SIEMENS

SIENET
MagicWeb VA50A

HS

DICOM Conformance Statement

Rev. 6.0

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Siemens AG Medical Solutions, Health Services
Henkestr. 127, D-91052 Erlangen

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1. Referenced Documents

Reference	Document
[1]	Mitra Broker Conformance Statement for PACS Broker 1.5.2 Revision 4.7
[2]	DICOM Standard 2003 PS 3.1 – 3.16
[3]	DICOM Supplement 64: Revised Part 2 (Conformance), Public Comment March 16, 2001

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DISCLAIMER:

DICOM Archive functionality is not available for SIENET MagicWeb.

DICOM Print functionality is not available for SIENET MagicWeb.

2. Conformance Statement Overview

The SIENET MagicWeb concept is based on a modular architecture for distributing medical images and reports within and outside of a clinical area. It allows external systems to send images to it for temporary storage, retrieve information about such images, and retrieve the images themselves. It provides prefetch, autorouding, export to CD-R/DVD-R and print to networked hardcopy device mechanisms and supports sending images across the network to other systems. Additionally SIENET MagicWeb is able to handle worklist and performed procedure step requests received from modalities by accessing a configured RIS database and to forward received MPPS messages to preconfigured DICOM nodes. Finally SIENET MagicWeb can store annotations and status information provided by special workstation requests.

SIENET MagicWeb is basically represented by the SIENET MagicWeb Online module. Additionally the DICOM Archive module is provided to enhance the Online system with long-term archiving functionality. The system conforms to the DICOM 3.0 standard to allow the sharing of medical information with other digital imaging systems.

The supported SOP Classes are listed in the table below according to the present version of SIENET MagicWeb (SIENET MagicWeb Online with or without DICOM Archive).

SOP Class Name	User of Service (SCU)	Provider of Service (SCP)	SIENET MagicWeb Online	+ DICOM Archive
Verification				
Verification	Yes	Yes	X	X
Query/Retrieve				
Patient Root Q/R Information Model - FIND	No	Yes	X	X
Patient Root Q/R Information Model - MOVE	No	Yes	X	X
Study Root Q/R Information Model - FIND	Yes	Yes	X	X
Study Root Q/R Information Model - MOVE	Yes	Yes	X	X
Patient Study Only Information Model - FIND	No	Yes	X	X
Patient Study Only Information Model - MOVE	No	Yes	X	X
Mitra Report Management - FIND	Yes	No	X	X
Modality Worklist				
Modality Worklist Information Model - FIND	No	Yes	X	X
MPPS				
Modality Performed Procedure Step	Yes	Yes	X	X

Storage Commitment				
Storage Commitment Push Model	No	Yes		X
Print				
Basic Grayscale Print Management Meta	Yes	No	X	X
Basic Color Print Management Meta	Yes	No	X	X
Print Job	Yes	No	X	X
Workstation Request				
Workstation - SET	No	Yes	X	X
Workstation - ACTION	No	Yes	X	X
Image Transfer				
Stored Print Storage	Yes	Yes	X	X
Hardcopy Grayscale Image Storage	Yes	Yes	X	X
Hardcopy Color Image Storage	Yes	Yes	X	X
Computed Radiography Image Storage	Yes	Yes	X	X
Digital X-Ray Image Storage - For Presentation	Yes	Yes	X	X
Digital X-Ray Image Storage - For Processing	Yes	Yes	X	X
Digital Mammography X-Ray Image Storage - For Presentation	Yes	Yes	X	X
Digital Mammography X-Ray Image Storage - For Processing	Yes	Yes	X	X
Digital Intra-oral X-Ray Image Storage - For Presentation	Yes	Yes	X	X
Digital Intra-oral X-Ray Image Storage - For Processing	Yes	Yes	X	X
CT Image Storage	Yes	Yes	X	X
MR Image Storage	Yes	Yes	X	X
Ultrasound Image Storage (Retired)	Yes	Yes	X	X
Ultrasound Image Storage	Yes	Yes	X	X
Secondary Capture Image Storage	Yes	Yes	X	X
Standalone Overlay Storage	Yes	Yes	X	X
Standalone Curve Storage	Yes	Yes	X	X
Standalone Modality LUT Storage	Yes	Yes	X	X
Standalone VOI LUT Storage	Yes	Yes	X	X
Grayscale Softcopy Presentation State Storage	Yes	Yes	X	X
Positron Emission Tomography Image Storage	Yes	Yes	X	X
Standalone PET Curve Storage	Yes	Yes	X	X
X-Ray Angiographic Image Storage	Yes	Yes	X	X
X-Ray Radiofluoroscopic Image Storage	Yes	Yes	X	X
X-Ray Angiographic Bi-Plane Image Storage	Yes	Yes	X	X
Ultrasound Multi-frame Image Storage (Retired)	Yes	Yes	X	X
Ultrasound Multi-frame Image Storage	Yes	Yes	X	X
Nuclear Medicine Image Storage	Yes	Yes	X	X
Nuclear Medicine Image Storage (Retired)	Yes	Yes	X	X
RT Image Storage	Yes	Yes	X	X
RT Dose Storage	Yes	Yes	X	X
RT Structure Set Storage	Yes	Yes	X	X
RT Plan Storage	Yes	Yes	X	X

VL Endoscopic Image Storage	Yes	Yes	X	X
VL Microscopic Image Storage	Yes	Yes	X	X
VL Slide-Coordinates Microscopic Image Storage	Yes	Yes	X	X
VL Photographic Image Storage	Yes	Yes	X	X
CSA Non-Image Storage	Yes	Yes	X	X
12-lead ECG Waveform Storage	Yes	Yes	X	X
General ECG Waveform Storage	Yes	Yes	X	X
Ambulatory ECG Waveform Storage	Yes	Yes	X	X
Hemodynamic Waveform Storage	Yes	Yes	X	X
Cardiac Electrophysiology Waveform Storage	Yes	Yes	X	X
Basic Voice Audio Waveform Storage	Yes	Yes	X	X
Radiotherapy Brachy Treatment Record Storage	Yes	Yes	X	X
Radiotherapy Summary Treatment Record Storage	Yes	Yes	X	X
Basic Text Structured Reporting	Yes	Yes	X	X
Enhanced Structured Reporting	Yes	Yes	X	X
Comprehensive Structured Reporting	Yes	Yes	X	X
Key Object Selection	Yes	Yes	X	X

Table 1: SUPPORTED NETWORKING DICOM SERVICE (SOP) CLASSES

In the follwing table an overview of the Media Storage Application Profiles supported by SIENET MagicWeb is provided.

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk - Recordable		
General Purpose CD-R	Yes	No

Table 2: SUPPORTED MEDIA SERVICES

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3. Introduction

3.1 Audience

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

3.2 Remarks

This document is the DICOM Conformance Statement for SIENET MagicWeb. The document is formatted according to DICOM Supplement 64.

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

The scope of this Conformance Statement is to facilitate communication between SIENET MagicWeb and other DICOM systems. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

- The comparison of different Conformance Statements is the first step towards assessing interconnectivity between SIENET MagicWeb and other DICOM conformant equipment.
- Test procedures should be defined to validate the desired level of connectivity.

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3.3 Abbreviations and Acronyms

AE	Application Entity
AET	Application Entity Title
CD-R	Compact Disk Recordable
DICOM	Digital Imaging and Communications in Medicine
DVD	Digital Versatile Disc Recordable
FSC	File-Set Creator
FSR	File-Set Reader
FSU	File-Set Updater
IP	Internet Protocol
JPEG	Joint Pictures Expert Group
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist
PACS	Picture Archiving and Communication System
PIR	Patient Information Reconciliation
RIS	Radiology Information System
SC	Service Class
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
SP	Service Pack
TCP	Transmission Control Protocol
UID	Unique Identifier
VR	Value Representation

4. Networking

4.1 Implementation Model

4.1.1 Application Data Flow

Application Entity Title Specification

By default all of the defined Application Entities have different AE Titles.

- AETs of QUERY-RETRIEVE-SCP (Level A), QUERY-RETRIEVE-SCP (Level B) and QUERY-RETRIEVE-SCP (Archive Level) must differ.

- AET of STORAGE-SCP can be the same as the AET of QUERY-RETRIEVE-SCP (Level A), QUERY-RETRIEVE-SCP (Level B) or QUERY-RETRIEVE-SCP (Archive Level).

- AETs of QUERY-SCU, RETRIEVE-SCU and REPORT-SCU can be set to any value.

- AET of STORAGE-SCU can be set to any value. If the STORAGE-SCU is used to transfer DICOM objects after a move request and the destination AET is the same as the calling AET the AET of the QUERY-RETRIEVE-SCP (Level A, Level B or Archive Level) is used as STORAGE-SCU AET.

- AETs of QUERY-RETRIEVE-SCP (Level A), QUERY-RETRIEVE-SCP (Level B) and QUERY-RETRIEVE-SCP (Archive Level) must be called for handling Verification, Query, Retrieve, Modality Worklist Query and Workstation Requests.

- AET of STORAGE-SCP must be called for handling Verification, Storage, Storage Commitment, MPPS and Workstation Requests.

Application Entity Description

- The STORAGE-SCU AE can send Composite SOP Instances. On the one hand it is used to handle requests from a Local User to send Images to selected Remote AEs. On the other hand the QUERY-RETRIEVE-SCP AE transmits via STORAGE-SCU AE Instances to a specific DICOM destination. Additionally the STORAGE-SCP AE autoroutes DICOM objects to configured partner STORAGE SCP AEs by using the STORAGE-SCU AE. The STORAGE-SCU AE functions as a C-STORE SCU.

- The STORAGE-SCP AE can receive incoming DICOM images and add them to the SIENET MagicWeb database. It can respond to external Storage and Verification Requests as a Service Class Provider (SCP) for solicited C-STORE and C-ECHO requests. The STORAGE-SCP AE can also handle Storage Commitment Push Model Requests. It can thus be used to query whether SIENET MagicWeb will confirm ownership and responsibility for specific Composite SOP Instances. Additionally the STORAGE-SCP AE initiates prefetch requests to load previous studies of a patient from DICOM Archive or partner AEs to SIENET MagicWeb Online automatically. For this purpose the AEs QUERY-SCU and RETRIEVE-SCU are used to perform the required query/retrieve requests.

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- The QUERY-SCU AE can query remote AEs for lists of studies. The QUERY-SCU AE functions as a C-FIND SCU.

- The RETRIEVE-SCU AE can direct remote AEs to transfer selected studies to SIENET MagicWeb. The RETRIEVE-SCU AE functions as a C-MOVE SCU.

- The QUERY-RETRIEVE-SCP AE (Level A) can handle incoming query and retrieve requests regarding to SOP Instances stored in Compression Level A. It can handle external queries for Patient, Study, Series, and Image data, and also handle Image retrieval requests. The QUERY-RETRIEVE-SCP AE (Level A) handles retrieval requests by issuing a command to the STORAGE-SCU AE to send the requested Images to the destination specified by the Remote AE. The QUERY-RETRIEVE-SCP AE (Level A) functions as a SCP for C-FIND, C-MOVE and N-SET requests.

- The QUERY-RETRIEVE-SCP AE (Level B) can handle incoming query and retrieve requests regarding to SOP Instances stored in Compression Level B. It can handle external queries for Patient, Study, Series, and Image data, and also handle Image retrieval requests. The QUERY-RETRIEVE-SCP AE (Level B) handles retrieval requests by issuing a command to the STORAGE-SCU AE to send the requested Images to the destination specified by the Remote AE. The QUERY-RETRIEVE-SCP AE (Level B) functions as a SCP for C-FIND, C-MOVE and N-SET requests.

- The QUERY-RETRIEVE-SCP AE (Archive Level) can handle incoming query and retrieve requests regarding to SOP Instances stored in Archive Level. It can handle external queries for Patient, Study, Series, and Image data, and also handle Image retrieval requests. The QUERY-RETRIEVE-SCP AE (Archive Level) handles retrieval requests by issuing a command to the STORAGE-SCU AE to send the requested Images to the destination specified by the Remote AE. The QUERY-RETRIEVE-SCP AE (Archive Level) functions as a SCP for C-FIND, C-MOVE and N-SET requests.

- The MODALIY-WORKLIST-SCP AE can handle incoming modality worklist query requests by accessing a RIS database and sending a set of matching responses back to the calling partner MODALITY-WORKLIST-SCU AE. The MODALITY-WORKLIST-SCP AE functions as a SCP for C-FIND requests.

- The MPPS-SCP AE can receive incoming MPPS requests and add the contained information to a RIS database. It can also initiate the forwarding of received MPPS messages to configured partner MPPS SCP AEs by issuing a command to the MPPS-SCU AE. The MPPS-SCP AE functions as a SCP for N-CREATE and N-SET requests.

- The MPPS-SCU AE can send MPPS Messages which are previously received by the MPPS-SCP AE to configured partner MPPS SCP AEs. The MPPS-SCU AE functions as a SCU for N-CREATE and N-SET requests.

- The REPORT-SCU AE can query for reports on a Mitra Broker and merge it to an already stored Study in the SIENET MagicWeb database. The REPORT-SCU AE functions as a SCU for Mitra specific C-FIND requests.

- The PRINT-SCU AE can send print requests for images selected by the user to configured partners PRINT SCP AEs and handles received status information to report the current print job status to the user. The PRINT-SCP AE functions as a SCU for sending N-GET, N-CREATE, N-SET, N-ACTION and N-DELETE requests and receiving N-EVENT-REPORT requests.

- The WORKSTATION-SCP AE can receive incoming workstation specific N-SET and N-ACTION requests in order to store annotations and modify status information in the SIENET MagicWeb database. The WORKSTATION-SCP AE functions as a SCP for N-SET and N-ACTION requests.

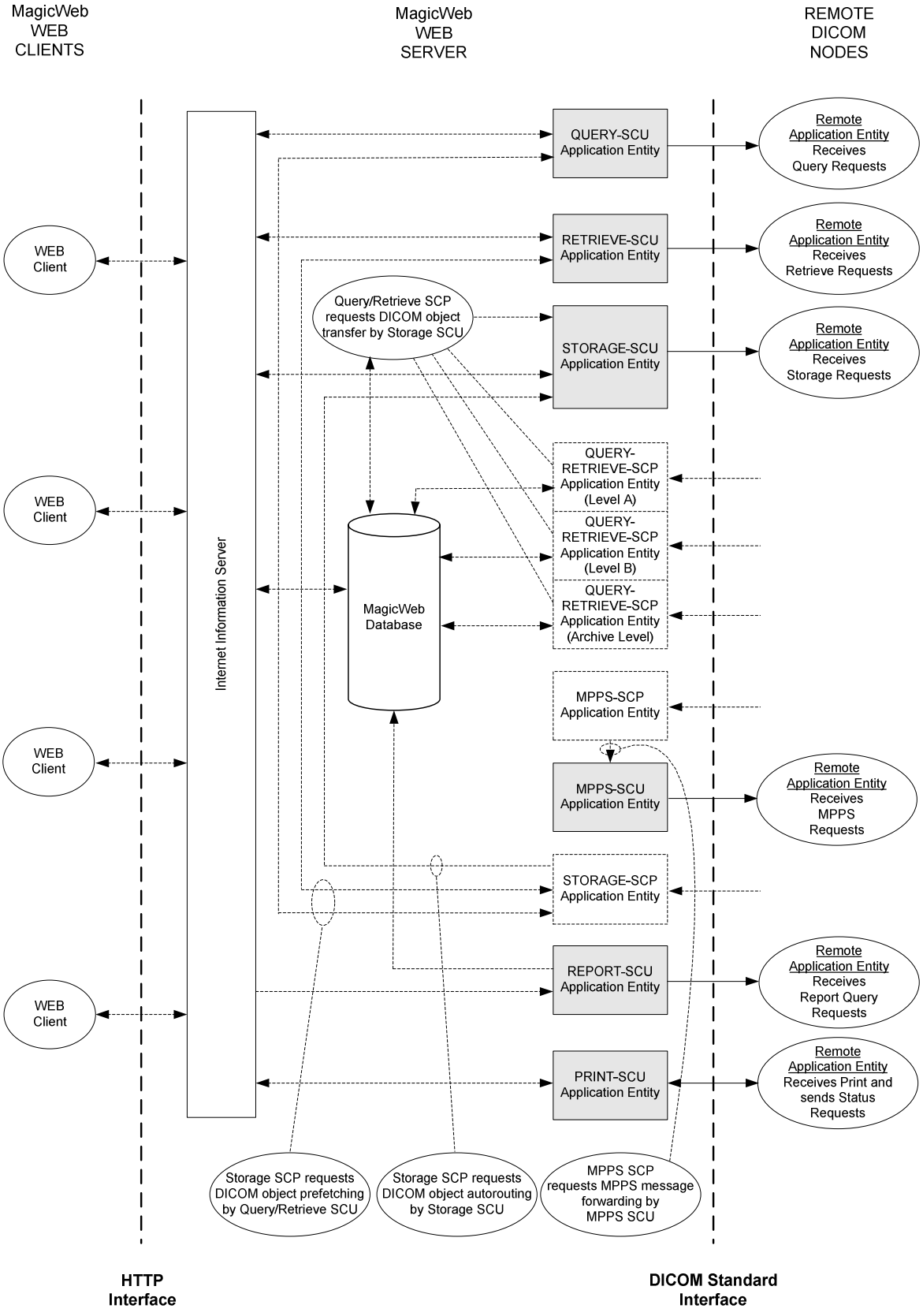

Figure 1: SIENET MagicWeb SCU AE DICOM DATA FLOW DIAGRAM

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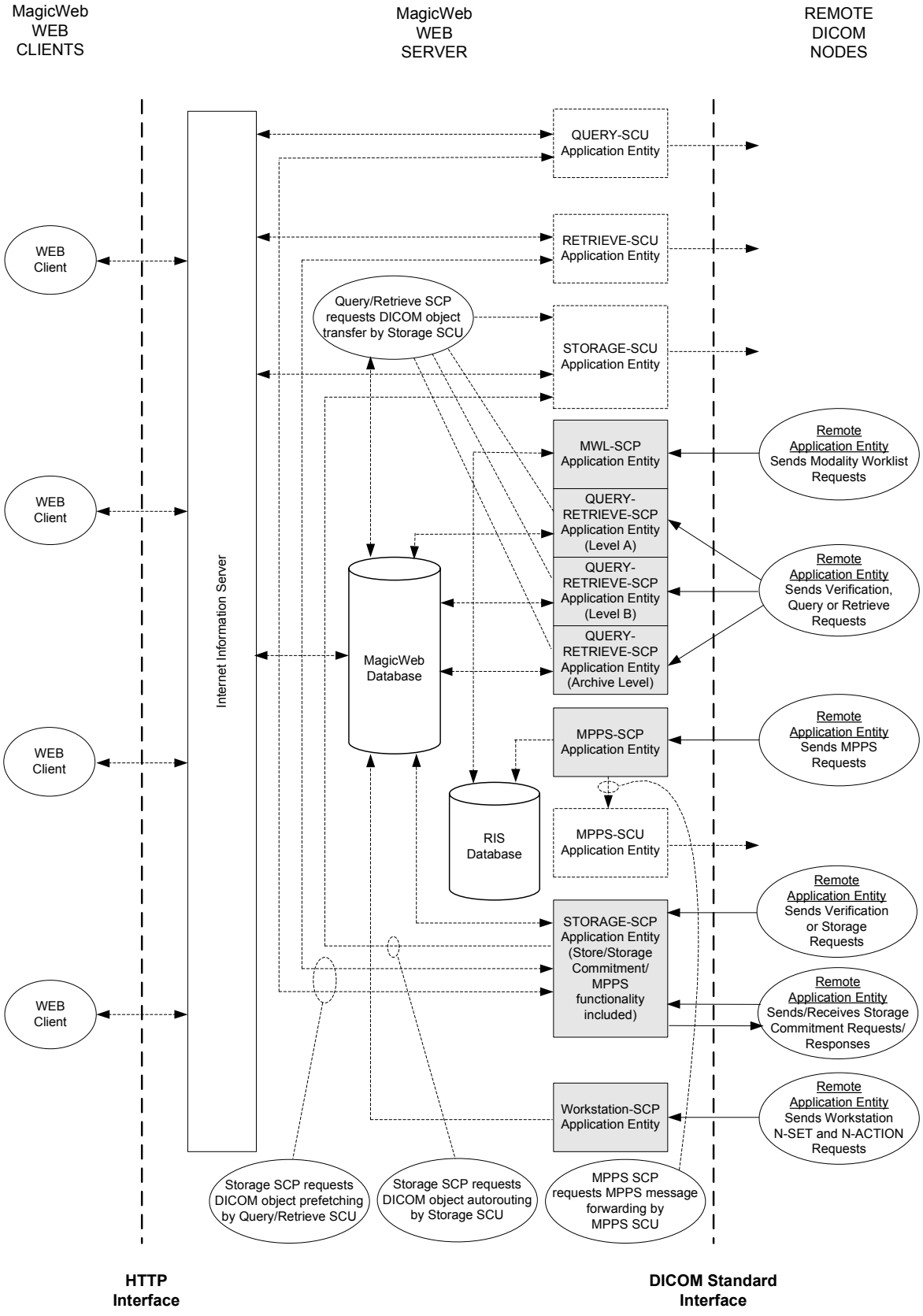

Figure 2: SIENET MagicWeb SCP AE DICOM DATA FLOW DIAGRAM

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4.1.2 Functional Definition of AEs

4.1.2.1 Functional Definition of STORAGE-SCU Application Entity

The STORAGE-SCU AE can be invoked by the QUERY-RETRIEVE-SCP AE (Move Request) or the STORAGE-SCP AE (Autorouting Request) to trigger the transfer of specific images to a remote destination AE. Additionally the STORAGE-SCU AE can be activated through the user interface when a user selects patients, studies, series or instances and requests that they be sent to a remote AE (selected from a preconfigured list). The STORAGE-SCU AE must be correctly configured with the host and port number of any external DICOM AE's that are to be C-STORE send, C-MOVE retrieval or autoroute destinations. The Presentation Contexts to use are determined from the headers of the DICOM files to be transferred. The conversion of the DICOM image objects to Transfer Syntax ‚Implicit VR Little Endian' is possible if the original compressed Transfer Syntax is not supported by the remote destination AE or if decompression is preferred.

4.1.2.2 Functional Definition of STORAGE-SCP Application Entity

The STORAGE-SCP AE waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, the STORAGE-SCP AE expects it to be a DICOM application. The STORAGE-SCP AE will accept Associations with Presentation Contexts for SOP Classes of the Verification, Storage and Storage Commitment Service Classes. Any images received on such Presentation Contexts will be added to the SIENET MagicWeb database. If a Storage Commitment Push Model N-ACTION Request is received (only possible if DICOM Archive module is present) then the STORAGE-SCP AE will 'cache' the Storage Commitment Push Model Requests until all the specified SOP Instances are migrated to DICOM Archive. A configurable maximum response time makes an earlier Storage Commitment check possible. After the Storage Commitment check is performed SIENET MagicWeb returns a N-EVENT-REPORT Notification. When a new study is received in SIENET MagicWeb Online a prefetch process is initiated to bring previous studies of the patient online.

4.1.2.3 Functional Definition of QUERY-SCU Application Entity

The QUERY-SCU AE is activated through the user interface when a user selects a remote AE to query (from a preconfigured list) or the STORAGE-SCP AE initiates a prefetch request with a partner AE configured as prefetch source. Queries are performed on the study level of the Study Root Information Model. The QUERY-SCU AE must be correctly configured with the host and port number of any external DICOM AE's that are to be QUERY-SCP.

4.1.2.4 Functional Definition of RETRIEVE-SCU Application Entity

The RETRIEVE-SCU AE is activated through the user interface when a user selects a study of a previously performed query result data set or the STORAGE-SCP AE initiates a prefetch request with a partner AE configured as prefetch source. Retrieves are performed on the study level of the Study Root Information Model. The RETRIEVE-SCU AE must be correctly configured with the host and port number of any external DICOM AE's that are to be RETRIEVE-SCP. The requested SOP Instances are always transferred to SIENET MagicWeb.

4.1.2.5 Functional Definition of QUERY-RETRIEVE-SCP Application Entity (Level A)

The QUERY-RETRIEVE-SCP AE waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, QUERY-RETRIEVE-SCP AE expects it to be a DICOM application. QUERY-RETRIEVE-SCP AE will accept Associations with Presentation Contexts for SOP Classes of the DICOM Query-Retrieve Service Class and Verification Service Class. It will handle query and retrieve requests on these Presentation Contexts and respond with data objects with values corresponding to the contents of the Compression Level A of the SIENET MagicWeb database. For C-MOVE requests the destination for the image objects is determined from the Destination AE Title contained in the C-MOVE request. When a retrieval request is received, the QUERY-RETRIEVE-SCP AE issues a command to the STORAGE-SCU AE to send the specified images to the C-MOVE Destination AE.

4.1.2.6 Functional Definition of QUERY-RETRIEVE-SCP Application Entity (Level B)

The QUERY-RETRIEVE-SCP AE waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, QUERY-RETRIEVE-SCP AE expects it to be a DICOM application. QUERY-RETRIEVE-SCP AE will accept Associations with Presentation Contexts for SOP Classes of the DICOM Query-Retrieve Service Class and Verification Service Class. It will handle query and retrieve requests on these Presentation Contexts and respond with data objects with values corresponding to the contents of the Compression Level B of the SIENET MagicWeb database. For C-MOVE requests the destination for the image objects is determined from the Destination AE Title contained in the C-MOVE request. When a retrieval request is received, the QUERY-RETRIEVE-SCP AE issues a command to the STORAGE-SCU AE to send the specified images to the C-MOVE Destination AE.

4.1.2.7 Functional Definition of QUERY-RETRIEVE-SCP Application Entity (Archive Level)

The QUERY-RETRIEVE-SCP AE waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, QUERY-RETRIEVE-SCP AE expects it to be a DICOM application. QUERY-RETRIEVE-SCP AE will accept Associations with Presentation Contexts for SOP Classes of the DICOM Query-Retrieve Service Class and Verification Service Class. It will handle query and retrieve requests on these Presentation Contexts and respond with data objects with values corresponding to the contents of the Archive Level of the SIENET MagicWeb database. For C-MOVE requests the destination for the image objects is determined from the Destination AE Title contained in the C-MOVE request. When a retrieval request is received, the QUERY-RETRIEVE-SCP AE issues a command to the STORAGE-SCU AE to send the specified images to the C-MOVE Destination AE.

4.1.2.8 Functional Definition of Modality-Worklist-SCP Application Entity

The MODALITY-WORKLIST-SCP AE waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, MODALITY-WORKLIST-SCP AE expects it to be a DICOM application. MODALITY-WORKLIST-SCP AE will accept Associations with Presentation Contexts for SOP Classes of the DICOM Modality Worklist Query Service Class and Verification Service Class. When a MWL query request is received it will query the RIS database for a list of Scheduled Procedure Steps matching the query and will return a pending C-FIND response for each match.

4.1.2.9 Functional Definition of MPPS-SCP Application Entity

The MPPS-SCP AE waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, the MPPS-SCP AE expects it to be a DICOM application. The MPPS-SCP AE will accept Associations with Presentation Contexts for SOP Classes of the DICOM Modality Performed Procedure Step Service Class and Verification Service Class. Reception of a MPPS N-CREATE or N-SET Request may result in updates to various tables in the RIS database and may result in changes to the tracking status of the Requested Procedure(s) referenced within the message.

