scheduled Procedure Step ID	0040,0009	1C	Yes
	>Scheduled Procedure Step Description	0040,0008	3	Yes
	Performed Procedure Step Start Date	0040,0244	3	Yes
	Performed Procedure Step Start Time	0040,0245	3	Yes
	Performed Procedure Step Description	0040,0254	3	Yes
Operators' Name	0008,1070	3	Yes	

SC Equipment	Conversion Type	0008,0064	1	Yes
	Modality	0008,0060	3	Yes
General Equipment	Manufacturer	0008,0070	2	Yes
	Institution Name	0008,0080	3	Yes
	Institution Address	0008,0081	3	Yes
	Station Name	0008,1010	3	Yes
	Institutional Department Name	0008,1040	3	Yes
	Manufacturer's Model Name	0008,1090	3	Yes
	Software Versions	0018,1020	3	Yes
General Image	Instance Number	0020,0013	2	Yes
	Patient Orientation	0020,0020	2C	Yes
	Content Date	0008,0023	2C	Yes
	Content Time	0008,0033	2C	Yes
	Acquisition Date	0008,0022	3	Yes
	Acquisition Time	0008,0032	3	Yes
Image Pixel	Samples per Pixel	0028,0002	1	Yes
	Photometric Interpretation	0028,0004	1	Yes
	Rows	0028,0010	1	Yes
	Columns	0028,0011	1	Yes
	Bits Allocated	0028,0100	1	Yes
	Bits Stored	0028,0101	1	Yes
	High Bit	0028,0102	1	Yes
	Pixel Representation	0028,0103	1	Yes
	Pixel Data	7FE0,0010	1C	Yes
	Red Palette Color Lookup Table Descriptor	0028,1101	1C	Yes
	Green Palette Color Lookup Table Descriptor	0028,1102	1C	Yes
	Blue Palette Color Lookup Table Descriptor	0028,1103	1C	Yes
	Red Palette Color Lookup Table Data	0028,1201	1C	Yes
	Green Palette Color Lookup Table Data	0028,1202	1C	Yes
Blue Palette Color Lookup Table Data	0028,1203	1C	Yes	
SC Image	Date of Secondary Capture	0018,1012	3	No
	Time of Secondary Capture	0018,1014	3	No
	Nominal Scanned Pixel Spacing	0018,2010	3	No
SOP Common	SOP Class UID	0008,0016	1	Yes
	SOP Instance UID	0008,0018	1	Yes

3.3.4 Real World Activity – Query / Retrieve

3.3.4.1 Real World Activity –Find

3.3.4.1.1 Associated Real World Activity – FIND

The StorM-Base will query the SCP (typically a PACS) to get the Study UID associated with the accession number provided by the RIS. This is done in preparation for a C-Move request as described in section 3.3.4.2.

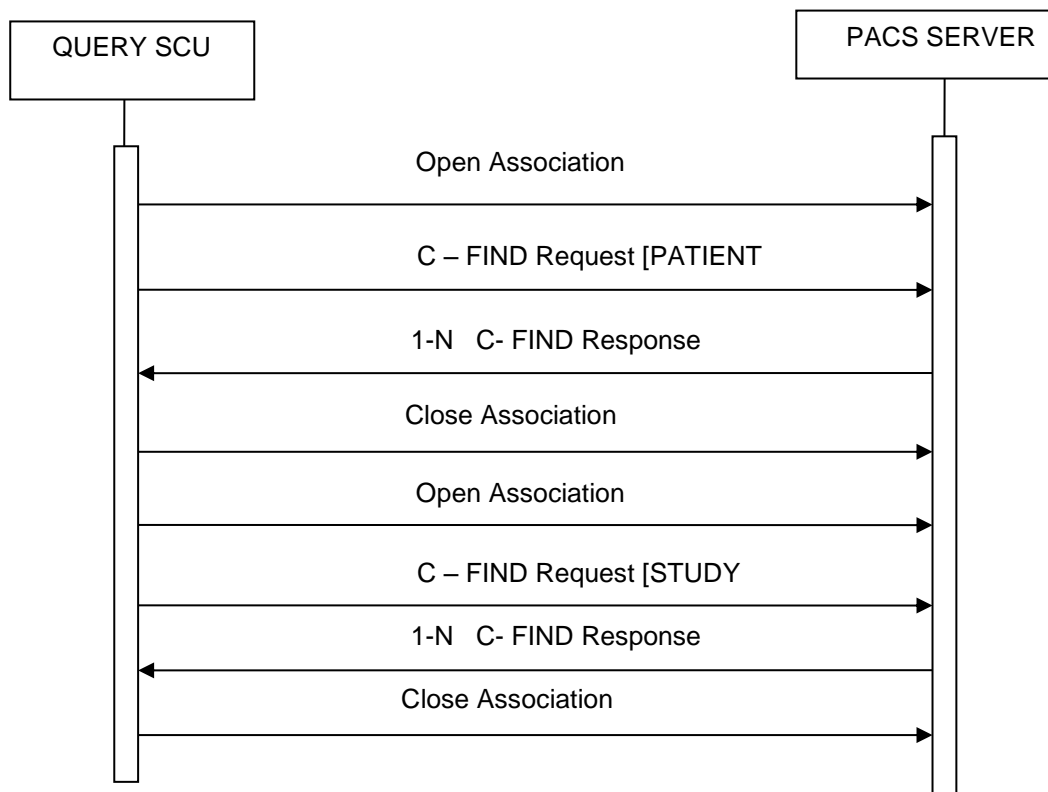


Figure 4 Sequence for Query

3.3.4.1.2 Presentation Context – FIND

The StorM-Base application supports the transfer syntaxes listed in Table 21.

It will accept any of the presentation Contexts listed in Table 22 for **Query / Retrieve - FIND**.

Table 21 Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.1008.1.2

Table 22 Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Study Root Query/Retrieve Information Model FIND	1.2.840.10008.5.1.4.1.2.2.1	All from Table 21	SCU	None

3.3.4.1.3 SOP Specific Conformance –FIND

SOP Classes of the **Query / Retrieve** Service Class are implemented via the DIMSE **C-FIND** and **C-MOVE** services as defined in Part 7 of the DICOM Standard.

