

DICOM

Conformance Statement

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1 Conformance Statement Overview

ENDOBASE is a workflow and image filing software. ENDOBASE implements the necessary services

- to upload Visible Light and Secondary Capture images to a DICOM Picture Archiving and Communication System (PACS)
- to find patients and studies on a PACS
- to download selected images from a PACS
- to request worklists from a DICOM worklist server

This document is intended to describe ENDOBASE's conformance to DICOM.

Table 1-1 provides an overview of the network services supported by ENDOBASE .

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Computed Radiography Image Storage		Yes
CT Image Storage		Yes
Ultrasound Multi-frame Image Storage (Retired)		Yes
Ultrasound Multi-frame Image Storage		Yes
MR Image Storage		Yes
Ultrasound Image Storage (Retired)		Yes
Ultrasound Image Storage		Yes
Secondary Capture Image Storage	Yes	Yes
VL Image Storage (Retired)	Yes	Yes
VL Endoscopic Image Storage	Yes	Yes
Video Endoscopic Image Storage	Yes	
X-Ray Angiographic Image Storage		Yes
X-Ray Radiofluoroscopic Image Storage		Yes
Nuclear Medicine Image Storage		Yes
Query / Retrieve		
Patient Root Query/Retrieve Information Model – FIND	Yes	
Study Root Query/Retrieve Information Model – FIND	Yes	
Study Root Query/Retrieve Information Model – MOVE	Yes	
Modality Worklist Information Model – FIND	Yes	Yes

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3 Introduction

3.1 Revision History

Document Version	Date of issue	Author	Description
1.0	2/1999	OT	Initial Version
1.1	2/2004	SR	Updated according to Supplement 64
2.0	3/2004	LS	Update according to ENDOBASE III 5.0
2.01	29/06/2004	HH	“Station Name” and “Institutional Department Name” added to General Equipment Module of created SOP instances
	23/08/2004	HH	Minor corrections
	31/08/2004	HH	Released this document for EB 5.0
3.0	14/12/2004	LS	Added Video Endoscopic Image Storage and MPEG2 video storage according to DICOM supplements 42 and 47
	17/12/2004	HH	Correction of typing error: 0040,0010 → 0040,0100 for Scheduled Procedure Step Sequence
7.0	20/09/2006	LS	Updated according to ENDOBASE 7.0 Added unsolicited import of images
7.5	13/12/2006	LS	Added support of Modality Worklist Information Model – FIND as SCP
7.5	29/01/2007	LS	Added filtering examination types for Modality Worklist Information Model – FIND
7.5	18/07/2007	LS	Do not send attribute modality (0008,0060) as matching attribute in Worklist Information Model – FIND request messages any longer

3.2 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.

3.3 Definitions, Terms and Abbreviations

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

Abbreviations and terms are as follows:

AE: DICOM Application Entity

IE: Information Entity
IOD: (DICOM) Information Object Definition
ISO: International Standard Organization
PACS: Picture Archiving and Communication System
PDU: Protocol Data Unit
SCU: DICOM Service Class User (DICOM client)
SCP: DICOM Service Class Provider (DICOM server)
SOP: DICOM Service-Object Pair
VR: Value Representation

3.4 References

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.16, 2003

[Supp 42] Digital Imaging and Communications in Medicine (DICOM), Supplement 42: MPEG2 Transfer Syntax

[Supp 47] Digital Imaging and Communications in Medicine (DICOM), Supplement 47: Visible Light Video

4 NETWORKING

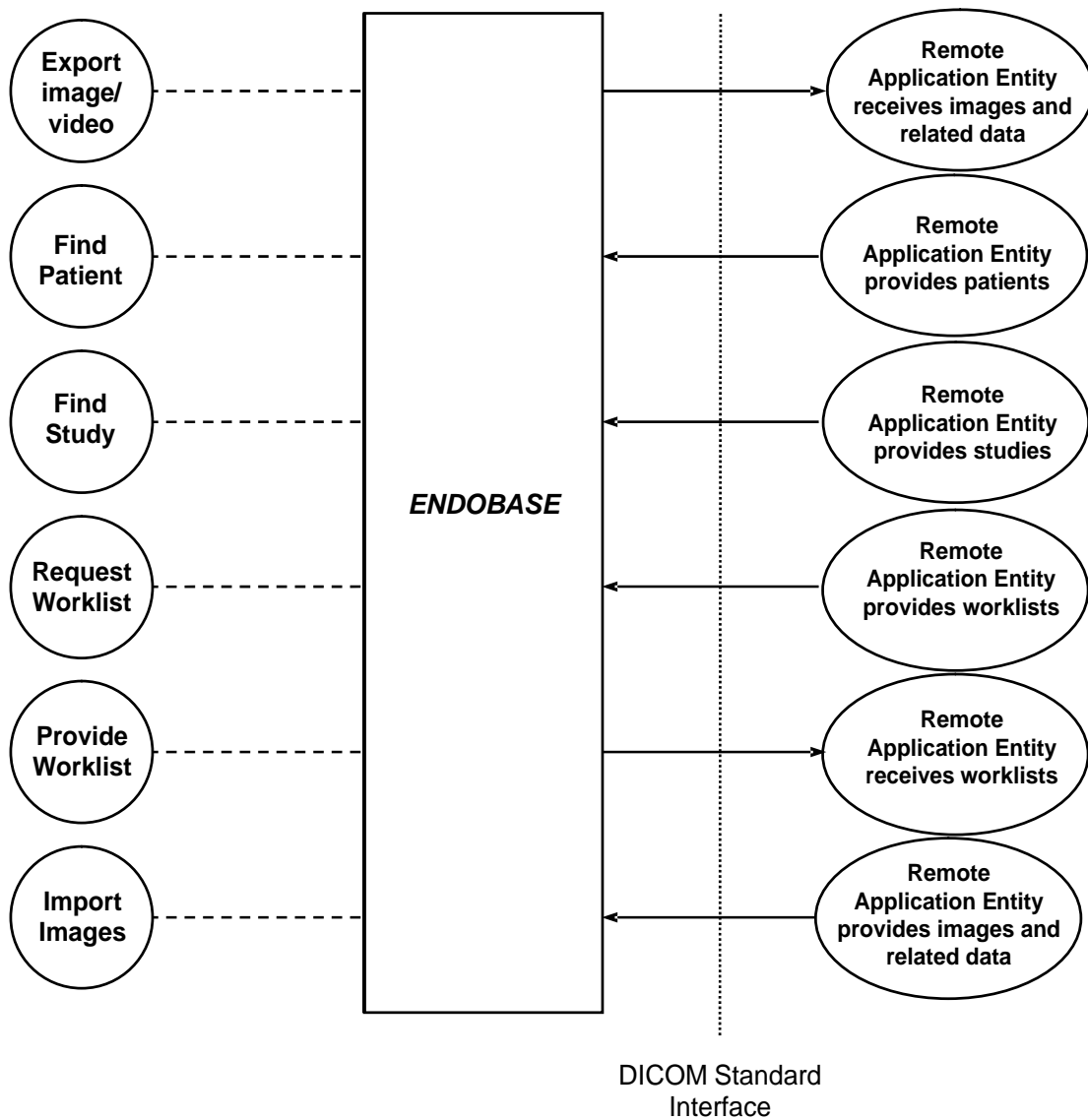
4.1 IMPLEMENTATION MODEL

ENDOBASE is implemented in one Application entity.

4.1.1 Application Data Flow

ENDOBASE initiates the association to remote PACS. When the association is established, ENDOBASE may request the storing of an image or request to receive patient data or image and related data from the remote Application Entity.

Figure 4-1 shows the Implementation Model for ENDOBASE.



4.1.2 Functional Definitions of the *ENDOBASE* AE

Depending on the configuration of *ENDOBASE* and the context the entire *ENDOBASE* system acts as one single AE or the different *ENDOBASE* workstations in a network act as separate individual AE's.

ENDOBASE supports the automatic export of all images/videos generated with *ENDOBASE* (respectively of a defined subset) as well as the manual export of single images/videos selected by the user. If an image / video export request is made, *ENDOBASE* sends an association request to the destination AE. If an association has been established successfully, *ENDOBASE* translates the image / video and related data into a DICOM message and sends it. After the images / videos have been sent *ENDOBASE* closes the association. If the association cannot be opened, the related export attempt is cancelled.

If a find patient request is made, *ENDOBASE* sends an association request to the destination AE. If an association has been established successfully, *ENDOBASE* queries the patient data. After the requested patient data have been received *ENDOBASE* closes the association. If the association cannot be opened, the related find attempt is cancelled.

If a find study request is made, *ENDOBASE* sends an association request to the destination AE. If an association has been established successfully, *ENDOBASE* queries the study data. After the requested study data have been received *ENDOBASE* closes the association. If the association cannot be opened, the related find attempt is cancelled.

Find patient and find study requests are made in preparation of import image requests.

If an import images request is made, *ENDOBASE* sends an association request to the destination AE. If the association cannot be opened, the related import attempt is cancelled. If an association has been established successfully, *ENDOBASE* requests images and the related data. *ENDOBASE* AE accepts an association from the destination AE and receives the images and related data. After all images have been received *ENDOBASE* closes its association.

ENDOBASE supports unsolicited image import while performing an endoscopic examination. During this time *ENDOBASE* accepts associations from other AE's and receives images and related data.

Additionally *ENDOBASE* supports unsolicited image import for examinations known to *ENDOBASE*. The identification of examinations is done using the study UID of the received image.

Worklist requests are done periodically by *ENDOBASE*. For each worklist request, *ENDOBASE* sends an association request to the destination AE. If an association has been established successfully, *ENDOBASE* queries the worklist data. After the requested worklist data have been received, *ENDOBASE* closes the association. If the association cannot be opened, the related worklist request attempt is cancelled.

ENDOBASE answers worklist requests from remote AE's. Depending on the matching keys from the worklist request *ENDOBASE* filters its own examination list and sends worklist data to the remote AE.

4.1.3 Sequencing of Real-World Activities

4.1.3.1 Sequencing of Real-World Activity Export Image / Video

Figure 4-2: Sequencing of Real-World Activity Export Image / Video

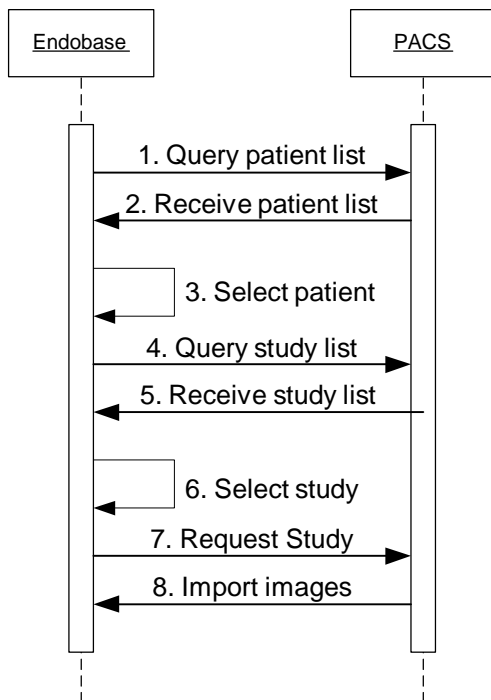


The following (simple) workflow applies:

1. Export Image / Video

4.1.3.2 Sequencing of Real-World Activities Find Patients, Find Studies and Import Images

Figure 4-3: Sequencing of Real-World Activities Find Patients, Find Studies and Import Images.



