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GE PACS
Conformance Statement for DICOM v3.0

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1. INTRODUCTION

This document is the DICOM Conformance Statement for GE Medical Systems Picture Archiving and Communication System (GE PACS.) This conformance statement describes the functions that allow DICOM compliant equipment to send DICOM composite information objects to GE PACS for Storage.

In addition, this document contains the DICOM Query and Retrieve Service Class Provider (SCP) Conformance Statement and describes the functions that allow DICOM compliant equipment to find (query) and retrieve patient, study, series, and other DICOM composite information objects from GE PACS.

1.1 Referenced Documents

Document Name	Authors/Reference
DICOM Standard, Parts 2 through 8	ACR/NEMA publication
GE PACS - DICOM Storage Service Class Provider Conformance Statement, Part Number 43 58 763 Rev02	GE Medical Systems
GE PACS - DICOM Q/R Service Class Provider Conformance Statement, Part Number 43 52 873 Rev02	GE Medical Systems

Table 1-1 *Referenced Documents*

2. OVERVIEW OF DICOM STORE AND QUERY/RETRIVE INTERFACES TO GE PACS

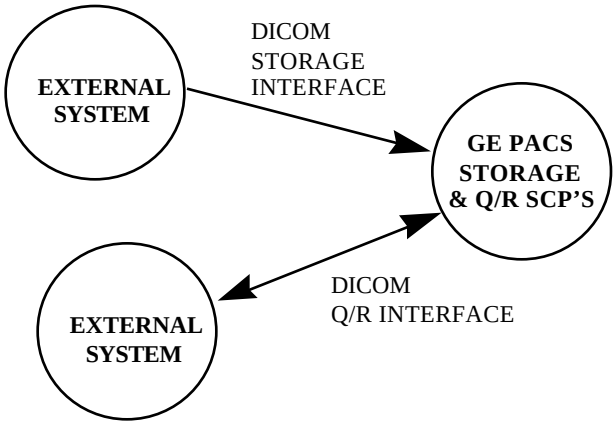

Figure 2-1 *DICOM Store and Query/Retrieve Interfaces to GE PACS*

GE PACS provides image management and archival services to external systems (acquisition modalities). Thus, it retains information about patients, studies, series, images, and associated relationships.

The Standard Storage Service Class Provider (SCP) allows DICOM compatible equipment to send DICOM composite information objects to GE PACS. The Storage SCP assumes the external system gets patient and study information from a source that is not part of the DICOM Interface. The external system sends images to GE PACS Standard Storage SCP. GE PACS is informed of study completion through a means external to the DICOM Interface (e.g., via an internal RIS or external HIS/RIS interface).

As images are received, the GE PACS correlates the images to series, studies, and patients via an internal database. The GE PACS also receives information about studies and patients from a HIS or RIS using a non-DICOM HL7 interface. GE PACS will store composite objects permanently. These composite objects can be retrieved at any time using the GE PACS Query/Retrieve SCP.

The Query/Retrieve SCP allows DICOM compatible equipment to find and retrieve patient, study, series and DICOM composite information objects from GE PACS. Data may be retrieved using the DICOM Patient Root or Study Root SOP Classes. The Relational Query method is not supported.

GE PACS storage system is composed of three main parts: a database, an image cache (Information Storage Unit or ISU), and an image archive. The database contains relationships and some attributes for patients, studies, series, images, and results. The image cache is used to store new and frequently accessed images. The image archive is used to permanently store all images. Access to images in the cache is faster than to those in the archive.

DICOM queries are performed against the GE PACS database. DICOM Image retrievals are performed against the GE PACS image cache and GE PACS image archive.