The StorM-Base application will include the following key attributes in its C-FIND request issued to the PACS:

Table 23 C-FIND Key Attributes

Attribute Name	Study Level	Series Level	Image Level
Patient ID	Specify	Specify	Specify
Study Instance UID	Empty	Specify	Specify
Series Instance UID	Empty	Empty	Specify
Study ID	Empty	NA	NA
Study Date	Empty	NA	NA
Study Time	Empty	NA	NA
Modality	Empty	NA	NA
Series Date	NA	Empty	NA
Series Time	NA	Empty	NA
Series Description	NA	Empty	NA

3.3.4.2 Real World Activity –Move

3.3.4.2.1 Associated Real World Activity – Move

StorM-Base will request the SCP (typically a PACS) move the study associated with the Study Instance UID provided by the C_FIND (section 3.3.4.1) to the StorM-Base host.

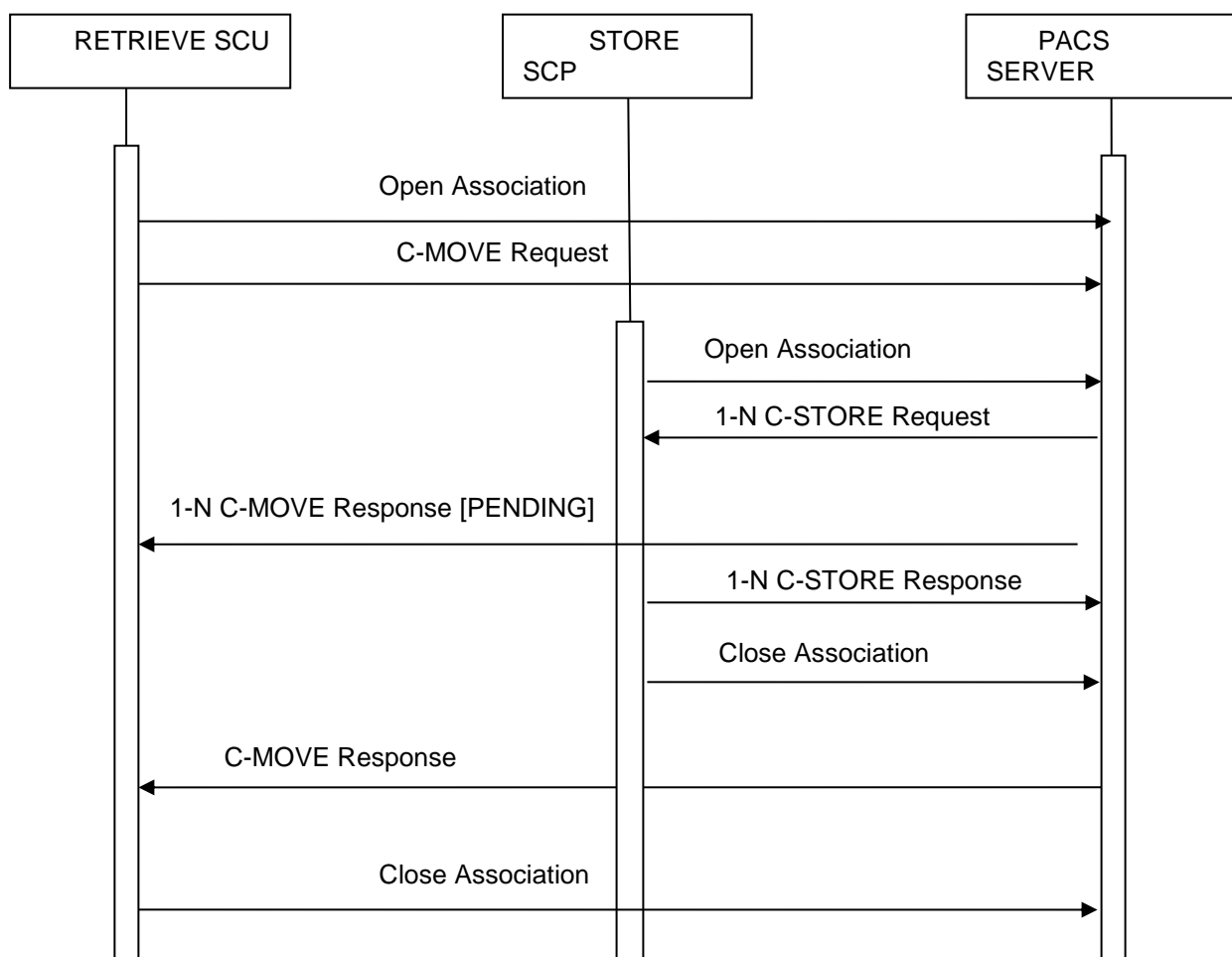


Figure 5 Sequence for Retrieve

The StorM-Base application supports the transfer syntaxes listed in Table 24.

It will accept any of the presentation Contexts listed in Table 25 for **Query / Retrieve - MOVE**.

Table 24 Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.1008.1.2

Table 25 Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Study Root Query/Retrieve Information Model MOVE	1.2.840.10008.5.1.4.1.2.2.2	All from Table 24	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	All from Table 24	SCU	None
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	All from Table 24	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	All from Table 24	SCU	None

3.3.4.2.3 SOP Specific Conformance –Move
 SOP Classes of the **Query / Retrieve** Service Class are implemented via the DIMSE **C-FIND** and **C-MOVE** services as defined in Part 7 of the DICOM Standard.

3.3.5 Real World Activity – MPPS

3.3.5.1 Real World Activity – MPPS

3.3.5.1.1 Associated Real World Activity – MPPS

StorM-Base will request the SCP (typically a RIS Server) to create and set the instance status which is received through the Modality Worklist. N-CREATE and N-SET DIMSE services will be used for this purpose.