Depending on the settings in *ENDOBASE* the following sequence constrains apply:

A: Import images by Patient ID:

4. Query study list
5. Receive study list
6. Select Study
7. Request Study

8. Import images

B: Import images by Patient Name:

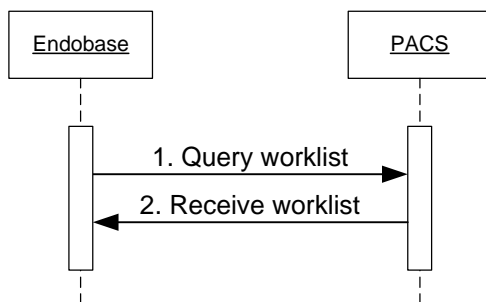
1. Query patient list
2. Receive patient list
3. Select patient (optional)
4. Query study list
5. Receive study list
6. Select Study
7. Request Study
8. Import images

C: Unsolicited Import of Images

8. Import images

4.1.3.3 Sequencing of Real-World Activities Request Worklist

Figure 4-4: Sequencing of Real-World Activities Request Worklist.

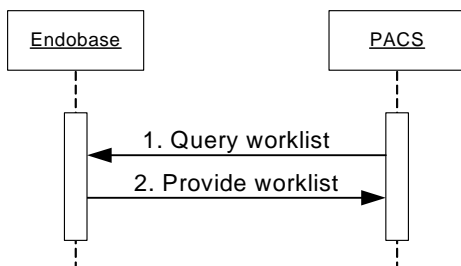


The following sequence applies:

1. Query worklist
2. Receive worklist

4.1.3.4 Sequencing of Real-World Activities Provide Worklist

Figure 4-5: Sequencing of Real-World Activities Provide Worklist.



The following sequence applies:

1. Query worklist
2. Receive worklist

4.2 AE SPECIFICATIONS

This section describes the *ENDOBASE* Application Entity

4.2.1 ENDOBASE AE Specification

4.2.1.1 SOP Classes

ENDOBASE provides Standard Conformance to the following DICOM SOP Classes:

Table 4-1: SOP classes for *ENDOBASE* AE

SOP Classes	SOP Class UID	User of Service (SCU)	Provider of Service (SCP)
Transfer			
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1		Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2		Yes
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3		Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1		Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4		Yes
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6		Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1		Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Yes	Yes
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	Yes
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Yes	
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1		Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2		Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20		Yes
Query / Retrieve			
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	Yes

4.2.1.2 Association Policies

4.2.1.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed and accepted.

Table 4-2: DICOM application context for AE ENDOBASE

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

4.2.1.2.2 Number of Associations

ENDOBASE initiates one association at a time for each destination to which a request is being processed.

Table 4-3: Number of associations initiated for AE ENDOBASE

Maximum number of simultaneous associations for image / movie export	1 per ENDOBASE client 1 per ENDOBASE server
--	--

ENDOBASE accepts associations to receive C-STORE requests for the a.m. image storage SOP classes.

Table 4-4: Number of associations accepted for AE ENDOBASE

Maximum number of simultaneous associations for manual image import	1 per ENDOBASE client
Maximum number of simultaneous associations for unsolicited import of images	25 per ENDOBASE client
Maximum number of simultaneous associations for worklist request (ENDOBASE is SCU)	1 per ENDOBASE server
Maximum number of simultaneous associations for worklist request (ENDOBASE is SCP)	25 per ENDOBASE server

4.2.1.2.3 Asynchronous Nature

The ENDOBASE does not support asynchronous operations (multiple outstanding transactions over a single association).

Table 4-5: Asynchronous Nature as a SCU for AE ENDOBASE

Maximum number of outstanding asynchronous transactions	1
---	---

4.2.1.2.4 Implementation Identifying Information

The implementation information for this application entity is:

Table 4-6: Implementation class and version for AE ENDOBASE

Implementation Class UID	1.2.392.200059.1.2
Implementation Version Name	OLY_ES_EB_2.0

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Export Image / Video

4.2.1.3.1.1 Description and Sequencing of Activities

ENDOBASE supports two modes of image export: manual and automatic.

In case of the manual export the user selects an image / video generated with ENDOBASE and initiates the export.

In addition, ENDOBASE can be configured to automatically export images / videos. Depending on a setting, all images / videos generated with ENDOBASE or a certain subset are transferred automatically. It is configurable to which PACS (AE) the images / videos are transferred. This setting can be done separately for each type of examination, during which the images / videos have been generated. Automatic export to one or more PACS (AE's) is possible. Refer to section 4.4.2 for further details regarding configuration options.

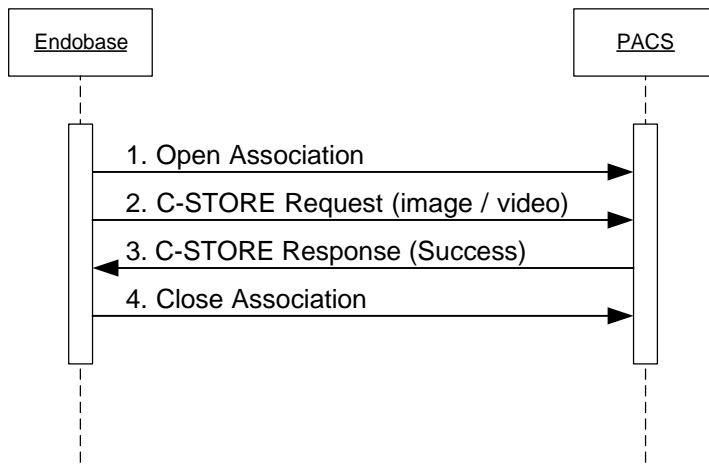
Images / videos that have been exported are not deleted in ENDOBASE. Therefore ENDOBASE does not need to retrieve images / videos back from the PACS later on after they have been exported.

The sequencing of activities is the same for manual and automatic export.

If an image / video should be stored on a PACS, ENDOBASE makes a C-STORE request to the destination AE. If the association cannot be opened, the export is cancelled.

If an association has been established successfully, ENDOBASE translates the image / video and related data into a DICOM message and sends it.

Figure 4-6: Sequencing of activity – Export Images.



A possible sequence of interactions between *ENDOBASE* and a PACS is illustrated in *Figure 4-6*:

1. *ENDOBASE* opens an association with the PACS.
2. An acquired image / video is transmitted to the PACS using a C-STORE request
3. The PACS replies with a C-STORE response (status success).
4. *ENDOBASE* closes the association with the PACS.

4.2.1.3.1.2 Proposed Presentation Contexts

ENDOBASE is capable of proposing one of the presentation contexts shown in Table 4-7.

Table 4-7: Proposed presentation contexts for activity Export Images / Videos:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	MPEG2 Main Profile @ Main Level	1.2.840.10008.1.2.4.100	SCU	None
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	MPEG2 Main Profile @ Main Level	1.2.840.10008.1.2.4.100	SCU	None

VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	MPEG2 Main Profile @ Main Level	1.2.840.10008.1.2.4.100	SCU	None
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	MPEG2 Main Profile @ Main Level	1.2.840.10008.1.2.4.100	SCU	None

The presentation context actually proposed depends on a setting in *ENDOBASE*.

4.2.1.3.1.3 SOP Specific Conformance

All image storage SOP classes supported by *ENDOBASE* exhibit the same behavior and are described together in this section.

If *ENDOBASE* fails in image sending, the information is written into a log file.

The behavior of *ENDOBASE* when encountering status codes in a C-STORE response is summarized in the table below:

Table 4-8: Storage C-STORE response status handling behavior:

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000h	The SCP has successfully stored the SOP instance. <i>ENDOBASE</i> returns to the calling window.
*	*	Any other	The reason is logged. In case of manual export the failure is reported to the user via a message box. In case of automatic export the export is repeated automatically after a settable time period.

The behavior of *ENDOBASE* during communication failure is summarized in the table below:

Table 4-9: Storage communication failure behavior:

Exception	Behavior
Timeout	The association is aborted using A-ABORT. The reason is logged.
Association aborted by the SCP or network layers.	The failure is report to the user via a message box. The reason is logged.

A failed image / video export can be restarted by user interaction.

The contents of Visible Light Image Storage SOP Instances created by *ENDOBASE* conform to the DICOM Visible Light Image IOD definition and are described in section 7.1.1.1.

The contents of Visible Light Endoscopic Image Storage SOP Instances created by *ENDOBASE* conform to the DICOM Visible Light Endoscopic Image IOD definition and are described in section 7.1.1.2.

The contents of Secondary Capture Image Storage SOP Instances created by *ENDOBASE* conform to the DICOM Secondary Capture Image IOD definition and are described in section 7.1.1.3.

The contents of Video Endoscopic Image Storage SOP Instances created by *ENDOBASE* conform to the DICOM Video Endoscopic Image IOD definition and are described in section 7.1.1.4.

Images are converted into a lossless format, even if they are only available in *ENDOBASE* in a lossy format.

If transfer syntax MPEG2 Main Profile @ Main Level is selected, Videos are converted into MPEG2 format, even if they are available in *ENDOBASE* in a different format. For transfer syntax Implicit VR Little Endian videos are transferred as multiframe images and are converted in a lossless format, even if they are only available in *ENDOBASE* in a lossy format.

4.2.1.3.2 Activity – Patient Query

4.2.1.3.2.1 Description and Sequencing of Activities

ENDOBASE can be configured to identify patients by Name or by Patient ID.

A user can import images from a PACS (ref. to section 4.2.1.3.3). In case *ENDOBASE* is configured to identify patients by name, the following activities take place before the import sequence itself.

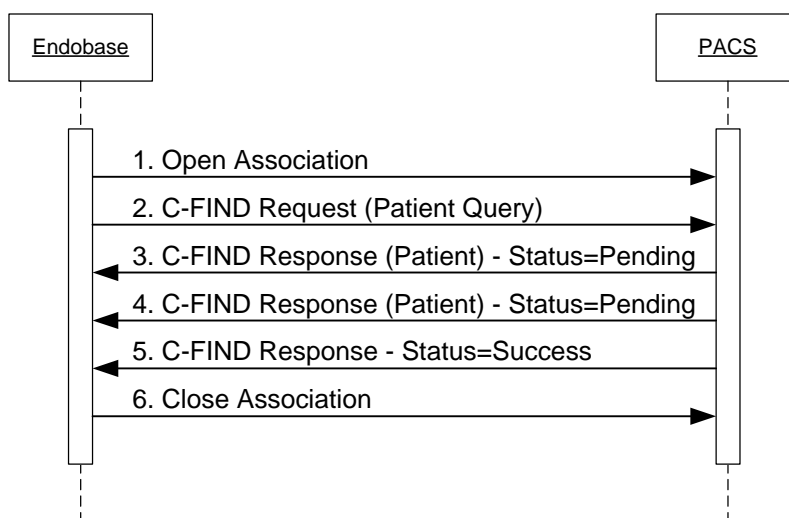
ENDOBASE builds an identifier for the C-FIND request, and initiates an association. If the association cannot be opened, the action is cancelled.