3. STANDARD STORAGE AND QUERY/RETRIEVE SCP SPECIFICATIONS

3.1 Storage Application Entity (AE) Data Flow Diagrams

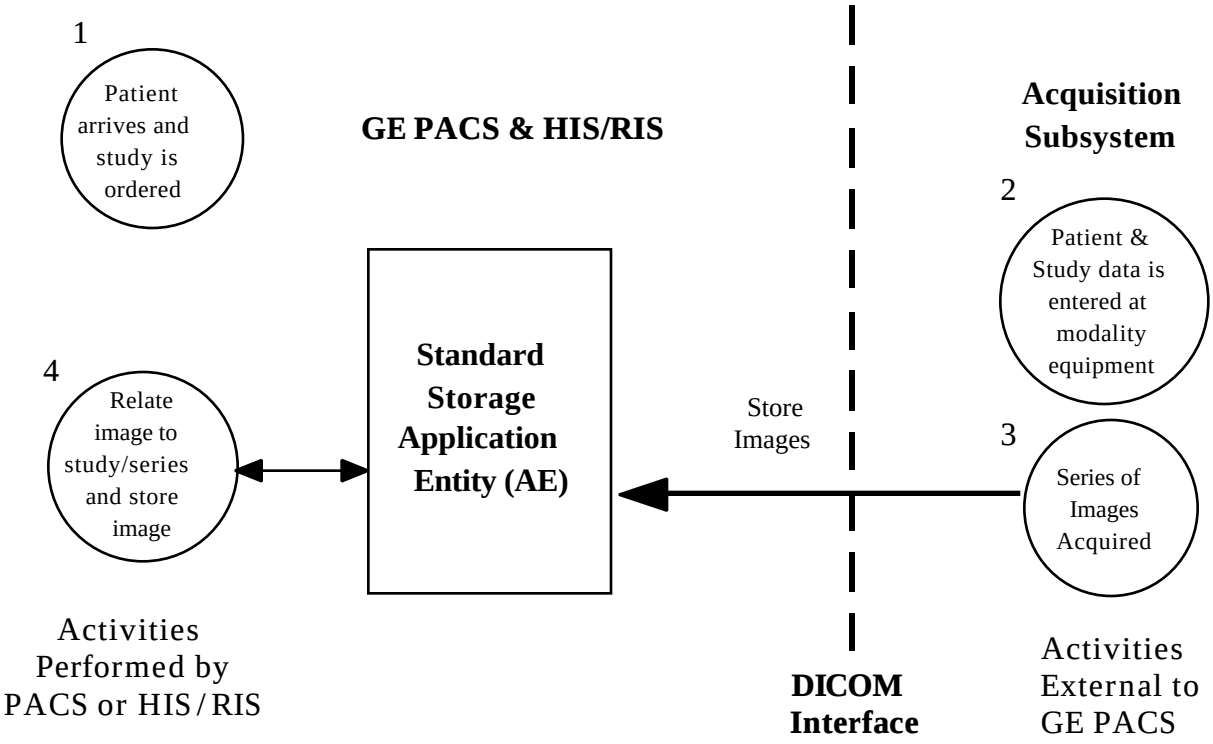

Figure 3-1 *Real World Activity Data Flow Model for Storage AE*

3.2 Functional Definition of Storage AE

The Standard Storage Application Entity, in conjunction with the GE PACS, supports the following functions:

- Relate patient, study, and series information with DICOM information objects received during DICOM C-STORE requests;
- Store patient, study, series, and image information permanently.

3.3 Sequencing of Real World Activities for Storage AE

A typical study is performed as follows (refer to Fig. 3-1):

1 A physician orders a study for the patient at the RIS. At the time the study is ordered, the RIS sends the study and patient information to GE PACS.

2 The patient arrives in the Radiology department for the exam. A technologist brings the patient study information up on the Acquisition Subsystem based on the information previously entered at RIS and/or on GE PACS. Any missing information the technologist may enter manually. The technologist then performs the study on the patient.

3 The Acquisition Subsystem uses the image data, patient demographic data and study data to build the proper DICOM objects. The Acquisition Subsystem then sends the objects to GE PACS.

4 GE PACS matches the DICOM objects received from the Acquisition Subsystem to a patient, study, and series. The matching is performed based on the information contained in the DICOM object, and on the information on the patient in the GE PACS.

3.4 Storage AE Specifications

The Standard Storage AE accepts Storage SOP Class Associations to store DICOM information objects. The Standard Storage AE does not initiate any associations. It is a Storage SCP only.

3.4.1 Real World Activities: Store Images

An Association is established by an SCU with an SCP of the appropriate Storage Information Object SOP Class. A C-STORE service element is then invoked to store each information object.

3.4.1.1 Real World Activities: Store Images

1 The Standard Storage AE can be configured to accept or reject associations from any Application Entity (see Section 6 "Configuration").

2 The Standard Storage AE can be configured to accept simultaneous associations.

3 The Standard Storage AE can simultaneously receive images from each open association.

4 The DICOM Explicit VR Big Endian Transfer Syntax is selected if offered.

5 SOP Class Extended Negotiation is not supported.

6 The Maximum PDU size accepted is 32768.

7 The SCU/SCP Role Selection Negotiation is not supported.

8 The default, synchronous mode of operation is used on all Associations. The Asynchronous Operations Window negotiation is not used.

9 The Implementation Identification Notification Class UID is "2.16.840.1.113709.1.1.2".

10 The Version name is "0100.19960330".

3.4.1.2 Storage Service Class Provider Behavior

1 Level 2 Storage will be supported as specified in DICOM Part 4, section B.4.1.

Note: When a Query Retrieve SCU retrieves a DICOM information object from the GE PACS, certain attributes may be overridden with RIS information.