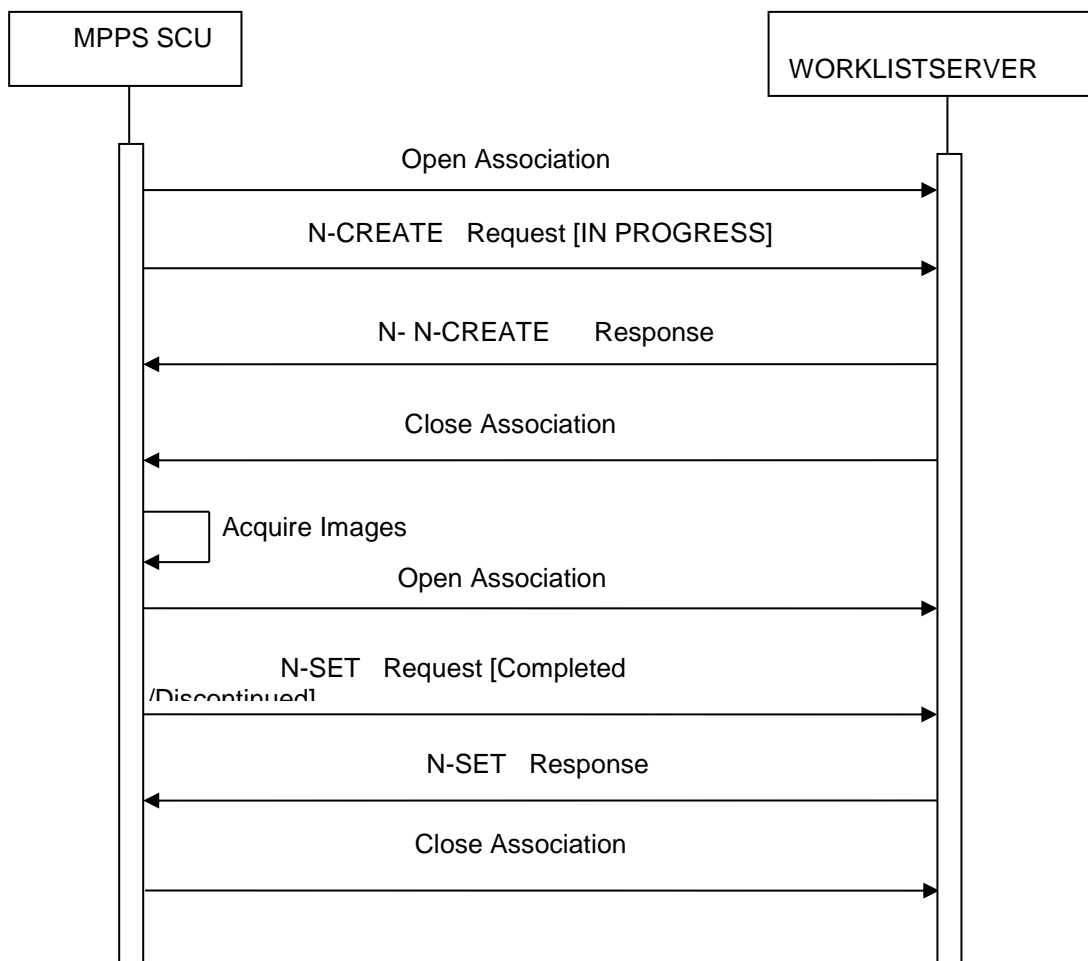


Figure 6 Sequence for Modality Performed Procedure Step

3.3.5.1.2 Presentation Context – MPPS

The StorM-Base application supports the transfer syntaxes listed in Table 24.

It will accept any of the presentation Contexts listed in Table 25 for **MPPS**.

Table 26 Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.1008.1.2

Table 27 Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	All from Table 26	SCU	None

3.3.5.1.3 SOP Specific Conformance – MPPS

SOP Classes of the **MPPS** Service Class are implemented via the DIMSE **N-CREATE** and **N-SET** services as defined in Part 7 of the DICOM Standard

Table 28 Modules

Module	Reference (see 1.2)
SOP Common	C.12.1
Performed Procedure Step Relationship	C.4.13
Performed Procedure Step Information	C.4.14
Image Acquisition Results	C.4.15
Radiation Dose	C.4.16

The StorM-Base application supports the attributes as listed in Table 29:

Table 29 Attributes

Module	Attribute Name	Tag	Type	Supported	
				N-CREATE	N-SET
SOP Common	SOP Class UID	0008,0016	1	Yes	-
	SOP Instance UID	0008,0018	1	Yes	-
	Specific Character Set	0008,0005	1C	Yes	-
Performed Procedure Step Relationship	Scheduled Step Attribute Sequence	0040,0270	1	Yes	-
	>Study Instance UID	0020,000D	1	Yes	-
	>Accession Number	0008,0050	2	Yes	-
	Patient's Name	0010,0010	2	Yes	-
	Patient ID	0010,0020	2	Yes	-
	Patient's Birth Date	0010,0030	2	Yes	-
	Patient's Sex	0010,0040	2	Yes	-
	Referenced Patient Sequence	0008,1120	2	Yes	-
	>Referenced SOP Class UID	0008,1150	1	Yes	-
>Referenced Instance UID	0008,1155	1	Yes	-	
Performed Procedure Step Information	Performed Procedure Step ID	0040,0253	1	Yes	-
	Performed Station AE Title	0040,0241	1	Yes	-
	Performed Station Name	0040,0242	2	Yes	-
	Performed Location	0040,0243	2	No	-
	Performed Procedure Step Start Date	0040,0244	1	Yes	-
	Performed Procedure Step Start Time	0040,0245	1	Yes	-
	Performed Procedure Step Status	0040,0252	1	Yes	Yes
	Performed Procedure Step Description	0040,0254	2	No	No
	Performed Procedure Type Description	0040,0255	2	Yes	No
	Procedure Code Sequence	0008,1032	2	No	No
	Performed Procedure Step End Date	0040,0250	2	No	Yes
	Performed Procedure Step End Time	0040,0251	2	No	Yes
Image Acquisition Results	Modality	0008,0060	1	Yes	-
	Study ID	0020,0010	2	Yes	-
	Performed Protocol Code Sequence	0040,0260	2	No	-
	Performed Series Sequence	0040,0340	2	No	Yes

	>Performing Physician's Name	0008,1050	2	No	Yes
	>Protocol Name	0018,1030	1	No	Yes
	>Operators' Name	0008,1070	2	No	Yes
	>Series Instance UID	0020,000E	1	No	Yes
	>Series Description	0008,103E	2	No	No
	>Retrieve AE Title	0008,0054	2	No	No
	>Referenced Image Sequence	0008,1140	2	No	Yes
	>>Referenced SOP Class UID	0008,1150	1	No	Yes
	>>Referenced SOP Instance UID	0008,1155	1	No	Yes
Radiation Dose	Total Time of Fluoroscopy	0040,0300	3	No	Yes
	Total Number of Exposures	0040,0301	3	No	Yes
	Image and Fluoroscopy Area Dose Product	0018,115E	3	No	Yes
	Exposure Dose Sequence	0040,030E	3	No	Yes
	>Radiation Mode	0018,115A	3	No	No
	>KVp	0018,0060	3	No	Yes
	>X-Ray Tube Current in μ A	0018,8151	3	No	No
	>Exposure Time	0018,1150	3	No	Yes

3.3.6 Real World Activity – Storage Commitment

3.3.6.1 Real World Activity – Storage Commitment

3.3.6.1.1 Associated Real World Activity – Storage Commitment

StorM-Base will request the SCP (Storage Server) to initiate the Storage Commitment procedure for the image instance UID stored in the Storage. N-ACTION service will be used for this.