If an association has been established successfully, *ENDOBASE* sends the C-FIND request and waits for answers. After retrieval of all responses the user can select the desired patient from a list.

It is not possible to cancel the query process.

ENDOBASE does not limit the number of processed patient responses.

Figure 4-7: Sequencing of activity –Patient Query.



A possible sequence of interactions between *ENDOBASE* and a PACS is illustrated in Figure 4-7.

1. *ENDOBASE* opens an association with the PACS.
2. *ENDOBASE* sends a C-FIND request to the PACS containing the patient query attributes.

3. The PACS returns a C-FIND response containing the requested attributes of the first matching patient.
4. The PACS returns another C-FIND response containing the requested attributes of the second matching patient.
5. The PACS returns another C-FIND response with status Success indicating that no further matching patient exists. This example assumes that only 2 patients match the patient query.
6. *ENDOBASE* closes the association with the PACS.

4.2.1.3.2.2 Proposed Presentation Contexts

ENDOBASE is capable of proposing the presentation contexts shown in Table 4-10.

Table 4-10: Proposed presentation context for Patient Query:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.1.3.2.3 SOP Specific Conformance

If patient query fails in *ENDOBASE*, the information is written into a log file.

The behavior of *ENDOBASE* when encountering status codes in a patient C-FIND response is summarized in the table below:

Table 4-11: Patient C-FIND response status handling behavior:

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000h	The SCP has completed the matches. Patients are available in <i>ENDOBASE</i> for display.
Pending	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	FF00h	The patient contained in the identifier is collected for later display.
Pending	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or	FF01h	The patient contained in the identifier is collected for later display.

	matching for this identifier		
*	*	Any other	The failure is reported to the user via a message box. The reason is logged.

The behavior of *ENDOBASE* during communication failure is summarized in the table below:

Table 4-12: Patient C-FIND communication failure behavior:

Exception	Behavior
Timeout	The association is aborted using A-ABORT. The reason is logged.
Association aborted by the SCP or network layers.	The failure is report to the user via a message box. The reason is logged.

A failed patient query can be restarted by user interaction.

The table below provides a description of the ENDOABSE III patient request identifier.

Non-matching responses returned by the SCP due to unsupported optional matching keys are ignored. No attempt is made to filter out possible duplicate entries.

Table 4-13 Patient request identifier

Module Name	Attribute Name	Tag	VR	M	R
SOP Common	Query/Retrieve Level	(0008,0052)	CS	S	
Patient Identification	Patient Name	(0010,0010)	PN	S	x
	Patient ID	(0010,0020)	LO		x
	Patient Birthday	(0010,0030)	DA		x

The above table should be read as follows:

Module Name: The name of the associated module for supported attributes.

Attribute Name: Attributes supported to build an *ENDOBASE* patient request identifier.

Tag: DICOM tag for this attribute

VR: DICOM VR for this attribute

M: Matching key. A "S" will indicate that *ENDOBASE* will supply an attribute value for single value matching, a "R" will indicate range matching and a "*" will denote wildcard matching.

R: Return keys. An "x" will indicate that *ENDOBASE* will supply this attribute at return key with zero length for universal matching.

4.2.1.3.3 Activity – Study Query

4.2.1.3.3.1 Description and Sequencing of Activities

A user can import images from a PACS (ref. to section 4.2.1.3.4). Before the actual import optionally the activities described in section 4.2.1.3.2 (patient query) take place (in case *ENDOBASE* is configured to identify patients by name) and the user has to select the study, from which images should be imported. The list of available studies is retrieved from the PACS, what is described in detail in this section.

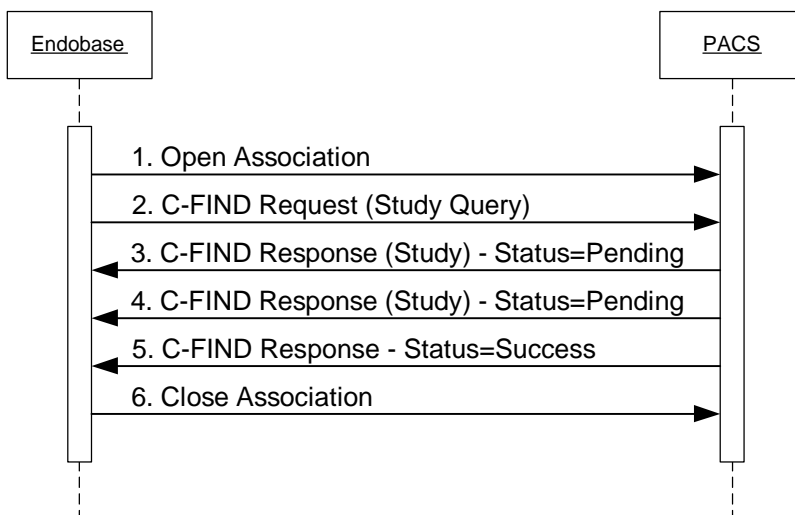
ENDOBASE builds an identifier for the C-FIND request, and initiates an association. If the association cannot be opened, the action is cancelled.

If an association has been established successfully, *ENDOBASE* sends the C-FIND request and waits for answers. After retrieval of all responses the user can select the desired study from a list.

It is not possible to cancel the query process.

ENDOBASE does not limit the number of processed study responses.

Figure 4-8: Sequencing of activity – Study Query.



A possible sequence of interactions between *ENDOBASE* and a PACS is illustrated in Figure 4-7.

1. *ENDOBASE* opens an association with the PACS.
2. *ENDOBASE* sends a C-FIND request to the PACS containing the study query attributes.
3. The PACS returns a C-FIND response containing the requested attributes of the first matching study.
4. The PACS returns another C-FIND response containing the requested attributes of the second matching study.
5. The PACS returns another C-FIND response with status Success indicating that no further matching study exists. This example assumes that only 2 studies match the study query.
6. *ENDOBASE* closes the association with the PACS.

4.2.1.3.3.2 Proposed Presentation Contexts

ENDOBASE is capable of proposing the presentation contexts shown in Table 4-14.

Table 4-14: Proposed presentation context for Study Query:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.1.3.3.3 SOP Specific Conformance

If study query fails in ENDOBASE, the information is written into a log file.

The behavior of ENDOBASE when encountering status codes in a study C-FIND response is summarized in the table below:

Table 4-15: Study C-FIND response status handling behavior:

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000h	The SCP has completed the matches. Studies are available in ENDOBASE for display.
Pending	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	FF00h	The study contained in the identifier is collected for later display.
Pending	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	FF01h	The study contained in the identifier is collected for later display.
*	*	Any other	The failure is reported to the user via a message box. The reason is logged.

The behavior of ENDOBASE during communication failure is summarized in the table below:

Table 4-16: Study C-FIND communication failure behavior:

Exception	Behavior
Timeout	The association is aborted using A-ABORT. The reason is logged.
Association aborted by the SCP or network layers.	The failure is report to the user via a message box. The reason is logged.

A failed study query can be restarted by user interaction.

The table below provides a description of the *ENDOBASE* study request identifier.

Non-matching responses returned by the SCP due to unsupported optional matching keys are ignored. No attempt is made to filter out possible duplicate entries.

Table 4-17 Study request identifier

Module Name	Tag	VR	M	R
Attribute Name				
SOP Common				
Query/Retrieve Level	(0008,0052)	CS	S	
Patient Identification				
Patient ID	(0010,0020)	LO	S	x
Study ID	(0020,0010)	SH		x
Study Date	(0008,0020)	DA		x
Study Instance UID	(0020,000D)	UI		x
Study Description	(0008,1030)	LO		x

The above table should be read as follows:

Module Name: The name of the associated module for supported attributes.

Attribute Name: Attributes supported to build an *ENDOBASE* study request identifier.

Tag: DICOM tag for this attribute

VR: DICOM VR for this attribute

M: Matching key. A "S" will indicate that *ENDOBASE* will supply an attribute value for single value matching, a "R" will indicate range matching and a "*" will denote wildcard matching.

R: Return keys. An "x" will indicate that *ENDOBASE* will supply this attribute at return key with zero length for universal matching.

4.2.1.3.4 Activity – Import Images

4.2.1.3.4.1 Description and Sequencing of Activities

A user can import images from a PACS. In case *ENDOBASE* is configured to identify patients by name, the activities described in section 4.2.1.3.2 (patient query) take place before the import sequence itself. After retrieval of all responses (patients) the user can select the desired patient, from whom images should be imported, from a list.

After the desired patient has been defined, *ENDOBASE* performs the activities described in section 4.2.1.3.3 (study query). After retrieval of all responses (studies of the selected patient) the user can select the study, from which images should be imported, from a list .

After the desired study has been selected, *ENDOBASE* builds an identifier for the C-MOVE request, and initiates an association. If the association cannot be open, the action is cancelled.

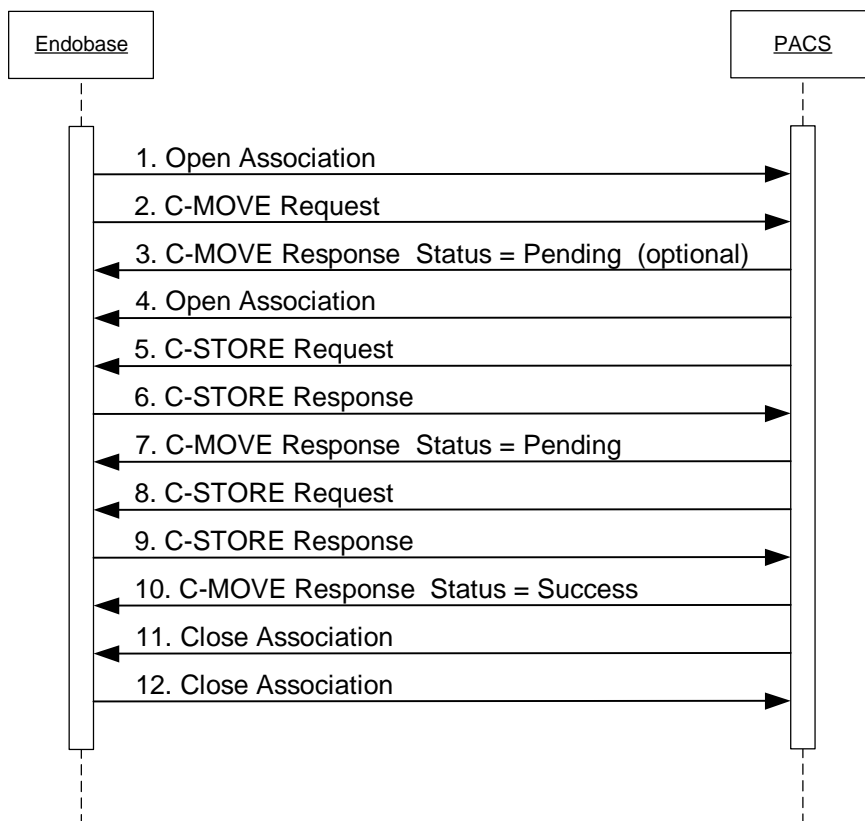
If an association has been established successfully, *ENDOBASE* sends the C-MOVE request and waits for answers. The PACS initiates an association (refer to section 4.2.1.4.4). If the association can be opened, the PACS sends a C-STORE requests for each image of the selected study. *ENDOBASE* sends a C-STORE response for each received C-STORE request. After receiving a C-STORE response, the PACS sends a C-MOVE response with the appropriate status. After having received all C-STORE responses, the PACS sends a C-MOVE response with status=Success. The PACS closes its association. *ENDOBASE* closes its association.