2 Private Data Elements will be stored.

3 DICOM objects received will be matched to patients and studies in the GE PACS database. If objects cannot be matched, the SCP will either create the patient or exam, or return an error status indicating that it cannot accept the image. See section 3.4.1.2.1, "Match DICOM objects to GE PACS Database".

4 The SCP assumes that images that are for one study are sent serially on one open association. The SCP can function when images are not sent in this manner but performance of the GE PACS system will not be optimum.

5 The SCP can change the status of study for the last received image to verified when an SCU closes an Association. When a study is verified in the GE PACS, the study may not receive any more images and the study can be read by a radiologist.

After the Study has been verified, images for the study can be re-sent but the images will be placed into a new study.

6 On successful completion of a C-STORE operation, storage duration is permanent. See section 3.4.1.2.3, "Image Caching and Abnormal Association Termination".

7 On successful completion of a C-STORE operation, storage access is supported through DICOM Query Retrieve services. See the GE PACS DICOM Query Retrieve Conformance Statement. See section 3.4.1.2.3, "Image Caching and Abnormal Association Termination".

8 The Standard Storage AE will modify the values of attributes to coerce the SOP Instance into the Query Model of the SCP. See the section 3.4.1.2.4, "Composite Information Object Attribute Coercion".

9 The Standard Storage AE will validate SOP Instances if configured to do so.

10 The value of the C-STORE priority attribute is ignored.

11 The Store SCP will abort associations with an A-ABORT when processing of Store Requests cannot be completed because the GE PACS storage or database subsystem is not functioning.

3.4.1.2.1 Match DICOM objects to GE PACS Database

The GE PACS matches a received DICOM object to patients and studies existing in the GE PACS Database. Table 3-1 lists the attributes of an image used to match images to a patient and study.

Attribute Name	Tag
Patient's Name	(0010,0010)
Patient ID	(0010,0020)
Study ID	(0020,0010)
Study Date	(0008,0020)
Study Instance UID	(0020,000D)
Modality	(0008,0060)
Accession Number	(0008,0050)

Table 3-1 *Attributes Used to Match Images to Patients*

Patient Names supplied by the SCU are converted to upper case before they are used to search for or create data in the GE PACS Database.

3.4.1.2.2 Behavior Selected By AE Title

If needed, the SCP can create patients and exams in the database. Automatic creation of patients and exams can be selected by creating associations with different AE Titles supported by the SCP.

The SCP can automatically set the status of a study in the GE PACS to verified when an association is normally closed. When studies in the GE PACS Database are set to the verified state, no more images may be placed into the study. In situations where more images or duplicate images must be transmitted to the GE PACS, the SCP will receive and store images belonging to the verified study in a new study. This behavior is selected by transmitting images to an AE Title that supports automatic creation of patients and exams.

The Store SCP can refuse to store DICOM objects that have certain important data attributes that are empty. Reject of objects allows a GE PACS installation to enforce certain data entry policies.

The following list of available Called AE Titles (AE Titles responded to by the Store SCP) describes the behavior of each AE Title

Called AE Title	Create Patient	Create Exam	Auto Verify	Reject on null:	Comments
Store	No	No	No	pat_id, study_id, pat_name	Reject if image does not belong to existing exam. Auto verify off
StoreE	No	Yes	No	pat_id, pat_name	Reject if image does not belong to existing patient. Auto verify off
StorePE	Yes	Yes	No		Accept all images
StorePER	Yes	Yes	No	pat_id, study_id, pat_name	Accept all images except those without patient name, id, or study id
Store_V	No	No	Yes	pat_id, study_id, pat_name	Reject if image does not belong to existing exam. Auto verify on
StoreE_V	No	Yes	Yes	pat_id, pat_name	Reject if image does not belong to existing patient. Auto verify on
StorePE_V	Yes	Yes	Yes		Accept all images. Auto verify on
StorePER_V	Yes	Yes	Yes	pat_id, study_id, pat_name	Accept all images except those without patient name, id, or study id. Auto verify on

Table 3-2 *AE Title to Profiling Mapping*

3.4.1.2.3 Image Caching and Abnormal Association Termination

The Storage SCP can cache several images locally in memory during image receipt. After each image is received, the Standard Store AE will acknowledge the receipt of the image with a C-STORE response but may not write the image to the GE PACS. Images are always written to the GE PACS when any of the following conditions are met:

- The association is closed: 1. The SCU requested association close; 2. The SCP closes the network connection because of network traffic time out. The operator shuts down the SCP.
- An image for a different study is received. All images cached for the previous study will be written to the GE PACS.
- The SCP image cache becomes full.