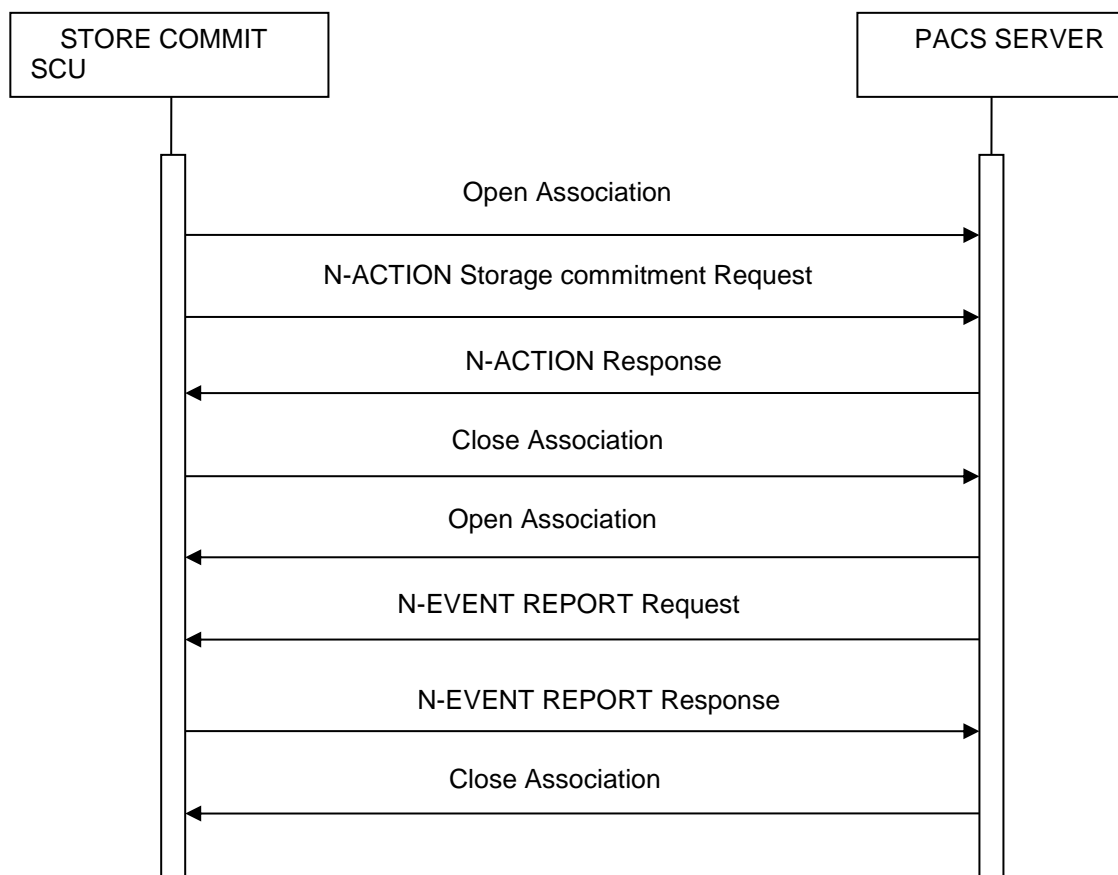


Figure 7 Sequence for Storage commitment

3.3.6.1.2 Presentation Context – Storage Commitment

The StorM-Base application supports the transfer syntaxes listed in Table 24.

It will accept any of the presentation Contexts listed in Table 25 for **Storage Commitment**.

Table 30 Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.1008.1.2

Table 31 Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	All from Table 28	SCU	None

3.3.6.1.3 SOP Specific Conformance – Storage Commitment

SOP Classes of the **Storage commitment** Service Class are implemented via the DIMSE **N-ACTION** and **N-EVENT-REPORT** services as defined in Part 7 of the DICOM Standard

3.3.7 Real World Activity – Print

3.3.7.1 Real World Activity – Print

3.3.7.1.1 Associated Real World Activity – Print

StorM-Base will request the SCP (Print Server) to initiate the Storage Commitment procedure for the image instance UID stored in the Storage. N-CREATE (Film Session and Film box), N-SET (Image box), N-ACTION (print), N-DELETE (remove session) services will be used for this.