The user can cancel the storing process by selecting another study or closing the DICOM image import window. In this case *ENDOBASE* closes all open associations and the action is cancelled.

The received images are shown as thumbnails within *ENDOBASE*. The user can choose an image to be displayed in its original size as well as one or more images to be stored permanently in *ENDOBASE*. Images that have not been selected for permanent storage are deleted in *ENDOBASE* when the user closes the DICOM image import window.

ENDOBASE does not limit the number of processed C-MOVE responses.

Figure 4-9: Sequencing of activity – Import Images.



A possible sequence of interactions between *ENDOBASE* and a PACS is illustrated in Figure 4-9.

1. *ENDOBASE* opens an association with the PACS.
2. *ENDOBASE* sends a C-MOVE request to the PACS containing the patient attributes.
3. The PACS sends a C-MOVE response indicating that images can be expected (optional).
4. The PACS opens an association with *ENDOBASE*.
5. An image is transmitted from the PACS to *ENDOBASE* using a C-STORE
6. *ENDOBASE* replies with a C-STORE response (status success).
7. The PACS sends a C-MOVE response indicating that more images can be expected.
8. Another image is transmitted from the PACS to *ENDOBASE* using a C-STORE
9. *ENDOBASE* replies with a C-STORE response (status success).
10. The PACS sends a C-MOVE response indicating that all images have been send. This example assumes that only 2 images are available for the selected patient.
11. The PACS closes the association with *ENDOBASE*.
12. *ENDOBASE* closes the association with the PACS.

The PACS may perform step 11 before 10. In addition, the PACS may close the association after each C-STORE response and open a new one for the next C-STORE request.

4.2.1.3.4.2 Proposed Presentation Contexts

ENDOBASE is capable of proposing the presentation contexts shown in Table 4-18.

Table 4-18: Proposed presentation contexts for activity Import Images:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.1.3.4.3 SOP Specific Conformance

If *ENDOBASE* fails in importing images, the information is written into a log file.

The behavior of *ENDOBASE* when encountering status codes in a patient C-MOVE response is summarized in the table below:

Table 4-19: Patient C-MOVE response status handling behavior:

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the matches. Images and examination data are displayed.
Pending	Sub-operations are continuing	FF00	The received image is collected for later display.

*	*	Any other	The failure is reported to the user via a message box. The reason is logged.
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The behavior of *ENDOBASE* during communication failure is summarized in the table below:

Table 4-20: Patient C-MOVE communication failure behavior:

Exception	Behavior
Timeout	The association is aborted using A-ABORT. The reason is logged.
Association aborted by the SCP or network layers.	The failure is reported to the user via a message box. The reason is logged.

A failed image import can be restarted by user interaction.

The table below provides a description of the *ENDOBASE III* image request identifier.

Non-matching responses returned by the SCP are ignored. A duplicate entry overwrites the entry received previously.

Received images, which could not be processed successfully since the image encoding is not supported by *ENDOBASE*, are ignored. However, even in such a case the status "Success" is sent to the PACS within the C-STORE response. The user will be informed via a message box about the number of ignored images.

Table 4-21: Image request identifier

Module Name	Attribute Name	Tag	VR	M
SOP Common	Query/Retrieve Level	(0008,0052)	CS	S
Patient Identification	Study Instance UID	(0020,000D)	UI	S

The above table should be read as follows:

Module Name: The name of the associated module for supported attributes.

Attribute Name: Attributes supported to build an *ENDOBASE* image request identifier.

Tag: DICOM tag for this attribute

VR: DICOM VR for this attribute

M: Matching key. A "S" will indicate the *ENDOBASE* will supply an attribute value for single value matching, a "R" will indicate range matching and a "*" will denote wildcard matching.

4.2.1.3.5 Activity – Worklist Query

4.2.1.3.5.1 Description and Sequencing of Activities

ENDOBASE can be configured to request worklist information for one or more AE's. With respect to AE's there are basically the following two ways to consider *ENDOBASE*:

- Each *ENDOBASE* client in a network with image capturing capability is regarded as a separate individual AE (respectively modality). In this case *ENDOBASE* should be configured to request and process separate worklists for the different AE's.
- The entire *ENDOBASE* system (including all clients in a network) is regarded as one single AE (respectively modality). In this case *ENDOBASE* should be configured to request and process one single worklist.

The AE's, for which *ENDOBASE* should request worklist, can be configured (refer to section 4.4.3).

If the worklist function is activated, *ENDOBASE* periodically queries the system acting as worklist server for worklists. Two independent cycle times can be defined for this.

After the defined time span between two worklist queries has been elapsed, *ENDOBASE* builds an identifier for the C-FIND request and initiates an association. If the association cannot be opened, the action is cancelled.

If an association has been established successfully, *ENDOBASE* performs the following steps for each defined AE:

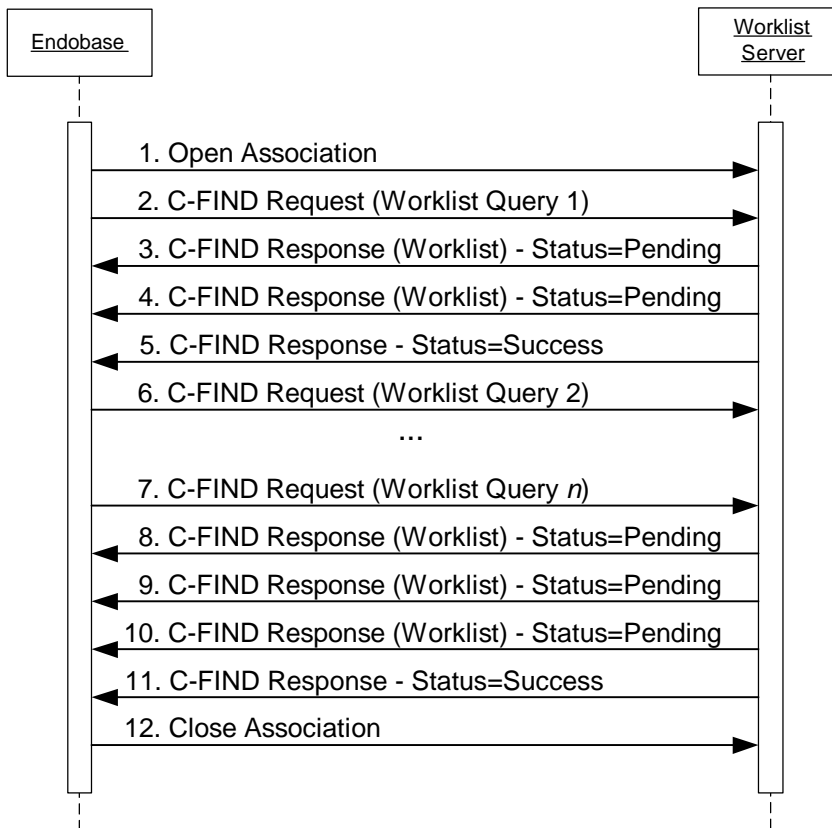
- send C-FIND request
- retrieve all corresponding C-FIND responses
- process responses

The requests only differ in the AE used as matching key. After having processed requests for all AE's, *ENDOBASE* closes the connection.

It is not possible to cancel the query process.

ENDOBASE does not limit the number of processed worklist responses.

Figure 4-10: Sequencing of activity –Worklist Query.



A possible sequence of interactions between *ENDOBASE* and a worklist server is illustrated in Figure 4-10.

1. *ENDOBASE* opens an association with the worklist server.
2. *ENDOBASE* sends a C-FIND request to the worklist server containing the worklist query attributes for the first defined AE.
3. The worklist server returns a C-FIND response with status Pending containing the requested attributes of the first matching worklist item.
4. The worklist server returns a C-FIND response with status Pending containing the requested attributes of the second matching worklist item.
5. The worklist server returns a final C-FIND response with status Success indicating that no further matching worklist items exist. This example assumes that only 2 worklist items match the query for this AE.
6. *ENDOBASE* sends a C-FIND request to the worklist server containing the worklist query attributes for the second defined AE.
- ...
7. *ENDOBASE* sends a C-FIND request to the worklist server containing the worklist query attributes for the *n*-th defined AE.
8. The worklist server returns a C-FIND response with status Pending containing the requested attributes of the first matching worklist item.
9. The worklist server returns a C-FIND response with status Pending containing the requested

attributes of the second matching worklist item.

10. The worklist server returns a C-FIND response with status Pending containing the requested attributes of the third matching worklist item.
11. The worklist server returns a final C-FIND response with status Success indicating that no further matching worklist items exist. This example assumes that only 3 worklist items match the query for this (last) AE.
12. *ENDOBASE* closes the association with the worklist server.

4.2.1.3.5.2 Proposed Presentation Contexts

ENDOBASE is capable of proposing the presentation contexts shown in the table below.

Table 4-22: Proposed presentation context for Worklist Query:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.1.3.5.3 SOP Specific Conformance

If worklist query fails in *ENDOBASE*, the information is written into a log file.

The behavior of *ENDOBASE* when encountering status codes in a worklist C-FIND response is summarized in the table below:

Table 4-23: Worklist C-FIND response status handling behavior:

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000h	The SCP has completed the matches. Worklist items are imported in <i>ENDOBASE</i>
Pending	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	FF00h	The contained worklist item is collected for import in <i>ENDOBASE</i> .
Pending	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this	FF01h	If contained worklist item matches the search criteria, it is collected for import in <i>ENDOBASE</i> . Otherwise the worklist item is ignored.

	identifier		
*	*	Any other	The association will be closed. The reason is logged.

The behavior of *ENDOBASE* during communication failure is summarized in the table below:

Table 4-24: Worklist C-FIND communication failure behavior:

Exception	Behavior
Timeout	The association is aborted using A-ABORT. The reason is logged.
Association aborted by the SCP or network layers.	The reason is logged.

A failed worklist query will be repeated automatically after the scheduled time period.

The table below provides a description of the *ENDOBASE* worklist request identifier. The requested return keys can be changed in *ENDOBASE* by modifying a configuration file (refer to section 4.4.3). The table shows the default configuration. The matching keys are not configurable in *ENDOBASE*.

Non-matching responses returned by the worklist server due to unsupported optional matching keys are ignored. Duplicate items are removed.