4.1.2.10 Functional Definition of MPPS-SCU Application Entity

The MPPS-SCU AE can be invoked by the MPPS-SCP AE to trigger the transfer of specific MPPS messages to a remote destination AE. The MPPS-SCU AE must be correctly configured with the host and port number of any external DICOM AE's that are MPPS N-CREATE or N-SET destinations.

4.1.2.11 Functional Definition of REPORT-SCU Application Entity

The REPORT-SCU AE is activated either manually by the user or automatically when a new study is created in the database. Special Mitra queries are performed to get report information belonging to previously received studies. The REPORT-SCU AE must be correctly configured with the host and port number of any external DICOM AE's that are to be a Mitra Broker.

4.1.2.12 Functional Definition of PRINT-SCU Application Entity

The PRINT-SCU AE is activated through the user interface when a user selects a set of images and initiates a new print job with the PRINT-SCP AE (selected from a preconfigured list). Both the status of the printer and the status of the initiated print jobs are monitored and reported to the user. The PRINT-SCU AE must be configured correctly with the host and port number of any external DICOM AE's that are to be PRINT-SCP.

4.1.2.13 Functional Definition of WORKSTATION-SCP Application Entity

The WORKSTATION-SCP AE waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, the WORKSTATION-SCP AE expects it to be a DICOM application. The WORKSTATION-SCP AE will accept Associations with Presentation Contexts for SOP Classes of the private Worklist Request Service Class and Verification Service Class. Reception of a Workstation N-ACTION or N-SET Request may result in updating the status of a specific study or storing annotations for referenced SOP Instances.

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4.1.3 Sequencing of Real-World Activities

The only sequencing constraint that exists across all the SIENET MagicWeb Application Entities is the fact that a Composite SOP Instance must be received by the STORAGE-SCP AE before Storage Commitment Push Model, Query-Retrieve or Report Requests related to this SOP Instance can be successfully handled:

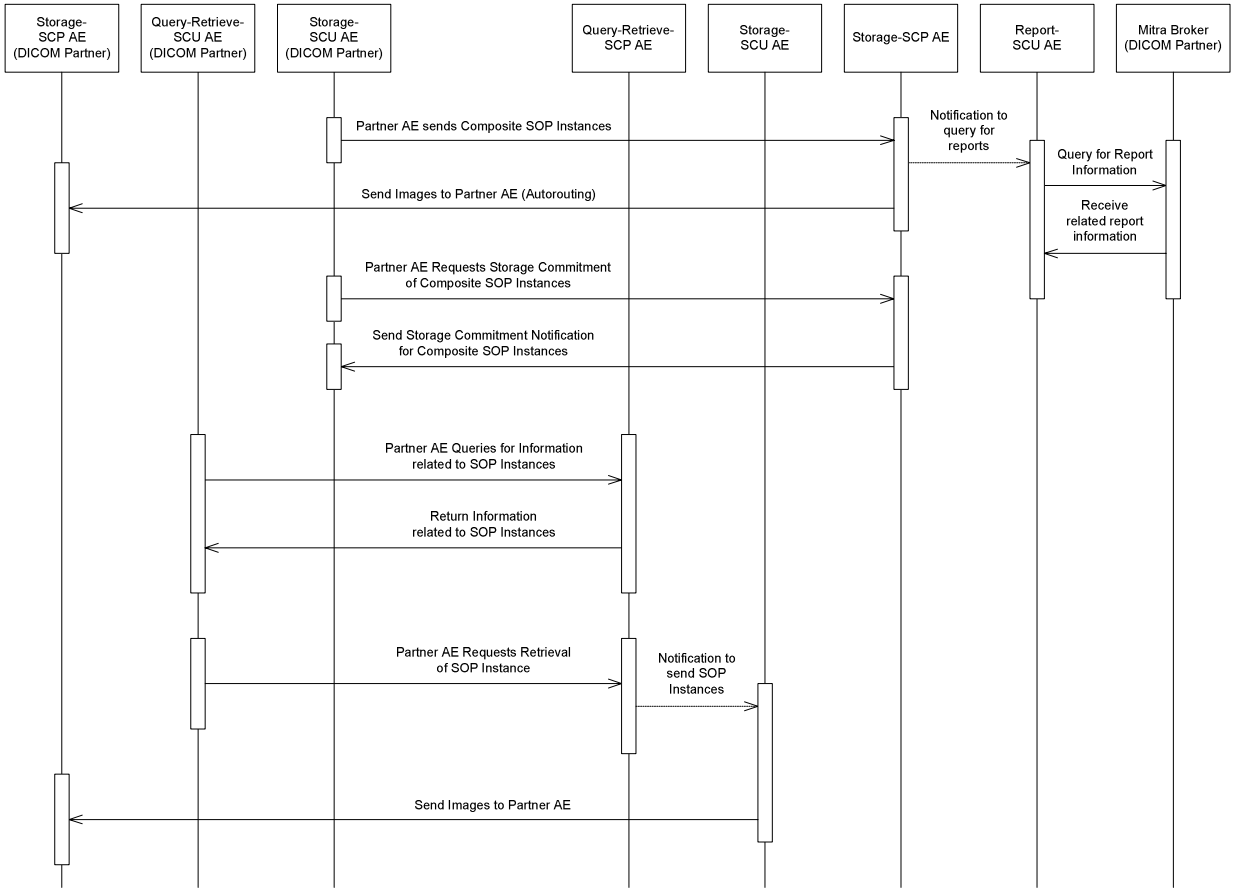

Figure 3: SEQUENCING CONSTRAINTS

Note that the only constraint is for the Composite SOP Instance to be received prior to the other events. For example, it is not necessary for the Storage Commitment Push Model Request to be received prior to receiving Query or Retrieval Requests related to the SOP Instance.

4.2 AE Specifications

4.2.1 STORAGE-SCU Application Entity Specification

4.2.1.1 SOP Classes

The STORAGE-SCU AE provides Standard Conformance to the following DICOM V3.0 SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	No
Stored Print Storage	1.2.840.10008.5.1.1.27	Yes	No
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	Yes	No
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	Yes	No
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	No
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	No
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	No
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	No
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	No
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Yes	No
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Yes	No
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Yes	No
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Yes	No
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Yes	No
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Yes	No
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	No
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	No
X-Ray Angiographic Bi-Plane Image Storage	1.2.840.10008.5.1.4.1.1.12.3	Yes	No
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	No
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	No
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Yes	No
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	No
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Yes	No

RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	No
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	No
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	No
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	No
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	No
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	No
CSA Non-Image Storage	1.3.12.2.1107.5.9.1	Yes	No
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	No
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	No
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	No
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	No
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Yes	No
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Yes	No
Radiotherapy Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Yes	No
Radiotherapy Summary Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Yes	No
Basic Text Structured Reporting	1.2.840.10008.5.1.4.1.1.88.11	Yes	No
Enhanced Structured Reporting	1.2.840.10008.5.1.4.1.1.88.22	Yes	No
Comprehensive Structured Reporting	1.2.840.10008.5.1.4.1.1.88.33	Yes	No
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	Yes	No

Table 3: SOP CLASSES FOR STORAGE-SCU AE

4.2.1.2 Association Establishment Policies

4.2.1.2.1 General

The STORAGE-SCU AE can only form Associations when requested to do so by the Local User, the QUERY-RETRIEVE-SCP AE or the STORAGE-SCP AE. The STORAGE-SCU AE can only request the opening of an Association. It cannot accept requests to open Associations from external Application Entities. The DICOM standard Application Context Name for DICOM 3.0 is always proposed:

Application Context Name	1.2.840.10008.3.1.1.1

Table 4: DICOM APPLICATION CONTEXT FOR STORAGE-SCU AE

4.2.1.2.2 Number of Associations

For each C-MOVE request one association to the C-MOVE Destination AE is established by the STORAGE-SCU AE. Since the configurable maximum number of simultaneous Query/Retrieve associations which are accepted by SIENET MagicWeb is limited by the License Key the maximum number of simultaneous associations requested by QUERY-RETRIEVE-SCP AE is also limited. One additional association can be requested by the Autorouter component. Up to 14 send jobs initiated by the Local Users can be performed simultanously (8 high prior jobs, 4 medium prior jobs and 2 low prior jobs).

There is no separate limit on the maximum number permitted to the same C-MOVE Destination AE.

Maximum number of simultaneous Associations	Limited by License Key

Table 5: NUMBER OF ASSOCIATIONS AS A SCU FOR STORAGE-SCU AE

4.2.1.2.3 Asynchronous Nature

The STORAGE-SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association). All association requests must be completed and acknowledged before a new operation can be initiated.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 6: ASYNCHRONOUS NATURE AS A SCU FOR STORAGE-SCU AE

4.2.1.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 7: DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE-SCU AE

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Send Images Requested by an External Peer AE

4.2.1.3.1.1 Description and Sequencing of Activity

The STORAGE-SCU AE will initiate a new Association when the Local User, the QUERY-RETRIEVE-SCP AE or the STORAGE-SCP AE invokes the STORAGE-SCU AE to transmit images. The Local User will issue such a command whenever patients, studies, series or instances are selected on the user interface and it is requested to send them to a preconfigured remote AE. The QUERY-RETRIEVE-SCP AE and the STORAGE-SCP AE will do this whenever a valid C-MOVE Request is received or if there are DICOM objects which should be autorouted. An Association Request is sent to the specified Destination AE and upon successful negotiation of the required Presentation Context the image transfer is started. All the indicated images are transmitted in a single association. The association will be released when all the images have been sent. If an error occurs during transmission over an open association then the image transfer is halted. Only for User initiated send requests a retry mechanism is provided with the STORAGE-SCU AE to independently repeat the image sending a configurable number of times whenever a transmission error occurs.
Note that the STORAGE-SCU AE does not support the unsolicited sending of SOP Instances using the DICOM Storage Service Class. It will only send SOP Instances in response to a User Request, a C-MOVE Request from a partner AE or an initiated autorouting job.

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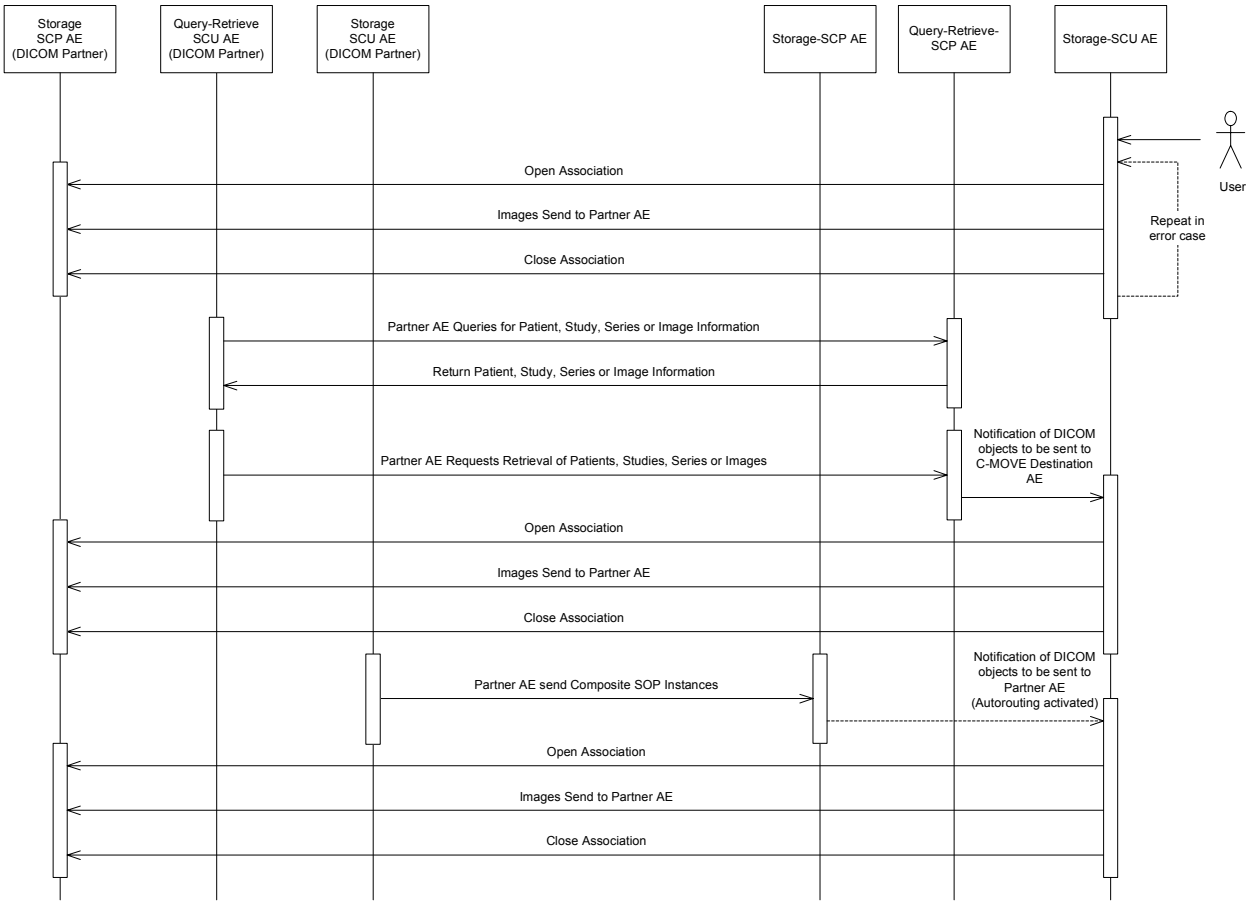

Figure 4: SEQUENCING OF ACTIVITY - SEND IMAGES

The following sequencing constraints illustrated in Figure 4 apply to the STORAGE-SCU AE for handling user initiated send requests:

1. User requests STORAGE-SCU AE to send the specified image Composite SOP Instances to the AEs selected as send destinations.
2. STORAGE-SCU AE opens a new association with the specified Destination AE.
3. STORAGE-SCU AE sends the indicated Composite SOP Instances.
4. STORAGE-SCU AE closes the association.
5. The send request is repeated a configurable number of times if transfer of SOP Instances failed.
6. The Verification Service is only supported as a utility function for Service staff. It is used only as a diagnostic tool.

The following sequencing constraints illustrated in Figure 4 apply to the STORAGE-SCU AE for handling DICOM object transfers after retrieve requests:

1. Partner AE requests retrieval of Patient, Study, Series, or Images from QUERY-RETRIEVE-SCP AE (C-MOVE-RQ).
2. QUERY-RETRIEVE-SCP AE signals STORAGE-SCU AE to send the image Composite SOP Instances indicated in the C-MOVE-RQ to the C-MOVE Destination AE.
3. STORAGE-SCU AE opens a new association with the indicated C-MOVE Destination AE.
4. STORAGE-SCU AE sends the indicated Composite SOP Instances.
5. STORAGE-SCU AE closes the association.
6. The Verification Service is only supported as a utility function for Service staff. It is used only as a diagnostic tool.

The following sequencing constraints illustrated in Figure 4 apply to the STORAGE-SCU AE for handling autorouting jobs:

1. Partner AE sends one or more Composite SOP Instances (C-STORE-RQ).
2. STORAGE-SCP AE signals STORAGE-SCU AE to forward the received Composite SOP Instances to the AEs configured as autorouting destinations.
3. STORAGE-SCU AE opens a new association with the specified Destination AE.
4. STORAGE-SCU AE sends the indicated Composite SOP Instances.
5. STORAGE-SCU AE closes the association.
6. The Verification Service is only supported as a utility function for Service staff. It is used only as a diagnostic tool.

4.2.1.3.1.2 Proposed Presentation Contexts

The STORAGE-SCU AE of SIENET MagicWeb will propose the Presentation Contexts as shown in Table 8.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Stored Print Storage	1.2.840.10008.5.1.1.27	see Table 9	see Table 9	SCU	None
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	see Table 9	see Table 9	SCU	None
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	see Table 9	see Table 9	SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	see Table 9	see Table 9	SCU	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	see Table 9	see Table 9	SCU	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	see Table 9	see Table 9	SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	see Table 9	see Table 9	SCU	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	see Table 9	see Table 9	SCU	None
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	see Table 9	see Table 9	SCU	None
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	see Table 9	see Table 9	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	see Table 9	see Table 9	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	see Table 9	see Table 9	SCU	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	see Table 9	see Table 9	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	see Table 9	see Table 9	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax			
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	see Table 9	see Table 9	SCU	None
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	see Table 9	see Table 9	SCU	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	see Table 9	see Table 9	SCU	None
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	see Table 9	see Table 9	SCU	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	see Table 9	see Table 9	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	see Table 9	see Table 9	SCU	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	see Table 9	see Table 9	SCU	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	see Table 9	see Table 9	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	see Table 9	see Table 9	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	see Table 9	see Table 9	SCU	None
X-Ray Angiographic Bi-Plane Image Storage	1.2.840.10008.5.1.4.1.1.12.3	see Table 9	see Table 9	SCU	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	see Table 9	see Table 9	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	see Table 9	see Table 9	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	see Table 9	see Table 9	SCU	None
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	see Table 9	see Table 9	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	see Table 9	see Table 9	SCU	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	see Table 9	see Table 9	SCU	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	see Table 9	see Table 9	SCU	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	see Table 9	see Table 9	SCU	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	see Table 9	see Table 9	SCU	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	see Table 9	see Table 9	SCU	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	see Table 9	see Table 9	SCU	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	see Table 9	see Table 9	SCU	None
CSA Non-Image Storage	1.3.12.2.1107.5.9.1	see Table 9	see Table 9	SCU	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	see Table 9	see Table 9	SCU	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	see Table 9	see Table 9	SCU	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	see Table 9	see Table 9	SCU	None
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	see Table 9	see Table 9	SCU	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	see Table 9	see Table 9	SCU	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	see Table 9	see Table 9	SCU	None
Radiotherapy Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	see Table 9	see Table 9	SCU	None
Radiotherapy Summary Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.7	see Table 9	see Table 9	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax			
Basic Text Structured Reporting	1.2.840.10008.5.1.4.1.1.88.11	see Table 9	see Table 9	SCU	None
Enhanced Structured Reporting	1.2.840.10008.5.1.4.1.1.88.22	see Table 9	see Table 9	SCU	None
Comprehensive Structured Reporting	1.2.840.10008.5.1.4.1.1.88.33	see Table 9	see Table 9	SCU	None
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	see Table 9	see Table 9	SCU	None

Table 8: PROPOSED PRESENTATION CONTEXTS BY THE STORAGE-SCU AE

The table below describes the Transfer Syntaxes which are supported by the STORAGE-SCU AE.

Transfer Syntax Name	Transfer Syntax UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1
Default lossless JPEG Compressed	1.2.840.10008.1.2.4.70
Lossy JPEG 8 Bit Compressed	1.2.840.10008.1.2.4.50
Lossy JPEG 12 Bit Compressed	1.2.840.10008.1.2.4.51
RLE Compressed	1.2.840.10008.1.2.5

Table 9: STORAGE-SCU AE TRANSFER SYNTAXES

The DICOM objects requested from the QUERY-RETRIEVE-SCP AE by a partner AE are transferred to the C-MOVE Destination AE with the Transfer Syntax with which they are stored within the accessed compression level of SIENET MagicWeb. The DICOM objects to be autorouted will be sent with the original Transfer Syntax with which they have been received by SIENET MagicWeb Online. Whenever a manual send process is initiated the User can select the compression level from which the DICOM objects are transferred.

In the following two situations the DICOM objects are converted to the default Transfer Syntax ‚Implicit VR Little Endian' before they are transmitted:

- The C-MOVE Destination AE does not support the present compressed Transfer Syntax.
- The C-MOVE Destination AE is configured on the administration interface to receive only uncompressed DICOM objects.

Note: Wavelet compressed DICOM objects will never be transferred because there is no appropriate Transfer Syntax available.

4.2.1.3.1.3 SOP Specific Conformance for Verification SOP Class

The STORAGE-SCU AE provides standard conformance to the Verification SOP Class as an SCU. The Verification Service as an SCU is actually only supported as a diagnostic service tool for network communication issues.

4.2.1.3.1.4 SOP Specific Conformance for Storage SOP Classes

Composite DICOM SOP Instances are maintained as DICOM Part 10 compliant files in the SIENET MagicWeb database. The entire set of tags received with the image will be saved in SIENET MagicWeb; this includes all Private and SOP Extended Elements. When a SOP Instance is selected for sending from SIENET MagicWeb, its content will be sent as it was originally received except the DICOM object was lossy compressed after reception. In this case a new SOP Instance UID and a new Series Instance UID is assigned to the object.

Note: A C-STORE Request is blocked by SIENET MagicWeb if the required SOP Instances are locked for a scheduled Patient Information Reconciliation (PIR) process.

The STORAGE-SCU AE will exhibit the following behavior according to the Status Code value returned in a C-STORE Response from a destination C-STORE SCP:

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0x0000	The SCP has successfully stored the transferred SOP Instance. User Request: The successful transfer is displayed in the status dialog to the User. Move Request: A message is sent to the QUERY-RETRIEVE-SCP AE indicating successful transfer. The QUERY-RETRIEVE-SCP AE will send the appropriate PENDING or SUCCESS Status in the C-MOVE Response. No message is posted to the User Interface. Autorouting Request: A message is sent to the STORAGE-SCP AE indicating successful transfer. The STORAGE-SCP AE considers the job as done. No message is posted to the User Interface. Success indication message is stored in the Trace Database if Detailed Trace is switched on.
Refused	Out of Resources	0xA700	This is treated as a permanent Failure. User Request: The failed transfer is displayed in the status dialog to the User and it is continued transferring the next DICOM object. The STORAGE-SCU AE starts a retry mechanism for sending the SOP Instance. Move Request: A message is sent to the QUERY-RETRIEVE-SCP AE indicating a transfer failure and it is continued transferring the next DICOM object. The QUERY-RETRIEVE-SCP AE will send an appropriate Status in the C-MOVE Response. No message is posted to the User Interface. Autorouting Request: A message is sent to the STORAGE-SCP AE indicating a transfer failure and it is continued transferring the next DICOM object. The STORAGE-SCP AE starts a retry mechanism for sending the SOP Instance. No message is posted to the User Interface. Error indication message is stored in the Trace Database.
Error	Data Set does not match SOP Class	0xA900	
Error	Cannot Understand	0xC000	
Error	Processing Failure	0x0110	
Warning	Coercion of Data Elements	0xB000	Image transmission is considered successful. User Request: The successful transfer is displayed in the status dialog to the User.

Warning	Data Set does not match SOP Class	0xB007	Move Request: A message is sent to the QUERY-RETRIEVE-SCP AE indicating successful transfer. The QUERY-RETRIEVE-SCP AE will send the appropriate PENDING or SUCCESS Status in the C-MOVE Response. No message is posted to the User Interface. Autorouting Request: A message is sent to the STORAGE-SCP AE indicating successful transfer. The STORAGE-SCP AE considers the job as done. No message is posted to the User Interface. Warning indication message is stored in the Trace Database.
Warning	Elements Discarded	0xB006	
*	*	Any other status code	This is treated as a permanent Failure. User Request: The failed transfer is displayed in the status dialog to the User and it is continued transferring the next DICOM object. The STORAGE-SCU AE starts a retry mechanism for sending the SOP Instance. Move Request: A message is sent to the QUERY-RETRIEVE-SCP AE indicating an transfer failure and it is continued transferring the next DICOM object. The QUERY-RETRIEVE-SCP AE will send an appropriate Status in the C-MOVE Response. No message is posted to the User Interface. Autorouting Request: A message is sent to the STORAGE-SCP AE indicating a transfer failure and it is continued transferring the next DICOM object. The STORAGE-SCP AE starts a retry mechanism for sending the SOP Instance. No message is posted to the User Interface. Error indication message is stored in the Trace Database.

Table 10: STORAGE-SCU AE C-STORE RESPONSE STATUS HANDLING BEHAVIOR

All Status Codes indicating an error or refusal are treated as a permanent failure. The STORAGE-SCU AE only resends images automatically for User initiated send requests when an error Status Code is returned in a C-STORE Response. For specific behavior regarding Status Code values returned in C-MOVE Responses, refer to the Services Supported as an SCP by the QUERY-RETRIEVE-SCP AE.

Exception	Behavior
Timeout expiry for an expected DICOM Message Response (DIMSE level timeout).	It is continued transferring the next DICOM object. User Request: The failed transfer is displayed in the status dialog to the User and it is continued transferring the next DICOM object. The STORAGE-SCU AE starts a retry mechanism for sending the SOP Instance. Move Request: A message is sent to the QUERY-RETRIEVE-SCP AE indicating an tranmsfer failure and it is continued transferring the next DICOM object. The QUERY-RETRIEVE-SCP AE will send an appropriate Status in the C-MOVE Response. No message is posted to the User Interface. Autorouting Request: A message is sent to the STORAGE-SCP AE indicating a transfer failure and it is continued transferring the next DICOM object. The STORAGE-SCP AE starts a retry mechanism for sending the SOP Instance. No message is posted to the User Interface. Error indication message is stored in the Trace Database.

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Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout).	It is continued transferring the next DICOM object. User Request: The failed transfer is displayed in the status dialog to the User and it is continued transferring the next DICOM object. The STORAGE-SCU AE starts a retry mechanism for sending the SOP Instance. Move Request: A message is sent to the QUERY-RETRIEVE-SCP AE indicating a transfer failure and it is continued transferring the next DICOM object. The QUERY-RETRIEVE-SCP AE will send an appropriate Status in the C-MOVE Response. No message is posted to the User Interface. Autorouting Request: A message is sent to the STORAGE-SCP AE indicating a transfer failure and it is continued transferring the next DICOM object. The STORAGE-SCP AE starts a retry mechanism for sending the SOP Instance. No message is posted to the User Interface. Error indication message is stored in the Trace Database.
Association A-ABORTed by the SCP or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	User Request: The failed transfer is displayed in the status dialog to the User and the Association is released. The STORAGE-SCU AE starts a retry mechanism for sending the SOP Instance. Move Request: A message is sent to the QUERY-RETRIEVE-SCP AE indicating a transfer failure and the Association is released. The QUERY-RETRIEVE-SCP AE will send an appropriate Status in the C-MOVE Response. No message is posted to the User Interface. Autorouting Request: A message is sent to the STORAGE-SCP AE indicating a transfer failure and the Association is released. The STORAGE-SCP AE starts a retry mechanism for sending the SOP Instance. No message is posted to the User Interface. Error indication message is stored in the Trace Database.

Table 11: STORAGE-SCU AE COMMUNICATION FAILURE BEHAVIOR

4.2.1.4 Association Acceptance Policy

The STORAGE-SCU AE does not accept Associations.

4.2.2 STORAGE-SCP Application Entity Specification

4.2.2.1 SOP Classes

The STORAGE-SCP AE provides Standard Conformance to the DICOM V3.0 SOP Classes listed in the table below. The received DICOM objects that are indicated by the last column can be displayed by the WEB Clients. Each Storage SOP Class can be configured via the administration interface to be discarded after reception.