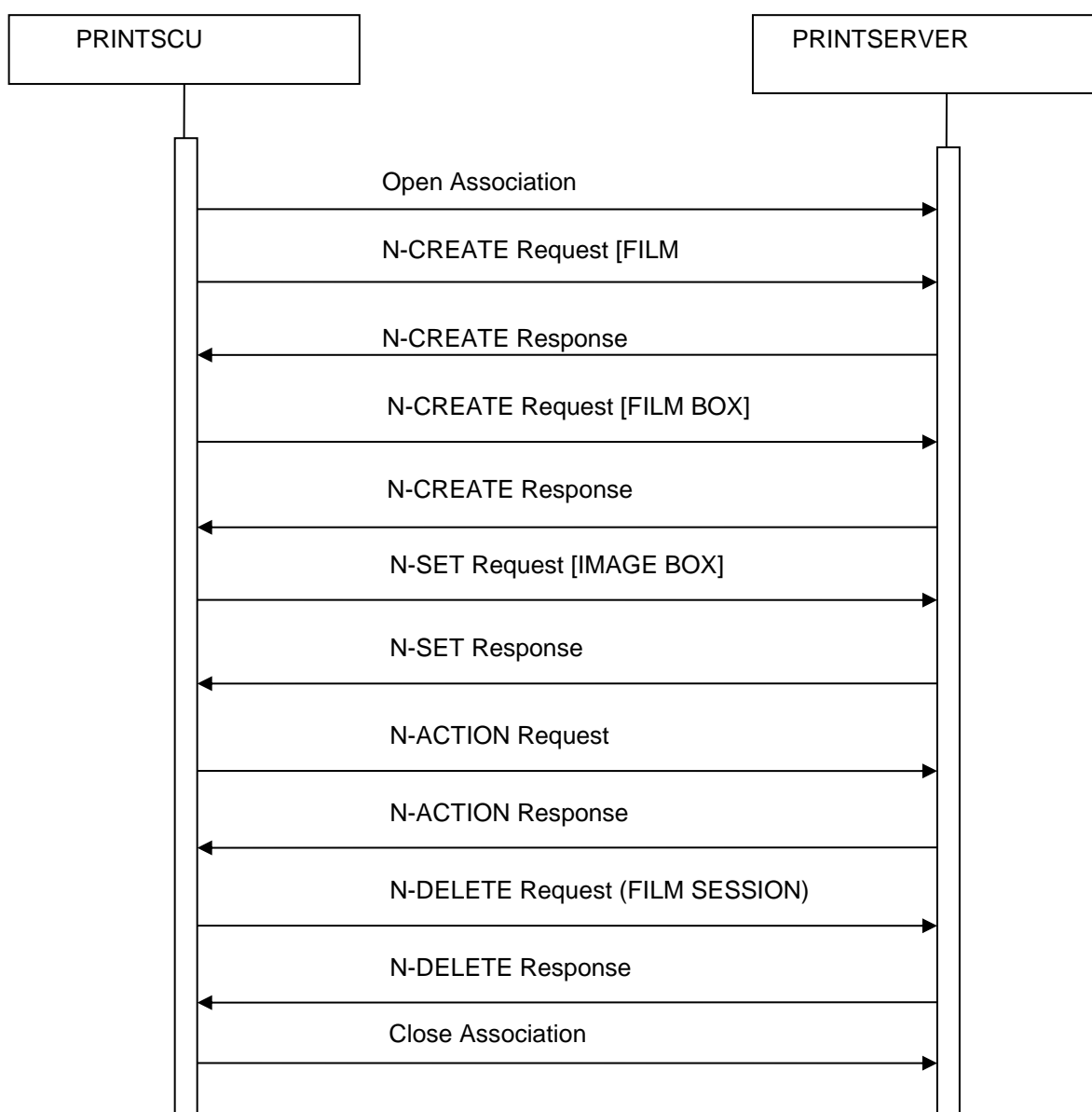


Figure 8 Sequence for Print

3.3.7.1.2 Presentation Context – Print

The StorM-Base application supports the transfer syntaxes listed in Table 24.

It will accept any of the presentation Contexts listed in Table 25 for **Storage Commitment**.

Table 32 Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.1008.1.2

Table 33 Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Basic Film Session	1.2.840.10008.5.1.1.1	All from Table 30	SCU	None
Basic Film Box	1.2.840.10008.5.1.1.2	All from Table 30	SCU	None
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	All from Table 30	SCU	None
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	All from Table 30	SCU	None

3.3.7.1.3 SOP Specific Conformance – Print

SOP Classes of the **Print** Service Class are implemented via the DIMSE **N-CREATE**, **N-SET** and **N-ACTION** and **N-DELETE** services as defined in Part 7 of the DICOM Standard

3.4 Association Acceptance Policy

The StorM-Base application accepts an association request for DICOM Storage in response to a C-MOVE request (Query / Retrieve SCU) and DICOM Storage commitment(N-EVENT-REPORT) in response to N-ACTION request(Storage commitment).

4 Communications Profiles

4.1 Supported Communication Stacks

The StorM-Base application interface provides DICOM V3.0 TCP/IP Network Communication support as defined in Part 8 of the DICOM Standard.

4.2 TCP/IP Stack

The StorM-Base application inherits its TCP/IP stack from the computer system upon which it executes.

4.3 Physical Medium Supported

The StorM-Base application is indifferent to the physical medium over which TCP/IP executes; it inherits the medium from the computer system upon which it executes.

5 Extensions / Specializations

5.1 Standard Extended / Specialized / Private SOPs

None supported.

5.2 Private Transfer Syntaxes

None supported.

6 Configuration

The configuration can be changed by the StorM-Base application - Option Dialog.

6.1 DICOM General configuration

The following setting can be changed:

SI No	Setting	Description	Required for
1	Calling AET	AE title of the calling SCP	Storage SCP AET for Retrieve operation
2	SCU AET	AE title of the local SCU	Storage Commit AET
3	Local port	Local port where the local SCP listen	Storage SCP local port for Retrieve operation
4	Modality	Modality of the system	For MWM operation
5	Station Name	Station name of the system	For MWM operation
6	Host Name	Host name of the system	For Storage SCP

6.2 DICOM Worklist/MPPPS configuration

The following setting can be changed:

SI No	Setting	Description
1	DICOM work list server	Name of the work list server
2	Host	Host name of the work list server
3	Server AET	AET of the calling SCP
4	Port	Port number of the SCP
5	Enable MPPS support	Flag for enabling MPPS support

6.3 DICOM Storage/Commitment configuration

SI No	Setting	Description
1	PACS	Name of the PACS server
2	SCP Server	Server name of the Storage SCP
3	SCP AET	AE title of the Storage SCP
4	SCP Port	Port number of Storage SCP
5	Deletion of local DICOM images	No.of days to delete the local images after the

	storage commitment have been received.
--	--

6.4 DICOM Query / Retrieve configuration

Please refer section 6.3

Note: It is not possible to use / configure different hosts for Storage Service and Query / Retrieve Service.

6.5 DICOM Print configuration

SI No	Setting	Description
1	Name	Logical name of the DICOM printer
2	Host name	Host name where the printer installed
3	Port	Port number of printer SCP
4	Called AET	AE title of the DICOM printer

7 Support for Extended Character Sets

7.1 DICOM Worklist SCU

Does not support any extended character set.

7.2 DICOM Storage SCU

Does not support any extended character set.

7.3 DICOM Query / Retrieve SCU

Does not support any extended character set.

