SIEMENS

ACOM.PC$^{®}$ 4.0

AX

DICOM Conformance Statement

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Table of Contents

Network Conformance Statement

1   Introduction

1.1   Overview

The Conformance Statement describes the DICOM interface for the Siemens ACOM.PC 4.0 in terms of part 2 of [DICOM].

This introduction describes the application's implemented DICOM functionality in general terms.

1.2   Scope and Field

The Siemens product ACOM.PC 4.0 is a software application for Viewing images derived from Cardiac Diagnostic and Interventional Procedures. The ACOM.PC 4.0 is designed to be integrated into an environment of Medical, DICOM-based devices in the Cardiac Lab. The ACOM.PC 4.0 supports Storage and Transfer of images utilizing the DICOM "Storage Service Class", the display of data and retrieval of images from DICOM Archives utilizing the DICOM "Query/Retrieve Service Class". Furthermore the Import of images from DICOM Cardiac and X-Ray Angiographic CD media is supported.

The ACOM.PC 4.0 DICOM network implementation supports the following services:

- DICOM Verification (C-ECHO) as SCU and SCP

- DICOM Storage (C-STORE) as SCU and SCP

- DICOM Query (C-FIND) as SCU

- DICOM Retrieve (C-MOVE) as SCU

The ACOM.PC 4.0 has "Quick Links" for easy integration with optional packages like ACOM.web®, ACOM.rec® and ACOM.Tele.PC®, which will extend the connectivity and interchange features of ACOM.PC 4.0.

The specific client interfaces of ACOM.PC 4.0 supporting the ACOM.net Server are outside the scope of this document, even if partially based on DICOM Services.

1.3   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.

1.4   Remarks

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

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 with Siemens and other vendors' Medical equipment. The Conformance Statement should be read and understood in

conjunction with the DICOM 3.0 Standard [DICOM]. 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 Siemens and non-Siemens equipment.

- Test procedures should be defined and tests should be performed by the user to validate the connectivity desired. DICOM itself and the conformance parts do not specify this.

- The standard will evolve to meet the users' future requirements. Siemens is actively involved in further developing the standard and therefore reserves the right to make changes to its products or to discontinue its delivery.

- Siemens reserves the right to modify the design and specifications contained herein without prior notice. Please contact your local Siemens representative for the most recent product information.

1.5   Definitions, Terms and Abbreviations

Definitions, terms and abbreviations used in this document are defined within the different parts of the DICOM standard.

Additional Abbreviations and terms are as follows:

ACR	American College of Radiology
AE	DICOM Application Entity
ASCII	American Standard Code for Information Interchange
CSE	Customer Service Engineer
DB	Database
DCS	DICOM Conformance Statement
DSA	Digital Subtraction Angiography
FSR	File System Reader
IOD	DICOM Information Object Definition
ISO	International Standard Organization
NEMA	National Electrical Manufacturers Association
R	Required Key Attribute
O	Optional Key Attribute
RIS	Radiology Information System
PDU	DICOM Protocol Data Unit
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair
U	Unique Key Attribute
UI	User Interface
UID	Unique Identifier
VR	Value Representation

1.6   References

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.14, 1999

1.7   Structure

The ACOM.PC Conformance Statement is subdivided into three Parts, which relate to individual documents needed to declare Conformance according to the requirements of "Part 2 - Conformance" of the DICOM Standard.

Those parts are:

- "DICOM Conformance Statement" for Network related Services

- and the "Offline Media Conformance Statement" to support local archive media.

- A general Annex.

2   Implementation Model Verification

The ACOM.PC DICOM Service Tool application requests Verification to verify the ability of a foreign DICOM application on a remote node to respond to DICOM messages.

Responding to Verification requests from remote nodes is handled by the Storage SCP application.

2.1   Application Data Flow Diagram

The ACOM.PC DICOM network implementation is a Windows NT application and acts as SCU for the C-ECHO DICOM network service.
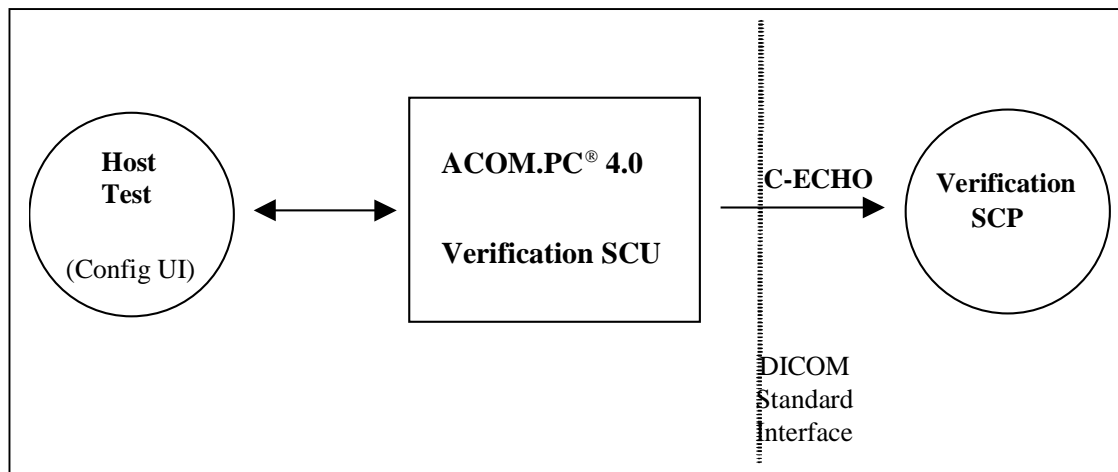
Figure 1: ACOM.PC Application Flow Diagram - Verification SCU

2.2   Functional Definitions of Applications

The ACOM.PC product supports the DICOM Verification service as SCU. With the "Host Test" utilities it is possible to open an association to the remote application and send a Verification message to verify that the remote application can respond to DICOM messages. This Service is only available during configuration.

The Verification SCP is included into the Storage SCP.

2.3   Sequencing of Real-World Activities

The ACOM.PC application provides configuration pages to configure the devices and also the remote DICOM nodes. There a "Host Test" button is provided to check for a configured remote DICOM node. When the button is pressed then ACOM.PC will issue a Verification and then a Query Request.

3   Application Entity Specification Verification

3.1   Verification AE Specification

3.1.1   Association Establishment Policies

3.1.1.1   General

The ACOM.PC DICOM Configuration Utility attempts to open an association for verification request whenever the "Host Test" function is activated during network configuration of a remote DICOM application.

The configuration of the ACOM.PC application defines the Application Entity Title used.

3.1.1.2   Number of Associations

The ACOM.PC DICOM Service Tool application initiates one association at a time to request verification.

3.1.1.3   Asynchronous Nature

The ACOM.PC DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

3.1.1.4   Implementation Identifying Information

Implementation Class UID	1.3.12.2.1107.5.4.9.40
Implementation Version Name	"ACOM_PC_40"

3.1.2   Association Initiation Policy

The ACOM.PC DICOM Service Tool application attempts to initiate a new association for

- DIMSE C-ECHO

service operations.