SOP Class Name	SOP Class UID	SCU	SCP	View-able
Verification	1.2.840.10008.1.1	No	Yes	-
Storage Commitment Push Model	1.2.840.10008.1.20.1	No	Yes	-
Stored Print Storage	1.2.840.10008.5.1.1.27	No	Yes	
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	No	Yes	
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	No	Yes	
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes	X
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Yes	X
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	No	Yes	
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	No	Yes	X
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	No	Yes	
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	No	Yes	X
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	No	Yes	
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	No	Yes	X
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	Yes	X
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	No	Yes	X
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	No	Yes	X
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes	X
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	No	Yes	
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	No	Yes	
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	No	Yes	
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	No	Yes	
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	No	Yes	
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	No	Yes	X
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	No	Yes	
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	No	Yes	X
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Yes	X
X-Ray Angiographic Bi-Plane Image Storage	1.2.840.10008.5.1.4.1.1.12.3	No	Yes	X
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	No	Yes	X
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes	X
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	No	Yes	X
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	No	Yes	X

RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	No	Yes	X
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	No	Yes	
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	No	Yes	
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	No	Yes	
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	No	Yes	X
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	No	Yes	X
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	No	Yes	X
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	No	Yes	X
CSA Non-Image Storage	1.3.12.2.1107.5.9.1	No	Yes	
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	No	Yes	
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	No	Yes	
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	No	Yes	
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	No	Yes	
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	No	Yes	
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	No	Yes	
Radiotherapy Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	No	Yes	
Radiotherapy Summary Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.7	No	Yes	
Basic Text Structured Reporting	1.2.840.10008.5.1.4.1.1.88.11	No	Yes	
Enhanced Structured Reporting	1.2.840.10008.5.1.4.1.1.88.22	No	Yes	
Comprehensive Structured Reporting	1.2.840.10008.5.1.4.1.1.88.33	No	Yes	
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	No	Yes	

Table 12: SOP CLASSES FOR STORAGE-SCP AE

4.2.2.2 Association Establishment Policies

4.2.2.2.1 General

The STORAGE-SCP AE will never initiate Associations; it only accepts Association Requests from external DICOM AEs. The STORAGE-SCP AE will accept Associations for Verification, Storage and Storage Commitment Push Model Service requests.
The DICOM standard Application Context Name for DICOM 3.0 is always accepted:

Application Context Name	1.2.840.10008.3.1.1.1

Table 13: DICOM APPLICATION CONTEXT FOR STORAGE-SCP AE

4.2.2.2.2 Number of Associations

The STORAGE-SCP AE can support multiple simultaneous Associations requested by partner AEs. Each time the STORAGE-SCP AE receives an Association, a child process will be spawned to process the Verification, Storage or Storage Commitment Push Model Service request. The maximum number of child processes, and thus the maximum number of simultaneous Associations that can be processed, is set by configuration. The maximum is limited by the License Key.

The STORAGE-SCP AE initiates one Association for each Storage Commitment Push Model request to send N-EVENT-REPORTs to partner AEs.

Maximum number of simultaneous Associations	- Limited by License Key - Restrictable by administrator
Maximum number of simultaneous Associations proposed by STORAGE-SCP AE	- Limited by License Key - Restrictable by administrator

Table 14: NUMBER OF SIMULTANEOUS ASSOCIATIONS AS AN SCP FOR STORAGE-SCP AE

4.2.2.2.3 Asynchronous Nature

The STORAGE-SCP AE does not support asynchronous communication (multiple outstanding transactions over a single association). The STORAGE-SCP AE does permit an SCU to send multiple Storage Commitment Push Model Requests before it has sent back any N-EVENT-REPORT Notifications. However, the STORAGE-SCP AE must send an N-ACTION Response before permitting another N-ACTION Request to be received so the DICOM communication itself is not truly asynchronous.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 15: ASYNCHRONOUS NATURE AS A SCP FOR STORAGE-SCP AE

There is no limit on the number of outstanding Storage Commitment Push Model Requests that can be received and acknowledged before the STORAGE-SCP AE has responded with the corresponding N-EVENT-REPORT Notifications

Maximum number of outstanding Storage Commitment Requests for which no N-EVENT Notification has been sent	No Maximum Limit

Table 16: OUTSTANDING STORAGE COMMITMENT PUSH MODEL REQUESTS FOR STORAGE-SCP AE

4.2.2.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 17: DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE-SCP AE

4.2.2.3 Association Initiation Policy

4.2.2.3.1 Activity – Send Storage Commitment Notification

4.2.2.3.1.1 Description and Sequencing of Activity

The STORAGE-SCP AE will always initiate a new Association for sending back Storage Commitment Push Model Notification (N-EVENT-REPORT). The original Association used to send the corresponding request will never be used for that.

An Association Request is sent to the partner AE that sent the Storage Commitment Push Model request and upon successful negotiation of the required Presentation Context the outstanding N-EVENT-REPORT is sent. If there are multiple outstanding N-EVENT-REPORTs to be sent to a single partner AE then the STORAGE-SCP AE will send them always over sparate Associations. The Association will be released when the N-EVENT-REPORT for the partner AE has been sent. If any type of error occurs during transmission (either a communication failure or indicated by a Status Code returned by the partner AE) over an open Association then the transfer of N-EVENT-REPORTs is halted. A new Association will be opened to retry sending outstanding N-EVENT-REPORTs. The maximum number of times the STORAGE-SCP AE will attempt to resend an N-EVENT-REPORT is configurable, along with the amount of time to wait between attempts to resend.

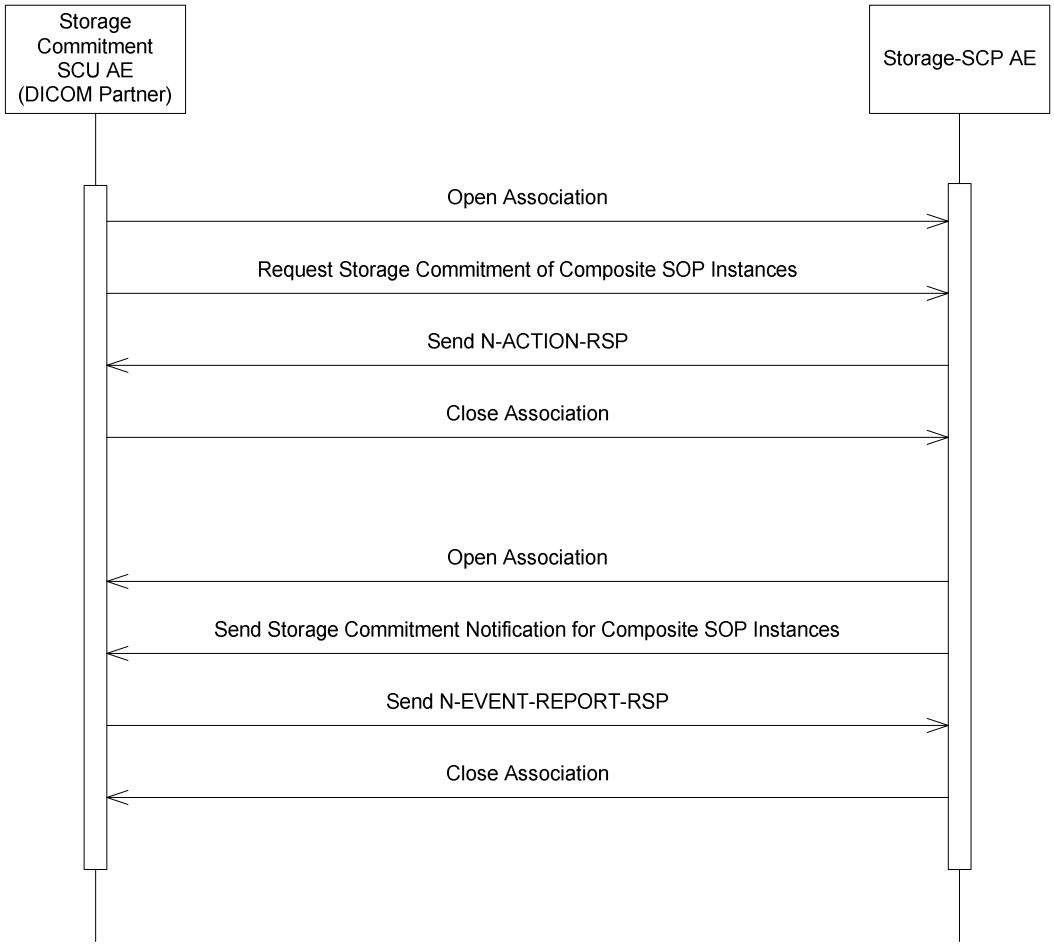

Figure 5: SEQUENCING OF ACTIVITY – SEND STORAGE COMMITMENT NOTIFICATION

The following sequencing constraints illustrated in Figure 5 apply to the STORAGE-SCP AE for handling Storage Commitment Push Model Requests (N-ACTION-Requests):

1. Partner AE opens an Association with the STORAGE-SCP AE.
2. Partner AE requests Storage Commitment of Composite SOP Instance(s) (partner sends N-ACTION-RQ and STORAGE-SCP AE responds with N-ACTION-RSP to indicate that it received the request).
3. Partner AE closes the Association.
4. STORAGE-SCP AE opens an Association with the partner AE.
5. STORAGE-SCP AE sends Storage Commitment Push Model Notification (N-EVENT-REPORT).
6. Partner AE returns a N-EVENT-REPORT-RSP Message to the STORAGE-SCP AE.
7. STORAGE-SCP AE closes the Association with the partner AE.
8. The send request is repeated a configurable number of times if transfer of N-EVENT-REPORT failed.

4.2.2.3.1.2 Proposed Presentation Contexts

The STORAGE-SCP AE will propose the Presentation Contexts as shown in Table 18.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None

Table 18: PROPOSED PRESENTATION CONTEXTS BY THE STORAGE-SCP AE

4.2.2.3.1.3 SOP Specific Conformance for Storage Commitment Push Model SOP Class

The associated Activity with the Storage Commitment Push Model service is the communication by the STORAGE-SCP AE to partner AEs that it has committed to permanently store Composite SOP Instances that have been sent to it. It thus allows Partner AEs to determine whether SIENET MagicWeb has taken responsibility for the archiving of specific SOP Instances so that they can be flushed from the partner AE system.

The maximum response time is configurable (time between receiving N-ACTION-RQ and sending N-EVENT-REPORT) because it is not predictable how image producing systems react if the Storage Commitment request handling takes more time than expected. Such situations can occur because the start time for migrating DICOM objects from SIENET MagicWeb Online to DICOM Archive is arbitrary. Since Storage Commitment can only be given for objects located in DICOM Archive the commitment check will be performed when the migration process is done. The configured response time maximum makes sure that the Storage Commitment check is executed within the allowed time regardless of the current migration state.

4.2.2.4 Association Acceptance Policy

4.2.2.4.1 Activity – Handling Storage and Storage Commitment Requests

4.2.2.4.1.1 Description and Sequencing of Activity

The STORAGE-SCP AE accepts Associations only if they have valid Presentation Contexts. If none of the requested Presentation Contexts are accepted then the Association Request itself is rejected. Only associations with Application Entity Titles of DICOM partner nodes will be accepted that are configured on the administration interface.

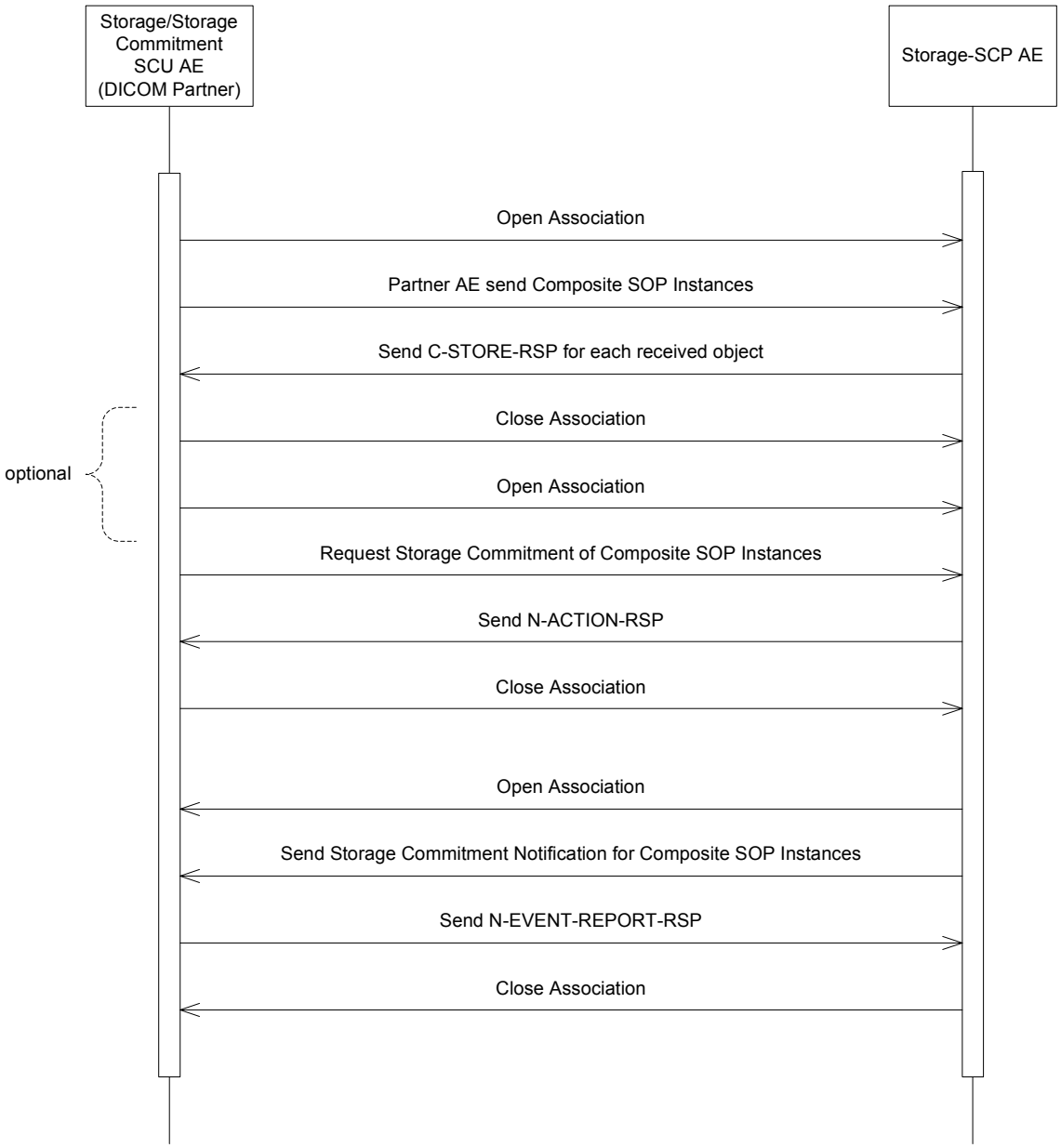

Figure 6: SEQUENCING OF ACTIVITY – RECEIVE IMAGES AND STORAGE COMMITMENT REQUESTS

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The following sequencing constraints illustrated in Figure 6 apply to the STORAGE-SCP AE for handling image receiving (C-STORE-Requests):

1. Partner AE opens an Association with the STORAGE-SCP AE.
2. Partner AE sends one or more Composite SOP Instances.
3. STORAGE-SCP AE returns a C-STORE-RSP Message to the Partner AE with the storage status.
4. Partner AE closes the Association. Note that the Partner AE does not have to close the Association immediately. Further C-STORE Requests can be sent over the Association before it is closed.
5. Partner AE opens an Association with the STORAGE-SCP AE.
6. Partner AE requests Storage Commitment of Composite SOP Instance(s) (partner sends N-ACTION-RQ and STORAGE-SCP AE responds with N-ACTION-RSP to indicate that it received the request).
7. Partner AE closes the Association.
8. STORAGE-SCP AE opens an Association with the Partner AE.
9. STORAGE-SCP AE sends Storage Commitment Push Model Notification (N-EVENT-REPORT).
10. Partner AE returns a N-EVENT-REPORT-RSP Message to the STORAGE-SCP AE.
11. STORAGE-SCP AE closes the Association with the Partner AE.

The STORAGE-SCP AE may reject Association attempts as shown in Table 19. The Result, Source and Reason/Diag columns represent the values returned in the corresponding fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4). The following abbreviations are used in the Source column:

a. 1 – DICOM UL service-user
b. 2 – DICOM UL service-provider (ASCE related function)
c. 3 – DICOM UL service-provider (Presentation related function)

Result	Source	Reason/Diag	Explanation
2 - rejected-transient	c	2 - local-limit-exceeded	The (configurable) maximum number of simultaneous Associations has been reached. An Association request with the same parameters may succeed at a later time.
1 - rejected-permanent	a	2 - application-context-name-not-supported	The Association request contained an unsupported Application Context Name. An association request with the same parameters will not succeed at a later time.
1 - rejected-permanent	a	7 - called-AE-title-not-recognized	The Association request contained an unrecognized Called AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association initiator is incorrectly configured and attempts to address the Association acceptor using the wrong AE Title.
1 - rejected-permanent	a	3 - calling-AE-title-not-recognized	The Association request contained an unrecognized Calling AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association acceptor has not been configured to recognize the AE Title of the Association initiator.
1 - rejected-permanent	b	1 - no-reason-given	The Association request could not be parsed. An Association request with the same format will not succeed at a later time.

Table 19: ASSOCIATION REJECTION REASONS

4.2.2.4.1.2 Accepted Presentation Contexts

The STORAGE-SCP AE of SIENET MagicWeb will accept the Presentation Contexts as shown in Table 20.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Stored Print Storage	1.2.840.10008.5.1.1.27	see Table 21	see Table 21	SCP	None
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	see Table 21	see Table 21	SCP	None
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	see Table 21	see Table 21	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	see Table 21	see Table 21	SCP	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	see Table 21	see Table 21	SCP	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	see Table 21	see Table 21	SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	see Table 21	see Table 21	SCP	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	see Table 21	see Table 21	SCP	None
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	see Table 21	see Table 21	SCP	None
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	see Table 21	see Table 21	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	see Table 21	see Table 21	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	see Table 21	see Table 21	SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	see Table 21	see Table 21	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	see Table 21	see Table 21	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	see Table 21	see Table 21	SCP	None
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	see Table 21	see Table 21	SCP	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	see Table 21	see Table 21	SCP	None
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	see Table 21	see Table 21	SCP	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	see Table 21	see Table 21	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	see Table 21	see Table 21	SCP	None
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	see Table 21	see Table 21	SCP	None
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	see Table 21	see Table 21	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	see Table 21	see Table 21	SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax			
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	see Table 21	see Table 21	SCP	None
X-Ray Angiographic Bi-Plane Image Storage	1.2.840.10008.5.1.4.1.1.12.3	see Table 21	see Table 21	SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	see Table 21	see Table 21	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	see Table 21	see Table 21	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	see Table 21	see Table 21	SCP	None
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	see Table 21	see Table 21	SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	see Table 21	see Table 21	SCP	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	see Table 21	see Table 21	SCP	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	see Table 21	see Table 21	SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	see Table 21	see Table 21	SCP	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	see Table 21	see Table 21	SCP	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	see Table 21	see Table 21	SCP	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	see Table 21	see Table 21	SCP	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	see Table 21	see Table 21	SCP	None
CSA Non-Image Storage	1.3.12.2.1107.5.9.1	see Table 21	see Table 21	SCP	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	see Table 21	see Table 21	SCP	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	see Table 21	see Table 21	SCP	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	see Table 21	see Table 21	SCP	None
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	see Table 21	see Table 21	SCP	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	see Table 21	see Table 21	SCP	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	see Table 21	see Table 21	SCP	None
Radiotherapy Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	see Table 21	see Table 21	SCP	None
Radiotherapy Summary Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.7	see Table 21	see Table 21	SCP	None
Basic Text Structured Reporting	1.2.840.10008.5.1.4.1.1.88.11	see Table 21	see Table 21	SCP	None
Enhanced Structured Reporting	1.2.840.10008.5.1.4.1.1.88.22	see Table 21	see Table 21	SCP	None
Comprehensive Structured Reporting	1.2.840.10008.5.1.4.1.1.88.33	see Table 21	see Table 21	SCP	None
Key Object Selection	1.2.840.10008.5.1.4.1.1.88.59	see Table 21	see Table 21	SCP	None

Table 20: ACCEPTED PRESENTATION CONTEXTS BY THE STORAGE-SCP AE

The table below describes the Transfer Syntaxes which are supported by the STORAGE-SCP AE. If multiple Transfer Syntaxes are proposed per Presentation Context then only the most preferable Transfer Syntax is accepted. The order of Transfer Syntax preference for the STORAGE-SCP AE is not

configurable. The default preference order if multiple Transfer Syntaxes are proposed in a single Presentation Context corresponds to the order of Transfer Syntaxes listed in the table.

Transfer Syntax Name	Transfer Syntax UID
Default lossless JPEG Compressed	1.2.840.10008.1.2.4.70
Lossy JPEG 8 Bit Compressed	1.2.840.10008.1.2.4.50
Lossy JPEG 12 Bit Compressed	1.2.840.10008.1.2.4.51
RLE Compressed	1.2.840.10008.1.2.5
Explicit VR Little Endian	1.2.840.10008.1.2.1
Implicit VR Little Endian	1.2.840.10008.1.2

Table 21: STORAGE-SCP AE TRANSFER SYNTAXES

Note:
To make some STORAGE-SCU partner DICOM nodes work it is desired to accept DICOM Objects of certain SOP Classes even though they should not be stored within SIENET MagicWeb. Each Storage SOP Class can be configured via the administration interface to be discarded after reception.

4.2.2.4.1.3 SOP Specific Conformance for Verification SOP Class

The STORAGE-SCP AE provides standard conformance to the Verification SOP Class as an SCP.

4.2.2.4.1.4 SOP Specific Conformance for Storage SOP Classes

The associated Real-World Activity with the Storage service is the storage of medical image data received over the network on a designated hard disk. The STORAGE-SCP AE will return a failure status if it is unable to store the images on to the hard disk.

The STORAGE-SCP AE does not have any dependencies on the number of Associations used to send images to it. Images belonging to more than one Study or Series can be sent over a single or multiple Associations. Images belonging to a single Study or Series can also be sent over different Associations. There is no limit on either the number of SOP Instances or the maximum amount of total SOP Instance data that can be transferred over a single Association.

The STORAGE-SCP AE is configured to retain the original DICOM data in DICOM Part 10 compliant file format. The STORAGE-SCP AE is Level 2 (Full) conformant as a Storage SCP. In addition, all Private and SOP Class Extended Elements are maintained in the DICOM format files. In addition to saving all Elements in files, a subset of the Elements are stored in the SIENET MagicWeb database to support query and retrieval requests.

The behavior for handling duplicate SOP Instances is configurable via administration interface. The default behavior is to replace the original object with the conflicting SOP Instance UID by the new SOP Instance. An alternative configuration is possible that causes the new received SOP Instance to be discarded.

If SOP Instances are compressed in a lossy format by SIENET MagicWeb new SOP Instance UIDs and new Series Instance UIDs are assigned to these objects. Additionally Reference UIDs will be resolved to keep the cross references persistent.

For the purposes of image display the system supports the following photometric interpretations: MONOCHROME1, MONOCHROME2, RGB, PALETTE COLOR, YBR FULL 422, and YBR FULL.

Note:

Enhanced CT and MR SOP Instances containing supplemental Palette Color LUTs will never be compressed by SIENET MagicWeb but only stored in the original compression format in SIENET MagicWeb Online and DICOM Archive even though compression is configured. SIENET MagicWeb identifies such images by analyzing the attribute Pixel Presentation (0008,9205). If the contained value is different from ‚MONOCHROME' image compression will not be performed.

Caution: SIENET MagicWeb Online is not an archive. Normally, no images are stored forever. Only employment of DICOM Archive guarantees long term image storage.

The STORAGE-SCP AE will return the Status Code values in C-STORE Responses as shown in the following table.

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0x0000	The Composite SOP Instance was successfully received and stored temporarily on the hard disk. A 'Success' status indicates not that the SOP Instance is verified and stored in the system database. Note: If the belonging SOP Class UID is configured to be discarded the response status is also set to 'Success'.
Refused	Out of Resources	0xA700	Indicates that there was not enough disk space to store the image. Error message is stored in the Trace Database. The SOP Instance will not be saved.
Error	Data Set does not match SOP Class	0xA900	Indicates that the Data Set does not encode a valid instance of the SOP Class specified. This status is returned if the DICOM Object stream can be successfully parsed but does not contain values for one or more elements which are necessary to store the object on hard disk. Error message is stored in the Trace Database. The SOP Instance will not be saved.
	Unable to process	0x0110	An internal processing error occurred which makes further processing of the store request impossible. Error message is stored in the Trace Database. The SOP Instance will not be saved.

Table 22: STORAGE-SCP AE C-STORE RESPONSE STATUS RETURN BEHAVIOR

Note:

If a failure condition does occur when handling an Association then all images previously received successfully over the Association are maintained in the SIENET MagicWeb database. No previously successfully received images are discarded. Even if an image is successfully received but an error occurs transmitting the C-STORE Response then this final image is maintained rather than discarded. If the loss of an Association is detected then the Association is closed

The behavior of STORAGE-SCP AE during communication failure is summarized in the following table:

Exception	Behavior
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout). I.e. The STORAGE-SCP AE is waiting for the next C-STORE Request on an open Association but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. If some Composite SOP Instances have already been successfully received then they are maintained in the database. They are not automatically discarded because of a later failure. Error indication message is stored in the Trace Database. No message is posted to the User Interface.
Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout). I.e. The STORAGE-SCP AE is waiting for the next C-STORE Data Set PDU but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. If a C-STORE Data Set has not been fully received then the data already received is discarded. If some Composite SOP Instances have already been successfully received over the Association then they are maintained in the database. Error indication message is stored in the Trace Database. No message is posted to the User Interface.
Association A-ABORTed by the SCU or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	If some Composite SOP Instances have already been successfully received then they are maintained in the database. They are not automatically discarded because of a later failure. Error indication message is stored in the Trace Database. No message is posted to the User Interface.

Table 23: STORAGE-SCP AE STORAGE SERVICE COMMUNICATION FAILURE BEHAVIOR

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4.2.2.4.1.5 SOP Specific Conformance for Storage Commitment Push Model SOP Class

The associated Activity with the Storage Commitment Push Model service is the communication by the STORAGE-SCP AE to partner AEs that it has committed to permanently store Composite SOP Instances that have been sent to it. It thus allows partner AEs to determine whether SIENET MagicWeb has taken responsibility for the archiving of specific SOP Instances so that they can be flushed from the partner AE system.

The STORAGE-SCP AE caches the Storage Commitment Push Model N-ACTION Requests in the database to enable processing of received requests after a restart of SIENET MagicWeb. The Storage Commitment check is executed as soon as the specified Composite SOP Instances are received by SIENET MagicWeb and migrated to DICOM Archive. A configurable maximum response time makes an earlier Storage Commitment check possible.

Once the STORAGE-SCP AE has checked for the existence of the specified Composite SOP Instances, it will then attempt to send the Notification request (N-EVENT-REPORT-RQ). The STORAGE-SCP AE will always initiate a new Association for sending back Storage Commitment Push Model Notification (N-EVENT-REPORT). The original Association used to send the corresponding request will never be used for that. If the Partner AE is not accessible for receiving the Notification request the send process is repeated. The number of retries and the delay time between the retries can be configured on the administration interface.

The STORAGE-SCP AE does not support the optional Storage Media File-Set ID & UID attributes in the N-ACTION Request.

The STORAGE-SCP AE supports Storage Commitment Push Model requests for SOP Instances of any of the Storage SOP Classes that are also supported by the STORAGE-SCP AE.

The STORAGE-SCP AE will return the Status Code values in N-ACTION Responses as shown in the following table:

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0x0000	The SCP has successfully received the Storage Commitment Push Model N-ACTION Request and can process the commitment request for the indicated SOP Instances.
Error	Invalid argument value	0x0115	Indicates that the action information value specified was out of range or otherwise inappropriate. Error message is stored in the Trace Database. The Storage Commitment Request will not be performed.
	Unable to process	0x0110	An internal processing error occurred which makes further processing of the storage commitment request impossible. Error message is stored in the Trace Database. The Storage Commitment Request will not be performed.