It is possible for the Storage SCP to fail in a manner where the data in the image cache is unrecoverable, such as a power failure. Thus when an association is terminated without the SCU receiving an association release response from the Storage SCP, the success or failure of the Storage SCP to retain any object sent on the association is undefined.

If the SCU issues an Association Abort (A-ABORT) or receives a provider initiated abort (A-P-ABORT), the success or failure of the Storage SCP to retain any object sent on the association is undefined.

3.4.1.2.4 Composite Information Object Attribute Coercion

The GE PACS matches DICOM Information Objects to patients and studies inside the GE PACS database. It is sometimes necessary, in order for GE PACS to match DICOM objects to patients and studies, for attribute coercion to be employed. Once the DICOM objects are stored inside the GE PACS, it is possible for the users to change information about the patient and study, thus manually coercing the DICOM Information Objects.

During the matching process, the Standard Storage AE may modify any of the following attributes.

Attribute Name	Tag
Patient ID	(0010,0020)
Study Instance UID	(0020,000D)
Series Instance UID	(0020,000E)

Table 3-3 *Attribute Coercion*

3.4.1.2.5 C-STORE Response Status

3.4.1.2.5.1 Unsuccessful Response Status

"ERROR: Cannot Understand" will be issued when a DICOM Composite Information Object does not have the following attributes: Patient Name, Patient ID, and Study ID. The Storage SCU should re-send the Composite Object with the necessary attributes when an image is rejected for missing attributes.

Depending on the operation of a Standard Storage AE Title, the SCP may reject the C-STORE with a response status of "ERROR: Cannot Understand" for images that cannot be matched to ordered studies. The operator should either order the study at the RIS or correct the attributes of the DICOM Composite Information Object and then re-send the DICOM Composite Information Object.

3.4.1.2.5.2 Warning Response Status

The Standard Storage AE will return a response status of "WARNING: Data Set does not match SOP Class" when a DICOM object does not match the DICOM SOP Class. This warning will only be produced when the Standard Storage AE is configured to validate DICOM messages.

3.4.1.2.5.3 Refused Response Status

A C-STORE Response Status of "REFUSED: Out of Resources" will be issued when processing of Store Requests cannot be completed because the GE PACS storage or database subsystem is not functioning.

3.4.1.3 Acceptable Presentation Contexts

Table 3-4 lists the Presentation Contexts that are accepted by the Standard Storage AE.

Presentation Context Table				
Abstract Syntax		Transfer Syntax	Role	Extended
SOP Class	UID	Name, UID		Negotiation
CR Image	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian, 1.2.840.10008.1.2	SCP	None
CT Image	1.2.840.10008.5.1.4.1.1.2		SCP	None
MR Image	1.2.840.10008.5.1.4.1.1.4		SCP	None
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7		SCP	None
Standalone Image Overlay	1.2.840.10008.5.1.4.1.1.8		SCP	None
Stand-alone Curve	1.2.840.10008.5.1.4.1.1.9		SCP	None
Stand-alone Modality LUT	1.2.840.10008.5.1.4.1.1.10		SCP	None
Stand-alone VOI LUT	1.2.840.10008.5.1.4.1.1.11	Explicit VR Little Endian, 1.2.840.10008.1.2.1	SCP	None
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1		SCP	None
Ultrasound Multiframe Image	1.2.840.10008.5.1.4.1.1.3.1		SCP	None
XA Image	1.2.840.10008.5.1.4.1.1.12.1		SCP	None
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2		SCP	None
XA Bi-Plane Image	1.2.840.10008.5.1.4.1.1.12.3		SCP	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian, 1.2.840.10008.1.2.2	SCP	None
Nuclear Medicine Image (ret.)	1.2.840.10008.5.1.4.1.1.5		SCP	None
Ultrasound Image (ret.)	1.2.840.10008.5.1.4.1.1.6		SCP	None
US Multiframe Image (ret.)	1.2.840.10008.5.1.4.1.1.3		SCP	None

Table 3-4 *Acceptable Presentation Contexts*

3.4.1.3.1 Private Attributes and Transfer Syntax

Because the GE PACS DICOM Store and Query/Retrieve interfaces provide Implicit and Explicit transfer syntax and support storage and retrieval of private attributes, it is possible for the GE PACS to receive and return attributes with unknown VR for private attributes.

It is recommend that the Explicit VR transfer syntax always be used if the GE PACS is used to store DICOM objects with private attributes.