3.1.2.1   Associated Real-World Activity

3.1.2.1.1   Associated Real-World Activity – Host Test

The associated Real-World activity is a C-ECHO request initiated by Service and Configuration SW environment whenever a "Host Test" is requested. If an association to a remote Application Entity is successfully established, Verification with the configured AET is requested via the open association. If the C-ECHO Response from the remote Application contains a status other than "Success" this will be indicated in the service environment and the association is closed.

3.1.2.1.2   Proposed Presentation Contexts – Host Test

The ACOM.PC DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table – Verification SCU					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.1.3 SOP Specific Conformance – Host Test

The Application conforms to the definition of a Verification SCU in accordance to the DICOM Standard.

3.1.3   Association Acceptance Policy

The Verification SCP is part of the Storage SCP – see section 5.1.3.

4   Implementation Model Storage

The ACOM.PC DICOM Application Entity both originates associations for Storage of DICOM
Composite Information Objects in Remote Application Entities and receives association requests
for Storage from Remote Application Entities.

4.1   Application Data Flow Diagram

The ACOM.PC DICOM network implementation is a Windows application and acts as SCU and
SCP for the C-STORE DICOM network service and as SCP for the C-ECHO DICOM network
service.
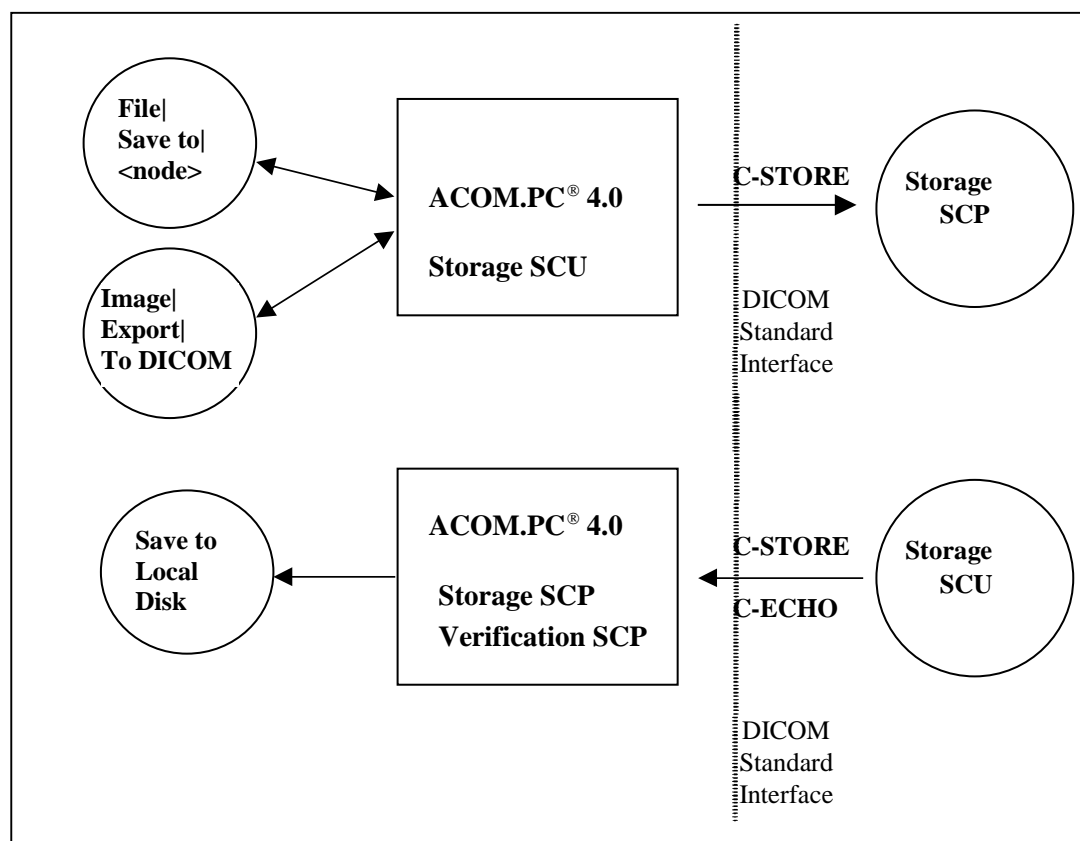
Figure 2: ACOM.PC Application Data Flow Diagram – Storage SCU/SCP

4.2   Functional Definitions of Application Entities

The ACOM.PC product supports the DICOM Storage service as SCU. For each selected patient
in the Browser application it opens an association to the remote application and sends the
images. From Viewer, single images can be immediately sent to a remote DICOM destination.

The Storage SCP is operating as background daemon process. It is existing while the ACOM.PC
application is running or while there are active jobs. The received objects are stored to Local disk.
From there they can be further processed or transferred to other destinations available.

The Verification SCP is included in the Storage SCP.

4.3   Sequencing of Real-World Activities

The ACOM.PC 4.0 application provides a User Interface to select patients or studies and send them to remote DICOM nodes. Some destinations require that the related images are already stored on the local disk in advance to the initiation of further transfers of those images.

Only while displaying images, the actual displayed image can be sent out from ACOM.PC viewer.

If it is existing and is referenced to by the related Patient record of the local DICOMDIR, the contents of the referenced Detached Patient Management Instance is applied to the image header before sending it to a destination. New UIDs will be created in this case on Study-/Series- and SOP Instance-Level.

5   Application Entity Specification Storage

5.1   Storage AEs Specification

The ACOM.PC 4.0 application provides one AE being used when initiating associations to remote DICOM nodes.

SIEMENS ACOM.PC DICOM product provides Standard Conformance to the following DICOM SOP Classes as an SCU and SCP:

SOP Class Name	SOP Class UID
Nuclear **M**edicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Ultra**S**ound Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultra**S**ound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary **C**apture Image Storage	1.2.840.10008.5.1.4.1.1.7
X-Ray **A**ngiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
Syngo Non-Image Storage	1.3.12.2.1107.5.9.1
Verification (only SCP)	1.2.840.10008.1.1

5.1.1   Association Establishment Policies

5.1.1.1   General

The configuration of the ACOM.PC application defines the Application Entity Title and its port number.

The default PDU size used will be 28 KB.

5.1.1.2   Number of Associations

The ACOM.PC DICOM application initiates several associations at a time, one for the selected images of each patient to be transferred.

It accepts and handles multiple associations in parallel.

5.1.1.3   Asynchronous Nature

The ACOM.PC DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

5.1.1.4   Implementation Identifying Information

Implementation Class UID	1.3.12.2.1107.5.4.9.40

Implementation Version Name	"ACOM_PC_40"

5.1.2 Association Initiation Policy – Storage SCU

With each request the ACOM.PC DICOM application attempts to initiate a new association for

- DIMSE C-STORE

service operations.

5.1.2.1 Associated Real-World Activities

5.1.2.1.1 Associated Real-World Activity – File|Save to|<node>

The associated Real-World activity is a C-Store request initiated by User Interface of the ACOM.PC application. If the process successfully establishes an association to a remote Application Entity, it will transfer each image one after another via the open association. If the C-STORE Response from the remote Application contains a status other than Success or Warning the association is aborted.