Table 24: STORAGE-SCP AE N-ACTION RESPONSE STATUS RETURN BEHAVIOR

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The STORAGE-SCP AE will exhibit the following behavior according to the Status Code value returned in an N-EVENT-REPORT Response from a destination Storage Commitment Push Model SCU:

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0x0000	The SCU has successfully received the Storage Commitment Push Model N-EVENT-REPORT Request. Success indication message is stored in the Trace Database if Detailed Trace is switched on. No message is posted to the User Interface.
*	*	Any other status code	This is treated as a temporary Failure. A retry mechanism is started for sending the N-EVENT-REPORT Request again. Error indication message is stored in the Trace Database. No message is posted to the User Interface.

Table 25: STORAGE-SCP AE N-ACTION RESPONSE STATUS RETURN BEHAVIOR

All Status Codes indicating an error or refusal are treated as a temporary failure. The STORAGE-SCP AE can be configured to automatically reattempt the sending of Storage Commitment Push Model N-EVENT-REPORT Requests if an error Status Code is returned or a communication failure occurs. The maximum number of times to attempt sending as well as the time to wait between attempts is configurable.

The behavior of STORAGE-SCP AE during communication failure is summarized in the following table:

Exception	Behavior
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout). I.e. The STORAGE-SCP AE is waiting for the next N-ACTION Request on an open Association but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Any previously received Storage Commitment Push Model N-ACTION Requests will still be fully processed. Error indication message is stored in the Trace Database. No message is posted to the User Interface.
Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout). I.e. The STORAGE-SCP AE is waiting for the next N-ACTION Data Set PDU but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Any previously received Storage Commitment Push Model N-ACTION Requests will still be fully processed. Error indication message is stored in the Trace Database. No message is posted to the User Interface.
Association A-ABORTed by the SCU or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	Any previously received Storage Commitment Push Model N-ACTION Requests will still be fully processed. Error indication message is stored in the Trace Database. No message is posted to the User Interface.

Table 26: STORAGE-SCP AE STORAGE COMMITMENT PUSH MODEL COMMUNICATION FAILURE BEHAVIOR

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4.2.3 Query-SCU Application Entity Specification

4.2.3.1 SOP Classes

The QUERY-SCU AE provides Standard Conformance to the following DICOM V3.0 SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	No
Study Root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No

Table 27: SOP CLASSES FOR QUERY-SCU AE

4.2.3.2 Association Establishment Policies

4.2.3.2.1 General

The QUERY-SCU AE forms Associations when requested to do so by the user or by the Prefetch component. The QUERY-SCU AE can only request the opening of an Association. It cannot accept requests to open Associations from external Application Entities.

The DICOM standard Application Context Name for DICOM 3.0 is always proposed:

Application Context Name	1.2.840.10008.3.1.1.1

Table 28: DICOM APPLICATION CONTEXT FOR QUERY-SCU AE

4.2.3.2.2 Number of Associations

It is not possible to perform several associations simultanously. Only one association at a time can be handled by the QUERY-SCU AE. An association must be completed before a new operation can be initiated.

Maximum number of simultaneous Associations	1 (Not Configurable)

Table 29: NUMBER OF ASSOCIATIONS AS A SCU FOR QUERY-SCU AE

4.2.3.2.3 Asynchronous Nature

The QUERY-SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association). All association requests must be completed and acknowledged before a new operation can be initiated.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 30: ASYNCHRONOUS NATURE AS A SCU FOR QUERY-SCU AE

4.2.3.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 31: DICOM IMPLEMENTATION CLASS AND VERSION FOR QUERY-SCU AE

4.2.3.3 Association Initiation Policy

4.2.3.3.1 Activity – Send Query Requests to an External Peer AE

4.2.3.3.1.1 Description and Sequencing of Activity

The QUERY-SCU AE will initiate a new Association when the user performs the query action from the user interface or a query is initiated by the Prefetch component. An Association Request is sent to the specified QUERY-SCP AE and upon successful negotiation of the required Presentation Context the query is started. The result messages are transmitted in the same association. The QUERY-SCU AE will not attempt to independently retry the query request if an error occurs. It is configurable to perform a Verification before the query is started in order to test the remote application.

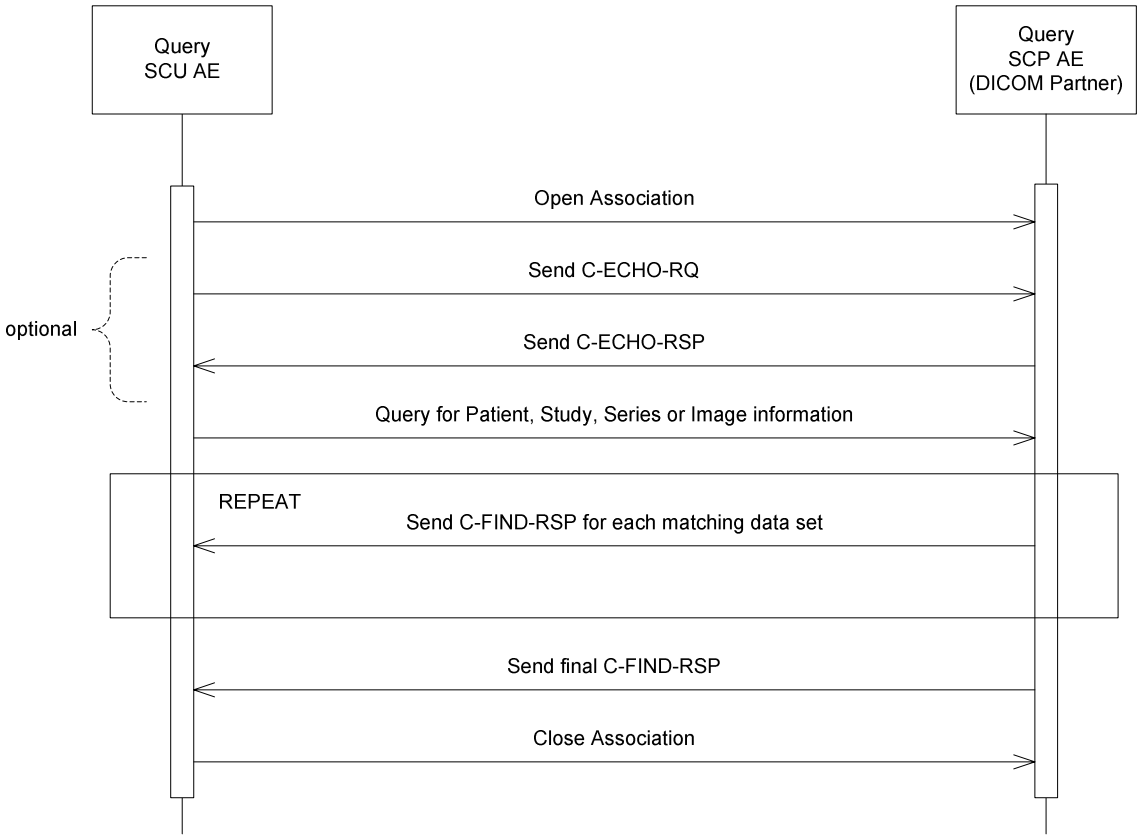

Figure 7: SEQUENCING OF ACTIVITY – PERFOMING QUERY REQUESTS

The following sequencing constraints illustrated in Figure 7 apply to the QUERY-SCU AE for initiating queries (C-FIND-Requests):

1. QUERY-SCU AE opens an Association with the Partner AE.
2. QUERY-SCU AE sends a C-ECHO-RQ Message (configurable).
3. Partner AE sends a C-ECHO-RSP Message (if configured).
4. QUERY-SCU AE sends a C-FIND-RQ Message.
5. Partner AE returns a C-FIND-RSP Message to the QUERY-SCU AE with matching information. A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. A final C-FIND-RSP is sent indicating that the matching is complete.
6. QUERY-SCU AE closes the Association.

4.2.3.3.1.2 Proposed Presentation Contexts

QUERY-SCU AE will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Study Root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

Table 32: PROPOSED PRESENTATION CONTEXTS BY THE QUERY-SCU AE

4.2.3.3.1.3 SOP Specific Conformance for Verification SOP Class

The QUERY-SCU AE provides standard conformance to the Verification SOP Class as an SCU.

4.2.3.3.1.4 SOP Specific Conformance for Query SOP Classes

The QUERY-SCU AE provides standard conformance to the supported C-FIND SOP Classes. Only a single information model, Study Root, is supported. All queries are initiated at the highest level of the information model (STUDY Level). The supported attributes are listed in the tables bellow. The Attribute Names that are used in former versions of the DICOM Standard are added in brackets. The last four columns have following meanings:

User Input:	User can specify a matching value as filter criteria.
Wildcard appended:	The wildcard '*' is appended to the user input automatically.
Value displayed:	The return value is displayed on the web interface.
Prefetch Query:	Attribute is used for prefetch querys. (only *Patient ID* is used if patient match strategy is set to 'PatientID')

Level Name Attribute Name	Tag	VR	Types of Matching	User Input	Wildcard appended	Value displayed	Prefetch Query
Study Level							
Patient's Name	(0010,0010)	PN	wild card, universal	X	X	X	X
Patient ID	(0010,0020)	LO	wild card, universal	X	X	X	X
Patient´s Birth Date	(0010,0030)	DA	universal			X	X
Patient´s Sex	(0010,0040)	CS	universal			X	X
Patient Comments	(0010,4000)	LT	wild card, universal	X	X	X	
Study Instance UID	(0020,000D)	UI	universal				
Study ID	(0020,0010)	SH	wild card, universal	X	X		
Study Date	(0008,0020)	DA	single value, range, universal	X		X	
Study Time	(0008,0030)	TM	universal			X	
Accession Number	(0008,0050)	SH	wild card, universal	X	X	X	
Referring Physician's Name	(0008,0090)	PN	single value, universal	X	X	X	
Study Description	(0008,1030)	LO	wild card, universal	X	X	X	
Number of Study Related Instances (Number of Study Related Images)	(0020,1208)	IS	universal			X	

Table 33: STUDY ROOT C-FIND SCU REQUESTED ELEMENTS

Note:

The Query SCU AE does not request the Instance Availability (0008,0056) Data Element explicitely because according to the DICOM Standard this value should not be included in a C-FIND request.

If this Data Element is provided with the C-FIND response by the DICOM Partner node the value of this attribute is displayed in the user interface.

4.2.3.4 Association Acceptance Policy

The QUERY-SCU AE does not accept Associations.

4.2.4 Retrieve-SCU Application Entity Specification

4.2.4.1 SOP Classes

The RETRIEVE-SCU AE provides Standard Conformance to the following DICOM V3.0 SOP Class:

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	No
Study Root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No

Table 34: SOP CLASSES FOR RETRIEVE-SCU AE

4.2.4.2 Association Establishment Policies

4.2.4.2.1 General

The RETRIEVE-SCU AE forms Associations when requested to do so by the user or by the Prefetch component. The RETRIEVE-SCU AE can only request the opening of an Association. It cannot accept requests to open Associations from external Application Entities.

The DICOM standard Application Context Name for DICOM 3.0 is always proposed:

Application Context Name	1.2.840.10008.3.1.1.1

Table 35: DICOM APPLICATION CONTEXT FOR RETRIEVE-SCU AE

4.2.4.2.2 Number of Associations

For each C-MOVE request one association to the C-MOVE Destination AE is established by the RETRIEVE-SCU AE. Retrieve requests initiated from the user interface will be stored in a job queue and up to 14 retrieve jobs can be performed simultanously (8 high prior jobs, 4 medium prior jobs and 2 low prior jobs).

Maximum number of simultaneous Associations	Up to 14 (Not Configurable)

Table 36: NUMBER OF ASSOCIATIONS AS A SCU FOR RETRIEVE-SCU AE

4.2.4.2.3 Asynchronous Nature

The RETRIEVE-SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association). All association requests must be completed and acknowledged before a new operation can be initiated.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 37: ASYNCHRONOUS NATURE AS A SCU FOR RETRIEVE-SCU AE

4.2.4.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 38: DICOM IMPLEMENTATION CLASS AND VERSION FOR RETRIEVE-SCU AE

4.2.4.3 Association Initiation Policy

4.2.4.3.1 Activity – Send Retrieve Requests to an External Peer AE

4.2.4.3.1.1 Description and Sequencing of Activity

The RETRIEVE-SCU AE will initiate a new Association when the user performs the retrieve action from the user interface or a retrieve is initiated by the Prefetch component. An Association Request is sent to the specified RETRIEVE-SCP AE and upon successful negotiation of the required Presentation Context the retrieve is started. The response messages are transmitted in the same association. For transferring the requested SOP Instances the RETRIEVE-SCP AE has to establish an Association with the the STORAGE-SCP AE of SIENET MagicWeb. It is not possible to configure another C-MOVE Destination than the own STORAGE-SCP AE. The RETRIEVE-SCU AE will not attempt to independently retry the retrieve request if an error occurs.

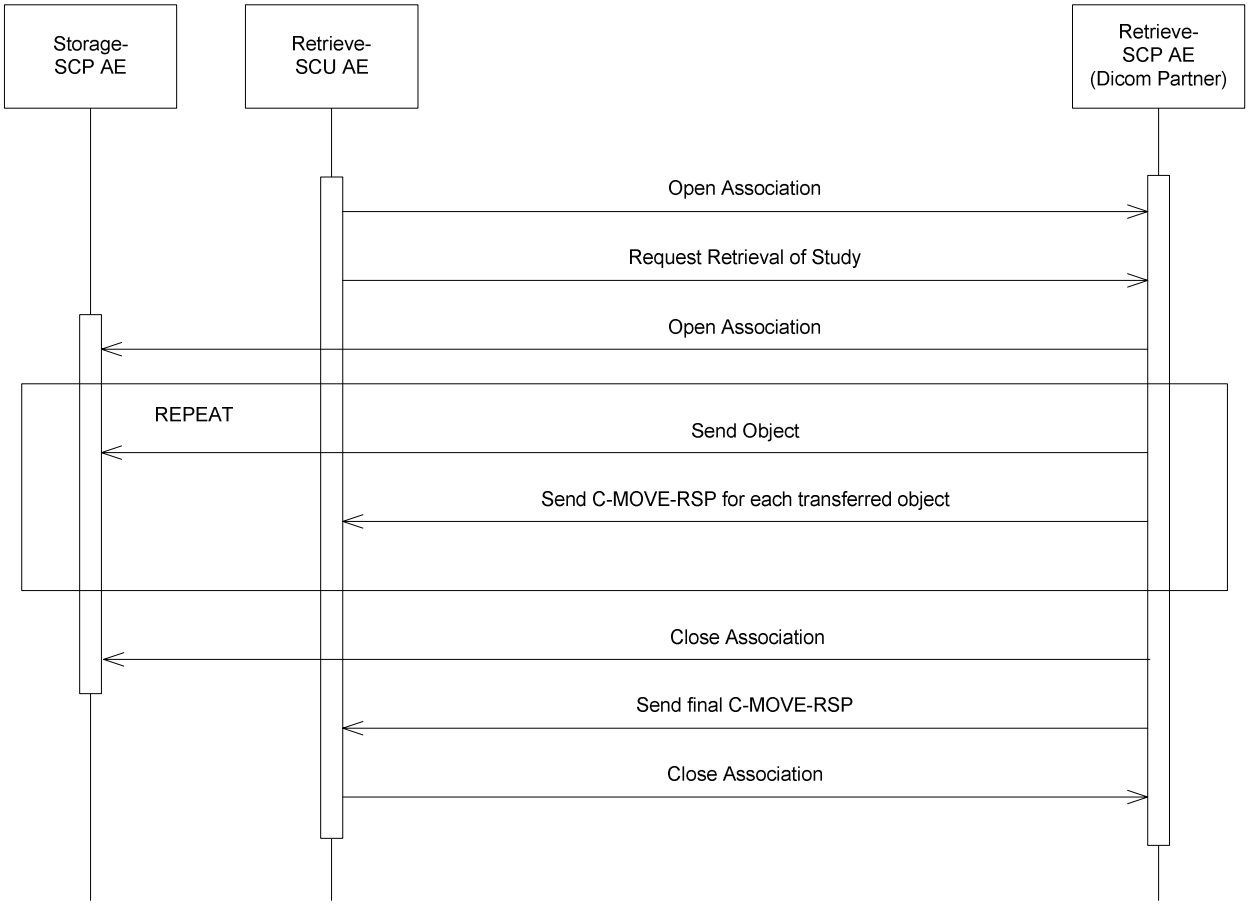

Figure 8: SEQUENCING OF ACTIVITY – PERFOMING RETRIEVE REQUESTS

The following sequencing constraints illustrated in Figure 8 apply to the RETRIEVE-SCU AE for initiating retrieves (C-MOVE-Requests):

1. RETRIEVE-SCU AE opens an Association with the Partner AE.
2. RETRIEVE-SCU AE sends a C-MOVE-RQ Message.
3. Partner AE sends the Composite SOP Instances to the STORAGE-SCP AE.
4. Partner AE sends a C-MOVE-RSP Message to the RETRIEVE-SCU AE for each transferred SOP Instance.
5. Partner AE sends a final C- MOVE-RSP indicating that the SOP Instance transfer is complete.
6. RETRIEVE-SCU AE closes the Association.
7. The Verification Service is only supported as a utility function for Service staff. It is used only as a diagnostic tool.

4.2.4.3.1.2 Proposed Presentation Contexts

RETRIEVE-SCU AE will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Study Root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

Table 39: PROPOSED PRESENTATION CONTEXTS BY THE RETRIEVE-SCU AE

4.2.4.3.1.3 SOP Specific Conformance for Verification SOP Class

The RETRIEVE-SCU AE provides standard conformance to the Verification SOP Class as an SCU. The Verification Service as an SCU is actually only supported as a diagnostic service tool for network communication issues.

4.2.4.3.1.4 SOP Specific Conformance for Retrieve SOP Classes

RETRIEVE-SCU AE provides standard conformance to the supported C-MOVE SOP Classes. Only a single information model, Study Root, is supported. All retrieves are initiated at the highest level of the information model (the STUDY level) so the Study Instance UID is the Request Identifier. Lists of UIDs will not be used for multiple study retrieve within a single retrieve request.

The instances are retrieved to the current application's local database since the destination is always the AE Title of the STORE-SCP AE of the local application.

Note:

It is not necessary to configure the RETRIEVE-SCP AE as a STORAGE SCU on the administration interface of SIENET MagicWeb to allow the partner AE to send SOP Instances after a retrieve request. A partner AE configured as a MOVE-SCP has always the permission to send DICOM objects to SIENET MagicWeb.

4.2.4.4 Association Acceptance Policy

The RETRIEVE-SCU AE does not accept Associations.

4.2.5 QUERY-RETRIEVE-SCP Application Entity (Level A) Specification

SIENET MagicWeb stores received DICOM objects in two different compression levels specified as Level A and Level B. The compression type can be configured for each level via administration interface. If DICOM Archive is present the DICOM objects are additionally stored with the original or lossless compressed format (configurable) in the Archive Level. The Query/Retrieve-SCU AE decides which Level is accessed for Query and Retrieve requests by using the appropriate AE Title that is assigned to each Level.

This chapter describes the DICOM behavior of the QUERY-RETRIEVE-SCP AE which represents the compression Level A.

4.2.5.1 SOP Classes

The QUERY-RETRIEVE-SCP AE (Level A) provides Standard Conformance to the following DICOM V3.0 SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No	Yes
Patient Root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	No	Yes
Patient Root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	No	Yes
Study Root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	No	Yes
Study Root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	No	Yes
Patient Study Only Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	No	Yes
Patient Study Only Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	No	Yes

Table 40: SOP CLASSES FOR QUERY-RETRIEVE-SCP AE (Level A)

4.2.5.2 Association Establishment Policies

4.2.5.2.1 General

The QUERY-RETRIEVE-SCP AE will never initiate Associations; it only accepts Association Requests from external DICOM AEs. The QUERY-RETRIEVE-SCP AE will accept Associations for Verification, C-FIND and C-MOVE requests. In the case of a C-MOVE request, the QUERY-RETRIEVE-SCP AE will issue a command to the STORAGE-SCU AE to initiate an Association with the Destination DICOM AE to send images as specified by the originator of the C-MOVE Request.
The DICOM standard Application Context Name for DICOM 3.0 is always accepted:

Application Context Name	1.2.840.10008.3.1.1.1

Table 41: DICOM APPLICATION CONTEXT FOR QUERY-RETRIEVE-SCP AE (LEVEL A)

4.2.5.2.2 Number of Associations

The QUERY-RETRIEVE-SCP AE can support multiple simultaneous Associations. Each time the QUERY-RETRIEVE-SCP AE receives an Association, a child process will be spawned to process the Verification, Query, or Retrieval request. The maximum number of child processes, and thus the maximum number of simultaneous Associations that can be processed, is set by configuration. The maximum is limited by the License Key.

Maximum number of simultaneous Associations	- Limited by License Key - Restrictable by administrator

Table 42: NUMBER OF ASSOCIATIONS AS A SCP FOR QUERY-RETRIEVE-SCP AE

4.2.5.2.3 Asynchronous Nature

The QUERY-RETRIEVE-SCP AE does not support asynchronous communication (multiple outstanding transactions over a single association). All association requests must be completed and acknowledged before a new operation can be initiated.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 43: ASYNCHRONOUS NATURE AS A SCP FOR QUERY-RETRIEVE-SCP AE

4.2.5.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 44: DICOM IMPLEMENTATION CLASS AND VERSION FOR QUERY-RETRIEVE-SCP AE

4.2.5.3 Association Initiation Policy

The QUERY-RETRIEVE-SCP AE does not initiate Associations.

4.2.5.4 Association Acceptance Policy

4.2.5.4.1 Activity – Handling Query and Retrieval Requests

4.2.5.4.1.1 Description and Sequencing of Activity

The QUERY-RETRIEVE-SCP AE accepts Associations only if they have valid Presentation Contexts. If none of requested Presentation Contexts are accepted then the Association Request itself is rejected. Only associations with Application Entity Titles of DICOM partner nodes will be accepted that are configured on the administration interface. If QUERY-RETRIEVE-SCP AE receives a query (C-FIND) request then the response(s) will be sent over the same Association used to send the C-FIND-Request.

If QUERY-RETRIEVE-SCP AE receives a retrieval (C-MOVE) request then the responses will be sent over the same Association used to send the C-MOVE-Request. The QUERY-RETRIEVE-SCP AE will notify the STORAGE-SCU to send the requested SOP Instances to the C-MOVE Destination. The STORAGE-SCU AE notifies the QUERY-RETRIEVE-SCP AE of the success or failure of each attempt to send a Composite SOP Instance to the partner C-MOVE Destination AE. The QUERY-RETRIEVE-SCP AE then sends a C-MOVE Response indicating this status after each attempt. Once the STORAGE-SCU AE has finished attempting to transfer all the requested SOP Instances, the QUERY-RETRIEVE-SCP AE sends a final C-MOVE Response indicating the overall status of the attempted retrieval.

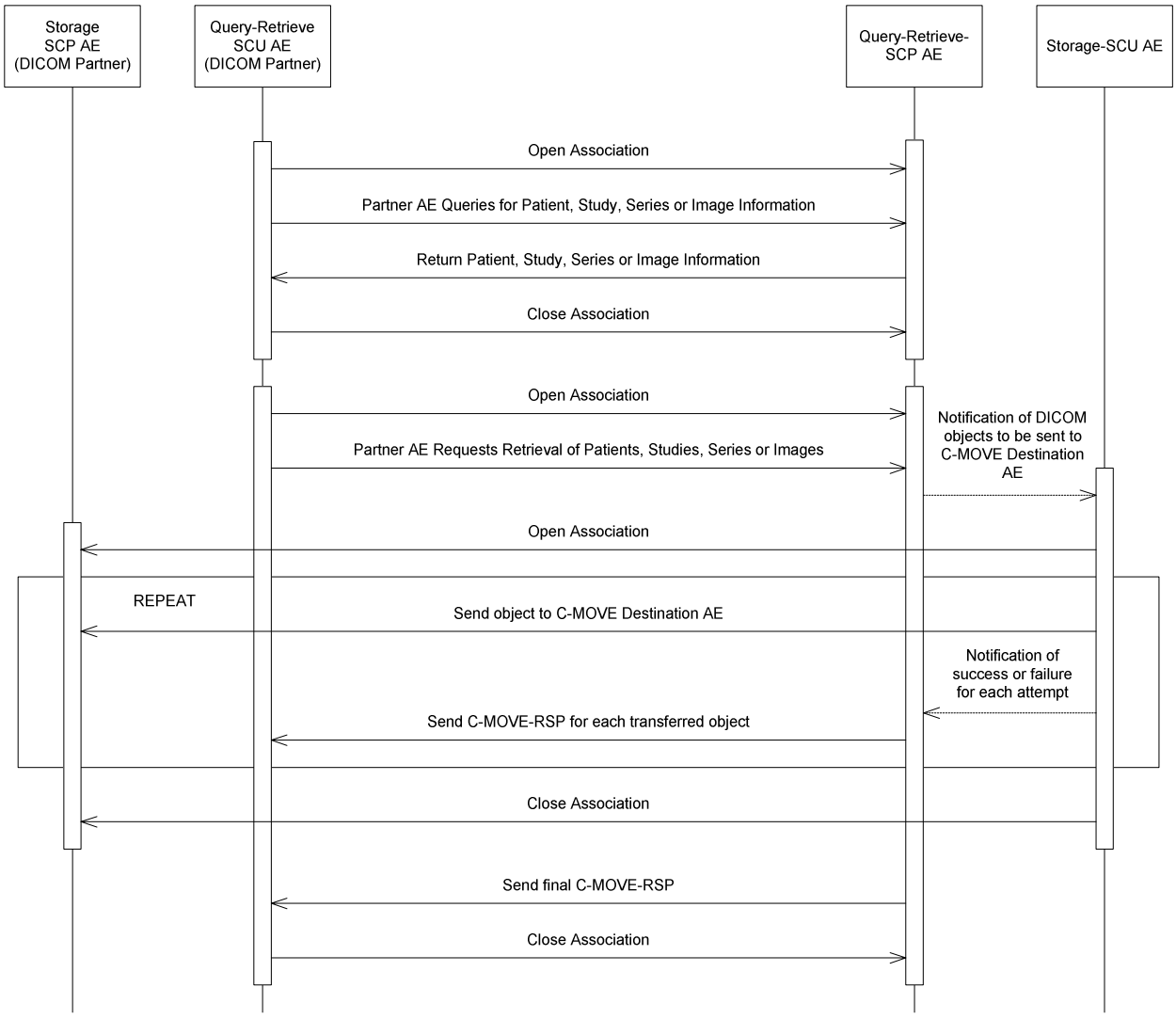

Figure 9: SEQUENCING OF ACTIVITY - HANDLING QUERY AND RETRIEVAL REQUESTS

The following sequencing constraints illustrated in Figure 9 apply to the QUERY-RETRIEVE-SCP AE for handling queries (C-FIND-Requests):

1. Partner AE opens an Association with the QUERY-RETRIEVE-SCP AE.
2. Partner AE sends a C-FIND-RQ Message.
3. QUERY-RETRIEVE-SCP AE returns a C-FIND-RSP Message to the Partner AE with matching information. A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. A final C-FIND-RSP is sent indicating that the matching is complete.
4. Partner AE closes the Association. Note that the Partner AE does not have to close the Association immediately. Further C-FIND or C-MOVE Requests can be sent over the Association before it is closed.