8 Annex A Configuration StorM-Base

8.1 SMB Plus Option Dialog - General

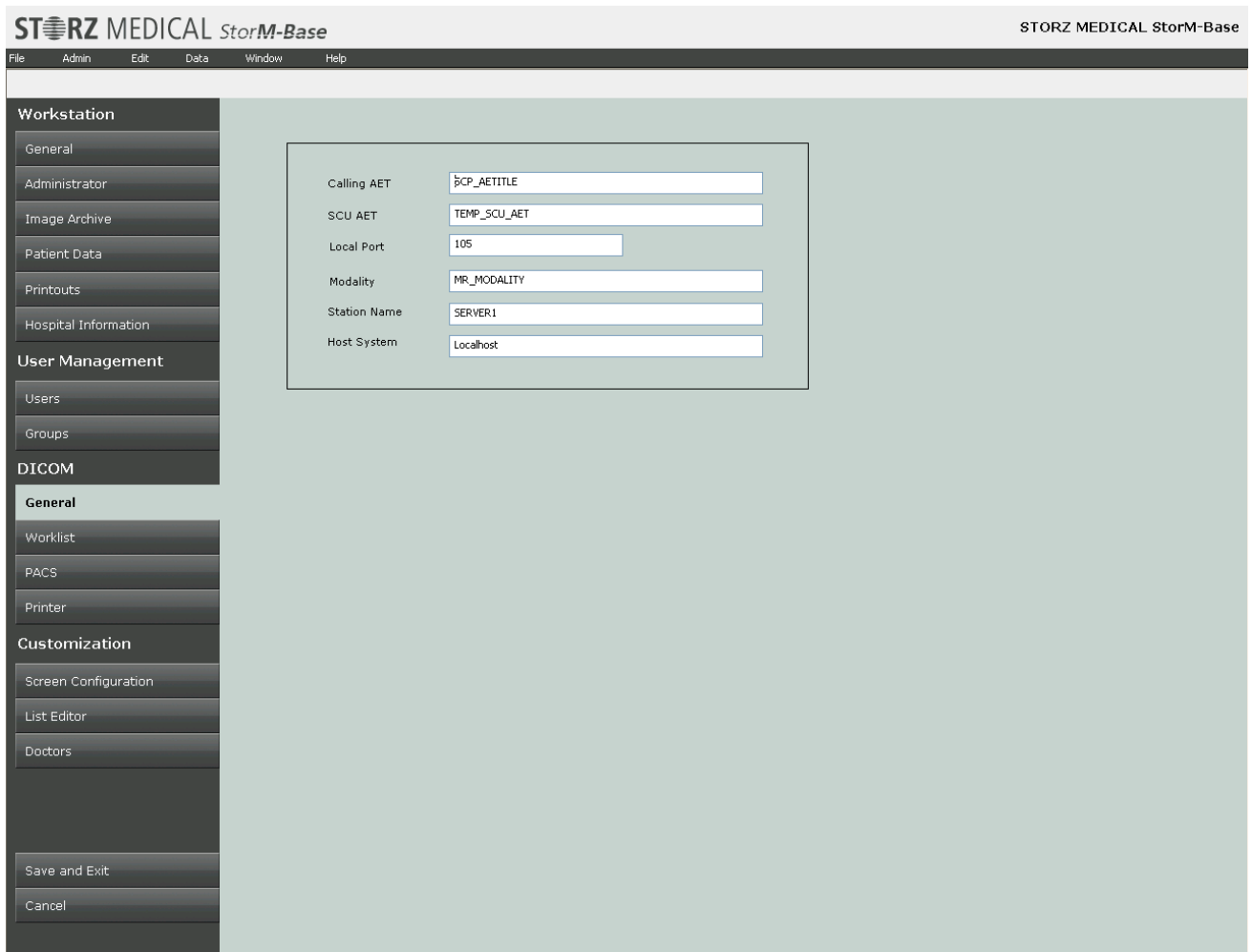


Figure 9 SMB Plus Option Dialog - General

8.2 SMB Plus Option Dialog - Worklist

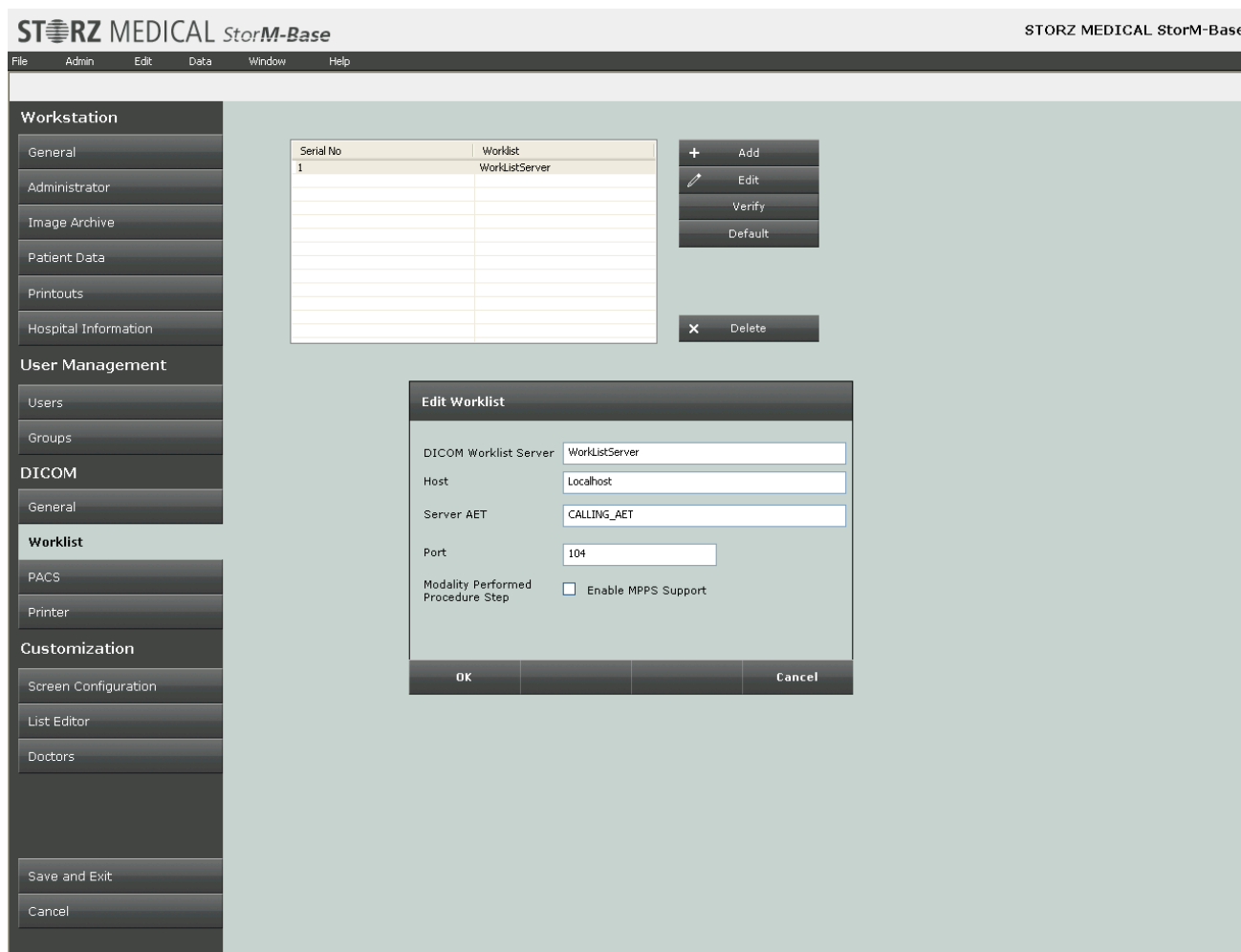


Figure 10 SMB Plus Option Dialog - Worklist

8.3 SMB Plus Option Dialog - PACS

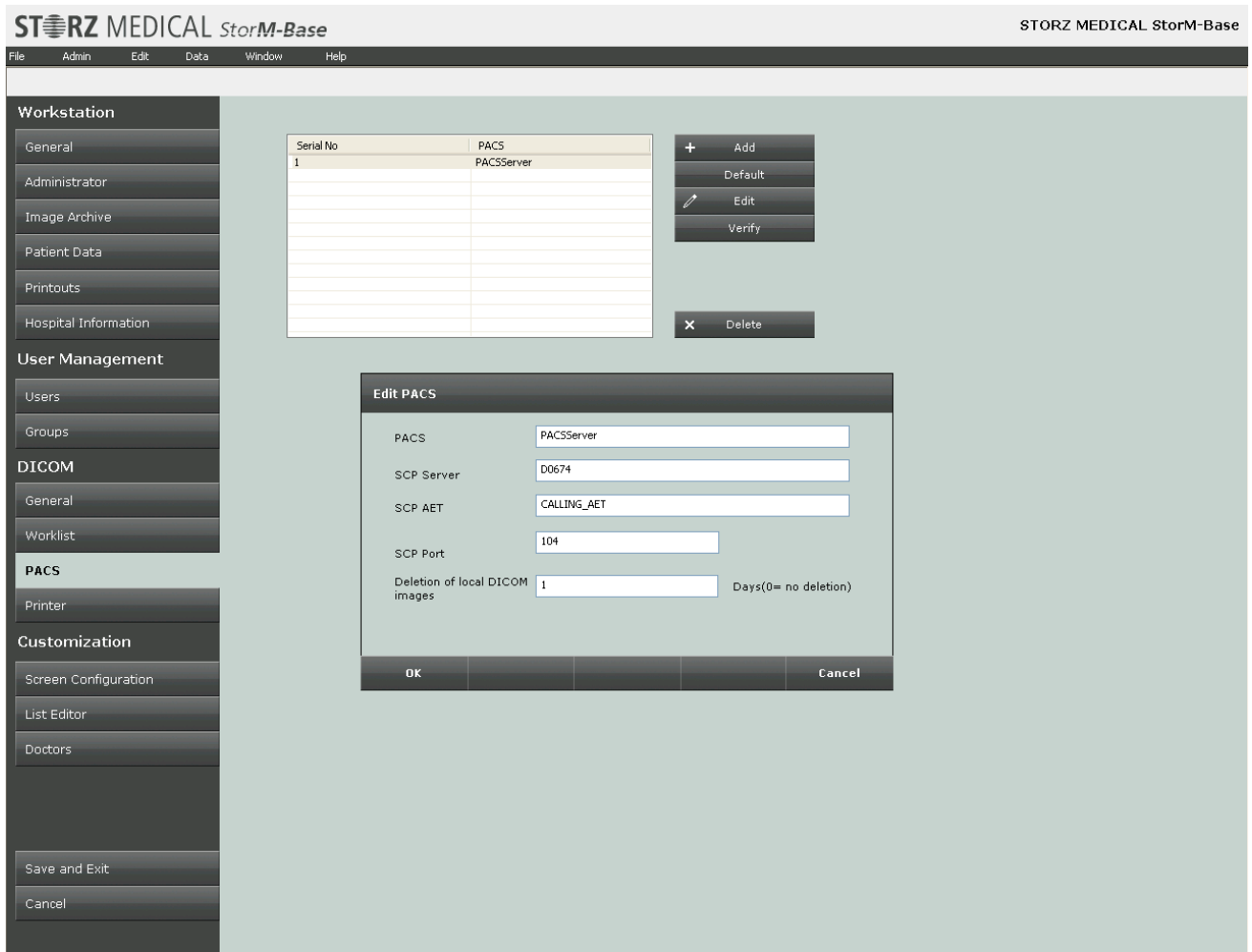


Figure 11 SMB Plus Option Dialog - PACS

8.4 SMB Plus Option Dialog – Printer

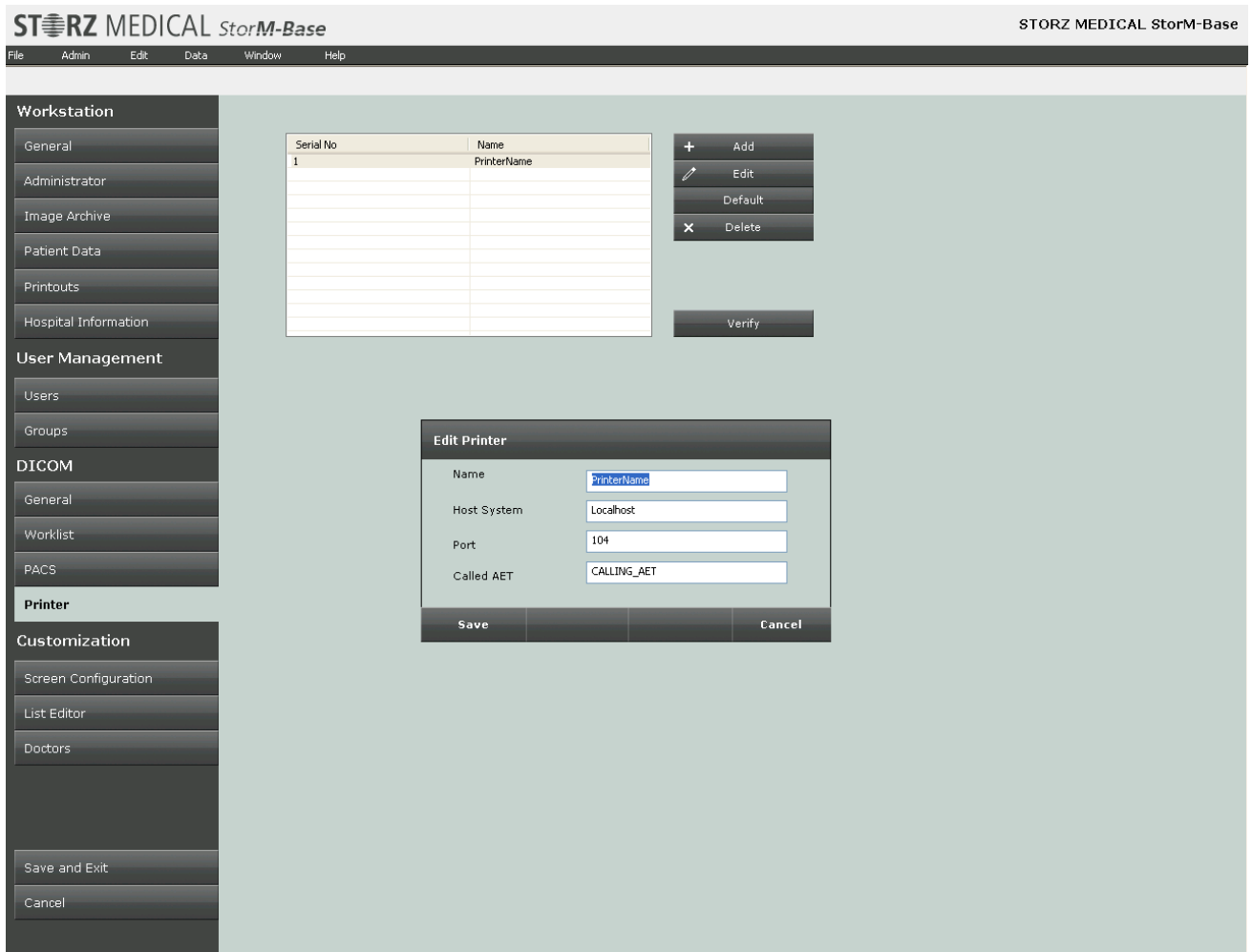


Figure 12 SMB Plus Option Dialog - Printer

8.5 Entry for work list:

The 'WorkList' dialog box has a title bar with the text 'WorkList'. Below the title bar, there are four input fields: 'Date' with the value '4/30/2012', 'Time' with the value '12:50:32 PM', 'Modality', and 'Station'. Each field has a small downward arrow on its right side. At the bottom of the dialog, there are two buttons: 'Cancel' on the left and 'OK' on the right.

Figure 13 Entry for worklist

8.6 Entry for DICOM Print:

The 'Printer' dialog box has a title bar with the text 'Printer'. Below the title bar, there are two radio buttons: 'Dicom' (which is selected) and 'System'. Below the radio buttons is a dropdown menu for selecting a printer. Underneath is a section titled 'Settings' with several fields: 'Copies' (a text input field), 'Priority' (a dropdown menu), 'Medium Type' (a dropdown menu), 'Destination' (a dropdown menu), 'Display Format' (a dropdown menu), and 'Orientation' (a dropdown menu). At the bottom of the dialog, there are three buttons: 'Cancel', 'Preview', and 'OK'.