5.1.2.1.2 Proposed Presentation Context – File|Save to|<node>

The ACOM.PC DICOM application will propose Storage SCU Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Nuclear **M**edicine Image Storage Service Class	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
Ultra-**S**ound Multi-Frame Image Storage Service Class	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Lossy Baseline JPEG Lossy Extended JPEG Lossless, Process 14	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Ultra-**S**ound Image Storage Service Class	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Lossy Baseline JPEG Lossy Extended JPEG Lossless, Process 14	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Secondary **C**aptured Image Storage Service Class	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Lossless, Process 14	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70	SCU	None
X-Ray **A**ngiographic Image Storage Service Class	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Lossy Baseline JPEG Lossy Extended JPEG Lossless, Process 14	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Syngo Non-Image Storage	1.3.12.2.1107.5.9.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None

5.1.2.1.3 SOP specific Conformance Statement – File|Save to|<node>

The DICOM images sent by the ACOM.PC application may contain additional private elements, which have to be discarded by a DICOM system when modifying the image.

The DICOM nodes are responsible for data consistency when modifying images. All unknown private attributes have to be removed upon modification!

"Precedence of Value" is applied to the image header prior to send, if a related Detached Patient Management Instance exists and is applicable by reference. New UIDs will be created in this case on Study-/Series- and SOP Instance-Level.

5.1.2.1.4 Associated Real-World Activity – Image|Export|"to DICOM"

The associated Real-World activity is a C-Store request initiated by User Interface of the ACOM.PC viewing application. The image is processed and encoded as SC Image and provided to the general send process. If the process successfully establishes an association to a remote Application Entity, it will transfer the image via the open association. If the C-STORE Response from the remote Application contains a status other than Success or Warning, the request is indicated as failed.

5.1.2.1.5 Proposed Presentation Context – Image|Export|"to DICOM"

The ACOM.PC DICOM viewer application will propose Storage SCU Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Secondary Captured Image Storage Service Class	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None

5.1.2.1.6 SOP specific Conformance Statement – Image|Export|"to DICOM"

The ACOM.PC viewing application will create a SOP Instance based on the SC IOD. The image is processed as it is displayed, with the exception that filtering and compression is not applied on the pixel-data. Matrix Size and Photometric Interpretation are preserved from the original image pixel.

"Precedence of Value" is applied to the image header prior to send, if a related Detached Patient Management Instance exists and is applicable by reference. New UIDs will be created in this case on Study-/Series- and SOP Instance-Level.

Please see Annex for detailed description of the created SC object's data.

5.1.3   Association Acceptance Policy – Storage SCP

The ACOM.PC DICOM application attempts to accept a new association for

- DIMSE C-ECHO

- DIMSE C-STORE

service operations.

5.1.3.1   Associated Real-World Activity

5.1.3.1.1 Associated Real-World Activity – Save to local disk

The associated Real-World activity is an image transfer initiated by a remote node. After successfully establishing an association, the ACOM.PC background process will receive the images via the open association and store them to the local hard disk.

5.1.3.1.2 Presentation Context Table – Save to local disk

The ACOM.PC DICOM application will accept Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Nuclear **M**edicine Image Storage Service Class	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Ultra-**S**ound Multi-Frame Image Storage Service Class	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Lossy Baseline JPEG Lossy Extended JPEG Lossless, Process 14	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
Ultra-**S**ound Image Storage Service Class	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Lossy Baseline JPEG Lossy Extended JEPG Lossless, Process 14	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
Secondary **C**aptured Image Storage Service Class	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Lossless, Process 14	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70	SCP	None
X-Ray **A**ngiographic Image Storage Service Class	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Lossy Baseline JPEG Lossy Extended JPEG Lossless, Process 14	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
CSA Non-Image Storage	1.3.12.2.1107.5.9.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None

5.1.3.1.3 SOP-specific Conformance Statement – Save to local disk

The ACOM.PC application conforms to the Full Storage Service Class at Level 2.

The DICOM images received by the ACOM.PC application may contain additional private elements. They are not discarded when stored to local hard disk (if received with an Explicit Value Representation). ACOM.PC will not convert private attributes either.

ACOM.PC will fill in missing offset tables for the JPEG transfer syntaxes when receiving the images. It will also create DICOMDIR objects for the images and generate the IconImageSQ items (Icon image size 128² or smaller depending on original image size).

In the event of a successful C-STORE operation, the image has successful been written onto disk.

ACOM.PC is not supporting retired date and time formats when displaying information from DICOM objects stored. Non-Latin characters are discarded.

The DICOM receiver returns the status Success upon successfully operation otherwise one of the following status codes is returned:

- Refused (A700):
  This error status indicates a lack of Resources (e.g. not enough disk space)

- Error (A900 or C000):
  An error occurred while processing the image, which makes it impossible to proceed. The image will not be stored.

5.1.3.1.4 Presentation Context Acceptance Criterion

The ACOM.PC DICOM application will accept any number of verification or storage SOP classes that are listed above. There is no limit on the number of presentation contexts accepted except for the DICOM limit. In the event that the Siemens DICOM application runs out of resources, it will reject the association request.

5.1.3.1.5 Transfer Syntax Selection Policies

The Siemens DICOM application supports

- the Explicit VR Little Endian, the Implicit VR Little Endian and Explicit VR Big Endian transfer syntaxes
  Explicit VR Little Endian should be preferred by SCU for uncompressed image transfer.

- the JPEG Lossless Non-hierarchical transfer syntax.

- the JPEG Lossy Baseline and Extended transfer syntaxes.

Any proposed presentation context, which includes one of these transfer syntaxes, will be accepted. Any proposed presentation context that does not include one of these transfer syntaxes will be rejected.

6   Implementation Model Query / Retrieve

The query/retrieve service class defines an application-level class of services which facilitates the management of images and patient data against the well defined information model of DICOM and allows a DICOM AE to browse database information of and retrieve images from a remote DICOM node. The ACOM.PC DICOM query/retrieve application supports the query/retrieve services to act as SCU.

6.1   Application Data Flow Diagram

The ACOM.PC DICOM network implementation is a Windows application and acts as SCU for the query/retrieve network service.
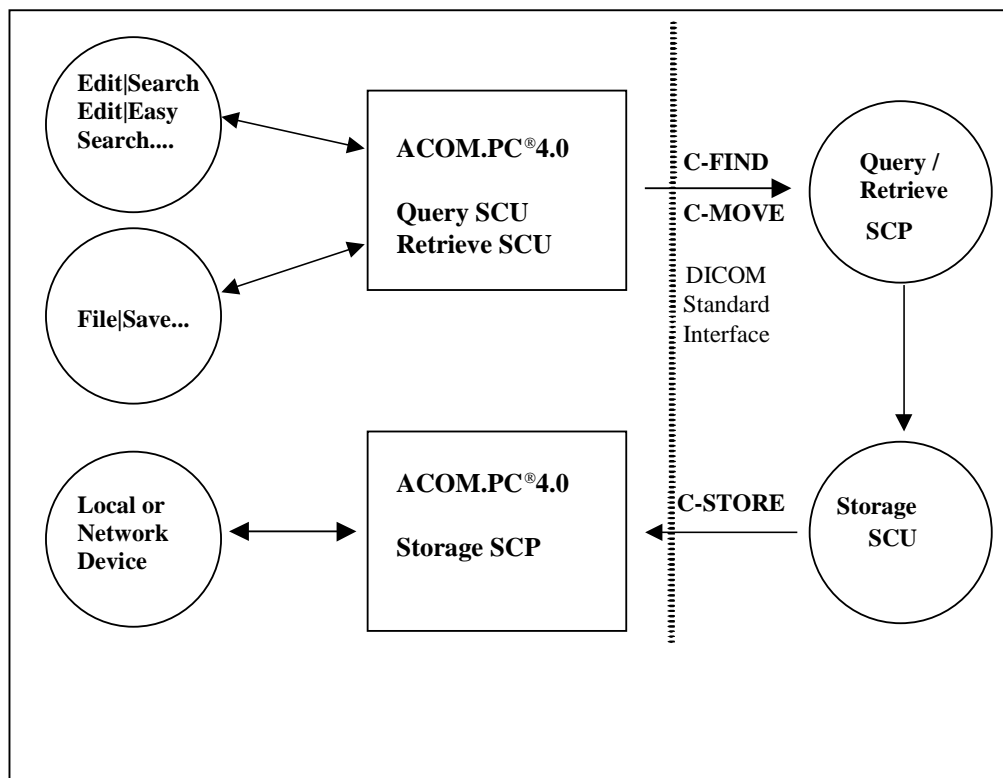
Figure 3: ACOM.PC Application Data Flow Diagram – Query/Retrieve SCU