The following sequencing constraints illustrated in Figure 9 apply to the QUERY-RETRIEVE-SCP AE for handling retrievals (C-MOVE-Requests):

1. Partner AE opens an Association with the QUERY-RETRIEVE-SCP AE.
2. Partner AE sends a C-MOVE-RQ Message.
3. QUERY-RETRIEVE-SCP AE notifies the STORAGE-SCU AE to send the Composite SOP Instances to the Partner C-MOVE Destination AE as indicated in the C-MOVE-RQ.
4. After attempting to send a SOP Instance, the STORAGE-SCU AE indicates to the QUERY-RETRIEVE-SCP AE whether the transfer succeeded or failed. The QUERY-RETRIEVE-SCP AE then returns a C-MOVE-RSP indicating this success or failure
5. Once the STORAGE-SCU AE has completed all attempts to transfer the SOP Instances to the C-MOVE Destination AE, or the first failure occurred, the QUERY-RETRIEVE-SCP AE sends a final C-MOVE-RSP indicating the overall success or failure of the retrieval.
6. Partner AE closes the Association. Note that the Partner AE does not have to close the Association immediately. Further C-FIND or C-MOVE Requests can be sent over the Association before it is closed.

The QUERY-RETRIEVE-SCP AE may reject Association attempts as shown in Table 45. The Result, Source and Reason/Diag columns represent the values returned in the corresponding fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4). The following abbreviations are used in the Source column:

a. 1 – DICOM UL service-user
b. 2 – DICOM UL service-provider (ASCE related function)
c. 3 – DICOM UL service-provider (Presentation related function)

Result	Source	Reason/Diag	Explanation
2 - rejected-transient	c	2 - local-limit-exceeded	The (configurable) maximum number of simultaneous Associations has been reached. An Association request with the same parameters may succeed at a later time.
1 - rejected-permanent	a	2 - application-context-name-not-supported	The Association request contained an unsupported Application Context Name. An association request with the same parameters will not succeed at a later time.
1 - rejected-permanent	a	7 - called-AE-title-not-recognized	The Association request contained an unrecognized Called AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association initiator is incorrectly configured and attempts to address the Association acceptor using the wrong AE Title.
1 - rejected-permanent	a	3 - calling-AE-title-not-recognized	The Association request contained an unrecognized Calling AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association acceptor has not been configured to recognize the AE Title of the Association initiator.
1 - rejected-permanent	b	1 - no-reason-given	The Association request could not be parsed. An Association request with the same format will not succeed at a later time.

Table 45: ASSOCIATION REJECTION REASONS

4.2.5.4.1.2 Accepted Presentation Contexts

QUERY-RETRIEVE-SCP AE will accept Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Patient Root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Patient Root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Study Root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Study Root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Patient Study Only Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Patient Study Only Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None

Table 46: ACCEPTED PRESENTATION CONTEXTS BY THE QUERY-RETRIEVE-SCP AE

4.2.5.4.1.3 SOP Specific Conformance for Verification SOP Class

The QUERY-RETRIEVE-SCP AE provides standard conformance to the Verification SOP Class as an SCP.

4.2.5.4.1.4 SOP Specific Conformance for Query SOP Classes

The QUERY-RETRIEVE-SCP AE supports hierarchical queries and not relational queries. The attributes Query/Retrieve Level (0008,0052) and Retrieve AE Title (0008,0054) are returnd by default. Query responses always return values from the SIENET MagicWeb database.

Patient Root Information Model

All unique keys have to be supplied according to the selected Query/Retrieve Level. The supported attributes on the various retrieve levels are listed in the following. Lists of UIDs are also supported except for Patient Level.

Patient Level:	Patient ID	(0010,0020)
Study Level:	Study Instance UID	(0020,000D)
Series Level:	Series Instance UID	(0020,000E)
Image Level:	SOP Instance UID	(0008,0018)

Study Root Information Model

All unique keys have to be supplied according to the selected Query/Retrieve Level. The supported attributes on the various retrieve levels are listed in the following. Lists of UIDs are also supported.

Study Level:	Study Instance UID	(0020,000D)
Series Level:	Series Instance UID	(0020,000E)
Image Level:	SOP Instance UID	(0008,0018)

Patient/Study Only Information Model

All unique keys have to be supplied according to the selected Query/Retrieve Level. The supported attributes on the various retrieve levels are listed in the following. Lists of UIDs are also supported except for Patient Level.

Patient Level:	Patient ID	(0010,0020)
Study Level:	Study Instance UID	(0020,000D)

The supported attributes on the various query levels of the three implemented information models are listed in the following tables. The Attribute Names that are used in former versions of the DICOM Standard are added in brackets. The private attributes are marked with an appropriate label.

Level Name Attribute Name	Tag	VR	Types of Matching
Patient Level			
Patient's Name	(0010,0010)	PN	single value, wild card, universal
Patient ID	(0010,0020)	LO	single value, wild card, universal
Patient´s Birth Date	(0010,0030)	DA	single value, range, universal
Patient´s Sex	(0010,0040)	CS	single value, wild card, universal
Patient Comments	(0010,4000)	LT	single value, wild card, universal
Number of Patient Related Studies	(0020,1200)	IS	universal
Number of Patient Related Series	(0020,1202)	IS	universal
Number of Patient Related Instances (Number of Patient Related Images)	(0020,1204)	IS	universal
Study Level			
Study Instance UID	(0020,000D)	UI	single value, universal
Study ID	(0020,0010)	SH	single value, wild card, universal
Study Date	(0008,0020)	DA	single value, range, universal
Study Time	(0008,0030)	TM	single value, range, universal
Accession Number	(0008,0050)	SH	single value, wild card, universal
Referring Physician's Name	(0008,0090)	PN	single value, wild card, universal
Modalities in Study	(0008,0061)	CS	single value, wild card, universal
Study Description	(0008,1030)	LO	single value, wild card, universal
Study Comments	(0032,4000)	LT	single value, wild card, universal
Name of Physician(s) Reading Study	(0008,1060)	PN	single value, wild card, universal
Diagnosed (private)	(2E15,1061)	ST	single value, wild card, universal
Number of Study Related Series	(0020,1206)	IS	universal
Number of Study Related Instances (Number of Study Related Images)	(0020,1208)	IS	universal
Series Level			
Series Instance UID	(0020,000E)	UI	single value, universal
Series Number	(0020,0011)	IS	single value, wild card, universal
Modality	(0008,0060)	CS	single value, wild card, universal

Series Date	(0008,0021)	DA	single value, range, universal
Series Time	(0008,0031)	TM	single value, range, universal
Series Description	(0008,103E)	LO	single value, wild card, universal
Performing Physician's Name	(0008,1050)	PN	single value, wild card, universal
Body Part Examined	(0018,0015)	CS	single value, wild card, universal
Manufacturer	(0008,0070)	LO	single value, wild card, universal
Number of Series Related Instances (Number of Series Related Images)	(0020,1209)	IS	universal
Image Level			
SOP Instance UID	(0008,0018)	UI	single value, universal
SOP Class UID	(0008,0016)	UI	single value, universal
Content Date (Image Date)	(0008,0023)	DA	single value, range, universal
Content Time (Image Time)	(0008,0033)	TM	single value, range, universal
Instance Number (Image Number)	(0020,0013)	IS	single value, wild card, universal
Number of Frames	(0028,0008)	IS	single value, wild card, universal
Rows	(0028,0010)	US	single value, wild card, universal
Columns	(0028,0011)	US	single value, wild card, universal
Graphical Attributes (private)	(2E15,1069)	ST	single value, wild card, universal
Transformations (private)	(2E15,106A)	ST	single value, wild card, universal
Pixel Performance Measurement (private)	(2E15,106B)	ST	single value, wild card, universal

Table 47: PATIENT ROOT C-FIND SCP SUPPORTED ELEMENTS

Level Name Attribute Name	Tag	VR	Types of Matching
Study Level			
Patient's Name	(0010,0010)	PN	single value, wild card, universal
Patient ID	(0010,0020)	LO	single value, wild card, universal
Patient´s Birth Date	(0010,0030)	DA	single value, range, universal
Patient´s Sex	(0010,0040)	CS	single value, wild card, universal
Patient Comments	(0010,4000)	LT	single value, wild card, universal
Number of Patient Related Studies	(0020,1200)	IS	universal
Number of Patient Related Series	(0020,1202)	IS	universal
Number of Patient Related Instances (Number of Patient Related Images)	(0020,1204)	IS	universal
Study Instance UID	(0020,000D)	UI	single value, universal
Study ID	(0020,0010)	SH	single value, wild card, universal
Study Date	(0008,0020)	DA	single value, range, universal
Study Time	(0008,0030)	TM	single value, range, universal
Accession Number	(0008,0050)	SH	single value, wild card, universal
Referring Physician's Name	(0008,0090)	PN	single value, wild card, universal
Modalities in Study	(0008,0061)	CS	single value, wild card, universal
Study Description	(0008,1030)	LO	single value, wild card, universal
Study Comments	(0032,4000)	LT	single value, wild card, universal
Name of Physician(s) Reading Study	(0008,1060)	PN	single value, wild card, universal
Diagnosed (private)	(2E15,1061)	ST	single value, wild card, universal
Number of Study Related Series	(0020,1206)	IS	universal
Number of Study Related Instances (Number of Study Related Images)	(0020,1208)	IS	universal
Series Level			
Series Instance UID	(0020,000E)	UI	single value, universal
Series Number	(0020,0011)	IS	single value, wild card, universal
Modality	(0008,0060)	CS	single value, wild card, universal
Series Date	(0008,0021)	DA	single value, range, universal

Series Time	(0008,0031)	TM	single value, range, universal
Series Description	(0008,103E)	LO	single value, wild card, universal
Performing Physician's Name	(0008,1050)	PN	single value, wild card, universal
Body Part Examined	(0018,0015)	CS	single value, wild card, universal
Manufacturer	(0008,0070)	LO	single value, wild card, universal
Number of Series Related Instances (Number of Series Related Images)	(0020,1209)	IS	universal
Image Level			
SOP Instance UID	(0008,0018)	UI	single value, universal
SOP Class UID	(0008,0016)	UI	single value, universal
Content Date (Image Date)	(0008,0023)	DA	single value, range, universal
Content Time (Image Time)	(0008,0033)	TM	single value, range, universal
Instance Number (Image Number)	(0020,0013)	IS	single value, wild card, universal
Number of Frames	(0028,0008)	IS	single value, wild card, universal
Rows	(0028,0010)	US	single value, wild card, universal
Columns	(0028,0011)	US	single value, wild card, universal
Graphical Attributes (private)	(2E15,1069)	ST	single value, wild card, universal
Transformations (private)	(2E15,106A)	ST	single value, wild card, universal
Pixel Performance Measurement (private)	(2E15,106B)	ST	single value, wild card, universal

Table 48: STUDY ROOT C-FIND SCP SUPPORTED ELEMENTS

Level Name Attribute Name	Tag	VR	Types of Matching
Patient Level			
Patient's Name	(0010,0010)	PN	single value, wild card, universal
Patient ID	(0010,0020)	LO	single value, wild card, universal
Patient´s Birth Date	(0010,0030)	DA	single value, range, universal
Patient´s Sex	(0010,0040)	CS	single value, wild card, universal
Patient Comments	(0010,4000)	LT	single value, wild card, universal
Number of Patient Related Studies	(0020,1200)	IS	universal
Number of Patient Related Series	(0020,1202)	IS	universal
Number of Patient Related Instances (Number of Patient Related Images)	(0020,1204)	IS	universal
Study Level			
Study Instance UID	(0020,000D)	UI	single value, universal
Study ID	(0020,0010)	SH	single value, wild card, universal
Study Date	(0008,0020)	DA	single value, range, universal
Study Time	(0008,0030)	TM	single value, range, universal
Accession Number	(0008,0050)	SH	single value, wild card, universal
Referring Physician's Name	(0008,0090)	PN	single value, wild card, universal
Modalities in Study	(0008,0061)	CS	single value, wild card, universal
Study Description	(0008,1030)	LO	single value, wild card, universal
Study Comments	(0032,4000)	LT	single value, wild card, universal
Name of Physician(s) Reading Study	(0008,1060)	PN	single value, wild card, universal
Diagnosed (private)	(2E15,1061)	ST	single value, wild card, universal
Number of Study Related Series	(0020,1206)	IS	universal
Number of Study Related Instances (Number of Study Related Images)	(0020,1208)	IS	universal

Table 49: PATIENT/STUDY ONLY ROOT C-FIND SCP SUPPORTED ELEMENTS

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The QUERY-RETRIEVE-SCP AE will return the Status Code values in C-FIND Responses as shown in the following table.

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0x0000	Matching is complete. No final identifier is supplied.
Failed	Identifier does not match SOP Class	0xA900	The C-FIND query identifier contains invalid Elements or values, or is missing mandatory Elements or values for the specified SOP Class. Error message is stored in the Trace Database.
	Unable to process	0xC001	An internal processing error occurred which makes further processing of the query request impossible. Error message is stored in the Trace Database.
Pending	Matches are continuing and current match is supplied	0xFF00	Indicates that the search for further matches is continuing. This is returned when each successful match is returned and when further matches are forthcoming. This status code is returned if all optional keys in the query identifier are actually supported.

Table 50: QUERY-RETRIEVE-SCP AE C-FIND RESPONSE STATUS RETURN BEHAVIOR

4.2.5.4.1.5 SOP Specific Conformance for Retrieval SOP Classes

The QUERY-RETRIEVE-SCP AE will convey to the STORAGE-SCU AE that an Association with a DICOM Application Entity named by the external C-MOVE SCU (through a MOVE Destination AE Title) should be established. It will also convey to the STORAGE-SCU AE to perform C-STORE operations on specific instances requested by the external C-MOVE SCU. One or more of the Image Storage Presentation Contexts listed in Table 8 will be negotiated.

An initial C-MOVE Response is always sent after confirming that the C-MOVE Request itself can be processed. After this, the QUERY-RETRIEVE-SCP AE will return a response to the C-MOVE SCU after the STORAGE-SCU AE has attempted to send each image. This response reports contain the number of remaining SOP Instances to transfer and the number of transfers having a successful, failed, or warning status.

Note: A C-MOVE Request is refused by SIENET MagicWeb with status 0xA702 if the required SOP Instances are locked for a scheduled Patient Information Reconciliation (PIR) process.

The QUERY-RETRIEVE-SCP AE will return the Status Code values in C-MOVE Responses as shown in the following table.

Service Status	Further Meaning	Error Code	Behavior
Success	Sub-operations complete – No Failures	0x0000	All the Composite SOP Instances have been successfully sent to the C-MOVE Destination AE.
Warning	Sub-operations complete – One or more Failures	0xB000	Some of the Composite SOP Instances have been successfully sent to the C-MOVE Destination AE. A list with all the failed SOP Instance UIDs is sent along with the response message (Tag 0008,0058).

Refused	Out of Resources – Unable to calculate number of matches	0xA701	Number of matches cannot be determined due to system failure. Returned if the server's database is not functioning so the search for matches to the C-MOVE Request cannot be found. Error indication message is stored in the Trace Database. No message is posted to the User Interface.
	Refused: Out of Resources – Unable to perform sub-operations	0xA702	C-STORE sub-operations cannot be performed due to failure to access Composite SOP Instances, or failure of a C-STORE Request. For example, this Status will be returned if the required SOP Instances are deleted in the meantime or the affected patient is locked for PIR process. Error indication message is stored in the Trace Database. No message is posted to the User Interface.
	Move destination unknown	0xA801	The Destination Application Entity named in the C-MOVE Request is unknown to Query-Retrieve SCP AE. Error indication message is stored in the Trace Database. No message is posted to the User Interface.
Failed	Data set does not match SOP Class	0xA900	The C-MOVE identifier contains invalid Elements or values, or is missing mandatory Elements or values for the specified SOP Class or retrieval level. Error message is stored in the Trace Database. No message is posted to the User Interface.
	Unable to process	0xC001	An internal processing error occurred which makes further processing of the retrieve request impossible. Error message is stored in the Trace Database. No message is posted to the User Interface.
Pending	Sub-operations are continuing	0xFF00	A Response with this Status Code is sent every time a Composite SOP Instance has been successfully sent to the C-MOVE Destination AE.

Table 51: QUERY-RETRIEVE-SCP AE C-MOVE RESPONSE STATUS RETURN BEHAVIOR

The behavior of QUERY-RETRIEVE-SCP AE during communication failure is summarized in the following table:

Exception	Behavior
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout). I.e. The QUERY-RETRIEVE-SCP AE is waiting for the next C-FIND or C-MOVE Request on an open Association but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Error message is stored in the Trace Database. If the STORAGE-SCU AE is still sending Composite SOP Instances as a result of an earlier C-MOVE Request received on this Association, it will continue attempting to complete the entire C-MOVE Request.
Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout). I.e. The QUERY-RETRIEVE-SCP AE is waiting for the next message PDU but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Error message is stored in the Trace Database. If the STORAGE-SCU AE is still sending Composite SOP Instances as a result of an earlier C-MOVE Request received on this Association, it will continue attempting to complete the entire C-MOVE Request.
Association A-ABORTed by the SCU or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	Error message is stored in the Trace Database. If the STORAGE-SCU AE is still sending Composite SOP Instances as a result of an earlier C-MOVE Request received on this Association, it will continue attempting to complete the entire C-MOVE Request.

Table 52: QUERY-RETRIEVE-SCP AE COMMUNICATION FAILURE BEHAVIOR

4.2.6 QUERY-RETRIEVE-SCP Application Entity (Level B) Specification

SIENET MagicWeb stores received DICOM objects in two different compression levels specified as Level A and Level B. The compression type can be configured for each level via administration interface. If DICOM Archive is present the DICOM objects are additionally stored with the original or lossless compressed format (configurable) in the Archive Level. The Query/Retrieve-SCU AE decides which Level is accessed for Query and Retrieve requests by using the appropriate AE Title that is assigned to each Level.

The difference between Level A and Level B is only the configured compression type so the DICOM behaviour of QUERY-RETRIEVE-SCP AE (Level B) is identical to QUERY-RETRIEVE-SCP AE which represents the compression Level A. See chapter 4.2.5 for the description of the Level B QUERY-RETRIEVE-SCP AE.

4.2.7 QUERY-RETRIEVE-SCP Application Entity (Archive Level) Specification

SIENET MagicWeb stores received DICOM objects in two different compression levels specified as Level A and Level B. The compression type can be configured for each level via administration interface. If DICOM Archive is present the DICOM objects are additionally stored with the original or lossless compressed format (configurable) in the Archive Level. The Query/Retrieve-SCU AE decides which Level is accessed for Query and Retrieve requests by using the appropriate AE Title that is assigned to each Level.

The difference between the Archive Level and Level A/Level B is only the location of the stored DICOM objects and the fact that the objects are always present in either the original or the lossless compressed format. So the DICOM behaviour of QUERY-RETRIEVE-SCP AE (Archive Level) is identical to QUERY-RETRIEVE-SCP AE which represents the compression Level A. See chapter 4.2.5 for the description of the Archvie Level QUERY-RETRIEVE-SCP AE.

4.2.8 MODALITY-WORKLIST-SCP Application Entity Specification

SIENET MagicWeb makes DICOM Modality Worklist Query functionality available to Radiology Information Systems with no own DICOM Interface. The Scheduled Procedure Step information is read from the RIS database which is configured via administration interface.

4.2.8.1 SOP Classes

The MODALITY-WORKLIST-SCP AE provides Standard Conformance to the following DICOM V3.0 SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No	Yes
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	No	Yes

Table 53: SOP CLASSES FOR MODALITY-WORKLIST-SCP AE

4.2.8.2 Association Establishment Policies

4.2.8.2.1 General

The MODALITY-WORKLIST-SCP AE will never initiate Associations; it only accepts Association Requests from external DICOM AEs. The MODALITY-WORKLIST-SCP AE will accept Associations for Verification and C-FIND requests.
The DICOM standard Application Context Name for DICOM 3.0 is always accepted:

Application Context Name	1.2.840.10008.3.1.1.1

Table 54: DICOM APPLICATION CONTEXT FOR MODALITY-WORKLIST-SCP AE

4.2.8.2.2 Number of Associations

The MODALITY-WORKLIST-SCP AE can support multiple simultaneous Associations. Each time the MODALITY-WORKLIST-SCP AE receives an Association, a child process will be spawned to process the Verification or MWL request. The maximum number of child processes, and thus the maximum number of simultaneous Associations that can be processed, is set by configuration. The maximum is limited by the License Key.

Maximum number of simultaneous Associations	- Limited by License Key - Restrictable by administrator

Table 55: NUMBER OF ASSOCIATIONS AS A SCP FOR MODALITY-WORKLIST-SCP AE

4.2.8.2.3 Asynchronous Nature

The MODALITY-WORKLIST-SCP AE does not support asynchronous communication (multiple outstanding transactions over a single association). All association requests must be completed and acknowledged before a new operation can be initiated.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 56: ASYNCHRONOUS NATURE AS A SCP FOR MODALITY-WORKLIST-SCP AE

4.2.8.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 57: DICOM IMPLEMENTATION CLASS AND VERSION FOR MODALITY-WORKLIST-SCP AE

4.2.8.3 Association Initiation Policy

The MODALITY-WORKLIST-SCP AE does not initiate Associations.

4.2.8.4 Association Acceptance Policy

4.2.8.4.1 Activity – Handling Query Requests

4.2.8.4.1.1 Description and Sequencing of Activity

The MODALITY-WORKLIST-SCP AE accepts Associations only if they have valid Presentation Contexts. If none of requested Presentation Contexts are accepted then the Association Request itself is rejected. Only associations with Application Entity Titles of DICOM partner nodes will be accepted that are configured on the administration interface. If MODALITY-WORKLIST-SCP AE receives a query (C-FIND) request then the response(s) will be sent over the same Association used to send the C-FIND-Request.

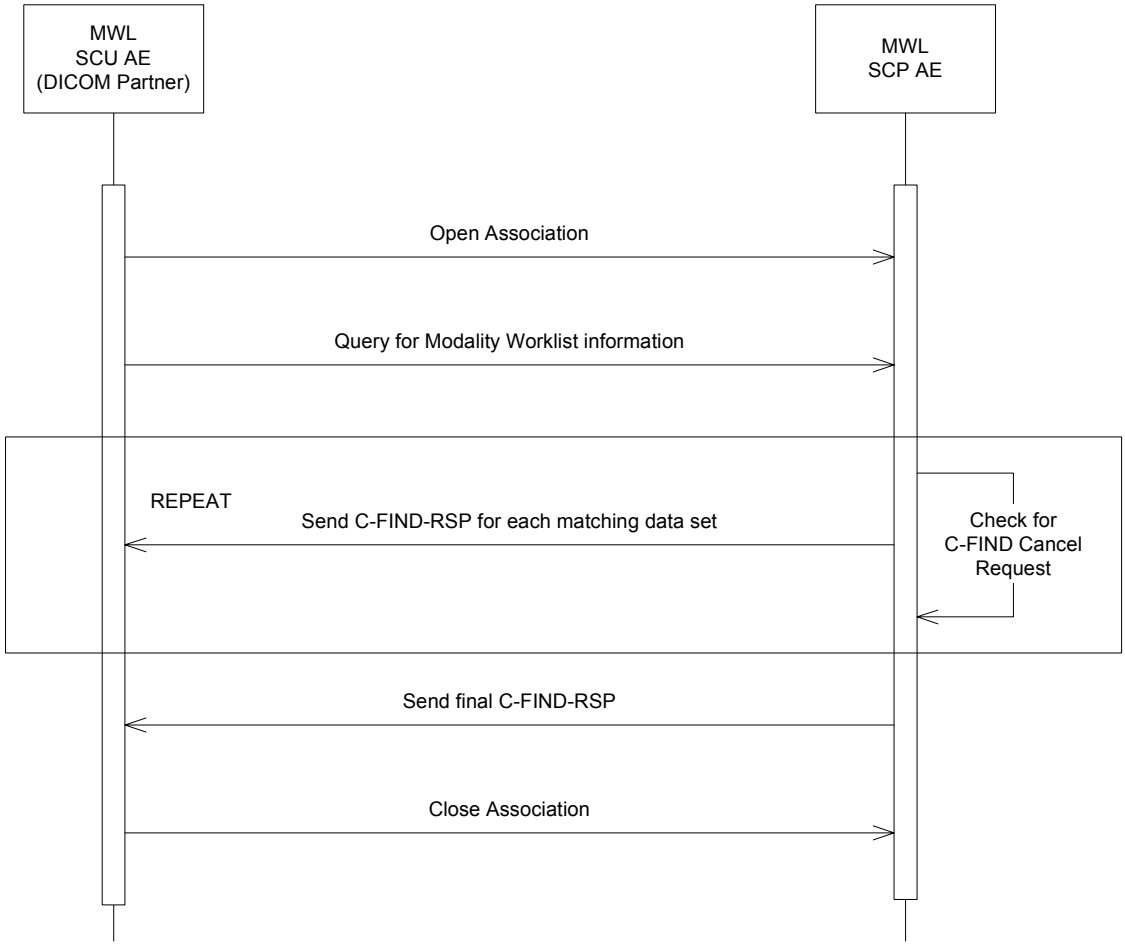

Figure 10: SEQUENCING OF ACTIVITY - HANDLING MODALITY WORKLIST QUERY REQUESTS

The following sequencing constraints illustrated in Figure 10 apply to the MODALITY-WORKLIST-SCP AE for handling Modality Worklist queries (C-FIND-Requests):

1. Partner AE opens an Association with the MODALITY-WORKLIST-SCP AE.
2. Partner AE sends a C-FIND-RQ Message.
3. MODALITY-WORKLIST-SCP AE returns a C-FIND-RSP Message to the Partner AE with matching information. A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. MODALITY-WORKLIST-SCP AE checks for a C-FIND Cancel Request after each sent Pending response message. If a Cancel is received then no further Pending responses are sent. A final C-FIND-RSP is sent indicating that the matching is complete or the query was canceled.
4. Partner AE closes the Association. Note that the Partner AE does not have to close the Association immediately. Further C-FIND Requests can be sent over the Association before it is closed.

The MODALITY-WORKLIST-SCP AE may reject Association attempts as shown in Table 58. The Result, Source and Reason/Diag columns represent the values returned in the corresponding fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4). The following abbreviations are used in the Source column:

d. 1 – DICOM UL service-user
e. 2 – DICOM UL service-provider (ASCE related function)
f. 3 – DICOM UL service-provider (Presentation related function)

Result	Source	Reason/Diag	Explanation
2 - rejected-transient	c	2 - local-limit-exceeded	The (configurable) maximum number of simultaneous Associations has been reached. An Association request with the same parameters may succeed at a later time.
1 - rejected-permanent	a	2 - application-context-name-not-supported	The Association request contained an unsupported Application Context Name. An association request with the same parameters will not succeed at a later time.
1 - rejected-permanent	a	7 - called-AE-title-not-recognized	The Association request contained an unrecognized Called AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association initiator is incorrectly configured and attempts to address the Association acceptor using the wrong AE Title.
1 - rejected-permanent	a	3 - calling-AE-title-not-recognized	The Association request contained an unrecognized Calling AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association acceptor has not been configured to recognize the AE Title of the Association initiator.
1 - rejected-permanent	b	1 - no-reason-given	The Association request could not be parsed. An Association request with the same format will not succeed at a later time.

Table 58: ASSOCIATION REJECTION REASONS

4.2.8.4.1.2 Accepted Presentation Contexts

MODALITY-WORKLIST-SCP AE will accept Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None

Table 59: ACCEPTED PRESENTATION CONTEXTS BY THE QUERY-RETRIEVE-SCP AE

4.2.8.4.1.3 SOP Specific Conformance for Verification SOP Class

The MODALITY-WORKLIST-SCP AE provides standard conformance to the Verification SOP Class as an SCP.