3.4.1.3.2 SOP Specific Conformance for DICOM Information Objects

No GE PACS Storage SOP Class attributes are specialized or privatized.

3.5 Query/Retrieve Application Entity Data Flow Diagrams

The following section describes the Query Retrieve Service Provider. The Application Entity (AE) which provides the DICOM functions is referred to as the Query Retrieve AE. Figure 3-2 illustrates how GE PACS and external system interact using a DICOM Query/Retrieve SOP Class.

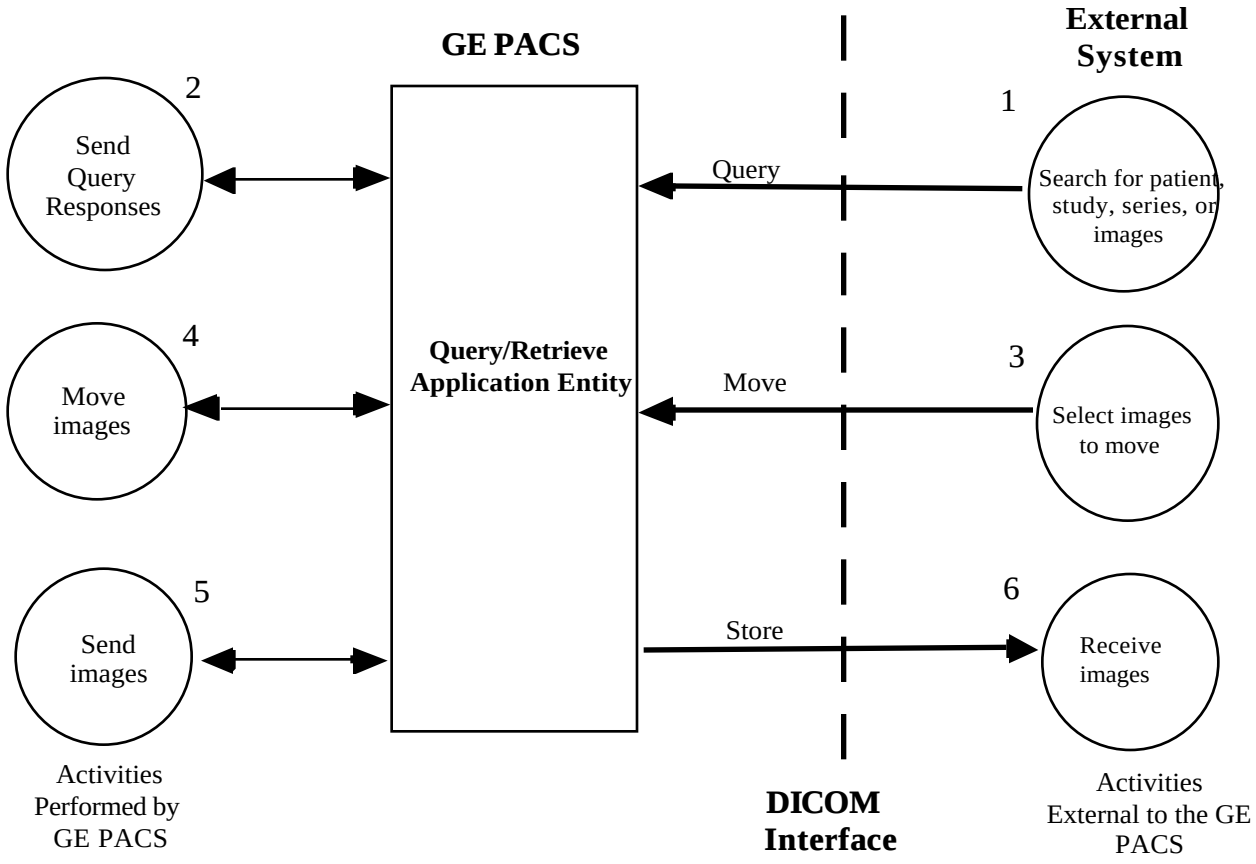

Figure 3-2 *Real World Activity Data Flow Model for Query/Retrieve AE*

3.6 Functional Definition of Application Entity

The Query Retrieve AE, in conjunction with the GE PACS, supports the following functions:

- Respond to queries about patients, studies, series, and images stored in the GE PACS
- Move images to the destination Application Entities

3.7 Sequencing of Real World Activities for the Q/R AE

The following typical sequence of real world activities are supported by the Query Retrieve AE (see Figure 3-2):

1 Search for patients, studies, series, or images

2 Send Query Responses

3 Select images to move

4 Move images

5 Send images

6 Receive images

3.8 Query Retrieve AE Specifications

The Query Retrieve AE accepts associations for the purpose of finding and retrieving DICOM Composite Information Objects stored in the GE PACS.