6.2   Functional Definitions of Application Entities

The ACOM.PC product supports the DICOM Query and Retrieve service as SCU. It opens one or more associations to a remote application and queries for database information or a single association to retrieve the images of a selected study or exam (group of series).

6.3   Sequencing of Real-World Activities

The ACOM.PC 4.0 application provides "Edit|Search.." User Interfaces to query a remote node for its patient information (with or without explicit query criteria) and display it in an exam list.

With "File|Save…" the content of one or more series is accessed from the previously queried list and a request to retrieve the data from the remote DICOM node is sent. The related instances are permanently stored on the location defined by the "Save..." target (e.g. Local).

7   Application Entity Specification Query/Retrieve

7.1   Query/Retrieve Service AEs Specification

The Query/Retrieve SCU requests that the remote SCP performs a match of all keys specified in the request, against the information in its database and the identified images will be moved over a different (C-MOVE) storage association.

The ACOM.PC DICOM application provides Standard Conformance to the following DICOM SOP Classes as SCU:

SOP Class Name	SOP Class UID
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

7.1.1   Association Establishment Policies – Query SCU

7.1.1.1   General

The configuration of the ACOM.PC application defines the Application Entity Title and its port number.

The default PDU size used will be 28 KB.

7.1.1.2   Number of Associations

The ACOM.PC DICOM application initiates several associations at a time.

For Query it initiates a new association to the remote node and issues the C-FIND request to retrieve all the requested patient and study information matching the search criteria. ACOM.PC initiates in parallel a second association to the destination node to query for all the series information for each study information returned on the first association.

For the Retrieve request (C-MOVE) only one association is initiated per destination.

But ACOM.PC accepts and handles multiple associations in parallel, for example to receive the requested images in parallel from different destinations.

7.1.1.3   Asynchronous Nature

The ACOM.PC DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

7.1.1.4   Implementation Identifying Information

Implementation Class UID	1.3.12.2.1107.5.4.9.40
Implementation Version Name	"ACOM_PC_40"

7.1.2   Association Initiation Policy

The ACOM.PC application attempts to initiate a new association for

- DIMSE C-FIND

- DIMSE C-MOVE

service operations. Reaching the maximum response limit or by users request a

- DIMSE C-FIND-CANCEL

Service operation will be sent over the open association.

7.1.2.1   Real World Activity - Find SCU

7.1.2.1.1 Associated RWA - "Edit|Search..." or "Edit|Easy Search..."

Associated to the "Edit|Search..." and "Edit|Easy Search..." Real-World activities a C-FIND request is initiated by the ACOM.PC DICOM application. If the process successfully establishes an association to the remote Application Entity, it will send the query request for the patient and study information over the open association.

In parallel ACOM.PC tries to initiate a second association to the remote Application Entity. This second association is used to automatically query for the series information of each Study returned by the remote AE on the first association.

All Patient/Study/Series information is then combined and displayed in the Browsing User Interface of ACOM.PC. There the user can select a patient or specific study/exam and ask to retrieve them from the remote AE.

If the C-FIND Response from the remote Application contains an error status, the association is aborted.

If the remote node returns more results than the maximum number of matches (3000), then ACOM.PC will issue a C-FIND-CANCEL Request. If the remote AE still continues sending results, then ACOM.PC will abort the association.

7.1.2.1.2 Proposed Presentation Contexts - "Edit|Search..." or "Edit|Easy Search..."

The ACOM.PC DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Ext. Neg.
Name	UID	Name List	UID List	Role	
Study Root Query/Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None

Note: C-FIND Extended Negotiation will be NOT supported by the SCU.

7.1.2.1.3 SOP Specific Conformance Statement - "Edit|Search..." or "Edit|Easy Search..."

The ACOM.PC DICOM Query/Retrieve SCU supports hierarchical queries with all mandatory search keys. The following tables describe the search keys for the supported Study Root query model that the ACOM.PC Query application supports as an SCU:

Attribute Name	Tag	Type	Matching	User Input	Return Value Display
Study Level ([0008,0052] = "STUDY")					
Specific character Set	(0008,0005)	O	Single Value	Fixed value ISO_IR 100	--
Referring Physician's Name	(0008,0090)	O	Universal(Null)	--	yes
Patient Name	(0010,0010)	R	Wildcard or Universal(Null)	Enter value	yes
Patient ID	(0010,0020)	U / R	Wildcard or Universal(Null)	Enter value	yes
Patient´s Birthdate	(0010,0030)	O	Single Value or Universal(Null)	Enter value	yes
Patient´s Sex	(0010,0040)	O	Wildcard or Universal(Null)	Enter value	yes
Patient Comments	(0010,4000)	O	Universal(Null)	--	yes
Study Instance UID	(0020,000D)	U	Universal(Null)	--	--
Study ID	(0020,0010)	R	Wildcard or Universal(Null)	Enter value	yes
Study Date	(0008,0020)	R	Range or Universal(Null)	Enter value	yes
Study Time	(0008,0030)	R	Universal(Null)	--	yes
Accession Number	(0008,0050)	R	Wildcard or Universal(Null)	Enter value	yes
Study Description	(0008,1030)	O	Wildcard or Universal(Null)	Enter value	yes
Series Level ([0008,0052] = "SERIES")					
Specific character Set	(0008,0005)	O	Single Value	Fixed value ISO_IR 100	--
Series Instance UID	(0020,000E)	U	Single Value	--	--
Series Number	(0020,0011)	R	Universal(Null)	--	--
Modality	(0008,0060)	R	Universal(Null)	--	yes
Performing Physician's Name	(0008,1050)	O	Wildcard or Universal(Null)	Enter value	yes
Series Date	(0008,0021)	O	Range or Universal(Null)	Enter value	yes
Series Time	(0008,0031)	O	Universal(Null)	--	yes
Series Description	(0008,103E)	O	Universal(Null)	--	--
Institution Name	(0008,0080)	O	Wildcard or Universal(Null)	Enter value	yes
Performed Procedure Step ID	(0040,0253)	O	Universal(Null)	--	--
Performed Procedure Step Start Date	(0040,0244)	O	Universal(Null)	--	yes
Performed Procedure Step Start Time	(0040,0245)	O	Universal(Null)	--	yes
Performed Procedure Step Description	(0040,0254)	O	Universal(Null)	--	--
Study Instance UID	(0020,000D)	U	Single Value	--	--

Note: The Search on a DICOM device is Case Sensitive!