4.2.8.4.1.4 SOP Specific Conformance for Modality Worklist SOP Class

The MODALITY-WORKLIST-SCP AE is able to handle all Attributes which are defined by the DICOM Standard for the Modality Worklist information model. The data elements provided by SIENET MagicWeb depend on the information that is available in the RIS database. The SIENET MagicWeb / RIS adaption has to be done by specifying the supported attributes in the SIENET MagicWeb database at installation time.

By default the MODALITY-WORKLIST-SCP AE does not support matching on any optional matching key attribute but this can be changed by modifying the settings in the SIENET MagicWeb database.

The matching behaviors of the attributes of the Modality Worklist information model are listed in the following table.

Attribute Name	Tag	VR	Types of Matching
Scheduled Procedure Step Sequence	(0040,0100)	SQ	-
>Scheduled Station AE Title	(0040,0001)	AE	single value, universal
>Scheduled Procedure Step Start Date	(0040,0002)	DA	single value, range, universal
>Scheduled Procedure Step Start Time	(0040,0003)	TM	single value, range, universal
>Modality	(0008,0060)	CS	single value, wildcard, universal
>Scheduled Performing Physician's Name	(0040,0006)	PN	single value, wildcard, universal
Patient's Name	(0010,0010)	PN	single value, wildcard, universal
Patient ID	(0010,0020)	LO	single value, wildcard, universal
All other Attributes of the Modality Worklist Information Model	-	-	universal

Table 60: MODALITY WORKLIST MATCHING ATTRIBUTE BEHAVIOR

Mapping of Attributes

The MODALITY-WORKLIST-SCP AE can map attribute values contained in the worklist request and response messages. This mechanism is primarily provided to eliminate inconsistency between the examination descriptions used by the RIS and the Modalities. The administrator can specify a set of description mappings for each configured MODALITY-WORKLIST-SCU AE on the administration interface. By default the attribute mapping is performed for the DICOM attribute 'Scheduled Procedure Step Description' (Tag 0040,0007) but it is possible to change or extend the affected attribute data set.

Mapping of Scheduled Station AE Title / Alias Name

It is assumed that the RIS uses the Alias Name specified in SIENET MagicWeb in place of the AE Title to identify the Scheduled Station. Therefore the attribute 'Scheduled Station AE Title' is mapped to the Alias Name by the MODALITY-WORKLIST-SCP AE automatically when a worklist query request is received. This mapping is also performed when filling up pending response messages with the return values.

The MODALITY-WORKLIST-SCP AE will return the Status Code values in C-FIND Responses as shown in the following table.

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0x0000	Matching is complete. No final identifier is supplied.
Failed	Identifier does not match SOP Class	0xA900	The C-FIND query identifier contains invalid Elements or values, or is missing mandatory Elements or values for the specified SOP Class. Error message is stored in the Trace Database.
	Unable to process	0xC001	An internal processing error occurred which makes further processing of the query request impossible. Error message is stored in the Trace Database.
Canceled	Matching derminated due to cancel request	0xFE00	This status is returned if a Cancel Request is received from the SCU during the processing of a Modality Worklist request.
Pending	Matches are continuing - Current match is supplied	0xFF00	Indicates that the search for further matches is continuing. This is returned when each successful match is returned and when further matches are forthcoming. This status code is returned if all optional keys in the query identifier are actually supported.
	Matching is continuin - Current match is supplied and any optional keys were supported in the same matter as required keys	0xFF01	Indicates that the search for further matches is continuing. This is returned when each successful match is returned and when further matches are forthcoming. This status code is returned if one or more optional matching or return keys are not supported for existence.

Table 61: MODALITY-WORKLIST-SCP AE C-FIND RESPONSE STATUS RETURN BEHAVIOR

The behavior of MODALITY-WORKLIST-SCP AE during communication failure is summarized in the following table:

Exception	Behavior
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout). I.e. The MODALITY-WORKLIST-SCP AE is waiting for the next C-FIND Request on an open Association but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Error message is stored in the Trace Database.
Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout). I.e. The MODALITY-WORKLIST-SCP AE is waiting for the next message PDU but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Error message is stored in the Trace Database.
Association A-ABORTed by the SCU or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	Error message is stored in the Trace Database.

Table 62: MODALITY-WORKLIST-SCP AE COMMUNICATION FAILURE BEHAVIOR

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4.2.9 MPPS-SCP Application Entity Specification

SIENET MagicWeb makes DICOM Modality Performed Procedure Step functionality available to Radiology Information Systems with no own DICOM Interface. The Performed Procedure Step status information is written to the RIS database which is configured via administration interface.

4.2.9.1 SOP Classes

The MPPS-SCP AE provides Standard Conformance to the following DICOM V3.0 SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No	Yes
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	No	Yes

Table 63: SOP CLASSES FOR MPPS-SCP AE

4.2.9.2 Association Establishment Policies

4.2.9.2.1 General

The MPPS-SCP AE will never initiate Associations; it only accepts Association Requests from external DICOM AEs. The MPPS-SCP AE will accept Associations for Verification, MPPS N-CREATE and N-SET requests.
The DICOM standard Application Context Name for DICOM 3.0 is always accepted:

Application Context Name	1.2.840.10008.3.1.1.1

Table 64: DICOM APPLICATION CONTEXT FOR MPPS-SCP AE

4.2.9.2.2 Number of Associations

The MPPS-SCP AE can support multiple simultaneous Associations. Each time the MPPS-SCP AE receives an Association, a child process will be spawned to process the Verification or MPPS request. The maximum number of child processes, and thus the maximum number of simultaneous Associations that can be processed, is set by configuration. The maximum is limited by the License Key.

Maximum number of simultaneous Associations	- Limited by License Key - Restrictable by administrator

Table 65: NUMBER OF ASSOCIATIONS AS A SCP FOR MPPS-SCP AE

4.2.9.2.3 Asynchronous Nature

The MPPS-SCP AE does not support asynchronous communication (multiple outstanding transactions over a single association). All association requests must be completed and acknowledged before a new operation can be initiated.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 66: ASYNCHRONOUS NATURE AS A SCP FOR MPPS-SCP AE

4.2.9.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 67: DICOM IMPLEMENTATION CLASS AND VERSION FOR MPPS-SCP AE

4.2.9.3 Association Initiation Policy

The MPPS-SCP AE does not initiate Associations.

4.2.9.4 Association Acceptance Policy

4.2.9.4.1 Activity – Handling MPPS Requests

4.2.9.4.1.1 Description and Sequencing of Activity

The MPPS-SCP AE accepts Associations only if they have valid Presentation Contexts. If none of requested Presentation Contexts are accepted then the Association Request itself is rejected. Only associations with Application Entity Titles of DICOM partner nodes will be accepted that are configured on the administration interface.

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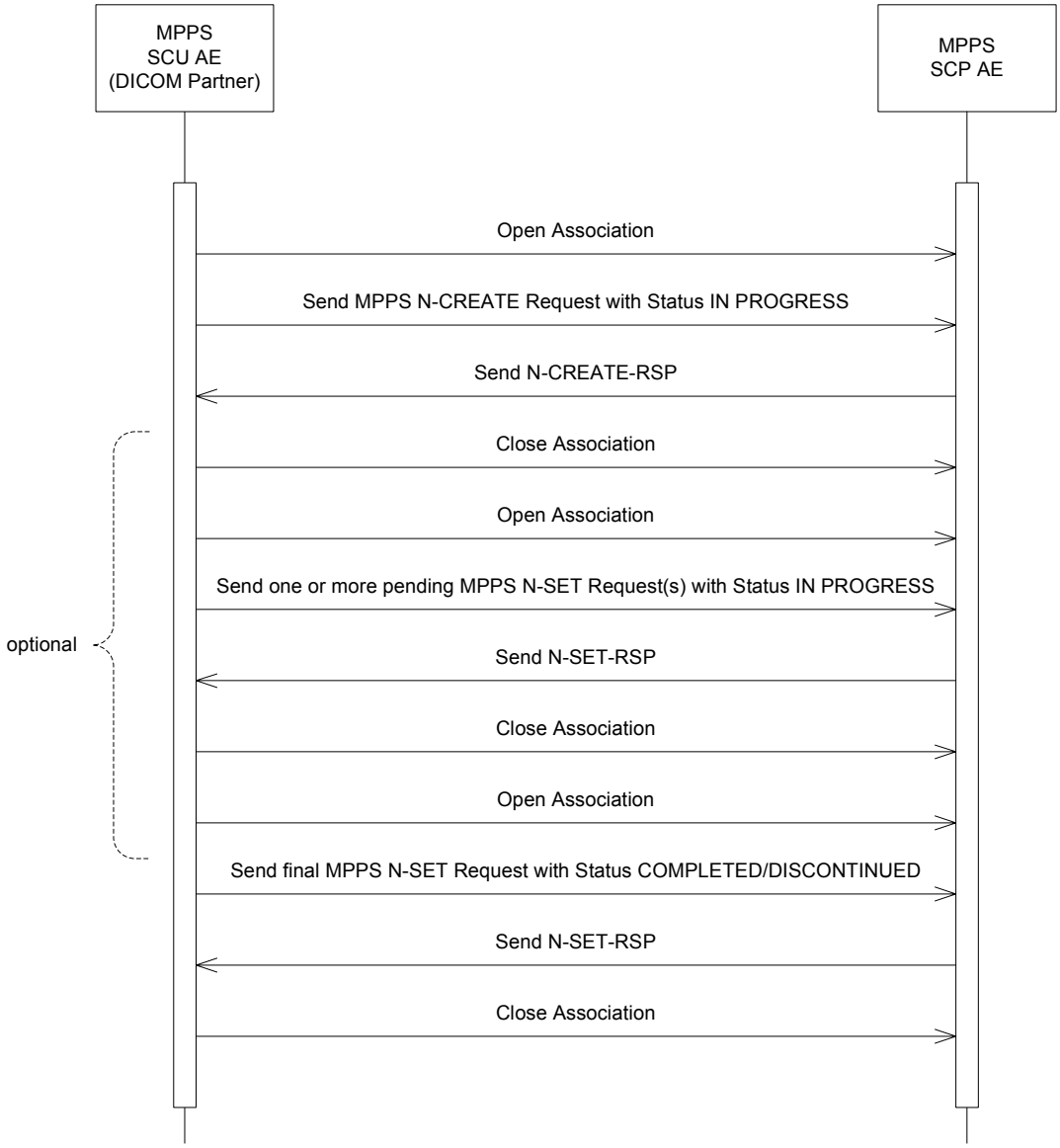

Figure 11: SEQUENCING OF ACTIVITY - HANDLING MPPS REQUESTS

The following sequencing constraints illustrated in Figure 11 apply to the MPPS-SCP AE for handling MPPS Requests (N-CREATE-/N-SET-Requests):

1. Partner AE opens an Association with the MPPS-SCP AE.
2. Partner AE sends a N-CREATE-RQ Message to signal that the Modality starts performing one or more Requested Procedures. MPPS-SCP AE returns a N-CREATE-RSP Message to indicate the reception of the request.
3. Partner AE sends one or more N-SET-RQ Message to signal the intermediate status of the performed Requested Procedures. MPPS-SCP AE returns a N-SET-RSP Message to indicate the reception of the request.
4. Partner AE sends a final N-SET-RQ Message to signal that the Modality has finished performing the Requested Procedures. MPPS-SCP AE returns a N-SET-RSP Message to indicate the reception of the request.
5. Partner AE closes the Association. Note that the Partner AE does not have to send all MPPS Messages over the same Association. For each N-CREATE-/N-SET-RQ Message an own Association can be established.

The MPPS-SCP AE may reject Association attempts as shown in Table 68. The Result, Source and Reason/Diag columns represent the values returned in the corresponding fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4). The following abbreviations are used in the Source column:

g. 1 – DICOM UL service-user
h. 2 – DICOM UL service-provider (ASCE related function)
i. 3 – DICOM UL service-provider (Presentation related function)

Result	Source	Reason/Diag	Explanation
2 - rejected-transient	c	2 - local-limit-exceeded	The (configurable) maximum number of simultaneous Associations has been reached. An Association request with the same parameters may succeed at a later time.
1 - rejected-permanent	a	2 - application-context-name-not-supported	The Association request contained an unsupported Application Context Name. An association request with the same parameters will not succeed at a later time.
1 - rejected-permanent	a	7 - called-AE-title-not-recognized	The Association request contained an unrecognized Called AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association initiator is incorrectly configured and attempts to address the Association acceptor using the wrong AE Title.
1 - rejected-permanent	a	3 - calling-AE-title-not-recognized	The Association request contained an unrecognized Calling AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association acceptor has not been configured to recognize the AE Title of the Association initiator.
1 - rejected-permanent	b	1 - no-reason-given	The Association request could not be parsed. An Association request with the same format will not succeed at a later time.

Table 68: ASSOCIATION REJECTION REASONS

4.2.9.4.1.2 Accepted Presentation Contexts

MPPS-SCP AE will accept Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None

Table 69: ACCEPTED PRESENTATION CONTEXTS BY THE MPPS-SCP AE

4.2.9.4.1.3 SOP Specific Conformance for Verification SOP Class

The MPPS-SCP AE provides standard conformance to the Verification SOP Class as an SCP.

4.2.9.4.1.4 SOP Specific Conformance for MPPS SOP Class

The MPPS-SCP AE is able to handle all Attributes which are defined by the DICOM Standard for the Modality Performed Procedure Step. The data elements processed by SIENET MagicWeb depend on the information that can be set in the RIS database. The SIENET MagicWeb / RIS adaption has to be done by specifying the supported attributes in the SIENET MagicWeb database at installation time.

Mapping of Attributes

The MPPS-SCP AE can map attribute values contained in the worklist request and response messages. This mechanism is primarily provided to eliminate inconsistency between the examination descriptions used by the RIS and the Modalities. The administrator can specify a set of description mappings for each configured MPPS-SCU AE on the administration interface. By default the attribute mapping is performed for the DICOM attribute 'Performed Procedure Step Description' (Tag 0040,0254) but it is possible to change or extend the affected attribute data set.

Mapping of Performed Station AE Title / Alias Name

It is assumed that the RIS uses the Alias Name specified in SIENET MagicWeb in place of the AE Title to identify the Performed Station. Therefore the attribute 'Performed Station AE Title' is mapped to the Alias Name by the MPPS-SCP AE automatically when a MPPS request is received.

The MPPS-SCP AE will return the Status Code values in N-CREATE/N-SET Responses as shown in the following table.

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0x0000	Matching is complete. No final identifier is supplied.
Error	Missing attribute value	0x0121	A required Attribute was not supplied with the MPPS request message. Error message is stored in the Trace Database.
	Invalid attribute value	0x0106	The Attribute Value specified was out of range or otherwise inappropriate. Error message is stored in the Trace Database.
	Unable to process	0x0110	An internal processing error occurred which makes further processing of the query request impossible. Error message is stored in the Trace Database.

Table 70: MPPS-SCP AE N-CREATE/N-SET RESPONSE STATUS RETURN BEHAVIOR

The behavior of MPPS-SCP AE during communication failure is summarized in the following table:

Exception	Behavior
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout). I.e. The MPPS-SCP AE is waiting for the next N-CREATE/N-SET Request on an open Association but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Error message is stored in the Trace Database.
Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout). I.e. The MPPS-SCP AE is waiting for the next message PDU but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Error message is stored in the Trace Database.
Association A-ABORTed by the SCU or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	Error message is stored in the Trace Database.

Table 71: MPPS-SCP AE COMMUNICATION FAILURE BEHAVIOR

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4.2.10 MPPS-SCU Application Entity Specification

SIENET MagicWeb provides a mechanism to forward incoming MPPS messages to configured DICOM Partner AEs. The forwarding rules can be defined via administration interface.

4.2.10.1 SOP Classes

The MPPS-SCU AE provides Standard Conformance to the following DICOM V3.0 SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	No
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Yes	No

Table 72: SOP CLASSES FOR MPPS-SCU AE

4.2.10.2 Association Establishment Policies

4.2.10.2.1 General

The MPPS-SCU AE can only form Associations when requested to do so by the MPPS-SCP AE. The MPPS-SCU AE can only request the opening of an Association. It cannot accept requests to open Associations from external Application Entities. The DICOM standard Application Context Name for DICOM 3.0 is always proposed:

Application Context Name	1.2.840.10008.3.1.1.1

Table 73: DICOM APPLICATION CONTEXT FOR MPPS-SCU AE

4.2.10.2.2 Number of Associations

For each MPPS request one association to the MPPS Destination AE is established by the MPPS-SCU AE. MPPS requests initiated by the MPPS-SCP AE will be stored in a job queue and up to 14 MPPS jobs can be performed simultanously (8 high prior jobs, 4 medium prior jobs and 2 low prior jobs).

Maximum number of simultaneous Associations	Up to 14 (Not Configurable)

Table 74: NUMBER OF ASSOCIATIONS AS A SCP FOR MPPS-SCU AE

4.2.10.2.3 Asynchronous Nature

The MPPS-SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association). All association requests must be completed and acknowledged before a new operation can be initiated.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 75: ASYNCHRONOUS NATURE AS A SCP FOR MPPS-SCU AE

4.2.10.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 76: DICOM IMPLEMENTATION CLASS AND VERSION FOR MPPS-SCU AE

4.2.10.3 Association Initiation Policy

4.2.10.3.1 Activity – Send MPPS Requests to an External Peer AE

4.2.10.3.1.1 Description and Sequencing of Activity

The MPPS-SCU AE will initiate a new Association when the MPPS-SCP AE invokes the MPPS-SCU AE to transmit MPPS messages. The MPPS-SCP AE will issue such a command whenever an appropriate rule requests the forwarding of MPPS messages to Partner AEs. An Association Request is sent to the specified MPPS-SCP AE and upon successful negotiation of the required Presentation Context the message transfer is started. If there are multiple outstanding MPPS messages to be sent to a single partner AE then the MPPS-SCU AE will send them always over separate Associations. The Association will be released when the N-CREATE/N-SET message for the partner AE has been sent. If any type of error occurs during transmission (either a communication failure or indicated by a Status Code returned by the partner AE) over an open Association then the transfer of MPPS messages is halted. A new Association will be opened to retry sending outstanding N-CREATE/N-SET messages. The maximum number of times the MPPS-SCU AE will attempt to resend a MPPS message is configurable, along with the amount of time to wait between attempts to resend.

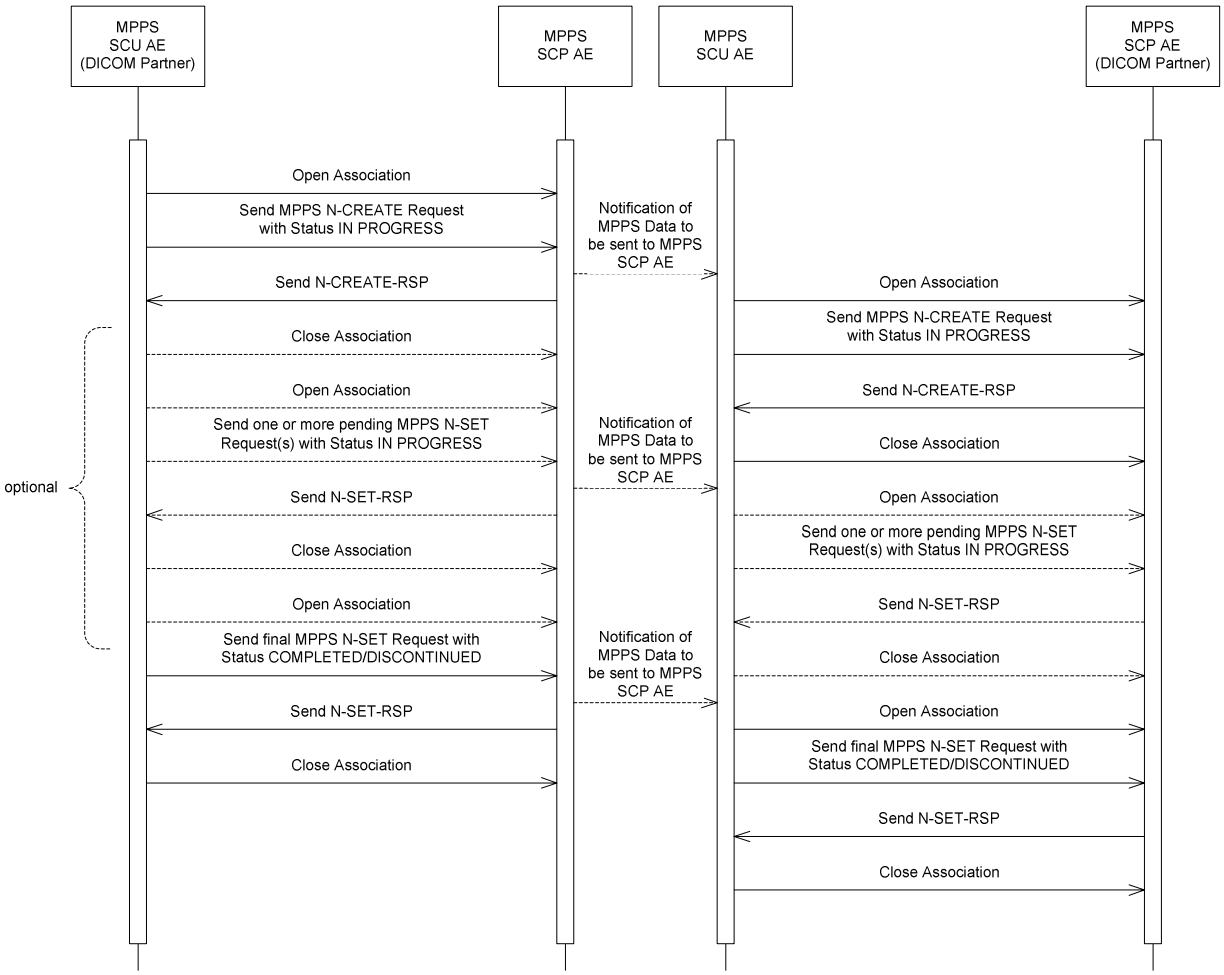

Figure 12: SEQUENCING OF ACTIVITY – SEND MPPS REQUESTS

The following sequencing constraints illustrated in Figure 12 apply to the MPPS-SCU AE for sending MPPS Requests (N-CREATE-/N-SET-Requests):

1. Partner AE opens an Association with the MPPS-SCP AE.
2. Partner AE sends a MPPS N-CREATE-RQ Message
3. Partner AE sends one or more MPPS N-SET-RQ Messages
4. Partner AE closes the Association. Note that the Partner AE have not to send all MPPS Messages over the same Association. For each N-CREATE-/N-SET-RQ Message an own Association can be established.
5. MPPS-SCP AE signals MPPS-SCU AE for each received MPPS Message to forward it to the Partner AEs configured as MPPS Message forwarding destinations.
6. MPPS-SCU AE opens a new association with the specified destination AE.
7. MPPS-SCU AE sends the N-CREATE- or N-SET-RQ Message.
8. Partner AE returns a N-CREATE- or N-SET-RSP Message to the MPPS-SCU AE.
9. MPPS-SCU AE closes the association. Note that the MPPS-SCP AE creates an own Association for each MPPS Message even if multiple outstanding MPPS messages have to be sent to a single partner AE.
10. The send request is repeated a configurable number of times if transfer of MPPS Messages failed.
11. The Verification Service is only supported as a utility function for Service staff. It is used only as a diagnostic tool.

4.2.10.3.1.2 Proposed Presentation Contexts

MPPS-SCU AE will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

Table 77: PROPOSED PRESENTATION CONTEXTS BY THE MPPS-SCU AE

4.2.10.3.1.3 SOP Specific Conformance for Verification SOP Class

The MPPS-SCU AE provides standard conformance to the Verification SOP Class as an SCU. The Verification Service as an SCU is actually only supported as a diagnostic service tool for network communication issues.

4.2.10.3.1.4 SOP Specific Conformance for MPPS SOP Class

When the MPPS-SCU AE forwads MPPS Messages to the Partner AEs the content of the Message will be sent as it was originally received.

4.2.10.4 Association Acceptance Policy

The MPPS-SCU AE does not accept Associations.

4.2.11 Report-SCU Application Entity Specification

4.2.11.1 SOP Classes

The REPORT-SCU AE provides Conformance to the following Mitra Broker Private SOP Class:

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	No
Mitra Report Management - FIND	1.2.840.113532.3500.8	Yes	No

Table 78: SOP CLASSES FOR REPORT-SCU AE

4.2.11.2 Association Establishment Policies

4.2.11.2.1 General

The REPORT-SCU AE forms Associations when requested to do so by the user. The REPORT-SCU AE can only request the opening of an Association. It cannot accept requests to open Associations from external Application Entities.

The DICOM standard Application Context Name for DICOM 3.0 is always proposed:

Application Context Name	1.2.840.10008.3.1.1.1

Table 79: DICOM APPLICATION CONTEXT FOR REPORT-SCU AE

4.2.11.2.2 Number of Associations

For each report request one association to the C-FIND Destination AE is established by the REPORT-SCU AE. Report requests initiated automatically or from the user interface will be stored in a job queue and up to 14 report jobs can be performed simultanously (8 high prior jobs, 4 medium prior jobs and 2 low prior jobs).

Maximum number of simultaneous Associations	Up to 14 (Not Configurable)

Table 80: NUMBER OF ASSOCIATIONS AS A SCU FOR REPORT-SCU AE

4.2.11.2.3 Asynchronous Nature

The REPORT-SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association). All association requests must be completed and acknowledged before a new operation can be initiated.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 81: ASYNCHRONOUS NATURE AS A SCU FOR REPORT-SCU AE

4.2.11.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 82: DICOM IMPLEMENTATION CLASS AND VERSION FOR REPORT-SCU AE

4.2.11.3 Association Initiation Policy

4.2.11.3.1 Activity – Send Report Requests to an External Peer AE

4.2.11.3.1.1 Description and Sequencing of Activity

The REPORT-SCU AE will initiate a new Association when the user performs the query action from the user interface or an automatic query is initiated after a new study is created. An Association Request is sent to the specified Mitra Broker and upon successful negotiation of the required Presentation Context the query is started. The result messages are transmitted in the same association. The reports are stored in a specific Results Folder in the form of text files. The administrator can configure if the Accession Number or the Requested Procedure ID is used to assign the reports to the belonging studies. When no assignment is possible the reports are moved to a folder for failed objects.

The number of retries, the delay time between the retries and the delay time before the query is started is configurable on the administration interface. If the report query is initiated by the user the start delay time is ignored and the query is performed immediately.