Table 4-25 Worklist request identifier

Module Name	Tag	VR	M	R
Attribute Name				
Scheduled Procedure Step Module				
Scheduled Procedure Step Sequence	(0040,0100)	SQ		
>Scheduled Station AE Title	(0040,0001)	AE	S	x
>Scheduled Procedure Step Start Date	(0040,0002)	DA	R	x
>Scheduled Procedure Step Start Time	(0040,0003)	TM		x
>Scheduled Procedure Step End Date	(0040,0004)	DA		x
>Scheduled Procedure Step End Time	(0040,0005)	TM		x
>Modality	(0008,0060)	CS		x
>Scheduled Performing Physician's Name	(0040,0006)	PN		x
>Scheduled Procedure Step Description	(0040,0007)	LO		x
>Scheduled Station Name	(0040,0010)	SH		x
>Scheduled Procedure Step Location	(0040,0011)	SH		x
>Pre-Medication	(0040,0012)	LO		x
>Scheduled Procedure Step ID	(0040,0009)	SH		x
>Comments on the Scheduled Procedure Step	(0040,0400)	LT		x
Requested Procedure Module				
Requested Procedure ID	(0040,1001)	SH		x

Requested Procedure Description	(0032,1060)	LO		x
Reason for Requested Procedure	(0040,1002)	LO		x
Study Instance UID	(0020,000D)	UI		x
Requested Procedure Location	(0040,1005)	LO		x
Requested Procedure Comments	(0040,1400)	LT		x
Image Service Request Module				
Accession Number	(0008,0050)	SH		x
Referring Physician's Name	(0008,0090)	PN		x
Reason for the Imaging Service Request	(0040,2001)	LO		x
Visit Identification Module				
Admission ID	(0038,0010)	LO		x
Patient Identification Module				
Patient Name	(0010,0010)	PN		x
Patient ID	(0010,0020)	LO		x
Patient Address	(0010,1040)	LO		x
Patient's Telephone Numbers	(0010,2154)	SH		x
Patient Demographic Module				
Patient's Birth Date	(0010,0030)	DA		x
Patient's Sex	(0010,0040)	CS		x

The above table should be read as follows:

Module Name: The name of the associated module for supported attributes.

Attribute Name: Attributes supported to build an *ENDOBASE* worklist request identifier.

Tag: DICOM tag for this attribute

VR: DICOM VR for this attribute

M: Matching key. A "S" will indicate that *ENDOBASE* will supply an attribute value for single value matching, a "R" will indicate range matching and a "*" will denote wildcard matching.

R: Return keys. An "x" will indicate that *ENDOBASE* will supply this attribute as return key with zero length for universal matching.

4.2.1.3.6 Activity – Worklist Response

ENDOBASE does not initiate any associations.

4.2.1.4 Association Acceptance Policy

4.2.1.4.1 Activity – Export Image / Video

ENDOBASE does not accept any associations.

4.2.1.4.2 Activity – Patient Query

ENDOBASE does not accept any associations.

4.2.1.4.3 Activity – Study Query

ENDOBASE does not accept any associations.

4.2.1.4.4 Activity – Import Images

4.2.1.4.4.1 Description and Sequencing of Activities

A) Import images from a PACS

A user can import images from a PACS.

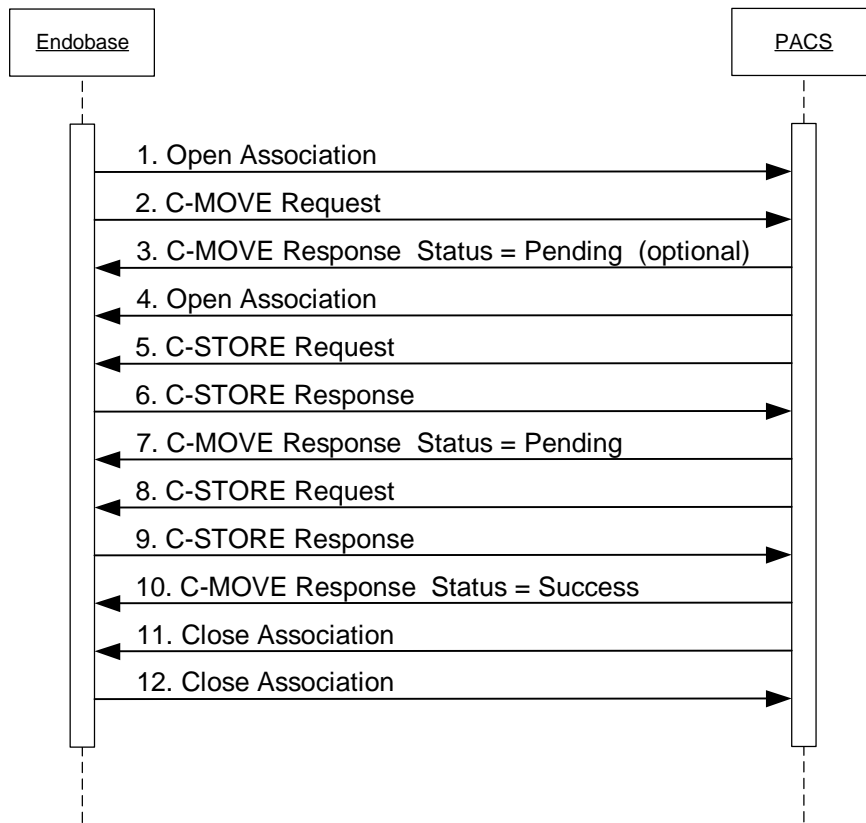
If an association has been established successfully by *ENDOBASE*, *ENDOBASE* sends the C-MOVE request and waits for answers (refer to section 4.2.1.3.3).

The PACS initiates an association. *ENDOBASE* accepts this association only, if it has sent a C-MOVE request before. If the association can be opened, the PACS sends a C-STORE request for each image of the selected patient. *ENDOBASE* sends a C-STORE response for each received C-STORE request. After receiving a C-STORE response, the PACS sends a C-MOVE response with the appropriate status. After having received all C-STORE responses, the PACS sends a C-MOVE response with status=Success. The PACS closes its association. *ENDOBASE* closes its association.

If the PACS closes an association after a C-STORE response, *ENDOBASE* accepts a new association initiated by the PACS for the next C-STORE request.

The user can cancel the storing process. In this case *ENDOBASE* closes all open associations and does not accept any new association, unless the user restartet the DICOM image import.

Figure 4-11: Sequencing of activity – Import Images from a PACS.



A possible sequence of interactions between *ENDOBASE* and a PACS is illustrated in Figure 4-11.

1. *ENDOBASE* opens an association with the PACS.
2. *ENDOBASE* sends a C-MOVE request to the PACS containing the patient attributes.
3. The PACS sends a C-MOVE response indicating that images can be expected (optional).
4. The PACS opens an association with *ENDOBASE*.
5. An image is transmitted from the PACS to *ENDOBASE* using a C-STORE
6. *ENDOBASE* replies with a C-STORE response (status success).
7. The PACS sends a C-MOVE response indicating that more images can be expected.
8. Another image is transmitted from the PACS to *ENDOBASE* using a C-STORE
9. *ENDOBASE* replies with a C-STORE response (status success).
10. The PACS sends a C-MOVE response indicating that all images have been send. This example assumes that only 2 images are available for the selected patient.
11. The PACS closes the association with *ENDOBASE*.
12. *ENDOBASE* closes the association with the PACS.

The PACS may perform step 11 before 10. In addition, the PACS may close the association after each C-STORE response and open a new one for the next C-STORE request.

B) Unsolicited Images Import

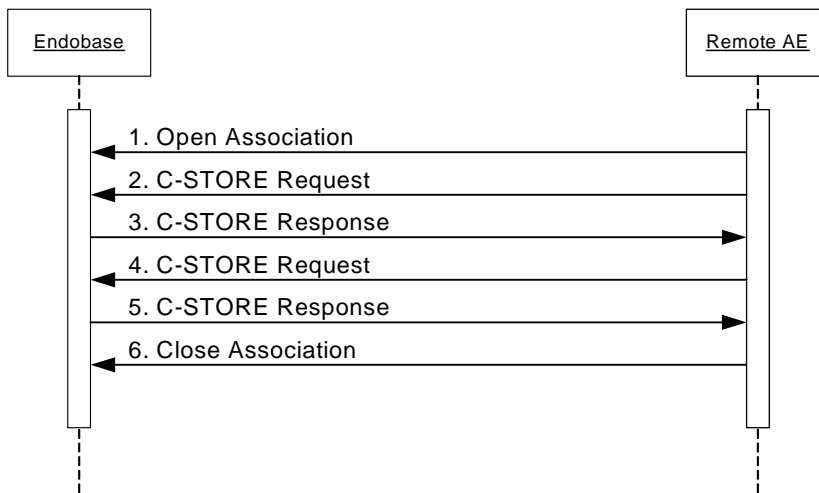
While performing an endoscopic examination, *ENDOBASE* client can received images from any

Application Entity. *ENDOBASE* server can always receive images from any Application Entity.

The remote AE initiates an association. *ENDOBASE* accepts this association. After the association has been opened, the remote AE sends a C-STORE request for each pending image. *ENDOBASE* sends a C-STORE response for each received C-STORE request. After having sent all C-STORE responses, the remote AE closes its association.

If the remote AE closes an association after a C-STORE response, *ENDOBASE* accepts a new association initiated by the remote AE for the next C-STORE request. Multiple remote AE may send images in parallel.

Figure 4-12: Sequencing of activity – Unsolicited Images Import.



A possible sequence of interactions between *ENDOBASE* and a remote AE is illustrated in Figure 4-11.

1. The remote AE opens an association with *ENDOBASE*.
2. An image is transmitted from the remote AE to *ENDOBASE* using a C-STORE
3. *ENDOBASE* replies with a C-STORE response (status success).
4. Another image is transmitted from the remote AE to *ENDOBASE* using a C-STORE
5. *ENDOBASE* replies with a C-STORE response (status success).
6. The remote AE closes the association with *ENDOBASE*.

The remote AE may close the association after each C-STORE response and open a new one for the next C-STORE request.

4.2.1.4.4.2 Accepted Presentation Contexts

ENDOBASE is capable of accepting the presentation contexts shown in Table 4-26.

Table 4-26: Accepted presentation contexts for activity Import Images:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		

Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
X-Ray Angiography Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
X-Ray Radiofluoroscopy Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Nuclear Medicine(NM) Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4.2.1.4.4.2.1 Transfer Syntax Selection Policies

To external systems, *ENDOBASE* selects only implicit Little Endian as Transfer Syntax except for MPEG encoded video export for which the transfer syntax MPEG2 MP@ML Image Compression is used.

4.2.1.4.4.3 SOP Specific Conformance

4.2.1.4.4.3.1 SOP Specific Conformance to Storage SOP Classes

ENDOBASE provides standard conformance to the Storage Service Class.

All of the Image Storage Classes listed in Table 4-26 are supported.

If ENDOBASE fails in importing images, the information is written into a log file.

4.2.1.4.4.3.2 Response Status

ENDOBASE will always send Success when generating the C-STORE response command message. This will be done, even if the received image can not be processed successfully. In case the received images is not processed as expected, the user will be informed about the number of lost images (manual image import from PACS) and an entry will be written to a log file (manual image import from PACS and unsolicited image import).

ENDOBASE will always send status=Success within a C-STORE response, even if the image received in the preceding C-STORE request could not be processed successfully. In such a case, the user will be informed via a message box about the number of images, which could not be processed.