Figure 14 Entry for DICOM print

8.7 Configuration XML

Following value in SMBPlusGeneralConfig.xml shall be configured for Storage Commitment SCP Port.

DICOM\StoreCommitSCPPort

9 Annex B Generated UID

9.1 Instance UID Formats

9.1.1 Study Instance UID

Study Instance UID is a number that shall be used to identify a case uniquely. StorM-Base shall generate the study instance number in the following format.

1.2.826.0.1.3680043.2.500.1xxxx.1yyyyyyyyyy

- xxxx: is a unique series number generated by the StorM-Base application. **Note:** A possibility to receive this unique number is to use a part of licence key for the application, which is needed to use the StorM-Base application.
- yyyyyyyyyy: is examination number which is a serial number, generated by StorM-Base. This number shall not be repeated for different patients.

Attention: In case of using **Worklist** information, the StudyInstanceUID is used by the received Worklist entry. Based on the received StudyInstanceUID, the SeriesInstanceUID and ImageInstanceUID will be generated.

Be cautioned that the StudyInstanceUID received by the Worklist entry **cannot be longer than 60 digits!** Otherwise it is not possible to generate the following UIDs for Series and Images within the maximum length of 64 digits defined by the DICOM standard.

Refer DICOM Standard 3.0 Part 5 Section 9 and Annex C.

9.1.2 Series Instance UID