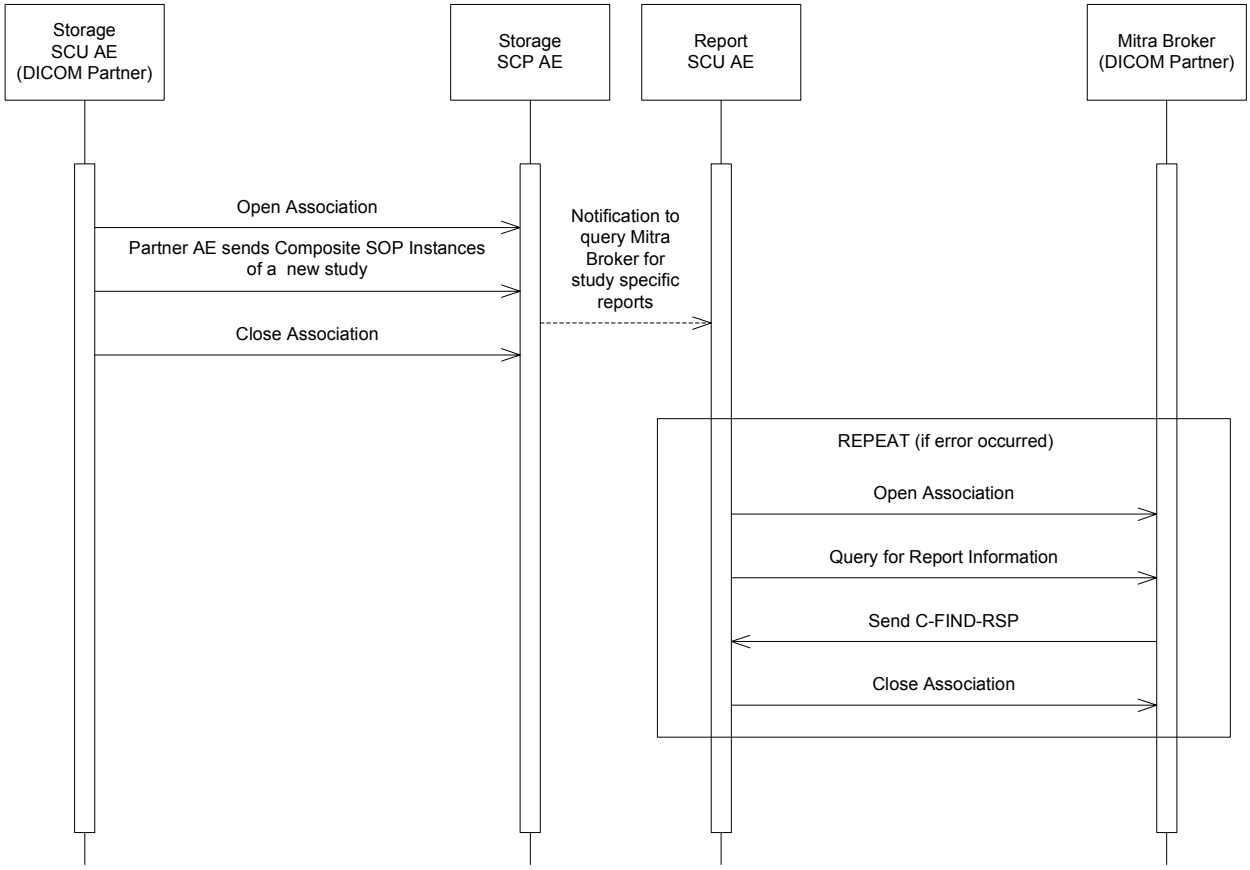

Figure 13: SEQUENCING OF ACTIVITY – PERFOMING AUTO REPORT REQUESTS

The following sequencing constraints illustrated in Figure 13 apply to the REPORT-SCU AE for initiating Mitra Report queries (C-FIND-Requests) triggered by a received SOP Instance for a new study:

1. Partner AE opens an Association with the STORAGE-SCP AE
2. Partner AE sends one or more Composite SOP Instances of a new study.
3. Partner AE closes the Association.
4. REPORT-SCU AE opens an Association with the Mitra Broker AE.
5. REPORT-SCU AE sends a C-FIND-RQ Message.
6. Mitra Broker AE returns a C-FIND-RSP Message to the REPORT-SCU AE with matching information.
7. REPORT-SCU AE closes the Association.
8. The points 4. – 7. will be repeated if an error occurred during report request.
9. The Verification Service is only supported as a utility function for Service staff. It is used only as a diagnostic tool.

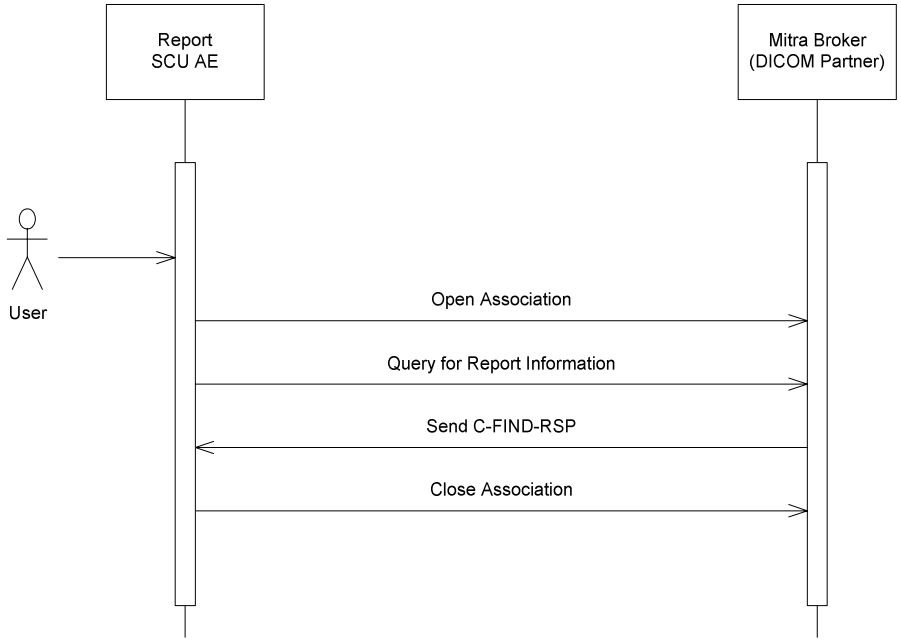

Figure 14: SEQUENCING OF ACTIVITY – PERFOMING USER REPORT REQUESTS

The following sequencing constraints illustrated in Figure 14 apply to the REPORT-SCU AE for initiating Mitra Report queries (C-FIND-Requests) triggered by the user:

1. User initiates a report request
2. REPORT-SCU AE opens an Association with the Mitra Broker AE.
3. REPORT-SCU AE sends a C-FIND-RQ Message.
4. Mitra Broker AE returns a C-FIND-RSP Message to the REPORT-SCU AE with matching information.
5. REPORT-SCU AE closes the Association.
6. The points 2. – 5. will be repeated if an error occurred during report request.
7. The Verification Service is only supported as a utility function for Service staff. It is used only as a diagnostic tool.

4.2.11.3.1.2 Proposed Presentation Contexts

REPORT-SCU AE will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Mitra Report Management - FIND	1.2.840.113532.3500.8	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Table 83: PROPOSED PRESENTATION CONTEXTS BY THE REPORT-SCU AE

4.2.11.3.1.3 SOP Specific Conformance for Verification SOP Class

The REPORT-SCU AE provides standard conformance to the Verification SOP Class as an SCU. The Verification Service as an SCU is actually only supported as a diagnostic service tool for network communication issues.

4.2.11.3.1.4 SOP Specific Conformance for Report SOP Classes

REPORT-SCU provides private conformance to the Mitra Broker. No CANCEL requests are ever issued. In the table below the attributes to be matched are listed.

Attribute Name	Tag	VR	Types of Matching
Patient ID	(0010,0020)	LO	single value
Accession Number	(0008,0050)	SH	single value
Study ID	(0020,0010)	SH	single value
Study Instance UID	(0020,000D)	UI	single value
Requested Procedure ID	(0040,1001)	SH	single value
Specific Character Set	(0008,0005)	CS	universal
Interpretation Text	(4008,010B)	ST	universal
Impressions	(4008,0300)	ST	universal

Table 84: REPORT C-FIND SCU REQUESTED ELEMENTS

Note:

Patient ID and one of Accession Number, Study ID, Study Instance UID or Requested Procedure ID is required in the query request message.

4.2.11.4 Association Acceptance Policy

The REPORT-SCU AE does not accept Associations.

4.2.12 Print-SCU Application Entity Specification

4.2.12.1 SOP Classes

The PRINT-SCU AE provides Standard Conformance to the following DICOM V3.0 SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	No
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Yes	No
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Yes	No
Print Job	1.2.840.10008.5.1.1.14	Yes	No

Table 85: SOP CLASSES FOR PRINT-SCU AE

4.2.12.2 Association Establishment Policies

4.2.12.2.1 General

The PRINT-SCU AE forms Associations when requested to do so by the user. The PRINT-SCU AE can only request the opening of an Association. It cannot accept requests to open Associations from external Application Entities.

The DICOM standard Application Context Name for DICOM 3.0 is always proposed:

Application Context Name	1.2.840.10008.3.1.1.1

Table 86: DICOM APPLICATION CONTEXT FOR PRINT-SCU AE

4.2.12.2.2 Number of Associations

For each print request one association to the Print Destination AE is established by the PRINT-SCU AE. Report requests initiated from the user interface will be stored in a job queue. The PRINT-SCU AE performes only one print job at a time to reduce memory consumption of SIENET MagicWeb.

Maximum number of simultaneous Associations	1 (Not Configurable)

Table 87: NUMBER OF ASSOCIATIONS AS A SCP FOR PRINT-SCU AE

4.2.12.2.3 Asynchronous Nature

The PRINT-SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association). All association requests must be completed and acknowledged before a new operation can be initiated.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 88: ASYNCHRONOUS NATURE AS A SCP FOR PRINT-SCU AE

4.2.12.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 89: DICOM IMPLEMENTATION CLASS AND VERSION FOR PRINT-SCU AE

4.2.12.3 Association Initiation Policy

4.2.12.3.1 Activity – Send Print Requests to an External Peer AE

4.2.12.3.1.1 Description and Sequencing of Activity

The PRINT-SCU AE will initiate a new Association when the user invokes the PRINT-SCU AE to print images. The user will issue such a command whenever images are selected on the user interface and it is requested to send them to a preconfigured remote AE for printing. Before the DICOM communication is established the film sheets are prepared and buffered to guaranty a fast transfer of print object data and to avoid running into timeouts. During the preparation process color images are converted to grayscale objects if the Partner AE doesn't provide support for the Basic Color Print Management SOP Class. The color to grayscale conversion is also performed if this is desiered by the user. Then an Association Request is sent to the specified Destination AE and upon successful negotiation of the required Presentation Context the print process is started. After the status of the printer is checked and a ready for printing status is reported the PRINT-SCU AE initiates the creation of a single Film Session. The printing of the film sheets is always performed on Film Box level by creating, filling, printing and deleting Film Boxes in a loop dependent on the number of requested film sheets (layout). A running print job can be cancelled by the user at any time by sending a delete request on Film Session Level. The Association will be released when the PRINT-SCU AE has sent all request messages or when the Partner AE reports the execution of each of the initiated Print Jobs (only if Print Job SOP Class is negotiated and N-EVENT-REPORT support is activated).

If any type of error occurs during transmission (either a communication failure or indicated by a Status Code returned by the Partner AE) over an open Association then the sending of print request messages is halted and the occurred failure is reported to the user.

A new Association will be opened to retry sending outstanding print request messages. The number of retries, the delay time between the retries and the delay time before the print job is initiated is configurable on the administration interface.

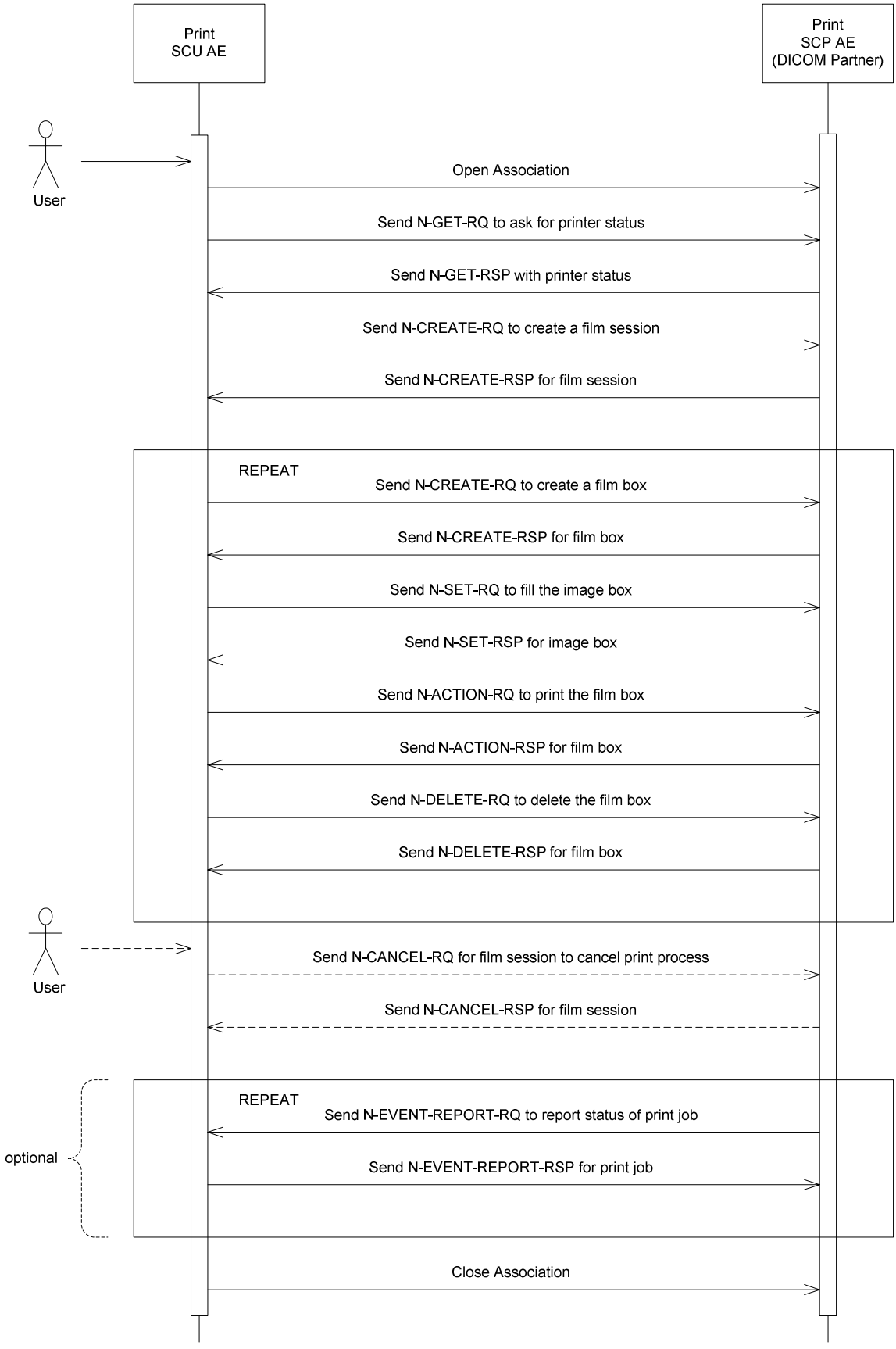

Figure 15: SEQUENCING OF ACTIVITY - PERFORMING PRINT REQUESTS

The following sequencing constraints illustrated in Figure 15 apply to the PRINT-SCU AE for initiating print requests:

1. PRINT-SCU AE opens an Association with the Partner AE.
2. PRINT-SCU AE sends a N-GET-RQ Message to obtain current printer status information.
3. Partner AE sends a N-GET-RSP Message with the current printer status to the PRINT-SCU AE. If the Printer reports a status of FAILURE the outstanding print job is not performed.
4. PRINT-SCU AE sends a N-CREATE-RQ Message to create a Film Session.
5. Partner AE sends a N-CREATE-RSP Message to the PRINT-SCU AE to indicate the reception of the request.
6. PRINT-SCU AE sends a N-CREATE-RQ Message to create a Film Box with one Image Box (PRINT-SCU AE only supports the format STANDARD\1,1).
7. Partner AE sends a N-CREATE-RSP Message to the PRINT-SCU AE to indicate the reception of the request.
8. PRINT-SCU AE sends a N-SET-RQ Message to fill the Image Box.
9. Partner AE sends a N-SET-RSP Message to the PRINT-SCU AE to indicate the reception of the request.
10. PRINT-SCU AE sends a N-ACTION-RQ Message to initiate printing of the Film Box. Partner AE creates a Print Job (if configured for PRINT-SCU AE and supported by Partner AE).
11. Partner AE sends a N-ACTION-RSP Message to the PRINT-SCU AE to indicate the reception of the request.
12. PRINT-SCU AE sends a N-DELETE-RQ Message to delete the Film Box.
13. Partner AE sends a N-DELETE-RSP Message to the PRINT-SCU AE to indicate the reception of the request.
14. The points 6. – 13. will be repeated for each film sheet to be printed.
15. Partner AE sends N-EVENT-REPORT-RQ Messages to report each status change of the created Print Jobs (if Print Job support is configured for PRINT-SCU AE and supported by PRINT-SCP AE).
16. PRINT-SCU AE sends a N-EVENT-REPORT-RSP Message to indicate the reception of the request (if Print Job support is configured for PRINT-SCU AE and supported by PRINT-SCP AE).
17. When the user cancels a running print request PRINT-SCU AE sends a N-DELETE-RQ Message to delete the Film Session. Partner AE sends a N-DELETE-RSP Message to the PRINT-SCU AE to indicate the reception of the request.
18. Incomming N-EVENT-REPORT-RQ Messages sent by the Partner AE to report the printer status are not evaluated by PRINT-SCU AE but only responded with N-EVENT-REPORT-RSP Messages.
19. PRINT-SCU AE closes the Association.
20. The print request is repeated a configurable number of times if transfer of Print Messages failed.
21. The Verification Service is only supported as a utility function for Service staff. It is used only as a diagnostic tool.

4.2.12.3.1.2 Proposed Presentation Contexts

PRINT-SCU AE will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Basic Grayscale Print Management Meta	1.2.840.10008.1.1.9	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Basic Color Print Management Meta	1.2.840.10008.1.1.18	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Print Job	1.2.840.10008.1.1.14	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

Table 90: PROPOSED PRESENTATION CONTEXTS BY THE PRINT-SCU AE

4.2.12.3.1.3 SOP Specific Conformance for Verification SOP Class

The PRINT-SCU AE provides standard conformance to the Verification SOP Class as an SCU. The Verification Service as an SCU is actually only supported as a diagnostic service tool for network communication issues.

4.2.12.3.1.4 SOP Specific Conformance for Basic Grayscale Print Management Meta SOP Class

The PRINT-SCU AE supports the following SOP Classes as defined by the Basic Grayscale Print Management Meta SOP Class.

SOP Class Name	SOP Class UID	SCU	SCP
Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
Printer	1.2.840.10008.5.1.1.16	Yes	No

Table 91: SOP CLASSES FOR BASIC GRAYSCALE PRINT MANAGEMENT META SOP CLASS

4.2.12.3.1.4.1 SOP Specific Conformance for Basic Film Session SOP Class

The PRINT-SCU AE supports the following DIMSE Services for the Basic Film Session SOP Class:

- N-CREATE
- N-DELETE

4.2.12.3.1.4.1.1 Basic Film Session SOP Class Operations for N-CREATE

The PRINT-SCU AE sends a N-CREATE Request to the PRINT-SCP AE to initiate the creation of a Basic Film Session SOP Instance. The attributes supplied by the PRINT-SCU AE with a N-CREATE Request Message are listed in the following table.

Attribute Name	Tag	Possible Values	Configured by[1]
Number of Copies	(2000,0010)	1 … n	User
Print Priority	(2000,0020)	LOW, MED, HIGH	User
Medium Type	(2000,0030)	PAPER, CLEAR FILM, BLUE FILM	User

Table 92: BASIC FILM SESSION SOP CLASS N-CREATE REQUEST ATTRIBUTES

Note: 1. The administrator predefines the values that are provided to the user depending on the selected Partner AE.

4.2.12.3.1.4.1.2 Basic Film Session SOP Class Operations for N-DELETE

The PRINT-SCU AE sends a N-DELETE Request to the Partner AE to cancel a running print request.

4.2.12.3.1.4.2 SOP Specific Conformance for Basic Film Box SOP Class

The PRINT-SCU AE supports the following DIMSE Services for the Basic Film Box SOP Class:

- N-CREATE
- N-ACTION
- N-DELETE

4.2.12.3.1.4.2.1 Basic Film Box SOP Class Operations for N-CREATE

The PRINT-SCU AE sends a N-CREATE Request to the PRINT-SCP AE to initiate the creation of a Basic Film Box SOP Instance. The attributes supplied by the PRINT-SCU AE with a N-CREATE Request Message are listed in the following table.

Attribute Name	Tag	Possible Values	Configured by[1]
Image Display Format	(2010,0010)	STANDARD\1,1	Auto[2]
Film Orientation	(2010,0040)	PORTRAIT, LANDSCAPE	User
Film Size ID	(2000,0050)	8INX10IN, 10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, A3, A4	User[3]
Magnification Type	(2010,0060)	REPLICATE, BILINEAR, CUBIC, NONE	Admin
Border Density	(2010,0100)	BLACK, WHITE	Admin
Min Density	(2010,0120)	0 ... n	Admin
Max Density	(2010,0130)	0 … n	Admin
Configuration Information	(2010,0150)		Admin
Referenced Film Session Sequence	(2010,0500)		
> Referenced SOP Class UID	(0008,1150)		Auto
> Referenced SOP Instance UID	(0008,1155)		Auto

Table 93: BASIC FILM BOX SOP CLASS N-CREATE REQUEST ATTRIBUTES

Notes:
1. The administrator predefines the values that are provided to the user depending on the selected Partner AE.
2. SIENET MagicWeb converts the film sheet always to a STANDARD\1,1 page independent from the layout format selected by the user.
3. The film size is provided to the user in form of Media Data Sets that are predefined by the administrator. These Media Data Sets represent a combination of film size and resolution and are identified by a significant alias name.

4.2.12.3.1.4.2.2 Basic Film Box SOP Class Operations for N-ACTION

The PRINT-SCU AE sends a N-ACTION Request to instruct the PRINT-SCP AE to print the contents of the Film Box. If a Presentation Context for the Print Job SOP Class has been negotiated the Print Job SOP Instance UID is read from the N-ACTION Reponse as a reference for evaluating subsequent Print Job status messages.

4.2.12.3.1.4.2.3 Basic Film Box SOP Class Operations for N-DELETE

The PRINT-SCU AE sends a N-DELETE Request to the PRINT-SCP AE to delete the last created Basic Film Box SOP Instance.

4.2.12.3.1.4.3 SOP Specific Conformance for Basic Grayscale Image Box SOP Class

The PRINT-SCU AE supports the following DIMSE Service for the Basic Grayscale Image Box SOP Class:

- N-SET

4.2.12.3.1.4.3.1 Basic Grayscale Image Box SOP Class Operations for N-SET

The PRINT-SCU AE sends a N-SET Request to the PRINT-SCP AE to provide the Basic Grayscale Image Box SOP Instance with presentation parameters and pixel data which apply to a single image of a sheet of film. The Basic Film Box SOP Instance is created when a N-CREATE Request on Film Box level is performed. The attributes supplied by the PRINT-SCU AE with a N-SET Request Message are listed in the following table.

Attribute Name	Tag	Possible Values	Configured by
Image Position	(2020,0010)	1	Auto[1]
Basic Grayscale Image Sequence	(2020,0110)		
> Pixel Aspect Ratio	(0028,0034)		Auto
> Samples Per Pixel	(0028,0002)	1	Auto
> Photometric Interpretation	(0028,0004)	MONOCHROME1, MONOCHROME2	Auto
> Rows	(0028,0010)		Auto
> Columns	(0028,0011)		Auto
> Bits Allocated[2]	(0028,0100)	8 (if Bits Stored = 8) 16 (if Bits Stored = 10, 12)	Auto
> Bits Stored[2]	(0028,0101)	8, 10, 12	Auto
> High Bit[2]	(0028,0102)	8 (if Bits Stored = 8) 9 (if Bits Stored = 10) 11 (if Bits Stored = 12)	Auto
> Pixel Representation	(0028,0103)	0	Auto
> Pixel Data	(7FE0,0010)		Auto

Table 94: BASIC GRAYSCALE IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES

Notes:
1. Only one Basic Grayscale Image Box is available because the Image Display Format is always set to STANDARD\1,1 when creating a Basic Film Box SOP Instance.
2. Normally the original bit depth of the images is used. The administrator can specify a lower value for Partner AE's with a restricted bit depth.

4.2.12.3.1.4.4 SOP Specific Conformance for Printer SOP Class

The PRINT-SCU AE supports the following DIMSE Services for the Printer SOP Class:

- N-GET
- N-EVENT-REPORT

4.2.12.3.1.4.4.1 Printer SOP Class Operations for N-GET

The PRINT-SCU AE sends a N-GET Request to the PRINT-SCP AE to obtain information about the current printer status. The attributes supplied by the PRINT-SCU AE with a N-GET Request Message are listed in the following table.

Attribute Name	Tag	VR	Types of Matching
Printer Status	(2110,0010)	CS	universal
Printer Status Info	(2110,0020)	CS	universal
Printer Name	(2110,0030)	LO	universal
Manufacturer	(0008,0070)	LO	universal
Manufacturer Model Name	(0008,1090)	LO	universal
Device Serial Number	(0018,1000)	LO	universal
Software Versions	(0018,1020)	LO	universal
Date of Last Calibration	(0018,1200)	DA	universal
Time of Last Calibration	(0018,1201)	TM	universal

Table 95: PRINTER SOP CLASS N-GET REQUEST ATTRIBUTES

The Printer Status (2110,0010) reported with the response message is evaluated as follows:

- NORMAL: Printer is ready for printing. The PRINT-SCU AE continues with the print process.
- WARNING: Printer is ready for printing but in a warning status. The PRINT-SCU AE reports the Printer Status Info (2110,0020) to the user and continues the print process.
- FAILURE: Printer is not ready for printing. The PRINT-SCU AE reports the Printer Status Info (2110,0020) to the user and aborts the print process.

The return values of the other attributes are only used for trace purpose.

4.2.12.3.1.4.4.2 Printer SOP Class Operations for N-EVENT-REPORT

The PRINT-SCU AE responds to received N-EVENT-REPORT requests always with status ‘Success’ (0x0000). The reported status information is not evaluated by the PRINT-SCU AE.

4.2.12.3.1.5 SOP Specific Conformance for Basic Color Print Management Meta SOP Class

The PRINT-SCU AE supports the following SOP Classes as defined by the Basic Color Print Management Meta SOP Class.

SOP Class Name	SOP Class UID	SCU	SCP
Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
Basic Color Image Box	1.2.840.10008.5.1.1.4.1	Yes	No
Printer	1.2.840.10008.5.1.1.16	Yes	No

Table 96: SOP CLASSES FOR BASIC COLOR PRINT MANAGEMENT META SOP CLASS

4.2.12.3.1.5.1 SOP Specific Conformance for Basic Film Session SOP Class

Refer to section 'SOP Specific Conformance for Basic Film Session SOP Class' in the chapter 'Basic Grayscale Print Management Meta SOP Class'.

4.2.12.3.1.5.2 SOP Specific Conformance for Basic Film Box SOP Class

Refer to section 'SOP Specific Conformance for Basic Film Box SOP Class' in the chapter 'Basic Grayscale Print Management Meta SOP Class'.

4.2.12.3.1.5.3 SOP Specific Conformance for Basic Color Image Box SOP Class

The PRINT-SCU AE supports the following DIMSE Service for the Basic Color Image Box SOP Class:

- N-SET

4.2.12.3.1.5.3.1 Basic Color Image Box SOP Class Operations for N-SET

The PRINT-SCU AE sends a N-SET Request to the PRINT-SCP AE to provide the Basic Color Image Box SOP Instance with presentation parameters and pixel data which apply to a single image of a sheet of film. The Basic Film Box SOP Instance is created when a N-CREATE Request on Film Box level is performed. The attributes supplied by the PRINT-SCU AE with a N-SET Request Message are listed in the following table.