Table 4-27: Storage C-STORE return status

Service Status	Further Meaning	Status Code	Reason
Success	Success	0000h	Operation complete

4.2.1.4.5 Activity – Worklist Request

4.2.1.4.5.1 Description and Sequencing of Activities

ENDOBASE can be configured to provide worklist information to other AE's. ENDOBASE answers requests from any remote AE.

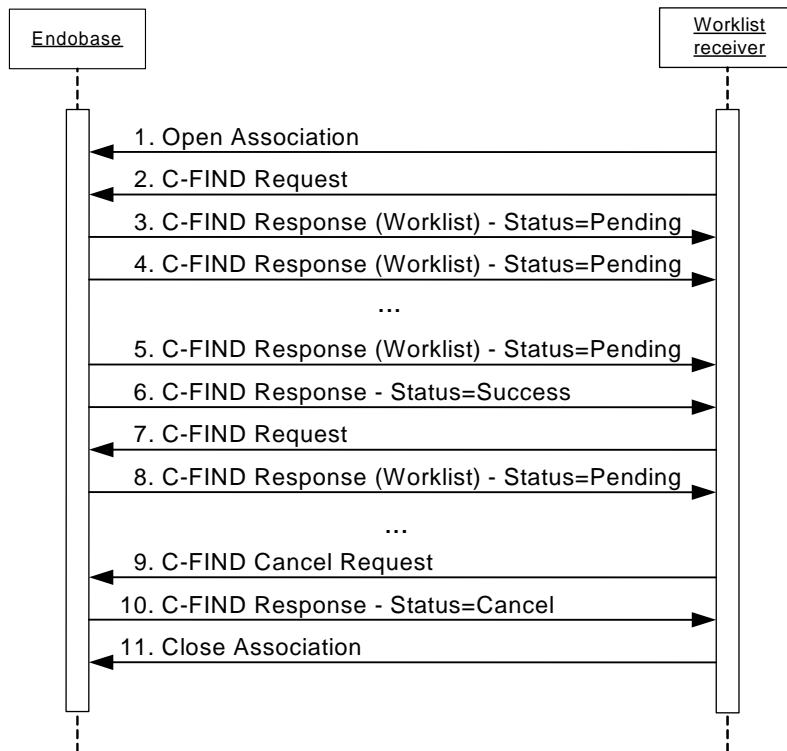
If an association has been established successfully, ENDOBASE performs the following steps for the request:

- receive C-FIND request
- retrieve matching keys and return keys from C-FIND request
- search examinations matching the matching keys in database
- send a C-FIND response for each matching entry
- close association (initiated by SCU)

The remote AE may cancel the process by sending a C-FIND cancel request. Multiple C-FIND requests may be sent by the SCU using the same association. The next C-FIND request is accepted after all C-FIND response messages for the previous C-FIND request have been sent.

ENDOBASE does not limit the number of processed worklist responses.

Figure 4-13: Sequencing of activity – Worklist Response.



A possible sequence of interactions between *ENDOBASE* and a worklist server is illustrated in Figure 4-10.

1. SCU opens an association with the worklist server.
2. SCU sends a C-FIND request to *ENDOBASE* containing the match and return keys.
3. *ENDOBASE* returns a C-FIND response with status Pending containing the requested attributes of the first matching worklist item.
4. *ENDOBASE* returns a C-FIND response with status Pending containing the requested attributes of the second matching worklist item.
- ...
5. *ENDOBASE* returns a C-FIND response with status Pending containing the requested attributes of the last matching worklist item.
6. *ENDOBASE* returns a C-FIND response with status Success indicating that no further matching worklist items exist.
7. SCU sends next C-FIND request to *ENDOBASE* containing the match and return keys.
8. *ENDOBASE* returns a C-FIND response with status Pending containing the requested attributes of the second matching worklist item.
- ...
9. SCU sends a C-FIND cancel request.
10. *ENDOBASE* returns a C-FIND response with status Cancel indicating that sending of worklist items has been cancelled by SCU.
11. SCU closes the association with the worklist server.

4.2.1.4.5.2 Accepted Presentation Contexts

ENDOBASE is capable of accepting the presentation contexts shown in the table below.

Table 4-28: Proposed presentation context for Worklist Query:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4.2.1.4.5.2.1 Transfer Syntax Selection Policies

To external systems, ENDOBASE selects only implicit Little Endian as Transfer Syntax.

4.2.1.4.5.3 SOP Specific Conformance

The meaning of status codes sent in a worklist C-FIND response by ENDOBASE is summarized in the table below:

Table 4-29: Worklist C-FIND response status codes:

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000h	All worklist items have been sent. Association may be closed
Failed	Unable to process	C000h	ENDOBASE failed to handle the request (0000,0902) contains error description
Cancel	Matching terminated due to Cancel request	FE00h	ENDOBASE has received a C-FIND-CANCEL. No more messages will follow. Association may be closed by peer.
Pending	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	FF00h	Current message contains a valid worklist entry. More messages will follow.
Pending	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	FF01h	Current message contains a valid worklist entry. More messages will follow. ENDOBASE does not support all given matching keys for match or does not support all return keys. Not supported return keys are missing in response. Not supported matching keys are

ignored.

The behavior of *ENDOBASE* during communication failure is summarized in the table below:

Table 4-30: Worklist C-FIND communication failure behavior:

Exception	Behavior
Timeout	The association is aborted using A-ABORT. The reason is logged.
Association aborted by the SCU or network layers.	The reason is logged.

The table below provides a description of the worklist matching and return keys supported by *ENDOBASE* as SCP.

Table 4-31 Worklist request identifier

Module Name	Attribute Name	Tag	VR	Value	M
Scheduled Procedure Step Module					
	Scheduled Procedure Step Sequence	(0040,0100)	SQ	Contains always a single item	
	>Scheduled Station AE Title	(0040,0001)	AE	The AE title from the list of known AE titles of <i>ENDOBASE</i>	S
	>Scheduled Procedure Step Start Date	(0040,0002)	DA	Examination date	S/R
	>Scheduled Procedure Step Start Time	(0040,0003)	TM	Examination start time	S/R
	>Scheduled Procedure Step End Date	(0040,0004)	DA	Examination end date	
	>Scheduled Procedure Step End Time	(0040,0005)	TM	Examination end time	
	>Modality	(0008,0060)	CS	If this is matching criterion: the requested modality, otherwise empty	S
	>Scheduled Performing Physician's Name	(0040,0006)	PN	Examiner	S/*
	>Scheduled Procedure Step Description	(0040,0007)	LO	Examination Type	S
	>Scheduled Station Name	(0040,0010)	SH	Description of remote AE	S
	>Scheduled Procedure Step Location	(0040,0011)	SH	Examination Room	S

>Pre-Medication	(0040,0012)	LO	Medications, multiple fields possible, each field in format <quantity> <unit> <medication name>	
>Scheduled Procedure Step ID	(0040,0009)	SH	HL7 Order ID	S
>Comments on the Scheduled Procedure Step	(0040,0400)	LT	Examination additional Information	
Requested Procedure Module				
Requested Procedure ID	(0040,1001)	SH	Examination number	S
Requested Procedure Description	(0032,1060)	LO	Examination Type	S
Reason for Requested Procedure	(0040,1002)	LO	Indication, multiple fields possible	
Study Instance UID	(0020,000D)	UI	DICOM study UID created by ENDOBASE if not already existing	S
Requested Procedure Location	(0040,1005)	LO	Examination Room	S
Requested Procedure Comments	(0040,1400)	LT	Examination additional Information	
Image Service Request Module				
Accession Number	(0008,0050)	SH	Generated by ENDOBASE the same way as for sending images	S
Referring Physician's Name	(0008,0090)	PN	Referring doctor name	S/*
Reason for the Imaging Service Request	(0040,2001)	LO	Indication	
Visit Identification Module				
Admission ID	(0038,0010)	LO	If examination set as performed: admissin number of examination else: current admission number of patient	S
Patient Identification Module				
Patient Name	(0010,0010)	PN	Patient name	S/*
Patient ID	(0010,0020)	LO	Patient ID	S
Patient Address	(0010,1040)	LO	Patient address in format <street>, <zip code> <city>	
Patient's Telephone Numbers	(0010,2154)	SH	Patient home phone	
Patient Demographic Module				
Patient's Birth Date	(0010,0030)	DA	Patient birth date	S/R

Patient's Sex	(0010,0040)	CS	Patient sex
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The above table should be read as follows:

- Module Name: The name of the associated module for supported attributes.
- Attribute Name: Attributes supported to build an *ENDOBASE* worklist request identifier.
- Tag: DICOM tag for this attribute
- VR: DICOM VR for this attribute
- Value: Value of *ENDOBASE* database used for matching / response
- M: Matching key. A "S" will indicate that *ENDOBASE* will support single value matching, a "R" will indicate range matching and a "*" will denote wildcard matching.

4.3 Network Interfaces

4.3.1 Physical Network Interface

All physical network interfaces supported by the Windows NT / 2000 / XP System upon which *ENDOBASE* runs can be used.

4.3.2 Additional Protocols

Where host names rather than IP addresses are used in the configuration properties to specify presentation addresses for remote AE's, 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

ENDOBASE can use different AE titles for different connections. This is necessary, because its different communication components may be installed on different computers (workstations, server). Following AE Titles can be administered in *ENDOBASE*:

- AE Title for manual export / import.
A different AE Title has to be administered for each *ENDOBASE* workstation. This setting is used for communication during manual import and manual export of images.
This setting can be changed in *ENDOBASE* administration. For the image import a TCP/IP port has to be configured for each workstation.
- AE Title for automatic export
A special AE Title (different from the *ENDOBASE* workstations) has to be set for automatic export of images.
This setting can be changed in *ENDOBASE* administration.
- AE Title for automatic image import on *ENDOBASE* server.
A special AE Title (different from the *ENDOBASE* workstations) has to be set for automatic import of images.
This setting can be changed in *ENDOBASE* administration.
- AE Title for worklist import

A special AE Title has to be set for the worklist import. This AE Title is used for communication with worklist provider.

This setting can be changed in the administration tool of the *ENDOBASE* worklist service.

- AE Title for worklist provider

A special AE title has to be set for worklist provider functionality. This AE title is used for communication with AE's using the worklist reponse functionality.

This setting can be changed in *ENDOBASE* administration.

The AE Titles mentioned above are used for identification of the communication component as described in DICOM standard. Additionally a list of AE Titles can be administered for worklist import. These AE Titles are not used for establishing communications, but as matching keys in the C-FIND request. This list of AE Titles can be changed in the administration tool of the *ENDOBASE* worklist service.

Only Olympus service engineers should perform the configuration.

Table 4-32: *ENDOBASE* title configuration table

Purpose	Default Calling Application Title	Default Port Number
Manual Import / Export Unsolicited Image Import	ENDOBASE	4003
Automatic Export	Not set	--
Automatic import on <i>ENDOBASE</i> server	Not set	--
Worklist import	Not set	--
Worklist provider	Not set	--

4.4.1.2 Remote AE Title / Presentation Address Mapping

Multiple remote PACS can be defined in *ENDOBASE*. AE Title, Host Name (Server Name / IP address) and Port Number can be defined for each remote application.