The entered Search string for the Performing Physicians Name is prepended as well as trailed with a wildcard character (e.g. "*Name*") to support the search on second and third physician names too.

The ACOM.PC Search application supports the

- DIMSE C-FIND-CANCEL

The ACOM.PC Application does issue a C-FIND-Cancel request if it receives more than the maximum number of matches (3000). If the remote AE still continues sending results then ACOM.PC will abort the association. The user can also cancel a running Query request via the ACOM.PC user interface ("Cancel" button while a Search is active).

The Find SCU interprets following status codes:

Service Status	Meaning	Error Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied	0000	None
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01	Identifier

After ACOM.PC application has received the C-FIND response with Status ´Success´ then it will close both associations. Same is true after Status ´Cancel´ when ACOM.PC had previously issued a C-FIND-CANCEL request.

7.1.2.2   Real-World Activity – Move SCU

7.1.2.2.1 Associated Real-World Activity – File|Save...

Associated to the "File|Save..." Real-World activity a C-MOVE request is initiated by User Interface of the ACOM.PC DICOM application. In the browsing User Interface one or more patients/studies/exams can be selected and are requested to be retrieved from the remote Application Entity.

ACOM.PC will try to establish an association to the remote Application Entity and request the one or more series (based on selection) to be transferred to ACOM.PC.

Then the ACOM.PC DICOM application waits for the new association from the remote AE and for the images to be transferred. The images are stored to the "Save…" destination. After all images are transferred and the association is closed by the remote AE, the ACOM.PC Browsing User Interface is updated automatically.

If the C-MOVE Response from the remote Application contains an error status, the association is aborted.

7.1.2.2.2 Proposed Presentation Contexts - File|Save...

The ACOM.PC DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Study Root Query/Retrieve Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None

Note: C-MOVE Extended Negotiation will be NOT supported by the SCU.

7.1.2.2.3 SOP Specific Conformance Statement - File|Save...

The ACOM.PC DICOM Query/Retrieve SCU supports hierarchical queries with all mandatory search keys. The following tables describe the matching keys for the supported query model that the ACOM.PC Retrieve application supports as an SCU:

Attribute Name	Tag	Type	Matching	User Input	Return Value Display
Study Level ([0008,0052] = "STUDY")					
Study Instance UID	(0020,000D)	U	List of UID	Select from list	--
Series Level ([0008,0052] = "SERIES")					
Study Instance UID	(0020,000D)	U	Single Value	Select from list	--
Series Instance UID	(0020,000E)	U	List of UID	Select from list	--
Image Level ([0008,0052] = "IMAGE")					
Study Instance UID	(0020,000D)	U	Single Value	Select from list	--
Series Instance UID	(0020,000E)	U	Single Value	Select from list	--
SOP Instance UID	(0008,0018)	U	List of UID	--	--

The ACOM.PC Application does not issue a C-MOVE-Cancel request.

The Move SCU interprets following status codes:

Service Status	Meaning	Error Codes	Related Fields
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)
	Out of Resources - Unable to perform sub operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
	Move destination unknown	A801	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures of Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warning	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

ACOM.PC will display a Success message at the user interface only after receiving the C-MOVE Response status of ´Success´.

7.1.3   Association Acceptance Policy

Not applicable for ACOM.PC.

8   Communication Profiles

8.1   Supported Communication Stacks

The DICOM Interface of the ACOM.PC provides DICOM TCP/IP Network Communication
Support as defined in Part 8 of the DICOM Standard.

8.1.1   TCP/IP Stack

The DICOM Interface of the ACOM.PC uses the TCP/IP stack from the SUN-OS system upon
which executes. It uses the MergeCOM subroutine library that is based on a Berkeley socket
interface.

8.1.1.1   API

The ACOM.PC DICOM application uses the MergeCOM library that is based on a TCP/IP socket
interface.

8.1.1.2   Physical Media Support

The DICOM Interface of the ACOM.PC is indifferent to the physical medium over which TCP/IP
executes; it inherits this from the Windows operating system upon which it executes.

9   Extensions / Specializations / Privatizations

9.1.1   Standard Extended / Specialized / Private SOPs

Please see Annex for definition of private Syngo Non-Image SOP class.

Please see Annex for detailed description of image that is created during "Image|Export|"to DICOM" function.

9.1.2   Private Transfer Syntaxes

Not applicable

10   Configuration

10.1   AE Title/Presentation Address Mapping

The Siemens ACOM.PC DICOM Application Entity Titles for the own application as well as the remote applications are configurable in the ACOM.PC Browser configuration dialog.

There also the port number for the own Storage SCP can be configured, default is port 104.

10.2   Configurable Parameters

The Application Entity Titles, host names and port numbers are configured using the ACOM.PC Browser Configuration dialog.

10.2.1   Number of Simultaneous Associations

ACOM.PC supports multiple associations at a time.

10.3   Default Parameters

This installation tool also uses some default parameters:

- max PDU size set to 28672 Bytes (28 kB)
- time-out for accepting/rejecting an association request: 120 s
- time-out for responding to an association open/close request: 120 s
- time-out for waiting for data between TCP/IP-packets: 120 s

The time-outs for waiting for a Service Request/Response message from the remote node are as follows:

- for Storage SCP/SCU: 120 s
- for Query/Retrieve SCP/SCU: 120 s

11   Support of Extended Character Sets

The Siemens ACOM.PC DICOM application supports the ISO 8859 Latin 1 (ISO-IR 100)
character set.

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Application Profile Conformance Statement

This chapter will contain the Conformance Statement to all "Offline Media Application Profiles (incl. private extentions)" supported by the ACOM.PC 4.0.

Those application profiles supported shall be:

- Basic Cardiac

- 1024 Extended Cardiac

- General Purpose CD

- M.A.S. private Application Profile

- ACOM.Rec augmented Profile

1 Introduction

1.1 Purpose

This DICOM Conformance Statement is written according to part PS 3.2 of [1].

The ACOM.PC® DICOM off-line media storage service implementation acts as FSR for the specified application profiles and the related SOP Class instances.

1.2 Scope

This DICOM Conformance Statement refers to SIEMENS ACOM.PC software product. The following table relates ACOM.PC software name to SIEMENS products:

Software Name	SIEMENS Product
4.0	ACOM.PC

1.3 Definitions, Abbreviations

1.3.1 Definitions

DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DICOM Message Service Element with Composite information objects

1.3.2 Abbreviations

ACR	American College of Radiology
AE	DICOM Application Entity
ASCII	American Standard Code for Information Interchange
DB	Database
DCS	DICOM Conformance Statement
FSC	File Set Creator
FSR	File Set Reader
FSU	File Set Updater
IOD	DICOM Information Object Definition
ISO	International Standard Organization
MOD	Magneto-optical Disk
NEMA	National Electrical Manufacturers Association
O	Optional Key Attribute
PDU	DICOM Protocol Data Unit
R	Required Key Attribute
RWA	Real-World Activity
U	Unique Key Attribute

1.4 References

[1] Digital Imaging and Communications in Medicine (DICOM) 3.0, NEMA PS 3.1-12, 1999

1.5   Remarks

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

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 with Siemens and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM 3.0 Standard [1]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

- The comparison of different conformance statements is the first step towards assessing interconnectivity between Siemens and non-Siemens equipment.