The Query Retrieve AE initiates associations in response to requests to move images. It is a Query Retrieve SCP and Storage SCU only.

3.8.1 Real World Activities 1 & 2: Search for Patients, Studies, Series, or Images

An Association is established with the Query Retrieve AE and a C-FIND service element is invoked to find information about patients, studies, series, and images.

3.8.1.1 Q/R Association Acceptance

The Query Retrieve AE supports the Patient Root and Study Root Query/Retrieve information models of DICOM.

1 The Query Retrieve AE can be configured to accept or reject associations from any Application Entity. See Section 6 "Configuration".

2 The Query Retrieve AE accepts a configurable number of simultaneous associations.

3 Only one outstanding query will be supported on each association with Q/R SCU.

4 The Query Retrieve AE does not support relational queries.

5 DICOM Explicit VR Big Endian Transfer Syntax is selected if offered.

6 SOP Class Extended Negotiation is not supported.

7 The Maximum PDU size is configurable.

8 The SCU/SCP Role Selection Negotiation is not supported.

9 The default, synchronous mode of operation is used on all Associations. The Asynchronous Operations Window negotiation is not used.

10 The Implementation Identification Notification Class UID is "2.16.840.1.113709.1.1.1".

11 The Version name is "0100.19960330".

3.8.1.2 Acceptable Presentation Contexts

Table 3-5 lists the Presentation Contexts that are accepted by the Query Retrieve AE.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
SOP Name	UID	Name List	UID List		Negotiation
Patient Root Q/R-FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCP	None
Study Root Q/R-FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCP	None

Table 3-5 *C-FIND Acceptable Presentation Contexts*

3.8.1.3 C-FIND Service Element Behavior

1 The Retrieve AE Title is returned with each C-FIND response at the Study, Series, and Image level.

2 The Storage Media File-Set ID is not returned in any C-FIND responses.

3 The Query Retrieve AE reserves the right to reject any query which would cause extremely large compute or I/O intensive operations during the search such as a query matching all studies in the database.

4 When a query specifies a key for a person name, the key value is converted to uppercase letters first. This makes the search case insensitive.

5 Priority attribute of the message is not used by the Query Retrieve AE.

6 Date and Time ranges cannot be searched indiscriminately. The GE PACS retains date and time as one value. Table 3-6 lists the possible date and time search combinations.

Date Specification See Table 3-7	**Time Specification** See Table 3-7	**Operation Performed**
NONE	NONE EQ GE LE RANGE	Search not qualified by date and time
EQ GE LE RANGE	NONE	Search using date specification
EQ	EQ GE LE RANGE	Search using specified date and time
GE LE RANGE	EQ GE LE RANGE	Search using date specification only

Table 3-6 *Date and Time Matching Operation*

Table 3-7 defines the date and time specification codes used in Table 3-6.

SPEC.	Key Value Description
NONE	No key or no key value was specified
EQ	<value> ; match all occurrences of value
GE	<value>- ; match all occurrences of value and subsequent values
LE	-<value> ; match all occurrences of prior to and including value
RANGE	<value1>-<value2> ; match all occurrences between value1 and value2 inclusive.

Table 3-7 *Date and Time Key Values*

3.8.1.3.1 Patient Root Query

Sections 3.8.1.3.1.1 through 3.8.1.3.1.4 define what attributes are supported for query. The following usage definitions are specified for each attribute:

Usage	Description of Term
Supported	Matching is supported, and values for it are returned
Partial Support	Partial matching is supported. Explanations will be given on a per key basis.
Returned	If the attribute is sent in the request, then if a value exists in the database it will be returned. No matching is performed

Table 3-8 *Query Attribute Usage Description*

3.8.1.3.1.1 Patient Level Key Attributes Supported

Description	Tag	Usage
Patient's Name	(0010,0010)	Supported
Patient ID	(0010,0020)	Supported
Patient's Birth Date	(0010,0030)	Returned
Patient's Sex	(0010,0040)	Returned
Other Patient IDs	(0010,1000)	Returned
Ethnic Group	(0010,2160)	Returned

Table 3-9 *Patient Level Key Attributes*

3.8.1.3.1.2 Study Level Key Attributes Supported

Description	Tag	Usage
Study Date	(0008,0020)	Supported See Table 3-6
Study Time	(0008,0030)	Partial Support See Table 3-6
Accession Number	(0008,0050)	Supported
Study ID	(0020,0010)	Supported
Study Instance UID	(0020,000D)	Supported
Referring Physician's Name	(0008,0090)	Returned
Study Description	(0008,1030)	Returned
Procedure Code Sequence	(0008,1032)	Supported
>Code Value	(0008,0100)	Supported
>Coding Scheme Designator	(0008,0102)	Supported
>Code Meaning	(0008,0104)	Supported