Following remote AE Titles can be administered in *ENDOBASE*:

- List of remote AE Titles for image / video import / export and for worklist provider functionality. For each AE Title the availability for import and for export can be set separately. During (manual and unsolicited) import of images, the sending AE Title (sender of C-STORE request) is not checked against the list of known AE Titles. That means all AE Titles are accepted. The AE Titles used for automatic export and as receiver of worklists can be set depending on examination type. This setting can be changed in *ENDOBASE* administration.
- Remote AE Title for worklist import
A special AE Title has to be set for the worklist import. This AE Title is used for communication with worklist provider.
This setting can be changed in the administration tool of the *ENDOBASE* worklist service.

4.4.2 Parameters

A number of parameters can be configured in *ENDOBASE* Administration. The table below shows those parameters.

Table 4-33: Configuration parameters table.

Parameter	Configurable (Yes/No)	Default Value
General Parameters		
Timeout waiting for acceptance or rejection Response to an Association Open Request (Application Level timeout)	Yes (Application level Timeouts are configured in one setting)	20 s
Time-out waiting for response to TCP/IP connect request (Low-level timeout)	No	300 s
Time-out waiting for acceptance of a TCP/IP connect request (Low-level timeout)	No	300 s
Time-out waiting for data between TCP/IP packets (Low-level timeout)	No	300 s
Storage Parameters		
Max PDU Receive Size	No	32,768 Bytes (32 kB)
Max PDU Send Size	No	32,768 Bytes (32 kB)
Storage SCU time-out waiting for a response to a C-STORE_RQ (Application level timeout)	Yes (Application level timeouts are configured in one setting)	20 s
Apply Patient ID for Unique Key (for each remote AE Title)	Yes (separately for each remote AE Title)	No
Image Exporting SOP (VL, VL Endoscopic or SC) (for each remote AE Title)	Yes (separately for each remote AE Title)	SC
Video Exporting SOP (VL, VL Endoscopic, SC or Video Endoscopic) (for each remote AE Title)	Yes (separately for each remote AE Title)	Video Endoscopic
Use Accession Number Field	Yes	HL7 Order ID
Type of images for automatic export (all examination images, selected examination images, report images)	Yes	All disabled
Re-send time for automatic export (retry after failed sending)	Yes	60 minutes
Discard time for automatic	Yes	10 days

export (stop of retry after failed sending)

4.4.3 Special Configuration of Worklist Query

A number of parameters can be configured in *ENDOBASE* Worklist Service Administration. The table below shows those parameters.

Table 4-34: Worklist configuration parameters table.

Parameter	Configurable (Yes/No)	Default Value
Short time list poll time. (Time between 2 worklists requests for the next days)	Yes	5 minutes
Long time list poll time. (Time between 2 worklists requests for all days from current date)	Yes	60 minutes
Days to check for short time worklist	Yes	1 Day (current + next day)

5 SUPPORT OF CHARACTER SETS

ENDOBASE supports the character set "ISO 8859 Latin1 (ISO-IR 100)".

6 Security

ENDOBASE does not support any specific security measures.

It is assumed *that ENDOBASE* is used within a secured environment. It is assumed that a secured environment includes at a minimum:

- Firewall or router protections to ensure that only approved external hosts have network access to *ENDOBASE*.
- Firewall or router protections to ensure that *ENDOBASE* only has network access to approved external hosts.
- Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN)).

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

7 Annexes

7.1 IOD Contents

7.1.1 Created SOP instances

Table 7-1 specifies the attributes of a Visible Light image transmitted by *ENDOBASE*.

Table 7-2 specifies the attributes of a Visible Light Endoscopic image transmitted by *ENDOBASE*.

Table 7-3 specifies the attributes of a Secondary Capture image transmitted by *ENDOBASE*.

Table 7-4 specifies the attributes of a Video Endoscopic image transmitted by *ENDOBASE*.

The following tables use a number of abbreviations.

The abbreviations used in the “Presence of...” column are:

NAP	Attribute not Always Present
VNAP	Value Not Always Present (attribute sent zero length if no value is present).
ALWAYS	Always present.
EMPTY	Attribute is sent without a value.

The abbreviations used in the “Source” column:

HIS	the attribute value source is the hospital information system.
USER	the attribute value is from user input.
AUTO	the attribute value is automatically generated by <i>ENDOBASE</i> .

7.1.1.1 Visible Light Image IOD (retired)

Table 7-1: IOD of created Visible Light SOP instances.

Information Entity / Module						
Attribute Name	Tag	VR	Value	Presence of Value	Source	
Patient / Patient				ALWAYS		
Patient's Name	(0010,0010)	PN	From HIS or user input. Will contain all 5 components (some of them are empty). Maximum 64 characters.	ALWAYS	HIS/ USER	
Patient ID	(0010,0020)	LO	From HIS or user input. Maximum 64 characters.	VNAP	HIS/ USER	
Patient's Birthday	(0010,0030)	DA	From HIS or user input.	VNAP	HIS/ USER	
Patient's Sex	(0010,0040)	CS	From HIS or user input.	VNAP	HIS/ USER	

Study / General Study					ALWAYS	
Study Instance UID	(0020,000D)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO	
Study Date	(0008,0020)	DA	<yyyymmdd>	ALWAYS	HIS/ USER	
Study Time	(0008,0030)	TM	<hhmmss>	ALWAYS	AUTO	
Referring Physician's Name	(0008,0090)	PN	From HIS or user input. Will contain all 5 components (some of them are empty). Maximum 64 characters.	VNAP	HIS/ USER	
Study ID	(0020,0010)	SH	From HIS or user input.	VNAP	HIS/ USER	
Accession Number	(0008,0050)	SH	Configurable (refer to section 4.4.2). From HIS, generated by <i>ENDOBASE</i> or user input.	VNAP	HIS/ AUTO/ USER	
Study Description	(0008,1030)	LO	Examination Type From HIS or user input.	VNAP	HIS/ USER	
Study / Patient Study					ALWAYS	
Patient's Age	(0010,1010)	AS	Calculated from Birthday on base of study date	ALWAYS	AUTO	
Series / General Series					ALWAYS	
Modality	(0008,0060)	CS	ES	ALWAYS	AUTO	
Series Instance UID	(0020,000E)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO	
Series Number	(0020,0011)	IS	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO	
Series Date	(0008,0021)	DA	<yyyymmdd>	ALWAYS	HIS/ USER	
Series Time	(0008,0031)	TM	<hhmmss>	ALWAYS	AUTO	
Series Description	(0008,103E)	LO	Examination Type From HIS or user input.	VNAP	HIS/ USER	
Equipment / General Equipment					ALWAYS	
Manufacturer	(0008,0070)	LO	OLYMPUS	ALWAYS	AUTO	
Station Name	(0008,1010)	SH	<i>ENDOBASE</i> examination room name From HIS or user input.	VNAP	HIS/ USER	
Institutional Department Name	(0008,1040)	LO	<i>ENDOBASE</i> department name From HIS or user input.	ALWAYS	HIS/ USER	
Image / General Image					ALWAYS	
Instance Number	(0020,0013)	IS	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO	
Content Date	(0008,0023)	DA	<yyyymmdd>	ALWAYS	USER	

Content Time	(0008,0033)	TM	<hhmmss>	ALWAYS	AUTO
Image / Cine				for multi frame images only	NAP
Frame Time	(0018,1063)	DS	40 * frame skip setting	NAP	USER
Image / Multi Frame				for multi frame images only	NAP
Number of frames	(0028,0008)	IS	Generated by <i>ENDOBASE</i>	NAP	AUTO
Frame Increment Pointer	(0028,0009)	AT	(0018,1063)	NAP	AUTO
Image / Image Pixel				ALWAYS	
Samples per Pixel	(0028,0002)	US	3	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	RGB	ALWAYS	AUTO
Rows	(0028,0010)	US	0..576	ALWAYS	AUTO
Columns	(0028,0011)	US	0..768	ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
High Bit	(0028,0102)	US	7	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0000H	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OW	Image pixel data	ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0	ALWAYS	AUTO
Image / Acquisition Context				ALWAYS	
Acquisition Context Sequence	(0040,0555)	SQ		EMPTY	
Image / VL Image				ALWAYS	
Image Type	(0008,0008)	CS	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	RGB	ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
High Bit	(0028,0102)	US	7	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0000H	ALWAYS	AUTO
Samples per Pixel	(0028,0002)	US	3	ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0	ALWAYS	AUTO

Image / SOP Common					ALWAYS	
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.14.1.1.77.1	ALWAYS	AUTO	
SOP Instance UID	(0008,0018)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO	
Instance Creator UID	(0008,0014)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO	

7.1.1.2 Visible Light Endoscopic Image IOD

Table 7-2: IOD of created Visible Light Endoscopic SOP instances.

Information Entity / Module						
Attribute Name	Tag	VR	Value	Presence of Value	Source	
Patient / Patient				ALWAYS		
Patient's Name	(0010,0010)	PN	From HIS or user input. Will contain all 5 components (some of them are empty). Maximum 64 characters.	ALWAYS	HIS/USER	
Patient ID	(0010,0020)	LO	From HIS or user input. Maximum 64 characters.	VNAP	HIS/USER	
Patient's Birthday	(0010,0030)	DA	From HIS or user input.	VNAP	HIS/USER	
Patient's Sex	(0010,0040)	CS	From HIS or user input.	VNAP	HIS/USER	
Study / General Study				ALWAYS		
Study Instance UID	(0020,000D)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO	
Study Date	(0008,0020)	DA	<yyyymmdd>	ALWAYS	HIS/USER	
Study Time	(0008,0030)	TM	<hhmmss>	ALWAYS	AUTO	
Referring Physician's Name	(0008,0090)	PN	From HIS or user input. Will contain all 5 components (some of them are empty). Maximum 64 characters.	VNAP	HIS/USER	
Study ID	(0020,0010)	SH	From HIS or user input.	VNAP	HIS/USER	
Accession Number	(0008,0050)	SH	Configurable (refer to section 4.4.2). From HIS, generated by <i>ENDOBASE</i> or user input.	VNAP	HIS/AUTO/USER	
Study Description	(0008,1030)	LO	Examination Type From HIS or user input.	VNAP	HIS/USER	
Study / Patient Study				ALWAYS		
Patient's Age	(0010,1010)	AS	Calculated from Birthday on	ALWAYS	AUTO	

				base of study date		
Series / General Series					ALWAYS	
Modality	(0008,0060)	CS	ES		ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Generated by <i>ENDOBASE</i>		ALWAYS	AUTO
Series Number	(0020,0011)	IS	Generated by <i>ENDOBASE</i>		ALWAYS	AUTO
Series Date	(0008,0021)	DA	<yyyymmdd>		ALWAYS	HIS/ USER
Series Time	(0008,0031)	TM	<hhmmss>		ALWAYS	AUTO
Series Description	(0008,103E)	LO	Examination Type From HIS or user input.		VNAP	HIS/ USER
Equipment / General Equipment					ALWAYS	
Manufacturer	(0008,0070)	LO	OLYMPUS		ALWAYS	AUTO
Station Name	(0008,1010)	SH	<i>ENDOBASE</i> examination room name From HIS or user input.		VNAP	HIS/ USER
Institutional Department Name	(0008,1040)	LO	<i>ENDOBASE</i> department name From HIS or user input.		ALWAYS	HIS/ USER
Image / General Image					ALWAYS	
Instance Number	(0020,0013)	IS	Generated by <i>ENDOBASE</i>		ALWAYS	AUTO
Content Date	(0008,0023)	DA	<yyyymmdd>		ALWAYS	USER
Content Time	(0008,0033)	TM	<hhmmss>		ALWAYS	AUTO
Image / Cine				for multi frame images only	NAP	
Frame Time	(0018,1063)	DS	40 * frame skip setting		NAP	USER
Image / Multi Frame				for multi frame images only	NAP	
Number of frames	(0028,0008)	IS	Generated by <i>ENDOBASE</i>		NAP	AUTO
Frame Increment Pointer	(0028,0009)	AT	(0018,1063)		NAP	AUTO
Image / Image Pixel					ALWAYS	
Samples per Pixel	(0028,0002)	US	3		ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	RGB		ALWAYS	AUTO
Rows	(0028,0010)	US	0..576		ALWAYS	AUTO
Columns	(0028,0011)	US	0..768		ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8		ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8		ALWAYS	AUTO