- Test procedures should be defined and tests should be performed by the user to validate the connectivity desired. DICOM itself and the conformance parts do not specify this.

- The standard will evolve to meet the users' future requirements. Siemens is actively involved in further developing the standard and therefore reserves the right to make changes to its products or to discontinue its delivery.

- Siemens reserves the right to modify the design and specifications contained herein without prior notice. Please contact your local Siemens representative for the most recent product information.

2   Implementation Model

2.1   Application Data Flow Diagram
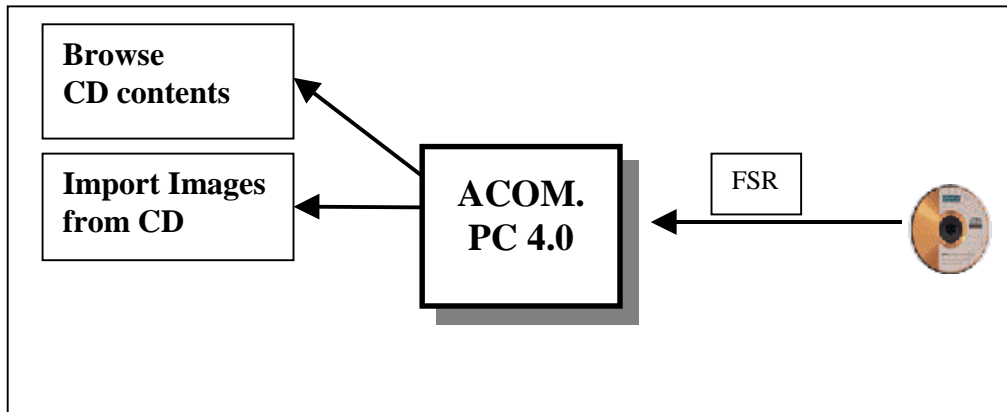
The DICOM archive application will serve as an interface to the CD-R offline medium device. It serves interfaces to include the offline media directory into the browser and to copy SOP instances to a medium or retrieve SOP Instances from medium into local storage.

The DICOM Archive application will support the 120mm CD medium.

2.2   Functional Definitions of AEs

The ACOM.PC product DICOM off-line media storage application consists all interfaces to access off-line media. It is capable of

- Reading the File-sets DICOMDIR information temporarily into the browser.

- Copy SOP Instance from medium directly onto a local directory or network directory or an dedicated ACOM.net Server.

2.3   Sequencing of Real-World Activities

The ACOM.PC 4.0 application will not perform transfers until the Directory information of the DICOMDIR is completely read in and displayed in the Browser.

2.4   File Meta Information Options

Implementation Class UID	1.3.12.2.1107.5.4.9.40
Implementation Version Name	"ACOM_PC_40"

3   AE Specifications

3.1   DICOM Archive Specification

The DICOM Archive provides Standard conformance to Media Storage Service Class (Interchange Option). Details are listed in following Table:

Application Profiles Supported	Real-World Activity	Role	SC Option
STD-GEN-CD AUG-GEN-CD	Browse Directory Information	FSR	Interchange
STD-XABC-CD AUG-XABC-DYNAMIC-CD STD-XA1K-CD PRI-XAMAS-CD PRI-AREC-CD	Import Images from CD	FSR	Interchange

3.1.1   File Meta Information for the Application Entity

The Source Application Entity Title is set to that of the ACOM.PC application, but the application is not modifying the contents of a CD. This function is provided by the ACOM.Rec option.

3.1.2   Real-World Activities for this Application Entity

3.1.2.1   Real-World Activity: Browse Directory Information

The ACOM.PC application acts as FSR and reads the DICOMDIR file as soon as a DICOM CD is inserted into the drive. The DICOMDIR contents are evaluated and the Patients listed in the Patient Browser. When a Patient entry is selected in this Patient Browser then the corresponding information about the studies on CD is displayed in the Study Browser.

With this RWA, the ACOM.PC application supports value precedence of a Detached Patient Management instance, if existent.

ACOM.PC is not supporting retired date and time formats when displaying information from DICOM objects stored on CD.

3.1.2.1.1 Application Profiles for the RWA: Browse Directory Information

See Table in section 3.1 for the Application Profiles listed that invoke this Application Entity for the Browse Directory Information RWA.

3.1.2.2   Real-World Activity: Import Images from CD

The ACOM.PC application acts as an FSR when requested to read Images to the local storage or an network drive or an dedicated ACOM.Server.

If Detached Patient Management objects are present then the new values from those objects take precedence over the image attributes when the images are sent over network. When only importing into local storage or network drive, the Detached Patient Management objects are only imported and no changes are applied to any image object instances.

Standalone IODs (Standalone Overlay, Standalone Curve, ..) are not supported by this RWA.

Non-Latin characters are discarded.

For media conforming to the STD-GEN-CD Profile the following SOP classes will be supported as an FSR:

Information Object Definition	SOP Class UID	Transfer Syntax UID
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Ultrasound multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Detached Patient Management	1.2.840.10008.3.1.2.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

3.1.2.2.1   Application Profiles for the RWA: Import Images from CD

See Table in section 3.1 for the Application Profiles listed that invoke this Application Entity for the Import into Local Storage RWA.

4   Augmented and Private Profiles

4.1   Augmented Application Profiles

4.1.1   AUG-XABC-DYNAMIC-CD

Depending on the Viewer Preferences->'Display Dynaview if available', the ACOM.PC DICOM application will make use of the lossy compressed Dynaview Image Object for immediate review ("First Pass").

Depending on the
  - Browser Preferences->Local->'Preload Dynaview' and/or
  - Browser Preferences->Network->'Preload Dynaview'
configuration, the Lossy Dynaview images will be additionally imported.

4.1.2   AUG-GEN-CD

For media conforming to an AUG-GEN-CD Profile the following SOP classes will be supported as an FSR:

Information Object Definition	SOP Class UID	Transfer Syntax UID
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossless, Process 14, 1.2.840.10008.1.2.4.70 JPEG Lossy Baseline (8 Bit), 1.2.840.10008.1.2.4.50 JPEG Lossy Extended (12 Bit), 1.2.840.10008.1.2.4.51
Ultrasound multi-frame Image	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossless, Process 14, 1.2.840.10008.1.2.4.70 JPEG Lossy Baseline (8 Bit), 1.2.840.10008.1.2.4.50 JPEG Lossy Extended (12 Bit), 1.2.840.10008.1.2.4.51

Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	JPEG Lossless, Process 14, 1.2.840.10008.1.2.4.70
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless, Process 14, 1.2.840.10008.1.2.4.70
Detached Patient Management	1.2.840.10008.3.1.2.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

4.2   Private Application Profiles

4.2.1   PRI-XAMAS-CD

The DICOM Archive application is capable of reading media that are conforming to the PRI-XAMAS application profile class. Information about this profile is provided with the Modalities (e.g. AXIOM Artis) that create such media.