Table 3-10 *Study Level Key Attributes*

3.8.1.3.1.3 Series Level Key Attributes Supported

Description	Tag	Usage
Modality	(0008,0060)	Supported
Series Number	(0020,0011)	Supported
Series Instance UID	(0020,000E)	Supported
Series Date	(0008,0021)	Supported See Table 3-6
Series Time	(0008,0031)	Partial Support See Table 3-6
Performing Physicians' Name	(0008,1050)	Returned
Series Description	(0008,103E)	Returned
Operator Name	(0008,1070)	Returned
Body Part Examined	(0018,0015)	Supported

Table 3-11 *Series Level Key Attributes*

3.8.1.3.1.4 Image Level Key Attributes Supported

Description	Tag	Usage
Image Number	(0020,0013)	Supported
SOP Instance UID	(0008,0018)	Supported

Table 3-12 *Image Level Key Attributes*

3.8.1.3.2 Study Root Query

The study level key attributes supported are the same as those listed in Section 3.8.1.3.1.1 and Section 3.8.1.3.1.2
The series level key attributes supported are the same as those listed in Section 3.8.1.3.1.3.
The image level key attributes supported are the same as those listed in Section 3.8.1.3.1.4.

3.8.2 Real World Activity 3 & 4: Move Images

An Association is established with the Query Retrieve AE and a C-MOVE service element is invoked to move images related to patients, studies, or series.

3.8.2.1 Association Acceptance

See Section 3.8.1.1 "Q/R Association Acceptance".

3.8.2.2 C-MOVE Service Element Behavior

1 The Query Retrieve AE searches the GE PACS database for the requested images of the entities specified by the Unique Key values. If no images can be found then the Query Retrieve AE will return C-MOVE responses to the requester with a status equal to success. The response will equal zero for the number of completed, failed, and warning sub-operations.

2 During the move operation the Query Retrieve AE will return C-MOVE responses to the requester with a status equal to pending. The response will contain the number remaining, completed, failed, and warning sub-operations.

3 The processing of C-Move based on priority is not supported.

3.8.2.3 Acceptable Presentation Contexts

Table 3-13 lists the Presentation Contexts that are accepted by the Query Retrieve AE.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
SOP Name	UID	Name List	UID List		Negotiation
Patient Root Q/R-MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCP	None
Study Root Q/R-MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2	SCP	None

Table 3-13 *C-MOVE Acceptable Presentation Contexts*

3.8.3 Real World Activity 5 & 6: Send Images

The Query Retrieve AE initiates an association to a move destination AE when a valid C-MOVE request is received.

3.8.3.1 Association Initiation

1 The Query Retrieve AE can be configured to initiate associations to any other Application Entity through the configuration tables, see Section 6 "Configuration".

2 The Query Retrieve AE will initiate simultaneous Storage associations to Receive AE.

3 Only one outstanding retrieve will be supported on each association with Q/R SCU.

4 The DICOM Explicit VR Big Endian Transfer Syntax is offered and preferred.

5 The SOP Class Extended Negotiation is not supported.

6 The Maximum PDU size is configurable.

7 The SCU/SCP Role Selection Negotiation is not supported.

8 The default, synchronous mode of operation is used on all Associations. The Asynchronous Operations Window negotiation is not used.

9 The Implementation Identification Notification Class UID is "2.16.840.1.113709.1.1.3".

10 The Version name is "0100.19960330".

3.8.3.2 C-STORE Service Element Behavior

1 On successful completion of a C-STORE operation, images are still retained by the GE PACS.

2 On unsuccessful completion of a C-STORE operation, the move requester will be notified of the failure using the C-MOVE response and images are still retained by the GE PACS.

3 All optional elements which exist in the Storage SOP Instance will be sent. The existence of optional elements depends on the equipment sending images to the GE PACS.

4 All private elements which exist in the Storage SOP Instance will be sent. The existence of private elements depends on the equipment sending images to the GE PACS.

5 When sending images to another AE, the Query Retrieve AE will modify composite image attributes to match the values of patient and study information stored in the RIS. See Section 3.8.3.2.1.

6 SOP Instances will be transmitted sequentially over each association with a storage SCP.

7 Non-DICOM images stored on a GE PACS will be retrievable, and transmitted, by the DICOM Secondary Capture SOP Class format.