High Bit	(0028,0102)	US	7		ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0000H		ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OW	Pixel data of image		ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0		ALWAYS	AUTO
Image / VL Image					ALWAYS	
Image Type	(0008,0008)	CS	Generated by <i>ENDOBASE</i>		ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	RGB		ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8		ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8		ALWAYS	AUTO
High Bit	(0028,0102)	US	7		ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0000H		ALWAYS	AUTO
Samples per Pixel	(0028,0002)	US	3		ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0		ALWAYS	AUTO
Image / SOP Common					ALWAYS	
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.14.1.1.77.1.1		ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Generated by <i>ENDOBASE</i>		ALWAYS	AUTO
Instance Creator UID	(0008,0014)	UI	Generated by <i>ENDOBASE</i>		ALWAYS	AUTO

7.1.1.3 Secondary Capture Image IOD

Table 7-3: IOD of created Secondary Capture SOP instances.

Information Entity / Module						
Attribute Name	Tag	VR	Value	Presence of Value	Source	
Patient / Patient					ALWAYS	
Patient's Name	(0010,0010)	PN	From HIS or user input. Will contain all 5 components (some of them are empty). Maximum 64 characters.	ALWAYS	HIS/USER	
Patient ID	(0010,0020)	LO	From HIS or user input. Maximum 64 characters.	VNAP	HIS/USER	
Patient's Birthday	(0010,0030)	DA	From HIS or user input.	VNAP	HIS/USER	

Patient's Sex	(0010,0040)	CS	From HIS or user input.	VNAP	HIS/ USER
Study / General Study				ALWAYS	
Study Instance UID	(0020,000D)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO
Study Date	(0008,0020)	DA	<yyyymmdd>	ALWAYS	HIS/ USER
Study Time	(0008,0030)	TM	<hhmmss>	ALWAYS	AUTO
Referring Physician's Name	(0008,0090)	PN	From HIS or user input. Will contain all 5 components (some of them are empty). Maximum 64 characters.	VNAP	HIS/ USER
Study ID	(0020,0010)	SH	From HIS or user input.	VNAP	HIS/ USER
Accession Number	(0008,0050)	SH	Configurable (refer to section 4.4.2). From HIS, generated by <i>ENDOBASE</i> or user input.	VNAP	HIS/ AUTO/ USER
Study Description	(0008,1030)	LO	Examination Type From HIS or user input.	VNAP	HIS/ USER
Study / Patient Study				ALWAYS	
Patient's Age	(0010,1010)	AS	Calculated from Birthday on base of study date	ALWAYS	AUTO
Series / General Series				ALWAYS	
Modality	(0008,0060)	CS	ES	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO
Series Date	(0008,0021)	DA	<yyyymmdd>	ALWAYS	USER
Series Time	(0008,0031)	TM	<hhmmss>	ALWAYS	AUTO
Series Description	(0008,103E)	LO	Examination Type From HIS or user input.	VNAP	HIS/ USER
Equipment / General Equipment				ALWAYS	
Manufacturer	(0008,0070)	LO	OLYMPUS	ALWAYS	AUTO
Station Name	(0008,1010)	SH	<i>ENDOBASE</i> examination room name From HIS or user input.	VNAP	HIS/ USER
Institutional Department Name	(0008,1040)	LO	<i>ENDOBASE</i> department name From HIS or user input.	ALWAYS	HIS/ USER
Equipment / SC Equipment				ALWAYS	
Conversion Type	(0008,0064)	CS	DI	ALWAYS	AUTO

Image / General Image					ALWAYS	
Instance Number	(0020,0013)	IS	Generated by <i>ENDOBASE</i>		ALWAYS	AUTO
Content Date	(0008,0023)	DA	<yyyymmdd>		ALWAYS	USER
Content Time	(0008,0033)	TM	<hhmmss>		ALWAYS	AUTO
Image / Cine			for multi frame images only		NAP	
Frame Time	(0018,1063)	DS	40 * frame skip setting		NAP	USER
Image / Multi Frame			for multi frame images only		NAP	
Number of frames	(0028,0008)	IS	Generated by <i>ENDOBASE</i>		NAP	AUTO
Frame Increment Pointer	(0028,0009)	AT	(0018,1063)		NAP	AUTO
Image / Image Pixel					ALWAYS	
Samples per Pixel	(0028,0002)	US	3		ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	RGB		ALWAYS	AUTO
Rows	(0028,0010)	US	0.576		ALWAYS	AUTO
Columns	(0028,0011)	US	0.768		ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8		ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8		ALWAYS	AUTO
High Bit	(0028,0102)	US	7		ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0000H		ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OW	Pixel data of image		ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0		ALWAYS	AUTO
Image / SC Image					NEVER	
only Type 3 fields are included in the module						
Image / SOP Common					ALWAYS	
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.14.1.1.7		ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Generated by <i>ENDOBASE</i>		ALWAYS	AUTO
Instance Creator UID	(0008,0014)	UI	Generated by <i>ENDOBASE</i>		ALWAYS	AUTO

7.1.1.4 Video Endoscopic Image IOD

Table 7-4: IOD of created Video Endoscopic Image SOP instances.

Information Entity / Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient / Patient				ALWAYS	
Patient's Name	(0010,0010)	PN	From HIS or user input. Will contain all 5 components (some of them are empty). Maximum 64 characters.	ALWAYS	HIS/ USER
Patient ID	(0010,0020)	LO	From HIS or user input. Maximum 64 characters.	VNAP	HIS/ USER
Patient's Birthday	(0010,0030)	DA	From HIS or user input.	VNAP	HIS/ USER
Patient's Sex	(0010,0040)	CS	From HIS or user input.	VNAP	HIS/ USER
Study / General Study				ALWAYS	
Study Instance UID	(0020,000D)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO
Study Date	(0008,0020)	DA	<yyyymmdd>	ALWAYS	HIS/ USER
Study Time	(0008,0030)	TM	<hhmmss>	ALWAYS	AUTO
Referring Physician's Name	(0008,0090)	PN	From HIS or user input. Will contain all 5 components (some of them are empty). Maximum 64 characters.	VNAP	HIS/ USER
Study ID	(0020,0010)	SH	From HIS or user input.	VNAP	HIS/ USER
Accession Number	(0008,0050)	SH	Configurable (refer to section 4.4.2). From HIS, generated by <i>ENDOBASE</i> or user input.	VNAP	HIS/ AUTO/ USER
Study Description	(0008,1030)	LO	Examination Type From HIS or user input.	VNAP	HIS/ USER
Study / Patient Study				ALWAYS	
Patient's Age	(0010,1010)	AS	Calculated from Birthday on base of study date	ALWAYS	AUTO
Series / General Series				ALWAYS	
Modality	(0008,0060)	CS	ES	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO
Series Date	(0008,0021)	DA	<yyyymmdd>	ALWAYS	HIS/ USER
Series Time	(0008,0031)	TM	<hhmmss>	ALWAYS	AUTO

Series Description	(0008,103E)	LO	Examination Type From HIS or user input.	VNAP	HIS/ USER
Equipment / General Equipment				ALWAYS	
Manufacturer	(0008,0070)	LO	OLYMPUS	ALWAYS	AUTO
Station Name	(0008,1010)	SH	ENDOBASE examination room name From HIS or user input.	VNAP	HIS/ USER
Institutional Department Name	(0008,1040)	LO	ENDOBASE department name From HIS or user input.	ALWAYS	HIS/ USER
Image / General Image				ALWAYS	
Instance Number	(0020,0013)	IS	Generated by ENDOBASE	ALWAYS	AUTO
Content Date	(0008,0023)	DA	<yyyymmdd>	ALWAYS	USER
Content Time	(0008,0033)	TM	<hhmmss>	ALWAYS	AUTO
Anatomic Region Sequence	(0008,2218)	SQ			
Image / Cine				ALWAYS	
Frame Time	(0018,1063)	DS	40	ALWAYS	AUTO
Image / Multi Frame				ALWAYS	
Number of frames	(0028,0008)	IS	Generated by ENDOBASE	ALWAYS	AUTO
Frame Increment Pointer	(0028,0009)	AT	(0018,1063)	ALWAYS	AUTO
Image / Image Pixel				ALWAYS	
Samples per Pixel	(0028,0002)	US	3	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	YBR_PARTIAL_420	ALWAYS	AUTO
Rows	(0028,0010)	US	videos with resolution 720 x 540 and	ALWAYS	AUTO
Columns	(0028,0011)	US	720 x 576 are created by ENDOBASE	ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
High Bit	(0028,0102)	US	7	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0000H	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OW	MPEG2 video data no audio stream included	ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0	ALWAYS	AUTO

Lossy Image Compression	(0028,2110)	CS	01		ALWAYS	AUTO
Image / SOP Common					ALWAYS	
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.77.1.1.1	ALWAYS	AUTO	
SOP Instance UID	(0008,0018)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO	
Instance Creator UID	(0008,0014)	UI	Generated by <i>ENDOBASE</i>	ALWAYS	AUTO	

7.1.2 Usage of attributes from received IOD's

No SOP Class specific fields are required.

7.1.3 Attribute Mapping

Not applicable.

7.1.4 Coerced/Modified fields.

No coercion is performed.

7.2 Data Dictionary of Private Attributes

No private attributes are defined.

7.3 Coded Terminologies and Templates

Not applicable.

7.4 Grayscale image consistency

Not applicable.

7.5 Standard Extended / Specialized / Private SOP Classes

No private SOP classes are supported.

Extensions and specializations are summarized below.

7.5.1 Visible Light Image Storage IOD (Retired)

An attribute (0008,0062) (empty) is sent.

7.5.2 Secondary Capture Image Storage IOD

7.5.2.1 SC Image modules

Although the module is defined as mandatory, attributes of the SC image module are never present. All attributes of this module are type 3 attributes (refer to section 7.1.1.3).

7.5.3 Activity – Import Images

ENDOBASE will always send status=Success within a C-STORE response, even if the image received in the preceding C-STORE request could not be processed successfully. In such a case, the user will be informed about the number of lost images (manual image import from PACS) and an entry will be written to a log file (manual image import from PACS and unsolicited image import) (refer to section 4.2.1.4.4.3.2).

7.6 Private Transfer Syntaxes

No private transfer syntaxes are supported.