In Series Instance UID is a number that shall be used to identify an treatment uniquely. StorM-Base shall generate the series instance number in the following format.

<<StudyInstanceUID>>.z

- Where <<StudyInstanceUID>> is the Study Instance UID values of the parent Study.
- z: is identification number for an attached treatment. This number shall not repeat within a case.

9.1.3 Image Instance UID

StorM-Base shall generate Image Instance UID in the format below.

<<SeriesInstanceUID>>.n

- Where <<SeriesInstanceUID>> is the Series Instance UID values of the parent Series.
- n: is a serial number generated by StorM-Base. This number shall not be repeated for images under different series.

10 Annex C Required Information

The following Chapter gives an Overview over all needed Information.
This information shall be available as early as possible to Storz Medical Service division.

Table 34 Required Information

#	Conformance Statements	Available
1	DICOM Conformance Statement of Worklist SCP (RIS, Broker) used by customer	
2	DICOM Conformance Statement of Storage SCP and Query/Retrieve SCP (PACS) used by customer	
Worklist Server		
3	Hostname or IP Address of Worklist Server used by customer	
4	AE Title of Worklist Server used by customer	
5	Port number of Worklist Server used by customer	
PACS		
6	Hostname or IP Address of PACS used by customer	
7	AE Title of PACS used by customer	
8	Port number of PACS used by customer	
9	Query / Retrieve Port number of PACS used by customer	
Network		
10	DHCP used by customer?	
11	Fix IP used by customer?	