4.2.2   PRI-AREC-CD

The DICOM Archive application is capable of reading media that are conforming to the PRI-AREC-CD application profile. Information about this profile is provided with the ACOM.Rec® product SW that creates such media.

5   Extensions, Specializations and Privatizations of SOP Classes and Transfer Syntaxes

The SOP Classes listed refer in majority to those created by the equipment to which this conformance Statement is related. For SOP classes not listed in this section, please refer to the Storage section of the DICOM Conformance Statement of the product. This will include all SOP Instances that can be received and displayed and therefor will be included into offline media storage even though these SOP Instances are not created by the equipment serving the Media Storage Service.

5.1   SOP Specific Conformance Statement for Basic Directory

5.1.1   Extension, Specialization for SIEMENS Non-Image Objects

According to the PRI-XAMAS Application Profile Class the usage of the Private Creator UIDs and further optional keys for the Directory Records referring to SIEMENS Non-Image Objects are listed in the following tables.

Attribute	Tag	Value used
Private Record UID	(0004,1432)	1.3.12.2.1107.5.9.1
SOP Class UID	(0008,0016)	1.3.12.2.1107.5.9.1

Those Non-Images will be ignored by ACOM.PC Archive implementation for the following activities

- Browse directory information

- Import Images from CD

6 Configuration

6.1 Dynaview Image handling

6.1.1 Browser

From 'Browser Preferences' configuration, the following two configuration items control transfer of Lossy Dynaview images:

- Local->'Preload Dynaview': Checked = Lossy Dynaview included in transfer to Local

- Network->'Preload Dynaview': Checked = Lossy Dynaview included in transfer to net-share.

6.1.2 Viewer

From 'Viewer Preferences' configuration, the following configuration item controls handling of Lossy Dynaview images for viewing:

- ->'Display Dynaview if available' –
  Checked = Lossy Dynaviews will be used for First Pass viewing.
  Not checked = (original) Image is used for First Pass viewing.

7 Support of Extended Character Sets

The ACOM.PC DICOM archive application supports the ISO 8859 Latin 1 (ISO-IR 100) character set. Non-Latin characters are discarded.

A　　　Annex

A.1　　　Siemens Private Syngo Non-Image IOD

For encoding binary data-streams not representing image data, Siemens has created a private "Non-Image IOD" according to the rules governed by the DICOM Standard. The following section will roll-out the definition of this Private IOD. It can be communicated with Network Storage Service and Offline Media Storage Services.

The Siemens "Non-Image IOD" is identified by a private Non-Image Storage SOP Class UID of

"1.3.12.2.1107.5.9.1"

A.1.1　　　Siemens Syngo Non-Image IOD – E-R Model

The E-R model in A.1.2 depicts those components of the DICOM Information Model which directly refer to the Siemens Non-Image IOD. The Frame of Reference IE, Overlay IE, Modality Lookup-Table IE, VOI Lookup-Table IE and Curve IE are not components of the Siemens Non-Image IOD.
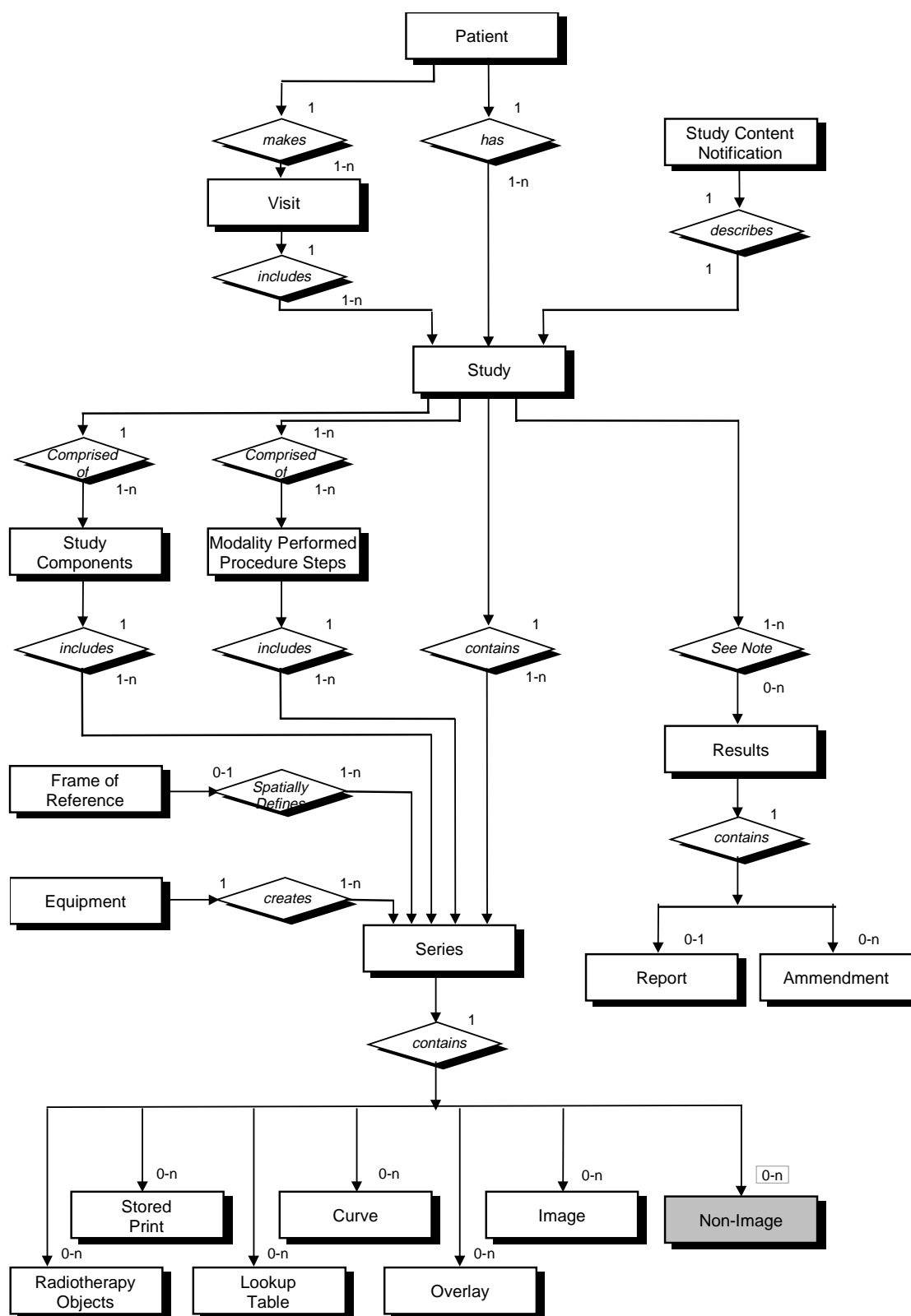
A.1.2　　Siemens Syngo Non-Image IOD - Module Table

IE	Module	Reference	Usage
Patient	Patient	[DICOM] PS3.3 C.7.1.1	M
Study	General Study	[DICOM] PS3.3 C.7.2.1	M
	Patient Study	[DICOM] PS3.3 C.7.2.2	U
Series	General Series	[DICOM] PS3.3 C.7.3.1	M
Equipment	General Equipment	[DICOM] PS3.3 C.7.5.1	U
CSA	CSA Image Header	A.2.1	U
	CSA Series Header	A.2.2	U
	MEDCOM Header	A.2.3	U
	CSA Non-Image	A.1.3.1	M
	SOP Common	[DICOM] PS3.3 C.12.1	M

A.1.3　　Siemens Syngo Non-Image IOD - Modules

A.1.3.1　　CSA Non-Image Module

The table in this section contains private IOD Attributes that describe CSA Non-Images.