Attribute Name	Tag	Possible Values	Configured by
Image Position	(2020,0010)	1	Auto[1]
Basic Color Image Sequence	(2020,0111)		
> Pixel Aspect Ratio	(0028,0034)		Auto
> Samples Per Pixel	(0028,0002)	3	Auto
> Photometric Interpretation	(0028,0004)	RGB	Auto
> Planar Configuration	(0028,0006)	1	Auto

> Rows	(0028,0010)		Auto
> Columns	(0028,0011)		Auto
> Bits Allocated	(0028,0100)	8	Auto
> Bits Stored	(0028,0101)	8	Auto
> High Bit	(0028,0102)	7	Auto
> Pixel Representation	(0028,0103)	0	Auto
> Pixel Data	(7FE0,0010)		Auto

Table 97: BASIC COLOR IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES

Note: 1. Only one Basic Color Image Box is available because the Image Display Format is always set to STANDARD\1,1 when creating a Basic Film Box SOP Instance.

4.2.12.3.1.5.4 SOP Specific Conformance for Printer SOP Class

Refer to section ‘SOP Specific Conformance for Printer SOP Class’ in the chapter ‘Basic Grayscale Print Management Meta SOP Class’.

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4.2.12.3.1.6 SOP Specific Conformance for Print Job SOP Class

The PRINT-SCU AE supports the following DIMSE Service for the Print Job SOP Class:

- N-EVENT-REPORT

4.2.12.3.1.6.1 Print Job SOP Class Operations for N-EVENT-REPORT

The PRINT-SCU AE is capable of receiving N-EVENT-REPORT requests. N-EVENT-REPORT is used to report the execution status change of previously created Print Jobs to the SCU in an asynchronous way.

Note: There are DICOM printers at the market with disabled sending of N-EVENT-REPORT request messages by default. For such systems it is possible either to activate the N-EVENT-REPORT sending or to configure the PRINT-SCU AE not to wait for N-EVENT-REPORT request messages even though the Print Job SOP Class is negotiated.

The attributes supplied by the Partner AE with a N-EVENT-REPORT Request Message and evaluated by the PRINT-SCU AE are listed in the following table.

Attribute Name	Tag	Possible Values
Event Type ID	(0000,1002)	1: PENDING 2: PRINTING 3: DONE 4: FAILURE
Execution Status Info	(2100,0030)	

The Event Type ID (0000,1002) reported with the request message is evaluated as follows:

- PENDING: Print Job is pending. PRINT-SCU AE continues waiting until Print Job is processed.
- PRINTING: Print Job is is being printed. PRINT-SCU AE continues waiting until Print Job is processed.
- DONE: Print Job is performed successfully. PRINT-SCU AE stops waiting.
- FAILURE: Print Job processing failed. PRINT-SCU AE stops waiting and reports the Execution Status Info (2100,0030) to the user.

If the Partner AE supports the Print Job SOP Class and N-EVENT-REPORT message sending is activated the PRINT-SCU AE waits until a N-EVENT-REPORT Request with status ‘DONE’ or ‘FAILURE’ is received for each of the previously created Print Jobs before the association is closed.

4.2.12.4 Association Acceptance Policy

The PRINT-SCU AE does not accept Associations.

4.2.13 WORKSTATION-SCP Application Entity Specification

SIENET MagicWeb provides the possibility to modify the status of a specified study and to store annotations along with a referenced SOP Instance in the SIENET MagicWeb database.

4.2.13.1 SOP Classes

The WORKSTATION-SCP AE provides Standard Conformance to the following Workstation Private SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No	Yes
Workstation - SET	1.2.528.1.1008.10001.2000.7	No	Yes
Workstation - ACTION	1.2.528.1.1008.10001.2000.11	No	Yes

Table 98: SOP CLASSES FOR WORKSTATION-SCP AE

4.2.13.2 Association Establishment Policies

4.2.13.2.1 General

The WORKSTATION-SCP AE will never initiate Associations; it only accepts Association Requests from external DICOM AEs. The WORKSTATION-SCP AE will accept Associations for Verification and Workstation N-SET or N-ACTION requests.
The DICOM standard Application Context Name for DICOM 3.0 is always accepted:

Application Context Name	1.2.840.10008.3.1.1.1

Table 99: DICOM APPLICATION CONTEXT FOR WORKSTATION-SCP AE

4.2.13.2.2 Number of Associations

The WORKSTATION-SCP AE can support multiple simultaneous Associations. Each time the WORKSTATION-SCP AE receives an Association, a child process will be spawned to process the Verification or Workstation request. The maximum number of child processes, and thus the maximum number of simultaneous Associations that can be processed, is set by configuration. The maximum is limited by the License Key.

Maximum number of simultaneous Associations	- Limited by License Key - Restrictable by administrator

Table 100: NUMBER OF ASSOCIATIONS AS A SCP FOR WORKSTATION-SCP AE

4.2.13.2.3 Asynchronous Nature

The WORKSTATION-SCP AE does not support asynchronous communication (multiple outstanding transactions over a single association). All association requests must be completed and acknowledged before a new operation can be initiated.

Maximum number of outstanding asynchronous transactions	1 (Not Configurable)

Table 101: ASYNCHRONOUS NATURE AS A SCP FOR WORKSTATION-SCP AE

4.2.13.2.4 Implementation Identifying Information

All SIENET MagicWeb AE's use the same Implementation Class UID and the same Implementation Version Name. This Version Name is updated with each new release of the product software, as the different AE versions are never released independently.

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 102: DICOM IMPLEMENTATION CLASS AND VERSION FOR WORKSTATION-SCP AE

4.2.13.3 Association Initiation Policy

The WORKSTATION-SCP AE does not initiate Associations.

4.2.13.4 Association Acceptance Policy

4.2.13.4.1 Activity – Handling Set Presentation State Requests

4.2.13.4.1.1 Description and Sequencing of Activity

The WORKSTATION-SCP AE accepts Associations only if they have valid Presentation Contexts. If none of requested Presentation Contexts are accepted then the Association Request itself is rejected. Only associations with Application Entity Titles of DICOM partner nodes will be accepted that are configured on the administration interface.

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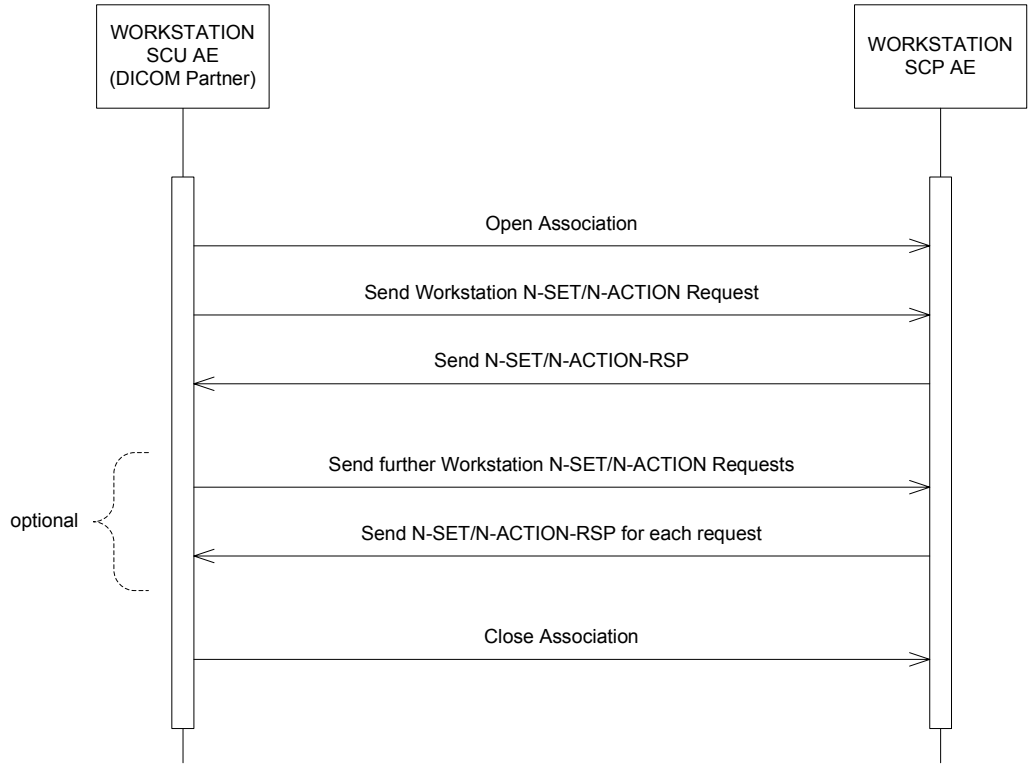

Figure 16: SEQUENCING OF ACTIVITY - HANDLING WORKSTATION REQUESTS

The following sequencing constraints illustrated in Figure 16 apply to the WORKSTATION-SCP AE for handling Workstation Requests (N-SET/N-ACTION-Requests):

1. Partner AE opens an Association with the WORKSTATION-SCP AE.
2. Partner AE sends a N-ACTION- or N-SET-RQ Message to modify the status of a specified study or to store annotations along with a referenced SOP Instance. WORKSTATION-SCP AE returns a N-ACTION- or N-SET-RSP Message to indicate the reception of the request.
3. Partner AE can optionally send further N-ACTION- or N-SET-RQ Messages over the same association. WORKSTATION-SCP AE returns a N-ACTION- or N-SET-RSP Message for each request to indicate the reception of the request.
4. Partner AE closes the Association.

The WORKSTATION-SCP AE may reject Association attempts as shown in Table 103. The Result, Source and Reason/Diag columns represent the values returned in the corresponding fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4). The following abbreviations are used in the Source column:

j. 1 – DICOM UL service-user
k. 2 – DICOM UL service-provider (ASCE related function)
l. 3 – DICOM UL service-provider (Presentation related function)

Result	Source	Reason/Diag	Explanation
2 - rejected-transient	c	2 - local-limit-exceeded	The (configurable) maximum number of simultaneous Associations has been reached. An Association request with the same parameters may succeed at a later time.
1 - rejected-	a	2 - application-context-name-	The Association request contained an unsupported Application Context Name. An association request with

permanent		not-supported	the same parameters will not succeed at a later time.
1 - rejected-permanent	a	7 - called-AE-title-not-recognized	The Association request contained an unrecognized Called AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association initiator is incorrectly configured and attempts to address the Association acceptor using the wrong AE Title.
1 - rejected-permanent	a	3 - calling-AE-title-not-recognized	The Association request contained an unrecognized Calling AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association acceptor has not been configured to recognize the AE Title of the Association initiator.
1 - rejected-permanent	b	1 - no-reason-given	The Association request could not be parsed. An Association request with the same format will not succeed at a later time.

Table 103: ASSOCIATION REJECTION REASONS

4.2.13.4.1.2 Accepted Presentation Contexts

WORKSTATION-SCP AE will accept Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Workstation - SET	1.2.528.1.1008.10001.2000.7	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None
Workstation - ACTION	1.2.528.1.1008.10001.2000.11	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None

Table 104: ACCEPTED PRESENTATION CONTEXTS BY THE WORKSTATION-SCP AE

4.2.13.4.1.3 SOP Specific Conformance for Verification SOP Class

The WORKSTATION-SCP AE provides standard conformance to the Verification SOP Class as an SCP.

4.2.13.4.1.4 SOP Specific Conformance for Workstation SOP Classes

The WORKSTATION-SCP AE is able to handle Workstation specific private N-ACTION and N-SET requests in order to modify the status of a specified study or to store annotations along with a referenced SOP Instance.

All STORAGE- and QUERY/RETRIEVE-SCU partner DICOM nodes are authorized to send such messages to SIENET MagicWeb. They can send the requests to any AET which is configured for SIENET MagicWeb QUERY-RETRIEVE-SCP (Level A), QUERY-RETRIEVE-SCP (Level B) and QUERY-RETRIEVE-SCP (Archive Level) or STORAGE-SCP.

The study status is modified by sending either a N-ACTION or a N-SET request message with the attributes which are listed in the table below. The Diagnosed Flag will be mapped by SIENET MagicWeb to the Study Status ID (Tag 0032,000A) field in the SIENET MagicWeb database ('Y' -> 'READ', 'N' -> 'VERIFIED' or 'COMPLETED' depending on the configured default value).

Attribute Name	Tag	VR	Required	Value
Query/Retrieve Level	(0008,0052)	CS	X	'STUDY'
Study Instance UID	(0020,000D)	UI	X	
Diagnosed (private)	(2E15,1061)	ST	X	'Y' (Yes) or 'N' (No)

Table 105: WORKSTATION SCP REQUESTED ELEMENTS FOR MODIFYING STUDY STATUS

The annotations are stored by sending either a N-ACTION or a N-SET request message with the attributes which are listed in the table below. If one of the attributes is missing in the message the corresponding value will not be changed in the SIENET MagicWeb database.

Attribute Name	Tag	VR	Required	Value
Query/Retrieve Level	(0008,0052)	CS	X	'IMAGE'
Study Instance UID	(0020,000D)	UI	X	
Graphical Attributes (private)	(2E15,1069)	ST		
Transformations (private)	(2E15,106A)	ST		
Pixel Performance Measurement (private)	(2E15,106B)	ST		

Table 106: WORKSTATION SCP REQUESTED ELEMENTS FOR STORING ANNOTATIONS

Note: Annotations and status information are stored in the SIENET MagicWeb database only. The SOP Instances will not be affected by Workstation N-SET/N-ACTION requests.

The WORKSTATION-SCP AE will return the Status Code values in N-ACTION Responses as shown in the following table.

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0x0000	Matching is complete. No final identifier is supplied.
	Invalid argument value	0x0115	Indicates that the action information value specified was out of range or otherwise inappropriate. Error message is stored in the Trace Database.
	Unable to process	0x0110	An internal processing error occurred which makes further processing of the query request impossible. Error message is stored in the Trace Database.

Table 107: WORKSTATION-SCP AE N-ACTION RESPONSE STATUS RETURN BEHAVIOR

The WORKSTATION-SCP AE will return the Status Code values in N-SET Responses as shown in the following table.

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0x0000	Matching is complete. No final identifier is supplied.
Error	Missing attribute value	0x0121	A required Attribute was not supplied with the Set Presentation State request message. Error message is stored in the Trace Database.
	Invalid attribute value	0x0106	The Attribute Value specified was out of range or otherwise inappropriate. Error message is stored in the Trace Database.
	Unable to process	0x0110	An internal processing error occurred which makes further processing of the query request impossible. Error message is stored in the Trace Database.

Table 108: WORKSTATION-SCP AE N-SET RESPONSE STATUS RETURN BEHAVIOR

The behavior of WORKSTATION-SCP AE during communication failure is summarized in the following table:

Exception	Behavior
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout). I.e. The WORKSTATION-SCP AE is waiting for the next N-ACTION/N-SET Request on an open Association but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Error message is stored in the Trace Database.
Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout). I.e. The WORKSTATION-SCP AE is waiting for the next message PDU but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Error message is stored in the Trace Database.
Association A-ABORTed by the SCU or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	Error message is stored in the Trace Database.

Table 109: WORKSTATION-SCP AE COMMUNICATION FAILURE BEHAVIOR

4.3 Physical Network Interfaces

4.3.1 Supported Communication Stacks

SIENET MagicWeb DICOM AEs provide DICOM 3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.3.1.1 TCP/IP Stack

SIENET MagicWeb DICOM AEs inherit their TCP/IP stack from the Windows 2000® Operating System upon which they execute.

4.3.2 Physical Network Interface

SIENET MagicWeb DICOM components are indifferent to the physical medium over which TCP/IP executes; they inherit this from the Windows 2000® Operating System upon which they execute.

4.3.3 Additional Protocols

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

4.4 Configuration

4.4.1 AE Title/Presentation Address Mapping

4.4.1.1 Local AE Titles

The mapping from AE Title to TCP/IP addresses and ports is configurable and set at the time of installation by Installation Staff.

Application Entity	Role	Default AE Title	Default TCP/IP Port
STORAGE-SCU	SCU	-	-
STORAGE-SCP	SCP	DW_SCP	2010
QUERY-SCU	SCU	-	-
RETRIEVE-SCU	SCU	-	-
QUERY-RETRIEVE-SCP (Level A)	SCP	DW_QR_LA	2010
QUERY-RETRIEVE-SCP (Level B)	SCP	DW_QR_LB	2010
QUERY-RETRIEVE-SCP (Archive Level)	SCP	DW_QR_ARCHIVE	2010
MODALITY-WORKLIST-SCP	SCP	same as QUERY-RETRIEVE-SCPs	2010
MPPS-SCP	SCP	same as STORAGE-SCP	2010
MPPS-SCU	SCU	-	-
REPORT-SCU	SCU	-	-
PRINT-SCU	SCU	-	-
WORKSTATION-SCP	SCP	same as STORAGE- or QUERY-RETRIEVE-SCPs	2010

Table 110: DEFAULT APPLICATION ENTITY CHARACTERISTICS

All Application Entities can be configured to have the same AE Title except the AETs of QUERY-RETRIEVE-SCP (Level A), QUERY-RETRIEVE-SCP (Level B) and QUERY-RETRIEVE-SCP (Archive Level) must differ.

4.4.1.2 Remote AE Title/Presentation Address Mapping

The mapping of external AE Titles to TCP/IP addresses and ports is configurable and set at the time of installation by Installation Staff. This mapping is necessary for resolving the IP address and port of C-MOVE Destination and Storage Commitment Result Receiving Application Entities.

4.4.2 Parameters

SIENET MagicWeb configuration parameters related to DICOM communications are below. A blank cell under the 'Default Value' heading indicates that there is no default value for the specific configuration attribute.

Parameter	Configurable	Default Value
General SCP Parameters		
TCP/IP Listen Port	Yes	2010
Maximum PDU length [byte]	Yes	16384
Maximum number of DICOM connections	Yes	16
DICOM Timeout [sec]	Yes	60
Number of retries to read incoming messages	No	10
General SCU Parameters		
Maximum PDU length [byte]	Yes	16384
DICOM Timeout [sec]	Yes	60
Number of Retries (Storage Commitment)	Yes	3
Delay between Retries [sec] (Storage Commitment)	Yes	30
Timeout for Result [min] (Storage Commitment)	Yes	60
Delay at Start [min] (Send)	Yes	0
Number of Retries (Send)	Yes	3
Delay between Retries [min] (Send)	Yes	1
Number of Retries (MPPS)	Yes	3
Delay between Retries [sec] (MPPS)	Yes	60
STORAGE-SCU AE Parameters		
Own Application Entity Title	Yes	
Application Entity Title of Partner	Yes	
TCP/IP Port of Partner	Yes	
Remote hostname or TCP/IP address of Partner	Yes	
DICOM Read Timeout [sec]	Yes	30
Send SOP Instances always uncompressed	Yes	Disabled
Dicom Send	Yes	Disabled
Priority for Dicom Send	Yes	Medium
Dicom Quick Send	Yes	Disabled
Priority for Dicom Quick Send	Yes	Medium
STORAGE-SCP AE Parameters		
Application Entity Title	Yes	DW_SCP
Application Entity Title of Partner	Yes	
TCP/IP Port of Partner (Storage Commitment)	Yes	
Remote hostname or TCP/IP address of Partner (Storage Commitment)	Yes	
DICOM Read Timeout [sec]	Yes	30

QUERY-/RETRIEVE-SCU AE Parameters		
Own Application Entity Title for Query	Yes	
Own Application Entity Title for Retrieve	Yes	
Application Entity Title of Partner	Yes	
TCP/IP Port of Partner	Yes	
Remote hostname or TCP/IP address of Partner	Yes	
DICOM Read Timeout [sec]	Yes	30
Priority	Yes	Medium
Retrieve job timeout [min] (Global Setting)	Yes	10
Send DICOM echo before query (Global Setting)	Yes	Off
Maximum number of study records to be returned as query results (Global Setting)	Yes	200
QUERY-RETRIEVE-SCP AE Parameters (Level A)		
Application Entity Title	Yes	DW_QR_LA
Application Entity Title of Partner	Yes	
TCP/IP Port of Partner	Yes	
Send SOP Instances always uncompressed	Yes	Disabled
QUERY-RETRIEVE-SCP AE Parameters (Level B)		
Application Entity Title	Yes	DW_QR_LB
Application Entity Title of Partner	Yes	
TCP/IP Port of Partner	Yes	
Send SOP Instances always uncompressed	Yes	Disabled
QUERY-RETRIEVE-SCP AE Parameters (Archive Level)		
Application Entity Title	Yes	DW_QR_ARCHIVE
Application Entity Title of Partner	Yes	
TCP/IP Port of Partner	Yes	
Send SOP Instances always uncompressed	Yes	Disabled
REPORT SCU AE Parameters		
Own Application Entity Title	Yes	
Application Entity Title of Partner	Yes	
TCP/IP Port of Partner	Yes	
Remote hostname or TCP/IP address of Partner	Yes	
DICOM Read Timeout [sec]	Yes	30
Assign the Reports to Study by Accession Number or Request ID	Yes	Accession Number
Priority	Yes	Medium
Auto Report Query	Yes	Disabled
Delay Time at Start [sec]	Yes	
Number of Retries	Yes	
Delay Time between Retries [sec]	Yes	
MODALITY WORKLIST SCP AE Parameters		

Application Entity Title	Yes	DW_QR_LA DW_QR_LB DW_QR_ARCHIVE
Application Entity Title of Partner	Yes	
MPPS SCP AE Parameters		
Application Entity Title	Yes	DW_SCP
Application Entity Title of Partner	Yes	
MPPS SCU AE Parameters		
Own Application Entity Title	Yes	
Application Entity Title of Partner	Yes	
TCP/IP Port of Partner	Yes	
Remote hostname or TCP/IP address of Partner	Yes	
DICOM Read Timeout [sec]	Yes	30
Priority	Yes	Medium
Number of Retries	Yes	
Delay Time between Retries [sec]	Yes	
Print SCU AE Parameters		
Own Application Entity Title	Yes	
Application Entity Title of Partner	Yes	
TCP/IP Port of Partner	Yes	
Remote hostname or TCP/IP address of Partner	Yes	
DICOM Read Timeout [sec]	Yes	30
Priority	Yes	Medium
Dicom Printer	Yes	
Partner sends N-EVENT-REPORTS to signal job status	Yes	Enabled
Delay Time at Start [sec]	Yes	
Number of Retries	Yes	
Delay Time between Retries [sec]	Yes	
Print Header	Yes	Information about Patient's Name, Patient ID and Patient's Birth Date
Print Footer	Yes	Information about Study Date and Time and Page Number

Table 111: CONFIGURATION PARAMETERS

5. Media Storage

5.1 Implementation Model

5.1.1 Application Data Flow

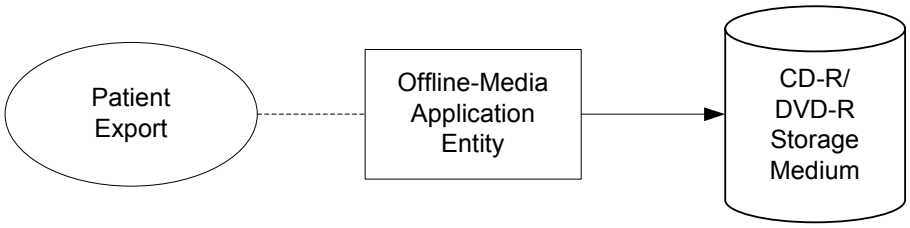

Figure 17: DICOM DATA FLOW DIAGRAM FOR MEDIA STORAGE

The Offline-Media Application Entity exports DICOM objects from SIENET MagicWeb Online to CD-R/DVD-R Storage medium. It is associated with the Real-World Activity “Patient Export”. “Patient Export” is performed upon user request for selected patients. An export of SOP Instances stored DICOM Archive is not supported.

5.1.2 Functional Definition of AEs

5.1.2.1 Functional Definition of Offline-Media Application Entity

Activation of the “Patient Export” icon will pass the currently selected patients to the Offline-Media Application Entity. The SOP Instances associated with the selection will be collected into one export job. The contents of each export job will be written to a single CD-R/DVD-R media.

5.1.3 Sequencing of Real-World Activities

At least one patient must exist and be selected before the Offline-Media Application Entity can be invoked. For CD-R/DVD-R creation a production server is used so it is necessary that there is a blank CD-R/DVD-R available in the media producing system.

5.1.4 File Meta Information Options

The implementation information written to the File Meta Header in each file is:

Implementation Class UID	1.2.276.0.45.1.1.0.40.20050804
Implementation Version Name	DicomWeb_40

Table 112: DICOM IMPLEMENTATION CLASS AND VERSION FOR MEDIA STORAGE

5.2 AE Specifications

5.2.1 Offline-Media Application Entity Specification

The Offline-Media Application Entity provides standard conformance to the DICOM Interchange Option of the Media Storage Service Class. The Application Profiles and roles are listed in the following table.

Application Profiles Supported	Real World Activity	Role	SC Option
STD-GEN-CD	Patient Export	FSC	Interchange

Table 113: APPLICATION PROFILES, ACTIVITIES AND ROLES FOR OFFLINE-MEDIA

5.2.1.1 File Meta Information for the Application Entity

The Source Application Entity Title used for DICOMDIR creation corresponds to the AET specified for the STORAGE-SCP AE. This value is also inserted in the DICOM files which are lossy compressed by SIENET MagicWeb Online. All other exported files contain the Application Entity Title of the Partner AE which sends the SOP Instance to SIENET MagicWeb.

5.2.1.2 Real-World Activities

5.2.1.2.1 Activity – Patient Export

The Offline-Media Application Entity acts as an FSC using the interchange option when requested to export SOP Instances from the local database to a CD-R/DVD-R medium.

The data size of the selected patients to be exported is displayed to the user. It is not possible to start the export job if the amount of data exceeds the maximum data size which can be configured on the administration interface.

The contents of the export job will be written with or without a corresponding DICOMDIR to a single-session CD-R/DVD-R (configurable). Writing in multi-session mode is not supported.

5.2.1.2.1.1 Media Storage Application Profiles

The Offline-Media Application Entity supports the STD-GEN-CD Application Profile.

5.2.1.2.1.2 Options

The Offline-Media Application Entity supports the same SOP Classes and Transfer Syntaxes as the STORAGE-SCU AE listed in Table 8 and Table 9. Additionally the following SOP Class and Transfer Syntax is used for DICOMDIR creation.

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Media Storage Directory Storage	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1

Table 114: IODS, SOP CLASSES AND TRANSFER SYNTAXES FOR OFFLINE-MEDIA

5.3 Augmented and Private Application Profiles

SIENET MagicWeb does not support any augmented for private application profiles.

5.4 Configuration

The generation and export of a DICOMDIR file can be switched on/off via administration interface. Additionally the administrator can specify if a Media Viewer is copied with the export data to the medium.

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6. Support of Extended Character Sets

All SIENET MagicWeb DICOM applications support the following extended character set:

ISO_IR 100 (ISO 8859-1:1987 Latin Alphabet No. 1 supplementary set)

As well as supporting this Extended Character Set for DICOM messaging, the Query-Server system database and user interface can support the expected display of this character set.

The use of any other extended character sets may produce incorrect and unreadable output on the Web interface.

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7. Security

7.1 Security Profiles

None supported.

7.2 Association Level Security

An association request is only accepted by SIENET MagicWeb if the called AE Title is equivalent to the AE Title of one of the SCP AEs. Additionally the calling AE Title is checked in order to give only those DICOM Partner Nodes the permission for accessing SIENET MagicWeb which are configured on the DICOM Partners page of the administration interface.
The Destination DICOM node for retrieving SOP Instances must be configured as a STORAGE-SCP Partner Node if it differs from the DICOM node which has initiated the retrieve request.

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