3.8.3.2.1 Composite Information Object Attribute Coercion

All GE PACS systems interface to customer HIS/RIS systems or use the RIS internal to GE PACS. The RIS information is always viewed by the GE PACS to contain the correct patient and study data and the RIS is always used to correct any data entry errors. When viewing, printing, or exporting a DICOM Composite Information Object, the GE PACS will override attributes listed in Table 3-14 with data form the RIS.

Attribute Name	Tag
Patient's Name	(0010,0010)
Patient ID	(0010,0020)
Patient's Birth Date	(0010,0030)
Patient's Sex	(0010,0040)
Study Date	(0008,0020)
Study Time	(0008,0030)
Name of Physician(s) Reading Study	(0008,1060)
Referring Physician's Name	(0008,0090)
Study ID	(0020,0010)
Accession Number	(0008,0050)
Study Description	(0008,1030)
Study Instance UID	(0020,000D)

Table 3-14 *C-STORE Object Attribute Coercion*

3.8.3.3 Presentation Contexts Proposed

Table 3-15 lists the Presentation Contexts that can be proposed by the Query Retrieve AE.

Presentation Context Table				
Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	UID	Name, UID		
CR Image	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian, 1.2.840.10008.1.2	SCU	None
CT Image	1.2.840.10008.5.1.4.1.1.2		SCU	None
MR Image	1.2.840.10008.5.1.4.1.1.4		SCU	None
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7		SCU	None
Standalone Image Overlay	1.2.840.10008.5.1.4.1.1.8		SCU	None
Stand-alone Curve	1.2.840.10008.5.1.4.1.1.9		SCU	None
Stand-alone Modality LUT	1.2.840.10008.5.1.4.1.1.10		SCU	None
Stand-alone VOI LUT	1.2.840.10008.5.1.4.1.1.11	Explicit VR Little Endian, 1.2.840.10008.1.2.1	SCU	None
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1		SCU	None
Ultrasound Multiframe Image	1.2.840.10008.5.1.4.1.1.3.1		SCU	None
XA Image	1.2.840.10008.5.1.4.1.1.12.1		SCU	None
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2		SCU	None
XA Bi-Plane Image	1.2.840.10008.5.1.4.1.1.12.3		SCU	None
Nuclear Medicine Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian, 1.2.840.10008.1.2.2	SCU	None
Nuclear Medicine Image (ret.)	1.2.840.10008.5.1.4.1.1.5		SCU	None
Ultrasound Image (ret.)	1.2.840.10008.5.1.4.1.1.6		SCU	None
US Multiframe Image (ret.)	1.2.840.10008.5.1.4.1.1.3		SCU	None

Table 3-15 *C-STORE Presentation Contexts*

3.8.3.3.1 SOP Specific Conformance

The Query Retrieve AE will use the Secondary Capture SOP Class to encode images that are not internally represented as DICOM objects.

4. COMMUNICATION PROFILE

4.1 TCP/IP Stack

TCP/IP Network Communication is supported as specified in DICOM Part 8.

4.2 Physical Media Support

Various physical media are supported for 10Mbit Ethernet and 100Mbit Ethernet. The physical media supported depends on network cabling and interfaces equipment available at the PACS site and interface equipment commercially available. Equipment list and configuration information for the physical media supported is available upon request.

5. EXTENSIONS/SPECIALIZATION/PRIVATIZATION

Private SOP Classes and Transfer Syntaxes are not supported. No extensions or specializations are accepted.

6. CONFIGURATION

The exact method for configuring each configurable item is specified in other GE PACS documentation. The following sections only describe what items are configurable.

6.1 AE Title/Presentation Address Mapping

A local mechanism is provided to configure an AE Title/Presentation Address mapping table. This table maps the AE names to TCP/IP addresses and ports.

6.2 Maximum Accepted and Initiated Simultaneous Associations

The maximum number of accepted simultaneous associations is configurable.
The maximum number of initiated simultaneous associations is configurable.

6.3 AE Title/Accepted Association Mapping

A local mechanism is provided to configure a table listing all AE that may query and retrieve images from the Query Retrieve AE. If the first entry in the table is set to * (asterisk) then any AE may query and retrieve images from the Query Retrieve AE.

6.4 Time-out

Time-out configuration parameters are supplied in product literature.

6.5 Message Verification

The Store SCP can verify incoming DICOM messages to see if the messages conform to the DICOM standard. A configuration option turns this checking on or off.

6.6 Maximum PCU Size Accepted

The maximum Protocol Data Unit size negotiated by the Store or Query/Retrieve SCU's is configurable up to a maximum of 32768 bytes.

7. SUPPORT FOR EXTENDED CHARACTER SETS

Extended character sets are not supported.

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