Attribute Name	Tag	Owner	Type	Notes
Image Type	(0008,0008)	-	3	Image identification characteristics.
Acquisition Date	(0008,0022)	-	3	The date the acquisition of data that resulted in this data set started.
Acquisition Time	(0008,0023)	-	3	The time the acquisition of data that resulted in this data set started.
Derivation Description	(0008,2111)	-	3	A text description of how this data set was derived.
Acquisition Number	(0020,0012)	-	3	A number identifying the single continuous gathering of data over a period of time which resulted in this data set.
CSA Data Type	(0029,xx08)	SIEMENS CSA NON-IMAGE	1	CSA Data identification characteristics. Defined Terms: BSR REPORT = Study Report Data
CSA Data Version	(0029,xx09)	SIEMENS CSA NON-IMAGE	3	Version of CSA Data Info (0029,xx10) format and CSA Non-Image Data (7FE1,xx10) format.
CSA Data Info	(0029,xx10)	SIEMENS CSA NON-IMAGE	3	Information to describe the CSA Data (7FE1,xx10).
CSA Data	(7FE1,xx10)	SIEMENS CSA NON-IMAGE	2	Binary data as byte stream.

A.2　　Siemens Standard Extended Modules

A.2.1　　CSA Image Header Module

The table in this section contains private IOD Attributes that describe the CSA Image Header:

Attribute Name	Tag	Owner	Type	Notes
CSA Image Header Type	(0029,xx08)	SIEMENS CSA HEADER	1	CSA Image Header identification characteristics. Defined Terms: NUM 4 = NUMARIS/4 SOM 5 = SOMARIS/5
CSA Image Header Version	(0029,xx09)	SIEMENS CSA HEADER	3	Version of CSA Image Header Info (0029,xx10) format.

CSA Image Header Info	(0029,xx10)	SIEMENS CSA HEADER	3	Manufacturer model dependent information.

A.2.2   CSA Series Header Module

The table in this section contains private IOD Attributes that describe the CSA Series Header:

Attribute Name	Tag	Owner	Type	Notes
CSA Series Header Type	(0029,xx28)	SIEMENS CSA HEADER	1	CSA Series Header identification characteristics. Defined Terms: NUM 4 = NUMARIS/4
CSA Series Header Version	(0029,xx29)	SIEMENS CSA HEADER	3	Version of CSA Series Header Info (0029,xx10) format.
CSA Series Header Info	(0029,xx20)	SIEMENS CSA HEADER	3	Manufacturer model dependent information.

A.2.3   MEDCOM Header Module

The table in this section contains private IOD Attributes that describe the MEDCOM Header:

Attribute Name	Tag	Owner	Type	Notes
MedCom Header Type	(0029,xx08)	SIEMENS MEDCOM HEADER	1C	MedCom Header identification characteristics. Defined Terms: MEDCOM 1 (Required if MedCom Header Info (0029,xx10) present.)
MedCom Header Version	(0029,xx09)	SIEMENS MEDCOM HEADER	2C	Version of MedCom Header Info (0029,xx10) format. (Required if MEDCOM Header Info (0029,xx10) present.)
MedCom Header Info	(0029,xx10)	SIEMENS MEDCOM HEADER	3	Manufacturer model dependent information. The value of the attribute MedCom Header Info (0029,xx10) can be build up in each user defined format.
MedCom History Information	(0029,xx20)	SIEMENS MEDCOM HEADER	3	MedCom defined Patient Registration history information. See A.1.3.1.
PMTF Information 1	(0029,xx31)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 2	(0029,xx32)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 3	(0029,xx33)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 4	(0029,xx34)	SIEMENS MEDCOM HEADER	3	Transformation Information

A.3   SC Image by ACOM.PC Viewer

The Viewer "Image|Export|to DICOM" function enables sending of the currently viewed image to a DICOM destination. A processed SC image is created prior to sending it. The following table gives an overview on the supplied attributes:

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	from Original
Image Type	(0008,0008)	DERIVED\<2nd to nth value from Original>
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	

Attribute Name	Tag	Value
Study Date	(0008,0020)	from Original
Series Date	(0008,0021)	from Original
Image Date	(0008,0023)	<yyyymmdd>
Study Time	(0008,0030)	from Original
Series Time	(0008,0031)	from Original
Image Time	(0008,0033)	<hhmmss>
Accession Number	(0008,0050)	from Original
Modality	(0008,0060)	from Original
Conversion Type	(0008,0064)	WSD
Manufacturer	(0008,0070)	Siemens
Institution Name	(0008,0080)	from Original
Referring Physician's Name	(0008,0090)	from Original
Study Description	(0008,1030)	from Original
Series Description	(0008,103E)	from Original
Performing Physician's Name	(0008,1050)	from Original
Manufacturer's Model Name	(0008,1090)	LEONARDO
Derivation Description	(0008,2111)	ACOMPC 40 SC Export
Patient's Name	(0010,0010)	from Original
Patient ID	(0010,0020)	from Original
Patient's Birth Date	(0010,0030)	from Original
Patient's Sex	(0010,0040)	from Original
Patient's Size	(0010,1020)	from Original
Patient's Weight	(0010,1030)	from Original
Patient Comments	(0010,4000)	from Original
Software Version	(0018,1020)	ACOMPC_40VA01A
Protocol Name	(0018,1030)	from Original
Study Instance UID	(0020,000D)	from Original
Series Instance UID	(0020,000E)	from Original
Study ID	(0020,0010)	from Original
Series Number	(0020,0011)	from Original
Image Number	(0020,0013)	
Patient Orientation	(0020,0020)	zero length
Image Comments	(0020,4000)	from Original
Samples per Pixel	(0028,0002)	from Original
Photometric Interpretation	(0028,0004)	from Original
Rows	(0028,0010)	from Original
Columns	(0028,0011)	from Original
Bits Allocated	(0028,0100)	from Original
Bits Stored	(0028,0101)	from Original
High Bit	(0028,0102)	from Original
Pixel Representation	(0028,0103)	from Original
Window Center	(0028,1050)	
Window Width	(0028,1051)	
Red Palette Color Lookup Table Descriptor	(0028,1101)	from Original, if required
Green Palette Color Lookup Table Descriptor	(0028,1102)	from Original, if required
Blue Palette Color Lookup Table Descriptor	(0028,1103)	from Original, if required
Red Palette Color Lookup Table Data	(0028,1201)	from original, if required
Green Palette Color Lookup Table Data	(0028,1202)	from original, if required
Blue Palette Color Lookup Table Data	(0028,1203)	from original, if required
Lossy Image Compression Flag	(0028,2110)	from Original
Study Comments	(0032,4000)	from Original
Pixel Data	(7FE0,0010)	